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DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

by
Barbara Harrod Handmacher, B.S., M.A.

* * * * *

The Ohio State University

1978

Reading Committee: Approved By
Professor Donald J. Tosi, Adviser
Professor Joseph J. Quaranta
Professor Herman J. Peters
Professor Nancy K. Clatworthy

Adviser
College of Education
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VITA

May 29, 1932 . . . . Born - Dayton, Ohio

1954 . . . . . . . . B.S., Northwestern University, Evanston, Illinois

1955 . . . . . . . . Assistant Program Director, Youth Department, Metropolitan Y.W.C.A., Columbus, Ohio

1964 . . . . . . . . Teacher, Villa Park Pre-School Villa Park, Illinois


1965-1966 . . . . Teacher, Parkview Elementary School, Glen Ellyn, Illinois


1970 . . . . . . . . M.A., The Ohio State University, Columbus, Ohio

1971-1978 . . . . Doctoral Candidate, The Ohio State University, Columbus, Ohio
FIELDS OF STUDY

Major Field: Guidance and Counseling
Professor Donald J. Tosi, Adviser

Studies in Counseling Physiology.
Professor Frank Fletcher

Studies in Sociology.
Professor Nancy K. Clatworthy
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CHAPTER I

INTRODUCTION

Background

Guidance and counseling is a humanizing agent within social and educational systems. While it is often concerned with the practical areas of academic planning, career guidance and decision making, it is at the same time involved with the personal growth of the whole person. As a field it is concerned with helping the individual cope with his environment, assisting the realization of his interests and abilities and encouraging the expansion of his potential and happiness.

The counselor is interested in how both intrapersonal and interpersonal factors relate to effective coping and the actualizing of potential.

It is recognized by psychologists that three basic expressions of intrapersonal emotional dysfunction are high levels of anxiety, hostility and depression. Anxiety is considered to be the principal personality dynamic behind most maladaptive behavior (Cammer, 1969; Ellis, 1973; 1.
For this reason Ellis (1973) considers the reduction of anxiety and hostility to be primary therapeutic goals:

The concrete constructive goals of psychotherapy are derivatives of the two primary goals: the minimization of the client's anxiety and hostility. For as long as a human being is needlessly anxious or hostile, he simply is not going to achieve self-interest, self-direction, tolerance, acceptance of uncertainty, flexibility, scientific thinking, commitment, risk taking, self-acceptance, or virtually any other road to positive mental health — for the simple reason that he will be ceaselessly consuming his time and energy in his anxious and hostile behavior, and will be sidetracked from doing almost anything else but being self-blaming and angry at others. (p. 161)

There have been a variety of definitions of anxiety. Most of them involve the mutual theme of reaction to a perceived threat or stressful situation.

Spielberger (1972b) summarizes:

The term anxiety is most often used to describe an unpleasant emotional state or condition which is characterized by subjective feelings of tension, apprehension and worry, and by activation or arousal of the autonomic nervous system. An anxiety state (A-State) is evoked whenever a person perceives a particular stimulus or situation as potentially harmful, dangerous or threatening to him. (p. 482)
Spielberger (1972b) also defines trait anxiety:

The term anxiety is also used to refer to relatively stable individual differences in anxiety proneness as a personality trait. Trait anxiety (A-Trait) is not directly manifested in behavior, but may be inferred from the frequency and the intensity of an individual's elevations in A-State over time. (p. 482)

The other major response to threat is hostility or anger, the fight response, a reaction against frustration (Arnold and Gasson, 1968; Horney, 1950; Maslow, 1954).

Depression is also one of the most prevalent expressions today of emotional distress. Anxiety and hostility are both manifest in depression with the further appraisal that the situation may be hopeless and that one is incompetent or powerless to effect change (Arnold, 1968a; Arnold and Gasson, 1968; Cammer, 1969).

It is known that emotional states have corresponding physiological states. The psychophysiological person is espoused by many contemporary scientists in the fields of psychology and medicine (Arnold, 1968a; Ellis, 1962; Goldstein, 1940; Selye, 1956; Weiss, 1972; Weiss, Glazer and Pohorecky, 1974).

The simultaneously heightened mental and physical systems during anxiety and hostility are nature's way of
preparing the organism for temporary action against perceived threat. However, a high degree of proneness to these affective states causes prolonged and inappropriate emotional and bodily response. The disabling effect of such response on mental and physical health is well documented. It prevents effective coping, results in stress accumulation (bodily wear and tear) and encourages vulnerability to psychosomatic illness (Arnold, 1968a; Arnold and Gasson, 1968; Beck, 1972, Friedman and Rosenman, 1974; McQuade and Aidman, 1974; Selye, 1956).

It is pointed out by Beck (1972) that there is a continual cycle of interaction involving a cognitive-anxiety-physical response. Cognitive appraisal of a situation as threatening precipitates anxiety and physiological symptoms. The anxiety symptoms are in turn judged as signals of threat leading to additional anxiety. Continuing anxiety may also have a physicochemical basis. Selye (1956) notes that the sensation of being "keyed up" during anxiety is caused by the production of excess hormones which in turn continues the anxiety feeling. He states that rest or relaxation is the way to combat excessive general stress. Beck (1972) suggests that this cycle can be broken at any major point:
by changing the environment or situation; through cognitive re-education; or by use of relaxation.

The counselor, then, is concerned with helping the individual to deal effectively with anxiety, depression and hostility.

Viewing the individual as a whole entails seeing him also as a social person. Guidance and counseling is interested in how affective and social orientation are associated and how interpersonal traits are related to effective coping and self-realization. The counselor assists the individual in cultivating healthy interpersonal relationships which avoid extremes and promote personal growth and happiness for one's self and others.

One way of understanding interpersonal orientation is to survey three fundamental areas of relating: inclusion - the degree of association with people; control - the extent of dominance over others; and affection - the degree of emotional closeness with people (Schutz, 1967, 1966; Ryan, 1971).

Maslow (1968, 1954) suggests that "release of anxiety" causes a person to become more affectionate and less hostile. It helps facilitate mental and social
maturity, or what he terms self-actualization. He offers descriptions of self-actualized people, some of which give insight into the healthy expressions of inclusion, control and affection. Such a person is accepting, tolerant and spontaneous with others. He is more autonomous, desires more solitude and privacy than the average person, but feels a deep basic identification with people and tends to have deeper relationships than most people. His character structure is democratic rather than authoritarian.

The counselor is also concerned with basic human characteristics which may have bearing upon psychological orientation and social relationships. A relevant consideration is sex differences, especially in the counseling of women who are seeking to expand roles and self-concepts. Do the sexes innately and/or culturally differ in their range and expression of particular personality characteristics?

Since the pioneering work of Terman and Miles (1936), interest in sex-linked behavior has produced thousands of studies (Maccoby, 1966; Maccoby and Jacklin, 1974). Many have attempted to shed light on whether sex characteristics,
innate or culturally determined, account for differences in expressions of anxiety, hostility, depression, inclusion, control and affection. Maccoby and Jacklin (1974) have drawn conclusions concerning these behavior traits from their interpretation of several thousand books and articles related to sex differences. It is their opinion that males exhibit more aggressive behavior across cultures. They do not consider females to be more socially oriented. Among personality traits which they consider open to question are timidity, anxiety, passivity, competitiveness, dominance and nurturance.

Techniques which are effective in the reduction of anxiety, hostility and depression and which promote personal potential and social satisfaction are of prime importance to the counselor.

Relaxation has been acknowledged as a useful counseling technique. Methods have ranged from biofeedback (Brown, 1974, 1970; Kamiya, 1969, 1968) to progressive relaxation and systematic desensitization (Ellis, 1973; Jacobson, 1934; Lazarus, 1971; Tosi, 1974; Wolpe, 1958).

Long associated with the esoteric traditions of the East, meditation is now generating scientific interest in
the West as a technique for deep relaxation which combats stress and anxiety, and as a method for expanding psychobiological states of consciousness.

Psychologists interested in meditation's relationship to deep relaxation and states of consciousness consider it an exercise which alters the human nervous system and promotes greater synchronization in the use of the right and left cerebral hemispheres. The functions of the left hemisphere are largely rational, verbal and mathematical, while the right hemisphere is involved with intuitive, spatial and creative modes of expression. Advocates claim that greater synthesis of the intuitive and rational sides of man through meditation affords expanded use of potential and leads to full humanness (Dean, 1973; Deikman, 1969, 1966; LeShan, 1974; Naranjo and Ornstein, 1971; Ornstein, 1972; Shafii, 1973b).

Early research on meditation involved yoga and Zen practitioners in India and Japan. It was inspired by claims of direct control of involuntary physiological processes by various voluntary physiological and psychological techniques (Akishige, 1968; Anand, Chhina and Singh, 1961a; Bagchi and Wenger, 1957; Brosse, 1946).
States of deep physical quiescence were reported in the early studies.

Since 1970, a growing body of research has revolved around a technique known as Transcendental Meditation (TM) taught by Maharishi Mahesh Yogi (1967, 1966).

The technique may be defined as turning the attention inwards towards the subtler levels of a thought until the mind transcends the experience of the subtest state of the thought and arrives at the source of the thought. This expands the conscious mind and at the same time brings it in contact with the creative intelligence that gives rise to every thought. (Maharishi, 1967, p. 470)

The TM program works with the concept of the psychophysiological person. It maintains that meditation and its corresponding effect on the nervous system and general physiology results in increased mental and physical health and the expansion of individual potential.

During Transcendental Meditation, a mantra is silently repeated with eyes closed for 20 minutes, twice daily.

The TM technique centers on a mantra. Mantras are sounds. As used in Eastern meditation they are usually particular Sanskrit phonemes. Yoga schola Eliade (1958) writes that the great majority of these Sanskrit sounds are unintelligible and bizarre but that the value of
many was known even in the Vedic period. It has been hypothesized that mantras may possess resonant, rhythmic and soothing properties (Carrington, 1977; Carrington and Ephron, 1975; Eliade, 1958; Glueck and Stroebel, 1975a; Maharishi, 1966). In the TM program a mantra is defined simply as a Sanskrit sound whose effects are known (Bloomfield, Cain and Jaffe, 1975; Forem, 1973).

The teaching of the TM technique is standardized and reputed to be simple to learn. This, plus its availability due to a world-wide organization of teachers, may account for its increasing use in counseling, social service programs and scientific research.

Physiological research on TM shows a significant decrease in respiration rate, cardiac activity, blood lactate, oxygen consumption and carbon dioxide output (Glueck and Stroebel, 1975a; Wallace, 1970a; Wallace and Benson, 1972; Wallace, Benson and Wilson, 1971).

Electroencephalography studies reveal an increase in slow alpha wave frequency (8-9 Hz) which is rapidly synchronized in the right and left cerebral hemispheres of the frontal and posterior areas (Banquet, 1973, 1972; Glueck and Stroebel, 1975a).
Studies also relate Transcendental Meditation to psychological changes. Research indicates that there is an association between meditation and a decrease in anxiety, hostility and depression levels, and an increase in inner directedness and qualities of self-actualization (Ballou, 1973; Carrington and Ephron, 1975; Ferguson and Gowan, 1975; Glueck and Stroebel, 1975a; Hjelle, 1974; Seeman, Nidich and Banta, 1972). There are also reports of improved personal relationships (Forem, 1973; Robbins and Fisher, 1972).

TM has been recommended as an adjunct to counseling. It has been suggested in this regard not only as a means of hypometabolic relaxation, but also as a type of self-paced desensitization. During meditation anxiety producing thoughts may surface spontaneously but are experienced while deeply relaxed (Bloomfield, Cain and Jaffe, 1975; Carrington, 1977; Carrington and Ephron, 1975; Glueck and Stroebel, 1975a, 1975b; Goleman, 1971).

Statement of the Problem

It has been acknowledged that reduction of high levels of anxiety, depression and hostility, and the
healthy expression of inclusion, control and affection, help the individual cope effectively with his environment and expand his potential and happiness. It has been indicated that two variables which may have bearing on these personality and behavior traits are meditation and sex characteristics.

Transcendental Meditation has been cited as a simple Westernized version of a traditional Eastern (yogic) meditation and has been suggested as a possible adjunct to counseling. TM has been reputed to aid in the reduction of excess anxiety, depression and hostility, to engender healthy interpersonal orientation and to expand personal potential. There is a continuing need to explore possible new counseling techniques such as TM which are said to be easy to learn and may benefit large numbers of people.

The relationship of chronological time spent in TM to temperament scores is a valid area of study. Evaluation of time spent in the practice affords a better understanding of the nature of meditation. It analyzes which characteristics change, if at all, immediately or over time.

Research on sex differences is also a legitimate
concern of guidance and counseling. Counseling professionals have been known to hold sex-role stereotypes (Broverman, Broverman and Clarkson, 1970). Continuing research on sex differences helps the counselor determine if there are significantly different levels of particular personality variables between the sexes such as anxiety, hostility and sociability, or whether there is a marked degree of overlap in any area of temperament.

This knowledge can be used to clarify misconceptions when differences are not found, and when they are found it can be used to strengthen characteristics necessary to promote growth and development. For example, Maccoby and Jacklin (1974) cite evidence that girls after age 11 excel in verbal and language skills, while boys are superior in visual-spatial tasks when they reach adolescence. With this information, educational instruction could be instituted which well might remedy the situation. Knowledge concerning sex differences can be utilized to expand choices, career options and personal potential for both sexes.

The interaction of time in meditation and sex differences related to personality trait scores merits examination.
This has not been assessed, to date, in TM studies. By introducing another factor into the research a more explicit picture of the relationship of TM to personality and behavior can be gained. If personality levels differ between the sexes, trait scores may be influenced in part by sex differences.

The overall approach in the present study examined the question: What is associated with differences in personality? Is it TM and time spent in the practice? Sex differences? The interaction of time in meditation and sex differences?

Personality research on TM commenced in the 1970's and a number of the studies including those measuring anxiety, depression and hostility were small and exploratory in nature. The present study adds to those findings and broadens the understanding of meditation's relationship to personality.

The vast majority of personality studies on TM have been concerned with intrapersonal variables. An assessment of interpersonal dimensions was included in the present study to expand upon the smaller amount of research on social orientation.
Only a few examinations thus far have attempted to evaluate chronological time spent in the practice of TM and the relationship to temperament. To broaden the scope of knowledge in this regard was the major focus of the present study.

The addition of sex differences considered for the first time in TM research, the possible influence and interaction of this independent variable which is always present with meditation.

**Purpose**

The purpose of this study was to relate time spent in Transcendental Meditation and sex differences to the intrapersonal traits of anxiety, hostility and depression, and the interpersonal traits of inclusion, control and affection.

The major goal of this study was to examine the relationship of chronological lengths of time (Time) spent in the practice of TM to personality and behavior traits. This was accomplished by evaluating trait differences within the meditating group which was divided categorically into 3 groups according to Time spent in the practice of TM. It was followed by a comparison with a group of
non-meditators.

The assessment of the relationship of sex differences (Sex) to intrapersonal and interpersonal orientation was another goal.

The interaction of Time and Sex with affective and social traits was studied as were correlations between intrapersonal and interpersonal variables.

The two independent variables were:

Time
Sex

The six dependent variables were:

Anxiety ........ 3 scales
Depression ...... 1 scale
Hostility ...... 1 scale
Inclusion ...... 2 scales
Control ........ 2 scales
Affection ...... 2 scales

Interpersonal orientation was measured by Schutz's Fundamental Relations Orientation - Behavior (FIRO-B) questionnaire. Spielberger's State-Trait Anxiety Inventory (STAI) was used to estimate state and trait anxiety. Traits of anxiety, depression and hostility were assessed by Zuckerman and Lubin's Multiple Affect Adjective Check List (MAACL).
Investigation involved a series of 2 x 2 and 2 x 3 factorial designs evaluated by a multivariate analysis of variance. Correlations between interpersonal and intrapersonal scales were performed on an 11 x 11 correlation matrix (FIRO-B with the STAI and MAACL).

Subjects (N=133) were randomly selected meditators and non-meditators. Meditators (N=71) were practitioners of Transcendental Meditation and students at Maharishi International University (MIU) in Fairfield, Iowa. They were divided into 3 Time groups according to the number of months they had practiced TM.

A comparison group of non-meditators (N=62) consisted of students from The Ohio State University (OSU) in Columbus, Ohio.

Questions

In view of the preceding observations, this study concerned itself with the following questions:

Time Variable

1. Do the intrapersonal variables of anxiety, depression and hostility, and the interpersonal variables of inclusion, control and affection differ with respect to Time in meditation?
a. Are there differences between the meditating group, whose members have spent various lengths of time in the practice of TM, and the non-meditating group whose members have spent no time in meditation?

b. Are there differences within the meditating group according to the length of time TM has been practiced? That is: what is the main effect of Time?

Sex Variable

2. Do the intrapersonal variables and the interpersonal variables differ between males and females? That is: what is the main effect of Sex?

Time and Sex

3. In what way does the interaction of Time and Sex variables relate to the intrapersonal and interpersonal variables? That is: what is the effect of interaction?

Intrapersonal and Interpersonal Variables

4. Is there a relationship between affective and social orientation?

Conceptual Hypotheses

Conceptual hypotheses were developed from the
above questions and were based on previous research and self reports:

1. a. Meditators will exhibit lower anxiety, depression, hostility and control, and higher inclusion, and affection than non-meditators.

   b. Meditators with longer practice in meditation will show lower anxiety, depression, hostility and control, and higher inclusion and affection than meditators with shorter practice.

2. Men and women will exhibit relatively the same degrees of anxiety, depression, hostility, inclusion, control and affection.

3. Men and women interacting with variations in Time will have the same direction and magnitude of response to the personality variables.

4. Inclusion and affection will increase and control will decrease as anxiety, depression and hostility decrease.

**Null Hypotheses**

Hypotheses were drawn from the above questions and stated in the null form.

1. Mean scores from groups of subjects defined in terms of Time will not differ significantly on the FIRO-B,
20.

STAI and MAACL.

2. There will be no significant differences due to Sex between male and female mean scores on the FIRO-B, STAI and MAACL.

3. FIRO-B, STAI and MAACL means from groups of subjects defined jointly in terms of Time and Sex will not differ significantly from the means expected by the simple addition of the main effects.

4. There will be no significant correlations between intrapersonal and interpersonal mean scores.

Definition of Terms

Transcendental Meditation: Transcendental Meditation (TM) is a self-induced, self-controlled mental technique of deep psychophysiological relaxation. A Sanskrit sound (mantra) is repeated silently 20 minutes twice daily with eyes closed. The mantra alternates in a natural way with any other thought which may come into the mind until all thought is transcended and a state of no defined thought is reached, called pure awareness or transcendental consciousness in TM. TM involves no particular diet, posture, belief or life style.
Sex Differences: This refers to differences between males and females, psychological, biological, innate or cultural.

Time: Time is interpreted as chronological lengths of time spent in the practice of TM.

Sex: Sex refers to sex differences.

Anxiety: State anxiety is interpreted as a transitory feeling of apprehension and tension with corresponding heightened autonomic nervous system activity. Trait anxiety refers to relatively stable anxiety proneness.

Depression: Depression is characterized by dejection, discouragement and melancholy.

Hostility: Hostility refers to anger, bitterness, discontent and vexation.

Stress: Stress is defined as a specific syndrome of non-specifically induced changes in a biologic system (Selye, 1956). It is bodily wear and tear caused by any stressor or agent of stimulation, physical or psychological, pleasant or unpleasant.

Consciousness: Consciousness refers to psychobiological states such as waking, sleeping and dreaming.
Inclusion: Inclusion refers to affiliation, association, social interest and interaction with other people.

Control: Control involves interpersonal responsibility, dominance and influence.

Affection: Affection is interpreted as love and personal intimacy in a close interpersonal relationship.

Limitations
The ex post facto - correlational methodology used in the study did not allow cause and effect deductions to be drawn. The research approach lent itself to description and possible inferences. Results could only be generalized to populations similar to those represented by the research samples: meditator and non-meditator college undergraduates.

Summary
Counseling defines its role as a humanizing, personalizing agent. It is concerned with helping the individual cope with his environment and realize his potential.

Two specific psychological and behavioral areas relating to this were examined by the current study: intrapersonal and interpersonal orientation. They were
assessed in the light of their relationship to time spent in the practice of Transcendental Meditation and sex differences.

It is hoped that this research will add to the understanding of the counselor regarding sex differences and what consideration they should be given in counseling. It is also anticipated that the examination of Transcendental Meditation will help the counselor determine if this technique could be of practical use in his counseling approach.

Chapter II reviews literature and previous studies concerning TM and sex differences with emphasis on their relationship to affective and social traits. Chapter III surveys the methods and procedures used in this study. Chapter IV analyzes and discusses the data while Chapter V contains a summary with implications and recommendations for further research.
CHAPTER II

LITERATURE REVIEW

Early Studies of Yoga and Zen Meditation

Accounts of Eastern meditation were subjective over the centuries. Meditation practices were varied, complex and esoteric. Individual approaches made generalizations difficult; nevertheless, intrigued by allegations of voluntary control over involuntary functions and the possible benefits implied for mankind, pioneer research commenced in 1935 (Brosse, 1946).

Various physiological changes during meditation were indicated in these early studies.

Decreased respiration frequency, reduced consumption of oxygen (O₂) and lowered elimination of carbon dioxide (CO₂) pointed to a slowing of basal metabolism (Anand, Chhina and Singh, 1961b; Bagchi and Wenger, 1957; Brosse, 1946; Rao, et al., 1958; Wenger and Bagchi, 1961).

Electroencephalography (EEG) reports (see TABLE 1 p. 22) on yoga meditators noted persistent predominate alpha waves indicative of a relaxed wakeful state (Anand, Chhina and Singh, 1961a; Bagchi and Wenger, 1957; Rao, et al., 1958). The alpha patterns in yoga meditation were not blocked by external stimuli. Das and Gastaut (1957) also recorded the appearance of some fast frequency beta with the predominant alpha.

EEG records on practitioners of Zen meditation were obtained by Kasamatsu and Hirai (1969). The subjects were grouped according to time:

- Group I - 1-5 years experience
- Group II - 5-20 years experience
- Group III - over 20 years experience

All subjects exhibited alpha waves during meditation. The alpha waves were blocked by external stimuli perhaps due to emphasis in Zen meditation on the here and now.
Some subjects with long experience produced a rhythmical theta train and it was noted that the more years one practiced meditation, the more changes were seen on the EEG.

The initial research on yoga and Zen techniques suggested that meditation could effect the autonomic nervous system and lower basal metabolism during a relaxed wakeful state.

Overcoming the shortcomings of these studies depended upon having a better defined meditative procedure taught by standardized methods. Needed also was greater availability of subjects assessed under controlled conditions with increasingly sophisticated equipment and methods of data analysis.

Updating a centuries old meditation technique was the undertaking of Indian teacher Maharishi Mahesh Yogi (1967, 1966), a Vedic scholar with a degree in physics. He simplified and standardized an ancient meditation procedure for use in diversified cultures and brought the essential method, Transcendental Meditation, to the Western world in 1959.

As the practice became popular, a defined and standardized form of meditation with greater numbers of subjects became available for scientific research.
<table>
<thead>
<tr>
<th>Brain Wave</th>
<th>Amplitude (µV)</th>
<th>Frequency (Cycles Per Second Hz)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta</td>
<td>20-40 µV</td>
<td>12-35 Hz</td>
<td>Awake and active-Mixed frequencies but predominate beta</td>
</tr>
<tr>
<td>Alpha</td>
<td>30-50 µV</td>
<td>8-12 Hz</td>
<td>Relaxed wakeful alertness-Calm tranquil, drowsy-Pleasant desirable mental state-Alpha wave trains appear when eyes are closed, resting or before sleep. Alpha blocking: a stimulus disrupts alpha and is replaced by beta</td>
</tr>
<tr>
<td>Theta</td>
<td>10-30 µV</td>
<td>5-8 Hz</td>
<td>Problem solving-Drowsiness-May appear through trains of alpha in transition from alpha to theta-Stage 1 sleep</td>
</tr>
<tr>
<td>Sleep Spindles</td>
<td>14 Hz</td>
<td></td>
<td>Stage 2 sleep-Short bursts</td>
</tr>
<tr>
<td>K Complexes</td>
<td></td>
<td></td>
<td>Stage 2 sleep-Disriminates external stimuli through sleep</td>
</tr>
<tr>
<td>Delta</td>
<td>75-300 µV</td>
<td>3 Hz or less</td>
<td>Stages 3 &amp; 4 sleep-Deep sleep</td>
</tr>
<tr>
<td>REM</td>
<td>20-50 µV</td>
<td></td>
<td>Dreaming-Variable frequency-Occasional alpha-most similar to Stage 1 sleep</td>
</tr>
</tbody>
</table>

Sources of chart material: Brown, 1970; Kamiya, 1968; Kanellakos and Lukas, 1974; Stewart, 1974; Walter, 1972.
Proponents of TM maintain the procedure is accompanied by biological change and a hypometabolic state (decreased metabolism) which is related to behavior change in activity outside of meditation. Due to this holistic concept, it is appropriate to review the findings of both physiological and psychological research on TM.

**Physiological Studies on TM**

Physiological studies on TM reported a significant decrease during meditation in respiration rate (3/min.), oxygen consumption (17%-20%), and carbon dioxide elimination (30 cc/min.). This was accompanied by a normal, unchanged respiration quotient, all of which indicated a lowered basal metabolism (Allison, 1970; Glueck and Stroebel, 1975a; Routt, 1973; Vassiliadis, 1973; Wallace, 1970a, 1970b; Wallace and Benson, 1972; Wallace, Benson and Wilson, 1971). Subjects in the initial Wallace and Benson research served as controls against their own pre and post experimental baselines, while later experiments, which replicated the original results on these and other physiological characteristics, included relaxing control groups.
Basal galvanic skin response (GSR) increased significantly for meditators during meditation indicating lack of stress in the system (Glueck and Stroebel, 1975a; Routt, 1973; Wallace, 1970a; Wallace and Benson, 1972; Wallace, Benson and Wilson, 1971). Orme-Johnson (1973) also measured spontaneous GSR (occurring independently of environmental conditions) in which frequency rises with anger or anxiety and decreases in a relaxed individual. Meditators exhibited significantly less spontaneous GSR than controls as well as increased basal GSR.

A significant decrease in cardiac output and heart rate (HR) was noted during meditation (Glueck and Stroebel, 1975a; Routt, 1973; Wallace, 1970a, 1970b; Wallace and Benson, 1972; Wallace, Benson and Wilson, 1971).

Decreased cardiac output permits greater blood flow which carries an increase of oxygen to cells. This has been suggested as one explanation for the expanded energy often mentioned by meditators. Wallace and Benson (1972) recorded a 32% increase in blood flow during meditation and a HR drop of 3-5 beats/min. The majority of S's had practiced TM for 2-3 years. Vassiliadis (1972) did not find a significant difference in HR between beginning
meditators and controls; however, after 6-9 months meditators in this study also registered a significant HR drop during meditation compared to relaxing controls.

Several assessments (Beary, Benson and Klemchuk, 1974; Walrath and Hamilton, 1975) invited comparison of TM with other techniques on some of the aforementioned physiological characteristics.

Walrath and Hamilton (1975) observed respiration rate, GSR and HR, comparing TM with an autohypnotic technique adapted from Slater (1941), and an instructed relaxation method. It was reported that the procedures were equally effective in lowering those physiological properties. A continuing non-significant decrease in HR was shown for meditators, however, in the post experimental period with an increase for other S's. This may have reflected the 10 minute test session utilized compared to 20-30 minutes in other meditation research. All S's were selected on the basis of high susceptibility to hypnosis, a factor which might have had some bearing on the findings according to Walrath and Hamilton (1975); nevertheless, they concluded that the results indicated that various physiological properties associated with meditation can be
duplicated under hypnotic suggestion.

Benson (1975) also concluded that data (Beary, Benson and Klemchuk, 1974) on a technique he patterned from a Zen method of breathing and counting paralleled TM results on decreased O₂, CO₂ and respiration rates, although no attempt was made to include a direct comparison with TM within the experiment.

These studies await replication as well as evaluation on other physiological characteristics such as brain wave activity.

High blood lactate levels have been associated with anxiety (Pitts, 1969). Wallace and Benson (1972) noted that the rate of blood lactate decrease during meditation was 4 times faster than the normal rate for persons resting in a prone position. Wallace (1970a); Wallace, Benson and Wilson (1971); and Wallace, Benson, Wilson and Garrett (1971) mentioned similar findings.

Studies monitored subjects with normal blood pressure during meditation and levels remained constant (Wallace, 1970a; Wallace and Benson, 1972; Wallace, Benson and Wilson, 1971). Research, however, with hypertensive meditators conducted outside of meditation for periods of up
to 63 weeks, recorded systolic and diastolic blood pressure levels that dropped significantly after learning TM. Levels remained low as long as subjects continued to meditate. Subjects who discontinued the practice returned to their former hypertensive levels in about 4 weeks (Benson, 1975; Benson, Rosner, Marzetta and Klemchuk, 1974; Benson and Wallace, 1972). Benson hypothesized that regular use of TM physiologically countered the increased sympathetic nervous system activity associated with high blood pressure, which is continually aroused today by the constant stimulation encountered in contemporary society.

A number of studies monitored brain wave activity. Occipital normal alpha waves are often found in persons relaxing with eyes closed. It was observed in TM research that in addition to the posterior alpha waves there was a marked increase in synchronized slow alpha activity (8-9 Hz) in anterior areas. It was reported to have involved the entire dominate left hemisphere and then to have spread to include both hemispheres often within 1-5 minutes after commencing meditation (Banquet, 1973, 1972; Glueck and Stroebel, 1975a; Wallace, 1970a, 1970b; Wallace and Benson, 1972; Wallace,
Examining novice (3-9 mo.) meditators, however, Vassiliades (1973) found significant increases in alpha waves only in posterior areas over controls. In contrast, Brown, Stewart and Blodgett (1971) and Glueck and Stroebel (1975a) observed significantly more frontal alpha activity in beginning meditators. Glueck and Stroebel (1975a) reported rapid EEG changes in anterior alpha frequencies within 4-5 minutes during first meditations and a marked increase in high density frontal alpha activity in both hemispheres by 6 months of meditative practice.

Beta, theta and delta waves were also occasionally observed during meditation but were reported to have had different patterns than normally seen in waking or sleeping (Banquet, 1973, 1972; Glueck and Stroebel, 1975a; Levine, Herbert and Haynes, 1976; Wallace and Benson, 1972; Wallace, Benson and Wilson, 1971; Wescott, 1975).

Similar to the Das and Gastaut (1957) study on practitioners of Kriya yoga meditation, Banquet (1973) and Glueck and Stroebel (1975a) also reported that a stable fast frequency beta rhythm could develop on the background of continuous slow alpha activity during
deep meditation. This differed from the beta waves of Banquet's (1973) control S's where activation caused fast frequencies without a regular pattern or rhythm.

Banquet (1973) observed that long rhythmic theta trains could develop after the initial shift into slow alpha waves in some meditators with 2-3 years experience. Wallace and Benson (1972) pointed out that theta trains reported on TM meditators were similar to those recorded on yoga and Zen meditators who had practiced 15-20 years. Banquet (1973) noted that such trains were continuous and dominate rather than discontinuous, mixed or alternating with alpha and delta frequencies as is the case in normal drowsiness or Stage 1 sleep. Theta waves during meditation in Banquet's (1973) research could be blocked, but in 1-3 seconds spontaneously returned to theta activity, whereas blocked theta patterns during drowsiness in control S's changed back to alpha frequencies.

Banquet (1973) observed that short bursts of delta waves with deep alpha curves, such as also occur in Stage 4 sleep, could appear in some advanced meditators. Nevertheless, instead of the loss of awareness found in deep
night sleep, Banquet (1973) stated that meditators gave voluntary signals by push button and memorized or answered questions accurately and quickly at any time indicating they were aware and awake.

It was also reported (Banquet, 1973; Wescott, 1975) that synchronized alpha and theta waves sometimes continued for meditators, unlike relaxed control S's, into the eyes-open post experimental period. Banquet (1973) concluded that a unique state of consciousness was produced during TM.

Several reports (Pagano, Rose, Stivers and Warrenberg, 1976; Younger, Adriance and Berger, 1975) took exception to this definition of meditation. Both of these studies involved repeated EEG measurements (4-10) on meditating S's serving as their own controls. Subjects reported adequate night sleep before testing. The interpretation of data suggested meditators spent 60% of meditating time alert or in alpha activity and 40% asleep. Pagano, et al. (1976) questioned whether reported benefits of meditation might be due to sleep.

Stage 2 was the dominate sleep phase noted. In addition, Pagano, et al. (1976), unlike Younger, et al. (1975),
reported Stages 3 and 4 sleep 17% of the time, but did not test, as had Banquet (1973), for meditator awareness which is normally lacking during conventional deep sleep. It was also not suggested how meditators cued themselves back to coherent consciousness when asleep at the end of a normal meditation period. No comment was given on further physiological differences between sleep and meditation cited in other studies (Benson, 1975; Kanellakos and Lukas, 1974; Wallace and Benson, 1972; Wallace, Benson and Wilson, 1971). These latter reports noted that blood pressure dropped in sleep, but not during meditation. Basal GSR increased an average of 130% over several hours of sleep whereas it increased an average of 160% within several minutes of meditation. Oxygen consumption decreased 10-20% slowly over 4-6 hours in sleep, while it decreased rapidly 17-20% within 5-10 minutes of meditation. Carbon dioxide concentration increased 4-6% during sleep but registered no change in meditation.

Percentages of time observed in sleep Stages 2, 3 or 4 were given by Pagano, et al. (1976) and Younger, et al. (1975), but analysis of particular waves and patterns
Describing in which ways specific data differed from other studies was not provided.

Discrepancies in definitions of various meditation phases may revolve around evaluation of responses to external stimuli; examination of corresponding physiological processes; and assessment of the particular brain wave patterns that arise. Meditation research, as a whole, recognized familiar waves of sleeping and waking, but described brain wave patterns, responses to stimuli, and the rate of occurrence or lack of certain physiological characteristics that were not typical of conventional states.

Other evaluations (Benson, 1975; Levine, Hebert and Haynes, 1976; Wallace, 1970a; and Wescott, 1975) concurred with Banquet (1973) that research indicated meditation produced a distinct state of consciousness which was different from normal waking, dreaming or sleeping. Benson (1975) referred to this as the relaxation response, while Wallace (1970a) considered it to be a fourth major state of consciousness.

In summary, the majority of physiological studies on meditation suggested that a state of hypometabolism
while alert, could be self-induced through TM. In addition, research indicated that TM produced a mental state which was associated with predominately high density, slow frequency, alpha activity, in both the frontal and rear brain areas. The activity of the right and left hemispheres was synchronized. The question remained: Did the practice of regularly inducing this state for short periods of time daily have any bearing on activity outside of meditation?

**TM Studies on Anxiety, Depression and Hostility**

Through subjective reports, meditators stated that they continued to feel more relaxed outside of meditation (Bloomfield, Cain and Jaffe, 1975; Forem, 1973; Robbins and Fisher, 1972). Exponents of TM have maintained that meditation's purpose is to encourage beneficial growth in everyday activity. After the early physiological studies commenced, interest was generated in objectively investigating the personal accounts of increased mental health. Was TM a verifiable factor associated with increased mental well being?

A majority of the studies which assessed anxiety levels resulted in significant pre-posttest reductions
in anxiety for meditators, or a significantly lower level of anxiety for a meditating group when contrasted with comparison or control groups (Ballou, 1973; Doucette, 1971; Fehr, Nerstheimer and Torber, 1975; Ferguson and Gowan, 1975; Glueck and Stroebel, 1975a, Hjelle, 1974; Lazar, Farwell and Farrow, 1972; Nidich, Seeman and Seibert, 1973; Orme-Johnson, Arthur, Franklin, O'Connell and Zold, 1975; Shecter, 1975). Van den Berg and Mulder (1975) found a drop for meditators which did not reach significance.

A few smaller studies utilized comparison groups (Doucette, 1971; Fehr, et al., 1975; Hjelle, 1974).

Hjelle (1974) compared subjects who had been meditating an average of 2 years with subjects predisposed but not yet initiated into TM. On the Bendig version of the Taylor Manifest Anxiety Scale, the practicing meditators were significantly lower in anxiety \( (p<.001) \). Doucette (1971) also reported that TM subjects were markedly lower in tension and anxiety levels compared to 2 groups not practicing TM.

At the University of Cologne, Germany, Fehr, et al. (1975) contrasted a group of TM teachers with a norm
group. For further analysis, the total group of teachers was divided into 2 groups: Group 1 which had meditated an average of 2.75 years and Group 2 which had an average experience of 7.8 years. The additional comparison groups were constructed from population norm groups.

On the 12-scale Frieburger Personality Inventory, the total group of meditators was markedly lower on the nervousness scale than the norm group. The second group (7.8 mean years) registered more significant scale differences from its norm group than did the first (2.75 mean years) group, and was significantly lower (p<.001) than the norm group on the nervousness scale.

Fehr, et al. (1975) felt that overall test results suggested the teachers had greater psychological stability than the norm; and that differences between the meditating groups indicated that longer time in the practice of meditation was related to the greater differences from non-meditators. No explanation was offered, however, for the lack of significance on the nervousness scale for the short-term meditating group (2.75 mean years). This departed from the more common findings of marked drops in anxiety for beginning meditators (1-14 weeks).
At California State University, Northridge, California, Ferguson and Gowan (1975) administered 2 measures of anxiety, the Cattell Anxiety Scale and the State-Trait Anxiety Inventory (STAI) trait scale, to 3 groups (1) controls who participated in encounter (2) short-term meditators of 6-1/2 weeks and (3) long-term meditators with a mean practice of 43.1 months.

Before instruction in the TM technique and encounter, short-term meditators and controls took pretests. At the end of 6-1/2 weeks of TM experience, posttests disclosed a significant reduction on the STAI ($p < .001$) and the Cattell ($p < .025$) for short-term meditators, but not for controls.

Ferguson and Gowan (1975) then gave the anxiety scales once to the long-term meditators. Compared to short-term meditators, significantly lower STAI scores ($p < .025$) and Cattell scores ($p < .001$) were found for the long-term meditators. Ferguson and Gowan (1975) concurred with Fehr, et al. (1975) that time spent in TM may have a bearing on
decreasing anxiety. In addition, Ferguson and Gowan (1975) found that short-term (6-1/2 weeks) meditators as well as long-term (43.1 mean months) meditators exhibited significantly lower anxiety levels than controls.

Another pre-posttest experiment which noted differences between controls and beginning meditators was conducted by Nidich, Seeman and Seibert (1973) using the state scale of the STAI measure of anxiety.

One and a half months after the experimental group learned TM, both groups were requested to perform a demanding task followed by relaxing with eyes closed for controls, and meditation for the experimental group. Then the STAI posttest was administered. It was concluded that TM was a positive influence in anxiety reduction (p<.05). In another pre-posttest study, Orme-Johnson, Arthur, Franklin, O'Connell and Zold (1975) also noted a significant reduction (p<.05) on the Taylor Manifest Anxiety Measure for a group of 10 week meditators compared to controls.

Lazar, Farwell and Farrow (1972) administered the IPAT Anxiety Scale Questionnaire to a randomly
selected group before and after (4 weeks) instruction in TM. The mean anxiety score decreased significantly (p<.05). A comparison group, who had meditated 4 weeks, also registered a significantly lower anxiety level (p<.05) compared to the pretest, and no significant difference compared to the posttest, of the first group.

Lazar, et al. (1972) conducted a second experiment which also used the IPAT. Pretests were administered to a control group and 3 experimental groups. Posttests were given to the experimental groups after 4, 8 and 12 weeks. Mean anxiety scores for experimental groups decreased markedly from pre to posttest. The combined posttest scores of the meditating groups were significantly lower (p<.001) compared to the control group.

The 12 week meditating group demonstrated a significantly greater reduction in anxiety from pretest to posttest than the 4 week group. Lazar, et al. (1972) surmised as did Ferguson and Gowan (1975) and Fehr, et al. (1975) that time in TM had bearing on mean anxiety score differences.

Ballou (1973), however, did not find progressive differences over a similar time period (10 weeks). The STAI state and trait scales were administered weekly to
meditating and control groups in an experiment conducted at Stillwater State Prison, Stillwater, Minnesota.

After the experimental group was initiated into TM, a significantly lower level of state and trait anxiety was demonstrated within a few days for the meditating group compared to the controls. No further significant decline was noted in the following 10 week period.

Ballou (1973) concluded that anxiety is reduced quickly after taking up the practice of TM and remains at a low level.

A project with TM of approximately 4 years, was conducted by Glueck and Stroebel (1975a, 1975b) in a psychiatric setting at the Institute of Living, Hartford, Connecticut. An initial segment of the study compared the results of biofeedback, TM and autogenic training (Wolpe, 1958) on reducing general anxiety symptoms and inducing a general state of relaxation. Behavior and psychopathology were evaluated with the Minnesota Multiphasic Personality Inventory (MMPI), the Minnesota Hartford Personality Assay (MHPA) and daily nursing records.

After 3 weeks of autogenic training, S's found the exercise boring and asked to transfer to the other groups.
Biofeedback S's were able to learn some general alpha activity control after 15 sessions, but a number reported an increase in tension trying to produce an alpha state and difficulty in replicating results away from biofeedback equipment. This part of the project was also discontinued. In the TM group, 83% continued to meditate regularly twice daily, and 6% stopped entirely. Glueck and Stroebel (1975b) noted that meditation produced a generalized relaxation state "immediately and dramatically" (p. 111) in psychiatric patients suffering from considerable overt anxiety. Anxiety symptoms were reported relieved after the first meditation. Symptoms returned, but gradually subsided and most disappeared by the end of 8 weeks.

To continue a comparison study, meditators were matched with other patients in the hospital on the basis of sex, age and the MMPI. Matched and TM patients were also involved in similar traditional therapy. The new comparison project permitted a continuation beyond the original experiment, the inclusion of new TM treatment S's, examination of recovery and release rates, and follow-up after leaving the hospital.
While acknowledging that strict design control was not possible in a psychiatric setting due to the continuation of other known therapy procedures, Glueck and Stroebel (1975a, 1975b) nevertheless offered some of the following results and conclusions concerning TM and its relationship to the reduction of anxiety. Patients practicing TM evidenced a greater improvement and discharge rate than the general hospital population (p<.001) and matched patients (p<.001). Follow-up letters after discharge indicated approximately 68% of the meditator respondents continued the practice outside the hospital environment 1 or 2 times daily and noted that TM was a valuable addition to their lives. Glueck and Stroebel (1975a, 1975b) concluded that TM was the most effective technique with psychiatric patients, contrasted with biofeedback and autogenic training, for producing a general state of relaxation and reducing anxiety symptoms.

One study introduced an additional factor, philosophical orientation, and assessed the role it played in TM results. A factorial design with 4 groups was used by Shecter (1975): Group 1 practiced TM; Group 2 took the Science of Creative Intelligence (SCI) course in the
theoretical understanding of TM; Group 3 participated in both TM and SCI and Group 4 was the control group. Anxiety was measured by the Attitudes Towards Specific Situations test. Pretests were given before learning TM and SCI. Only the 2 groups practicing TM showed a significant reduction in anxiety level from pretest to posttest (p<.001) 14 weeks later. There was no significant interaction effect between TM and SCI which Shecter felt demonstrated the effectiveness of TM meditation.

In summary, the majority of comparisons between meditators and non-meditators reported significantly lower levels of anxiety for meditators compared to non-meditators and marked reductions in anxiety from pretest to posttest for meditators compared to controls.

A rapid initial decline in anxiety was noted for meditators over a period ranging from beginning meditation practice through 14 weeks.

Research was scant concerning further decline beyond 14 weeks; however, several comparison studies suggested the possibility of additional decrease over a number of years. No conjecture was made on individual baselines within a possible range of limits needed for the most effective operation of the human organism or how far anxiety
levels should be expected to drop on any given measure.

One evaluation was conducted on possible interacting factors with TM. It suggested that theoretical orientation did not have a bearing on the results of practicing the technique of meditation.

Evaluation of depression and hostility levels was covered in a few studies (Boese and Berger, 1972; Fehr, et al., 1975; Ferguson and Gowan, 1975; Van den Berg and Mulder, 1975).

Ferguson and Gowan (1975) found short-term meditators (6-1/2 weeks) had significantly reduced pre-posttest depression scores compared to controls (p<.005) as did long-term (43 mean months) meditators (p<.01) compared to the short-term (6.5 weeks) meditators.

Similar results were recorded by Van den Berg and Mulder (1975). On posttest scores (9 weeks), depression was significantly lower for meditators compared to non-meditator controls (p<.025).

Comparing short-term meditators (2.75 mean years) and long-term meditators (7.8 mean years) to norm groups, Fehr, et al. (1975) found significantly less depression (p<.001) for the long-term group although not for the
short-term. The total meditating group was also reported below norms on depression (p<.001).

The same study included an "irritability" scale pertaining to hostility, which showed a markedly lower level (p<.001) for all meditators compared to norms as well as for short-term (p<.05) and long-term (p<.001) meditators. Boese and Berger (1972) also noted a significant decrease (p<.05) from pre to posttest scores for meditators in verbalized hostility on the Thematic Apperception Test.

These studies noted significantly lower levels of depression and hostility for meditators compared to non-meditators; marked pre-posttest reductions for meditators compared to controls and possible further decline over a period of between 2.75 (mean) and 7.8 (mean) years. With the small amount of data available on these variables, however, the findings await further research to determine the strength of the results.

**TM Studies on Inclusion, Control and Affection**

The FIRO-B had not been used previously with meditators and the particular terms inclusion, control and
affection were not found in the research literature. There were, however, studies which included approximately the same variables of sociability and interpersonal orientation (Fehr, et al., 1975; Hagberg, 1973; Nidich, Seeman and Dreskin, 1973; Seeman, Nidich and Banta, 1972; Shelly, 1973; Tjoa, 1975; Van den Berg and Mulder, 1975).

Results varied in the studies which were related to inclusion (Fehr, et al., 1975; Shelly, 1973; Tjoa, 1975; Van den Berg and Mulder, 1975).

Among the scales on the Freiburger Personality Inventory used by Fehr, et al. (1975) was a Sociability measure described as a gauge of "Increased sociability, liveliness, friendliness". The total group of meditators was reported higher than norms (p<.05) as were the 7.8 mean year meditators (p<.02).

The Amsterdams Biografesche utilized by Tjoa (1975) contained an Extraversion scale. Subjects in the pre-posttest (16 months) experiment included (1) regular meditators (2) irregular meditators and (3) controls. There was a significant correlation between regularity of practice and the amount of increase in extraversion;
however, the experimental groups increased only slightly while the controls showed a small decrease on the scale.

The Social Inadequacy scale of the Nederlandse Personality Inventory was described as a measure of "neuroticism", "introversion", "avoiding people" and "feeling unhappy in social relations". In the pre-posttest experiment using this inventory, Van den Berg and Mulder (1975) noted a decrease (p<.10) for meditators compared to non-meditators.

At the University of Kansas, Shelly (1973, 1971) conducted a series of studies, over a period of several years, involving TM meditators and non-meditators as part of a research program on sources of satisfaction and happiness.

Shelly (1976, 1973, 1971) found that although meditators sought social contacts as often as non-meditators, they avoided crowds (p<.05) and noisy places (p<.001). Shelly (1976, 1973, 1971) also noted, pertaining to this theme, that meditators experienced greater satisfaction with the environment through fewer external stimuli than non-meditators, seeking arousal as often while avoiding extreme forms and spending more time alone than non-meditators. Shelly (1973) commented that meditators
may develop more internal sources for satisfaction.

In personal communication with Dr. Shelly (1976) he summarized the findings of his research:

Meditators wanted less stimulation than non-meditators such as loud music and groups of people, and would pick softer music and more quiet surroundings. Greater environmental stimulation did not enhance their satisfaction.

Meditators were more sensitive and easily upset than non-meditators, but recovered faster, which is different from Eysenck's neurotic personality who is overly sensitive, but slow to recover.

Meditators found that deep personal relationships enhanced their sense of satisfaction and they were as desirous as non-meditators for deep personal relationships.

Using a modified version of Shelly's questionnaire, Landrith (1974) reported similar characteristics for meditators compared to non-meditators: increased autonomy, time spent alone and happiness, and richer emotional reactions and interpersonal relationships.

Support for Shelly is suggested in additional findings on field independence and inner directedness (Hjelle, 1974; Nidich, Seeman and Dreskin, 1973; Pelletier, 1974; Seeman, Nidich and Banta, 1972).
Assessing the Inner Directed scale of the Personal Orientation Inventory (POI), Hjelle (1974) found a significantly higher level for meditators compared with non-meditators (p<.001). Nidich, Seeman and Dreskin (1973) and Seeman, et al. (1972) also observed that meditators were significantly higher than controls on the posttest scores of the same scale (p<.01)(p < .02).

In addition, Hjelle (1974) utilized Rotter's Locus of Control scale. Results indicated meditators exhibited more internal perception of control of life events (p<.001) compared to non-meditators.

Pelletier's (1974) pre-posttest experiment on field independence used the Embedded Figures Test and Rod-and-Frame Test. The 3 month posttest disclosed a significant increase (p<.001) for meditators over controls in ego distance and field independence denoting less dependence on the external environment.

Several studies utilized inventories with scales closely allied to the area of control (Fehr, et al., 1975; Van den Berg and Mulder, 1975).

Assessing a Dominance scale defined as "being enterprising and leading others", Van den Berg and Mulder
(1975) observed no marked differences between meditators and controls. In contrast, Fehr, et al. (1975) had a Tendency to Dominate scale interpreted as "Decreased tendency to dominate, more respect and increased cordiality" which showed a significantly lower level $(p < .001)$ for the total group of meditating teachers compared to a norm group, as well as for short-term (2.75 mean years) and long-term (7.8 mean years) meditators.

Relevant to the area of affection, a few studies explored the Capacity for Intimate Contact scale of the Personal Orientation Inventory (POI), (Hagberg, 1973; Hjelle, 1974; Nidich, Seeman and Dreskin, 1973; Seeman, Nidich and Banta, 1972).

Hjelle (1974) reported meditators higher $(p < .05)$ on the scale than non-meditators. Comparing pre-post-test scores, Hagberg (1973) found a significant increase $(p < .01)$ on the POI Capacity for Intimate Contact scale for meditators, but also obtained an increase $(p < .05)$ for controls.

The original research of Seeman, Nidich and Banta (1972) was a pre-posttest design employing a meditating group and a control group. The POI was
administered before TM instruction and again 2 months later. Posttests showed a mean difference increase (p<.10) for meditators compared to non-meditators on the scale.

In a replication with the POI, Nidich, Seeman and Dreskin (1973) observed an increase which reached significance (p<.01) for meditators contrasted to controls on the Capacity for Intimate Contact scale.

Shelly's (1973, 1971) research also included an analysis of meditators compared with non-meditators in the area of affection. Shelly concluded that meditators "develop deeper personal relationships and depend less on their external surroundings for happiness" (Kanellakos and Lucas, 1974, p. 29) than non-meditators.

Summarizing the literature related to inclusion, no clear profile was etched on the meditator due to varied results from a small number of studies. While one assessment indicated that meditators increased in sociability compared to non-meditators, several others did not demonstrate that meditators were higher or lower than norm and control groups in either social inadequacy or extraversion. The best picture that emerged
was drawn by the addition of an account which indicated that meditators seek a normal amount of inclusion, but also spend more time alone and avoid large groups for social contact.

Research in the area of control was scant. A dominance scale interpreted as leading others, registered no differences between meditators and controls, while a dominance measure explained as a gauge of respect for others found meditators higher compared to non-meditators.

The affection assessments, however, did suggest an increase in this variable that was associated with meditation. Additional research is called for in all the interpersonal areas.

**TM in Counseling and Therapy**

There was evidence in the literature that the practice of TM is related to aspects of good mental health such as decreasing anxiety symptoms and increasing capacity for affection. A few studies on intrapersonal and interpersonal variables were inconclusive but most pointed in the direction of benefit to the individual. There also appears to be a cautious but increasing
advocacy and use of meditation by counselors, therapists and psychiatrists (Bloomfield, Cain and Jaffe, 1975; Bloomfield and Kory, 1976; Bowers, 1972; Carrington and Ephron, 1975; Glasser, 1976; Glueck and Stroebel, 1975a, 1975b; Goleman, 1971; Shafii, 1973a; West, 1974).

It was noted that TM had qualities similar to free association (Carrington and Ephron, 1975; Shafii, 1973a). Practitioners in both exercises are instructed to permit any thoughts to enter consciousness non-judgementally, but the meditation process permits a more rapid flow of verbal plus non-verbal experience and feeling. Carrington and Ephron (1975) conjectured this may allow for a more comprehensive approach to tension, induce change in hard to reach conditioned responses and offer periods of freedom from the critical superego.

Transcendental Meditation was also likened to systematic desensitization (Carrington and Ephron, 1975; Shafii, 1973a; Goleman, 1971). Both procedures encourage anxiety producing concerns to be experienced in a relaxed state, however, TM permits spontaneous self-
selection from the whole range of waking thought while traditional desensitization works through a structured hierarchy in one chosen area. Goleman (1971) referred to TM as a "global self-desensitization". Carrington and Ephron (1975) hypothesized this may be similar to a tape with vast amounts of information being demagnetized or uncharged at high speed. Several reports noted faster rates of improvement in meditating patients (Bowers, 1972; Glueck and Stroebel, 1975a).

A few negative effects were reported (Lazarus, 1976). An example was a case history from French, Schmid and Ingalls (1975). The case of 39 year old Mrs. M. related a temporary sequence, after beginning meditation, of euphoria and fantasies leading to mild thought disorder, unusual behavior, and finally negative moods and a state of exhaustion. When this pattern subsided, psychological testing indicated increased feelings of autonomy and comfort with no evidence of thought disorder. The professional opinion of French, et al. (1975) was that the behavior of this "trip" was distinct from psychotic behavior, but could have been modified by a temporary decrease in meditation time.
and frequent contact with an experienced teacher and mental health professional. Some degree of mental or physical discomfort, associated with the release of stress and repressed material is reported to be experienced at times by meditators, but severe reactions are said to be rare. All psychiatric and TM literature advised practitioners to follow recommended time limits in meditation. Over-meditating was thought to be a possible source of difficulty associated with severe tension release symptoms.

The average person was reported to be able to comfortably accommodate and integrate any change processes of meditation. The literature reflected, however, that any potential change agent in therapeutic use carries some risk and therefore professional supervision and/or adjustment of meditation time was recommended for some people (Carrington, 1977; Carrington and Ephron, 1975; French, et al., 1975; Glueck and Stroebel, 1975a).

Concurring with the experimental studies, therapists also reported anxiety and tension reduction in their clients and lifting of depression (Bloomfield
and Kory, 1976; Carrington and Ephron, 1975; Shafii, 1973a). Of interest to counseling and therapy was the observation of additional growth characteristics. Some major changes cited were more self-confidence and ego strength, and less self-criticism. Reports also noted increased spontaneity and emotional responsiveness, and decreased rigidity and obsessive-compulsive behavior. Other modifications included greater energy, alertness and efficiency, and less dependency on negative addictions such as alcohol and drugs (Bloomfield and Kory, 1976; Bowers, 1972; Carrington and Ephron, 1975; Shafii, 1973a; Shafii, Lavely and Jaffe, 1975, 1974).

Glasser's (1976) book was written on the premise that certain activities which are non-competitive, non-self-critical, are believed to have value and are easy to perform, can become beneficial "positive addictions". As prime examples, jogging and TM were explored. When practiced daily for 40-60 minutes, he reported these activities can produce a relaxed and transcendent state of mind. This state of mind is the key, hypothesized Glasser (1976), to optimal conditions for the expansion of interconnected neuronal pathways in the brain, creating
and utilizing stronger mental potential.

In summary, a growing number of counselors, therapists and psychiatrists are using meditation in their programs, noting the similarities to free association and systematic desensitization, while understanding that meditation incorporates a more rapid verbal-nonverbal free flow of repressed and/or consciousness material.

Most individuals are said to cope well and comfortably with the processes of meditation. Some are reported to have experienced more severe reactions with overmeditating suggested as one possible cause. Professional supervision and/or adjustment of meditation was recommended for these people.

Concurring with the experimental studies, a number of positive increases in mental health characteristics were noted, related to the practice of TM by clients.

An Overview of Sex Difference Studies

Most studies on TM concerned meditation without regard to other factors. One factorial study (Shecter, 1975) considered theoretical orientation, while the present study examined the interaction of a factor always present with meditation: sex characteristics. A review of existing literature, which included measures of sex differences,
was undertaken to determine if particular differences of sufficient strength were revealed which might have a bearing on meditation results. Findings reviewed pertained to adult populations.

**Anxiety, Depression, Hostility**

No pen and pencil or self-report data was discovered which rated men higher than women in anxiety, while approximately one-half of such studies noted higher anxiety scores for women. (Benton, Gelber, Kelley and Liebling, 1969; Brim, Glass, Lavin and Goodman, 1962; Hannah, Storm and Caird, 1965; MacDonald, 1970; Mendelsohn and Griswold, 1967; Sinick, 1956; Terman and Miles, 1936).

About 50% of the pen and pencil and self-report assessments indicated no significant differences between adult females and males (Bendig, 1954, 1960; Kidd and Cherymisin, 1965; Lazowick, 1955; MacDonald, 1970; Taylor, 1953; Wrightsman, 1962).

The majority of pen and pencil evaluations used the Taylor Manifest Anxiety Scale (TMAS). Other measures included the Cattell IPAT Anxiety Scale, the MMPI, the Maudsley Personality Inventory, and several self-reports.

Overall results were not clearly definitive, with
one-half of the tests showing women higher in anxiety and one-half indicating no differences between men and women. Maccoby and Jacklin (1974) suggested the absence of male high scores might be due to men having greater fear with different kinds of experiences than were presented on the scales; or to a possible willingness of women to more readily admit to anxiety.

Statistics indicated that more women than men were treated for serious depression symptoms (Chester, 1972; National Institute of Mental Health Statistics, 1965-1968). National percentages for each sex, related to treatment for depression in clinics and hospitals (1965-1968) are given in Table 2.

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>DEPRESSIVE PATIENTS</th>
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<tr>
<td></td>
<td>General Hospitals</td>
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<td></td>
<td>M</td>
</tr>
<tr>
<td>Psychotic depressive</td>
<td>31%</td>
</tr>
<tr>
<td>Manic depressive</td>
<td>36%</td>
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</tbody>
</table>
This represented a population under treatment. Although depression is held to be one of the most prevalent disorders in the general population (Bloomfield and Kory, 1976) it was not maintained that these percentages could be generalized to unreported or milder cases. A question was left as to whether more women in the general population became depressed or whether a higher percentage of women than men admitted to emotional difficulties and sought help.

There was stronger evidence that males exhibit more aggression and hostility than females.


A few data noted women higher than men (Bennett and Cohen, 1959; Harmatz, 1967; Taylor and Epstein, 1967).

Divergent findings were reported in some studies. Closer inspection sometimes revealed a difference in degree and kind. For example, Bennett and Cohen (1959) discovered females indicated greater covert hostility; while males disclosed greater overt aggressiveness, revealed a need to be more uncompromising and ruthless, and saw the world as more socially hostile. Again, Devi (1967) observed men to have more overt aggression while no significant differences were found in suppressed or self-aggression.

Overall analysis of aggression-hostility studies lent support to the hypothesis that adult males are more aggressive than females. Some findings suggested that
men express hostile tendencies outwardly more than women. Maccoby and Jacklin (1974) noted that a biological as well as cultural basis may underlie greater overt male aggressiveness because (1) the difference is similar in man and other primates (2) it appears to be cross-cultural and (3) sex hormones are known to influence levels of aggression.

Inclusion, Control, Affection

The greater number of studies contained data which found women higher in inclusion and social orientation than men (Bennett and Cohen, 1959; Dosey and Meisels, 1969; Exline, 1963, Exline, Gray and Schuette, 1965; Jones, 1971; Lagrone, 1963; Lunneborg and Rosenwood, 1972; Spangler and Thomas, 1962; Terman and Miles, 1936; Wagman, 1967; Willis, 1966; Witryol and Kaess, 1957).

These included a variety of approaches. Terman and Miles' (1936) pioneering study consisted of a 7-part, 910 item multiple choice test in which the 1936 woman was found to have high interpersonal and domestic interests.

In the 1950's, Bennett and Cohen (1959) used an adjective check list which indicated women felt stronger social orientation and social propriety with a greater need for
"environmental friendliness", while men exhibited greater need for personal attainment.

Witryol and Kaess (1957) utilized a memory-task situation and discovered women displayed more ability to remember names and faces from both real contact and photographs. Witryol and Kaess (1957) postulated that culturally feminine sex-roles emphasized development of better social skills compared to masculine sex-roles.

Research of the 1960's used assessments such as daydreams (Wagman, 1967) and the Edwards Personal Preference Schedule (EPPS), (Spangler and Thomas, 1962) which denoted higher affiliation needs for women.

Evaluations also included approach-avoidance observations and eye contact experiments (Dosey and Meisels, 1969; Exline, 1963; Exline, Gray and Schuette, 1965; Leviner and Moreland, 1969; Willis, 1966). Examinations disclosed (1) women approached closer to women than to men, while men approached both sexes at equal distance (2) women stood closer to "good friends" and farther from "acquaintance friends" (3) in a situation of implied threat, no sex difference was found in closeness to friend or stranger and (4) women used more visual interaction in interpersonal situations.
Lagrone's (1963) rank ordered expressed needs suggested that affiliation especially expressed in terms of marriage and family, was the primary drive for females while the major drive for males included adventures, sex and possession needs.

This trend continued into the 1970's exemplified by Lunneborg and Rosenwood's (1972) short survey. To one of three primary questions, "what would make you happy", 46% of the women responded in terms of affiliation compared to 29% of the men.

There were, however, an increasing number of evaluations, commencing in the 1960's and continuing into the 1970's, which observed no significant differences between men and women in inclusion needs (Dosey and Meisels, 1969; Levinger and Moreland, 1969; MacDonald, 1970; Mascaro and Graves, 1973; Novak and Lerner, 1968; Rosenfeld, 1966; Sampson and Hancock, 1967). An occasional study noted men higher in affiliation (Borgotta and Stimson, 1963).

The greater amount of research supported the contention that women show greater interest in social and interpersonal relationships.
There is some evidence in older studies (1930's through 1960's) that traditional social interest for women was directed toward closer associations such as family and better-known friends, while men disclosed greater willingness to approach either sex without regard to closeness of relationship.

A transition was marked in the 1960's continuing through the 1970's, in which a growing amount of data denoted no essential differences in inclusion between men and women with the occasional appearance of men high in affiliation. Such a shift may have reflected changing sex-role images and the greater exposure of women to work and non-traditional social situations.

Maccoby and Jacklin (1974) noted that although research continues to show women more interested in interpersonal orientation, it should not be over-generalized that there is more feminine capacity for association; and innate masculine social judgment and responsiveness should not be under-rated.

In the area of control, more dominance measures, (ranging from eye contact and speaking intensity experiments to leadership perception scales) evidenced no sex differences in dominance than men high in dominance.
A number of older studies indicated women were more dependent and compliant than were men (Brim, et al., 1962; Crutchfield, 1955; Kagan and Moss, 1962; Nakamura, 1958; Scheidel, 1963; Spangler and Thomas, 1962).

A greater number of contemporary research assessments, however, strongly implied there were no sex differences on compliance and influence measures (Dean, Austin and Watts, 1971; Demark and Diggory, 1966; Eagley and Telaak, 1972; Endler and Hoy, 1967; Marquis, 1973; Nisbett and Gordon, 1967; Rule and Rehill, 1970; Silverman, 1968; Willis and Willis, 1970).

It was pointed out by Maccoby and Jacklin (1974) that the area of male-female control in interpersonal relations is complex. They related that male aggression becomes minimized as a means of adult dominance. While young boys may rely on aggression and "toughness" for control, most adult males outgrow this as the chief source of power in relationships and avenues of leadership become more diverse.

Toughness of a kind may be needed in leadership, but interpersonal aggression is often detrimental. In any
group or pair where there is interest in maintaining solidarity and effective and rewarding functioning it will be minimized. The "potential" for force by the male, however, hypothesized Maccoby and Jacklin (1974), may operate as a restraint on women to seldom provoke aggressive male behavior.

In groups or pairs dominance is usually assumed initially by the member with the most formal status. This often belongs to men in our society due to sex-role stereotyping, according to Maccoby and Jacklin (1974), but they found the longer the association the more equal influence is assumed by women. Adult leadership in relationships becomes more dependent on being effective in using skills and competencies for reaching goals than in using force, and this can be accomplished by both sexes.

Maccoby and Jacklin (1974, p. 274) summarized:

In adolescence and adulthood aggression declines as the means for achieving dominance (or leadership). As the power to influence others comes to depend more and more upon competencies and mutual affection and attraction, rather than simple power assertion by force, equality of the sexes in power-bargaining encounters becomes possible.

Studies related to affection, or closeness in
interpersonal relationships, included altruism, self-disclosure, empathy and nurturance evaluations.

Willingness to be open and close through self-disclosure did not differ significantly between the sexes (Hochreich and Rotler, 1970; Jourard and Friedman, 1970; Levinger and Senn, 1967; Marlatt, 1970). Studies on married couples (Levinger and Senn, 1967) found that husbands and wives reported an equal amount of disclosure of feelings in marriage. Similarly, research with college students (Hochreich and Rotler, 1970; Jourard and Friedman, 1970) indicated that trust and personal disclosure on intimate and non-intimate topics were essentially the same for men and women.

No definitive differences were found between males and females on empathy or personal sensitivity to the emotions of others. Some experiments found women more sensitive to interpersonal cues such as taped voices and the emotion of televised faces (Buck, Savin, Miller and Caul, 1972; Solomon and Ali, 1972). On the other hand, Kohn and Fiedler (1961) found men made greater personality distinctions concerning people they knew well. The larger group of studies indicated no sex
differences on personal sensitivity to others (Ekman) and Friesen, 1971; Hilton, Lambert, Murphy, Epstein and Samsky, 1969; Isen, 1970; Marlatt, 1970).

Traditional nurturance scales such as those on the EPPS and the TAT have tended to show women higher on nurturance (Lindzey and Goldberg, 1953; Spangler and Thomas, 1962). Schopler and Bateson (1965) noted, however, that men and women both evidenced nurturance tendencies, with men responding more when the dependency of others was slight and women giving greater response to more dependent individuals. One of the few nurturance studies on men and infants was conducted by Parke and O'Leary (Maccoby and Jacklin, 1974). Fathers were observed, in several sample families, who displayed as much or more nurturant interaction with their infants as the mother.

Altruism or concerned and supportive behavior toward others was also approximately equal for men and women (Aronson and Cope, 1968; Bickman, 1972; Darley and Latane, 1968; Gruder and Cook, 1971; Isen, 1970). A few studies found men higher in altruistic behavior (Gaertner and Bickerman, 1971; Piliavin, Rodin and Piliavin, 1969), while one denoted women behaving more altruistically (Thalhofer, 1971).
The greater amount of data denoted no essential differences between men and women in affection or personal closeness as estimated by nurturance, altruism, empathy and self-disclosure studies.

Summary

This chapter reviewed physiological and psychological literature on Transcendental Meditation and sex differences. Data on TM and sex differences related to anxiety, depression, hostility, inclusion, control and affection were presented.

In the area of TM, basic findings indicated:

A state of wakeful hypometabolism was induced during meditation with predominately alpha activity synchronized in the right and left hemispheres of the brain. This resulted in a deep state of psychobiological relaxation.

Anxiety was significantly lower and/or significantly reduced in meditators compared to non-meditators. Reduction was rapid within 14 weeks after initiation. The further rate of decline was not clear, although there was some suggestion of continued reduction over a period of years.

Depression and hostility levels were reduced and/or lower for meditators; however, the smaller number of published data only allowed for the suggestion of a general direction.

Inclusion for meditators was normal compared to non-meditators, although more time
was spent alone and crowds were avoided. There is no clear evidence that meditation was related to either an increase or decrease in sociability levels.

Control was not found to be higher or lower for meditators than non-meditators. There is some indication that any differences in dominance relate to kind.

Affection increase was associated with the practicing of meditation.

TM was likened to a rapid verbal - non-verbal free association and desensitization in counseling and therapy literature. Reports agreed that while there were some contraindications, most people realized increased mental health benefits from the practice of meditation concurring with experimental research.

In the area of sex differences, basic findings indicated:

Anxiety was not clearly revealed as higher or lower for men or women.

Depression was treated in more women than men, but it was questionable whether more women than men suffered from depression in the general population.

Hostility-aggression data presented strong evidence that men displayed more overt aggression than women.

Inclusion orientation was higher for women especially in older research. This trend has continued; however, a number of more recent studies has denoted no sex differences in affiliation which may reflect changing cultural influences.

Most dominance research disclosed no significant differences between the sexes. Some older research indicated greater compliance in women.
Most affection research revealed no significant differences between men and women.

Chapter III will present the design, methods and procedures of the present study.
CHAPTER III

METHODS AND PROCEDURES

Overview of the Project

The purpose of this study was to relate time spent in meditation (Time) and sex differences (Sex) to intrapersonal and interpersonal personality traits. The ex post facto research incorporated developmental cross-sectional, norm group comparison and correlational methods.

Designs included:

1) Factorial:
   2 x 2 and 2 x 3 factorial designs

Analysis involved:

1) Multivariate analysis of variance
2) Pearson product-moment correlation coefficients
3) Post hoc F test using Wilks lambda criterion and univariate F tests

The independent variables were:

Time ) 2 independent
Sex ) variables

77.
The dependent variables were:

- Anxiety . . . . . 3 scales )
- Depression . . . 1 scale ) 6 dependent
- Hostility . . . . 1 scale ) variables
- Inclusion . . . . 2 scales )
- Control . . . . 2 scales ) 11 scales
- Affection . . . . 2 scales )

Instruments used to assess the dependent personality variables were 1) the Fundamental Interpersonal Relations Orientation - Behavior (FIRO-B) questionnaire 2) the State-Trait Anxiety Inventory (STAI) and 3) the Multiple Affect Adjective Check List (MAACL).

The major focus of the study was to examine meditator inventory scores across 3 categories of Time that had been spent in the practice to determine if there were any differences related to Time. This was followed by comparing the personality traits of the total group of meditators with the traits of S's who had spent no time in meditation.

Sex main effect was evaluated by relating the sex gender of the S's to the personality variables. The interaction of Time and Sex was also assessed as well as the main effects. Finally, correlations between the intrapersonal and interpersonal personality traits were examined.
Research Methodology

The methodology was basically descriptive in contrast to experimental or historical. The ex post facto method incorporated 1) developmental cross-sectional 2) norm group comparison, and 3) correlational approaches (Campbell and Stanley, 1963; Isaac and Michael, 1971; Kerlinger, 1964; Van Dalen, 1962).

In keeping with the descriptive nature of the method, statistical analysis and discussion were followed by implications suggested from the study set in context with the existing research.

The broad interpretation of ex post facto research appropriate for the current study was defined by Kerlinger (1964, p. 379).

Ex post facto research is systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulable. Inferences about relations among variables are made, without direct intervention, from concomitant variation of independent and dependent variables.
Ex post facto research is often used for the study of human behavior within a social science framework. It examines facts as they are rather than structuring conditions in an experimental setting. Unlike pure experimental research there is no random assignment of S's or treatments to groups and no manipulation of independent variables.

It does not control variance to the extent that pure experimental research controls it. However, greater control can be afforded through the research plan and appropriate design, such as the factorial design used for the present multivariate ex post facto study. Because of this, the ex post facto approach does not attempt to pinpoint cause and effect. Its aim is to compare and describe similarities and differences among existing phenomena, often permitting a less artificial observation than the experimental. It lends itself to multifactored observation inherent in natural social complexity. Inference about relationships is properly conservative using possible explanations and implications followed by recommendations for future study.
In the present study the ex post facto method was used to describe 1) three designated Time categories within the self-selected meditating population 2) two existing groups: student meditators and non-meditators 3) the naturally dichotomous levels of males and females in those groups and 4) the possible interaction of Time and Sex.

The method tried to answer the following questions:

"Are there personality differences which distinguish persons who practice meditation from persons who do not?"

"Are there differences in personality related to variations in the length of chronological time spent in the practice of meditation?"

"Are there sex differences associated with the expression of personality?"

"Do Time and Sex interact in a way which reveals expressions of personality that are different from those observed with Time or Sex separately?"

The primary focus of the overall ex post facto method was the developmental cross-sectional approach related to Time. The developmental method pertains to
the study of human growth or change over time by either longitudinal or cross-sectional techniques. The longitudinal approach basically repeats the same measures with the same S's over time, while cross-sectional research measures samples of different S's with each sample representing a different Time category.

The main purpose of the current research was to examine personality variables related to longer levels of Time in TM than many of the previous studies had attempted to assess. The existing population of meditators used for the study ranged in practice from 3 to 86 months and a cross-sectional approach was chosen as more feasible for this project.

Correlation was used to observe the degree and direction of relationships between personal and social personality characteristics. The intrapersonal variables of anxiety, depression and hostility were related to the interpersonal variables of inclusion, control and affection. Correlations were made for the meditators and non-meditators combined (N=133).
Research Design

Fundamental design refers to the total framework within which particular problems are examined. The problems concerning this study were conceptualized through questions and hypotheses. This was followed by a blueprint (the factorial design[s]) to execute procedures which viewed the relationships among the variables, and helped to control variance. The nature of the particular design also indicated the method of appropriate analysis. Finally, design encouraged descriptive boundaries and possible answers to the research questions.

Questions

There were questions which this project attempted to answer:

Question 1A: Are there personality differences between meditators and non-meditators?

Question 1B: Are there personality differences among meditators who have practiced varying lengths of time?
Question 2: Are there personality differences between men and women?

Question 3: Do males and females interacting with variations in Time differ in response?

Question 4: What are the relationships between the intrapersonal and interpersonal variables?

Conceptual hypotheses

Specific conceptual hypotheses were developed from the above questions:

Conceptual Hypothesis 1-A: Meditators will exhibit lower anxiety, depression, hostility and control, and higher inclusion and affection than non-meditators.

Conceptual Hypothesis 1-B: Meditators with longer practice in meditation will show lower anxiety, depression, hostility and control, and higher inclusion and affection than meditators with shorter practice.

Conceptual Hypothesis 2: Men and women will exhibit relatively the same amounts of anxiety, depression, hostility, inclusion, control and affection.
Conceptual Hypothesis 3: The magnitude and direction of male-female response will be the same over Time.

Conceptual Hypothesis 4: Inclusion and affection will increase and control will decrease as anxiety, depression and hostility decrease. Anxiety, depression and hostility will have a positive correlation with control and a negative correlation with inclusion and affection.

Null hypotheses

For statistical analysis the informal hypotheses were formulated in the following null form:

Null Hypothesis 1: Mean scores from groups of subjects defined in terms of time spent in meditation will not differ significantly on the FIRO-B, STAI and MAACL.

Null Hypothesis 2: There will be no significant differences between male and female mean scores on the FIRO-B, STAI and MAACL.

Null Hypothesis 3: FIRO-B, STAI and MAACL means from groups of subjects defined jointly in terms of Time and Sex will not differ significantly from the means expected by the simple addition of the main effects.

Null Hypothesis 4: There will be no significant correlations between the intrapersonal and interpersonal mean scores.
Independent and dependent variables

The independent variables were:

Time   )  2 independent variables
Sex    

Time was interpreted as chronological time (Time) spent in the twice a day practice of TM. The OSU sample (N=62) denoted No-Time: 0 months. The MIU sample (N=71) represented 3 categories of Time: C1: 3–18 months (n=25) C2: 19–36 months (n=23) and C3: 37–69 months (n=23). Time served as a pre-manipulated self-selected variable assessed for main effect and interaction.

Sex gender (Sex) was the second independent variable. Primarily used as a natural attribute variable for main effect and interaction, the factorial designs also enabled Sex to serve as a control variable in relation to Time.

The dependent variables were:

Personal (Intrapersonal)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>STAI X-1</td>
</tr>
<tr>
<td>Depression</td>
<td>MAACL-D</td>
</tr>
<tr>
<td>Hostility</td>
<td>MAACL-H</td>
</tr>
</tbody>
</table>
Social (Interpersonal)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusion expressed</td>
<td>FIRO-B eI</td>
</tr>
<tr>
<td>Inclusion wanted</td>
<td>FIRO-B wI</td>
</tr>
<tr>
<td>Control expressed</td>
<td>FIRO-B eC</td>
</tr>
<tr>
<td>Control wanted</td>
<td>FIRO-B wC</td>
</tr>
<tr>
<td>Affection expressed</td>
<td>FIRO-B eA</td>
</tr>
<tr>
<td>Affection wanted</td>
<td>FIRO-B wA</td>
</tr>
</tbody>
</table>

Subjects categorized by Time and Sex were measured by the STAI and the MAACL on the personal characteristics of anxiety, depression and hostility, while the social characteristics of inclusion, control and affection were evaluated through the FIRO-B.

Factorial designs

Factorial designs were used as appropriate means for testing the null hypotheses. By permitting more than one factor to vary at a time, and by structuring the independent variables for the observation of possible interaction, the factorial designs lent themselves for use in this study of multifactored social and personal behavior. Due to these designs a one-time assessment for each population was able to be carried out to test the multiple hypotheses.

In order to compare the meditating MIU population with the non-meditating OSU population, a $2 \times 2$
factorial design was employed which utilized the total MIU sample (N=71) and the total OSU sample (N=62). FIGURE 1 illustrates the 2 x 2 factorial design which permitted the examination of the relationship of the 2 independent variables (Time and Sex) and their possible interaction. There were 2 levels of Time, labeled Levels A: A₁(Time) and A₂(No-Time) and 2 levels of Sex identified as Levels B: B₁(Males) and B₂(Females).

<table>
<thead>
<tr>
<th>Levels A</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MIU)</td>
<td>(OSU)</td>
</tr>
<tr>
<td>A₁(Time)</td>
<td>A₂(No-Time)</td>
</tr>
<tr>
<td>B₁(Male)</td>
<td>A₁B₁ n=37</td>
</tr>
<tr>
<td></td>
<td>A₂B₁ n=32</td>
</tr>
<tr>
<td></td>
<td>n=37</td>
</tr>
<tr>
<td>B₂(Female)</td>
<td>A₁B₂ n=34</td>
</tr>
<tr>
<td></td>
<td>A₂B₂ n=30</td>
</tr>
<tr>
<td></td>
<td>n=34</td>
</tr>
</tbody>
</table>

FIGURE 1 The 2 x 2 factorial design
The 2 x 3 factorial design enabled the 3 Time categories comprising the total MIU sample to be compared in a developmental cross-sectional study. FIGURE 2 represents the 2 x 3 design. There were 3 categories of Time designated Levels C: C₁(3-18 mo.), C₂(19-36 mo.) and C₃(37-69 mo.) and 2 dimensions of Sex titled Levels D: D₁(Male) and D₂(Females).

<table>
<thead>
<tr>
<th>Levels C</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIU</td>
<td>MIU</td>
</tr>
<tr>
<td>C₁ Time</td>
<td>C₂ Time</td>
</tr>
<tr>
<td>(3-18 mo.)</td>
<td>(19-36 mo.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Levels D Sex</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁(Males)</td>
<td>C₁D₁ n=12</td>
<td>C₂D₁ n=11</td>
</tr>
<tr>
<td>D₂(Females)</td>
<td>C₁D₂ n=13</td>
<td>C₂D₂ n=12</td>
</tr>
</tbody>
</table>

Levels C
- C₁ (3-18 mo.) n=25
- C₂ (19-36 mo.) n=23
- C₃ (37-69 mo.) n=23

Total N=71

Levels D
- D₁ (Males) n=37
- D₂ (Females) n=34

Total N=71

FIGURE 2 The 2 x 3 factorial design
Control of Variance

Besides testing hypotheses, design is intended to control variance. Random assignment and manipulation of independent variables are means of control which are not indigenous to the ex post facto method. Control that was possible was attempted through design which encouraged the principle of maximizing systematic variance and minimizing extraneous and error variance, so that the systematic variance could stand out as much as possible (Kerlinger, 1964).

Some loss of both control and between-groups variance was expected due to possible unequivocal groups and categorizing a continuous variable (Time), but maximizing systematic variance was attempted by making the categories as distinct as possible. Sex gender fit this condition as a natural dichotomy and Time categories within the meditating sample in the cross-sectional study were held to 3 across a 6 year span. Comparison of a meditating vs. non-meditating group permitted a distinct contrast. Although these contrasts invited the maximization of systematic variance the nature of the independent variables (attribute and/or
self-selected) without random assignment and manipulation denoted limitations for interpretation.

While recognizing the inferential restrictions and weakening of some extraneous control due to self-selection, strengths were afforded internal validity by the group comparisons permitted by the current designs (Campbell & Stanley, 1963). Because the factorial designs enabled a one-time testing of hypotheses, there was little threat to internal validity due to:

1) events occurring between several measurements
2) effects of a pre-test on a post-test
3) a change in the way measurements were taken, presented or used from pre to post-test
4) statistical regression between pre and post-tests

Controlling the influence of independent variables besides those used in the study was another method of controlling extraneous variance. In this study the age and educational background of all S's was held relatively constant. This in turn, however, effected external validity, the extent to which results could be generalized.

Independent variables can be built into the design
as a means of extraneous control. Sex, studied for main effect and interaction also was used as a control-variable, in line with the research hypothesis, affording a possible removal of its variance from the total variance which would in turn maximize any systematic variance found for Time.

The more randomization, the more extraneous control. Random assignment of S's to groups and of treatments to groups is not within the scope of the ex post facto approach. Stratified random selection was used as the best means of representing all Time levels and each Sex level, but was effected to some degree by mortality with 71 meditators volunteering out of the selected 90, and 62 non-meditators participating out of 90.

Some check was put on error variance by use of: reliable measures, simple preliminary and standardized self-directed test instructions for all S's, and the use of large samples and moderately large sub-samples.

Statistical Analysis of Data

In addition to positing questions and concepts, controlling variance and testing hypotheses, the design denoted appropriate methods of analysis.
Multivariate analysis of variance

The factorial designs permitted 6 independent personality variables to be assessed in relation to Time and Sex and the joint action of Time and Sex.

Six traits were examined across 11 scales:

<table>
<thead>
<tr>
<th>Measures</th>
<th>Variables</th>
<th>Scales</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAI-X1, STAI-X2, MAACL-A</td>
<td>Anxiety</td>
<td>3</td>
</tr>
<tr>
<td>MAACL-D</td>
<td>Depression</td>
<td>1</td>
</tr>
<tr>
<td>MAACL-H</td>
<td>Hostility</td>
<td>1</td>
</tr>
<tr>
<td>FIRO-B eI,wI</td>
<td>Inclusion</td>
<td>2</td>
</tr>
<tr>
<td>FIRO-B eC,wC</td>
<td>Control</td>
<td>2</td>
</tr>
<tr>
<td>FIRO-B eA,wA</td>
<td>Affection</td>
<td>2</td>
</tr>
</tbody>
</table>

A multivariate analysis of variance was used to evaluate Time and Sex main effects and interaction related to the personality scales of the dependent variables (Cooley and Lohnes, 1971). The multivariate analysis sought to maximize systematic variance between groups. The dependent variables were considered in combination as inter-dependent groupings or vectors. The system worked with vector random variables comprised of multivariate dependent elements, and with the centroid or vector of means.

In this study, the scale scores comprised 2 vectors for each of the 133 S's. There was a 6-variate
vector for the FIRO-B scales and a 5-variate vector for the combined STAI and MAACL scales. Pathology on the FIRO-B is only denoted by having all extreme low and/or high scores, 0 and/or 9. Direction is centered. On the STAI and MAACL, pathology is only represented by extreme high scores. Direction runs low to high. For each simultaneous computer analysis the FIRO-B was evaluated separately from the combined STAI and MAACL so that the jointness of the vectors was not disturbed by direction. The F test of significance used Wilks lambda criterion. Post hoc univariate F tests were run to determine which variables were involved. Significance was accepted at the .05 level.

Pearson product-moment correlation coefficients

The comparison of the intrapersonal variables of anxiety, depression and hostility with the interpersonal variables of inclusion, control and affection was afforded through an 11 x 11 correlation matrix for the combined samples (N=133) representing the 11 dependent variable scales.

The Pearson product-moment correlation coefficient was computed to assess the degree and direction
of each set of measures. Significance was recognized at the .05 level but was considered concomitantly with the degree of magnitude associated with it.

**Data processing**

Two programs were utilized at the Vogelback Computing Center, Northwestern University, Evanston, Illinois. One was the MANOVA program written at Biometric Laboratory, University of Miami, Coral Gables, Florida. The second program was the Statistical Package for Social Sciences (SPSS) written at Stanford University, University of Chicago and Northwestern University by Nie, Hull, Jenkins, Steinbrenner and Bent. The computer was Control Data Corporation Model 6400.

**Selection of Subjects**

The total group of subjects (N=133) was drawn from 2 undergraduate college populations. Meditating S's (N=71) were students from Maharishi International University (MIU), Fairfield, Iowa. MIU is a small 4-year liberal arts college. All students are practitioners of Transcendental Meditation. Non-meditating
S's (N=62) were sociology students from The Ohio State University (OSU), in Columbus, Ohio.

Similar in educational background, the S's came from all 4 undergraduate levels. Another similar variable between the 2 populations was age. MIU students ranged in ages from 17-32 years with a mean age of 21.1 years and the OSU students ranged in ages from 19-33 years with a mean age of 21.2 years.

The regular student body at MIU (N=438) constituted the accessible meditating population from which a stratified random sample was drawn. Students were grouped into 3 Time categories C₁(3-18 mo.), C₂(19-36 mo.) and C₃(37-86 mo.) corresponding to months that had been spent in the regular twice a day practice of TM. Each of the Time categories was divided into 2 dimensions, male (D₁) and female (D₂). Separate random samples (n=15) were drawn from the resulting 6 cells. The 90 randomly selected S's were invited to participate and 71 elected to take part. This resulted in 3 sub-sample Time categories as follows: C₁ (n=25), C₂ (n=23) and C₃ (n=23).
TM practitioners may participate in additional meditation time (rounding) supervised by TM teachers during residence courses held for periods of time which range from a weekend to any number of weeks. Rounding information was requested from S's to see if it changed the grouping in Time categories. Rank ordered, with and without the rounding time, S's fell into identical levels presenting no difficulty for evaluation of the randomly selected Time categories.

The accessible non-meditating population consisted of students in an OSU undergraduate sociology class (N=210). A simple stratified random selection was made by dividing the population into males and females and drawing separate random samples (n=45) for each segment. Sixty-two of the 90 randomly selected subjects elected to participate.

Descriptive statistics on MIU and OSU samples and sub-samples are given in TABLE 3.
<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>AGE - YEARS MEAN</th>
<th>S.D.</th>
<th>MONTHS IN MEDITATION MEAN</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIU-OSU (N=133)</td>
<td>21.1</td>
<td>2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIU-OSU-M (N=69)</td>
<td>21.0</td>
<td>1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIU-OSU-F (N=64)</td>
<td>21.3</td>
<td>3.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIU (N=71)</td>
<td>21.1</td>
<td>2.5</td>
<td>28.5</td>
<td>15.0</td>
</tr>
<tr>
<td>MIU-M (n=37)</td>
<td>21.1</td>
<td>1.9</td>
<td>29.3</td>
<td>15.4</td>
</tr>
<tr>
<td>MIU-F (n=34)</td>
<td>21.2</td>
<td>3.0</td>
<td>27.5</td>
<td>14.7</td>
</tr>
<tr>
<td>MIU-C1 (n=25)</td>
<td>20.2</td>
<td>2.4</td>
<td>13.5</td>
<td>3.7</td>
</tr>
<tr>
<td>MIU-C2 (n=23)</td>
<td>21.7</td>
<td>3.2</td>
<td>26.1</td>
<td>4.0</td>
</tr>
<tr>
<td>MIU-C3 (n=23)</td>
<td>21.5</td>
<td>1.5</td>
<td>47.1</td>
<td>7.7</td>
</tr>
<tr>
<td>MIU-C1-M (n=12)</td>
<td>19.0</td>
<td>1.2</td>
<td>12.8</td>
<td>4.4</td>
</tr>
<tr>
<td>MIU-C1-F (n=13)</td>
<td>21.4</td>
<td>2.6</td>
<td>14.2</td>
<td>2.9</td>
</tr>
<tr>
<td>MIU-C2-M (n=11)</td>
<td>22.3</td>
<td>1.5</td>
<td>26.0</td>
<td>3.6</td>
</tr>
<tr>
<td>MIU-C2-F (n=12)</td>
<td>21.1</td>
<td>4.2</td>
<td>26.2</td>
<td>4.6</td>
</tr>
<tr>
<td>MIU-C3-M (n=14)</td>
<td>21.9</td>
<td>1.2</td>
<td>45.4</td>
<td>8.3</td>
</tr>
<tr>
<td>MIU-C3-F (n=9)</td>
<td>21.0</td>
<td>1.8</td>
<td>48.7</td>
<td>7.0</td>
</tr>
<tr>
<td>OSU (N=62)</td>
<td>21.2</td>
<td>2.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSU-M (n=32)</td>
<td>21.0</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSU-F (n=30)</td>
<td>21.3</td>
<td>3.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Instrumentation

Three pen and pencil inventories were used to measure feelings and behavior associated with anxiety, depression, hostility, inclusion, control and affection.

The State-Trait Anxiety Inventory (STAI) by C. D. Spielberger, R. L. Gorsuch and R. Lushene was used to assess state and trait anxiety. Traits of anxiety, depression and hostility were evaluated through the Multiple Affect Adjective Check List (MAACL), General form, constructed by Marvin Zuckerman and Bernard Lubin. Interpersonal orientation, involving inclusion, control and affection, was measured by William C. Schutz's Fundamental Interpersonal Relations Orientation - Behavior (FIRO-B) questionnaire.

State-Trait Anxiety Inventory (STAI)

When Spielberger began construction of the STAI in 1964 at Vanderbilt University, the goal was to devise a 1-scale measure representing both state and trait anxiety. Initial research located 177 items which correlated at or about .25 with the IPAT Anxiety Scale, the Taylor Manifest Anxiety Scale and
the Welsh Anxiety Scale.

The STAI underwent numerous design modifications and research screenings since 1964 with over 3,000 college students tested on earlier versions, and more than 3,300 additional high school and college students participating in standardization research on the present form. The STAI developed into a 40 item inventory with 2 scales, one designed to measure the individual's current level of tension and apprehension (state anxiety or A-State), the other designed to assess anxiety proneness or vulnerability (trait anxiety or A-Trait).

Spielberger, et al. (1970) cited important changes in the concept of anxiety, due to research findings, as the major reason for the modification of the initial goal of an all purpose single measure of anxiety into the 2 scale STAI of today.

Without viewing anxiety as two related but different constructs, Spielberger (1972a, 1972b) reasoned that ambiguity developed.

Basic to the total concept is Spielberger's (1972) theory of state anxiety as transitory and
associated with a complex process. This process follows a sequence of events: 1) a stressful situation or environment 2) the cognitive appraisal and reappraisal of the stressor as a threat 3) the A-State reaction which involves feelings of apprehension and tension; autonomic nervous system arousal; use of psychological defenses or coping behavior; and other physiological and behavioral patterns which seek to reduce the intensity of the state.

While most discussions of anxiety have revolved around the components of the A-State response process, Spielberger (1972a, 1972b) noted that a comprehensive theory of anxiety must take into consideration the degree to which people differ in their proneness to experience the A-State. According to Spielberger, the second concept of anxiety as a personality trait (A-Trait) is related to the frequency and intensity of the occurrence of the A-State in an individual over time.

The author stated that trait anxiety measures such as the IPAT, TMAS and STAI (A-Trait scale) are highly correlated with each other and measure
vulnerability to anxiety in social situations. In interpersonal situations which are perceived as threatening to self-esteem and personal adequacy, the A-State will be experienced more frequently in individuals who score high in A-Trait. Due to the two constructs of anxiety as interpreted by Spielberger, the STAI design developed into a measure with separate scales for A-State and A-Trait. Interest for the current study lay with the A-Trait form of the STAI.

The 20 items on the A-Trait scale consist of statements such as "I worry too much over something that really doesn't matter", and "I try to avoid facing a crisis or difficulty" as well as shorter phrases: "I feel pleasant", "I tire easily". A-Trait items are rated across 4 categories: 1) almost never 2) sometimes 3) often and 4) almost always.

Possible scores range from a minimum of 20, corresponding to a low anxiety level, to a maximum of 80, representing high anxiety, on both A-State and A-Trait scales. The STAI was originally
constructed to measure anxiety in "normal" adults such as the 2 samples of 1466 Florida State University student subjects used to establish freshman level and undergraduate college norms for the present inventory.

The authors also felt that the STAI could be used to measure anxiety in more disturbed populations and in screening high school and college students for anxiety proneness and neurotic anxiety.

A-Trait scale test-retest reliability was considered high according to Spielberger, et al. (1970). It was reported between +.76 and +.84 for 1 hour, between +.76 and +.86 for 20 days and between +.73 and +.77 for 104 days.

The STAI manual stated that A-State and A-Trait items had to meet internal validity criteria for each anxiety construct, as interpreted by the authors, at each state of test construction.

Concurrent validity for the A-Trait scale was reported as relatively high. STAI A-Trait scale correlations with the IPAT were said to be between +.75 and +.76 and between +.79 and +.80 with the TMAS.
Multiple Affect Adjective Check List (MAACL)-
General Form

The anxiety scale of the MAACL known as the Affect Adjective Check List (AACL) was the first scale to be developed by Zuckerman (1960).

A list of 61 adjectives, simple items of common usage and 8th grade readability, were selected.

Items were based on adjectives used in a study comparing high anxiety psychiatric patients with subjects judged low in anxiety through a psychiatric interview, and from an experiment involving normal subjects in an anxiety state under hypnosis. The final selection of items included anxiety-plus adjectives such as "afraid", "desperate" and "fearful", as well as anxiety-minus items such as "calm", "cheerful" and "contented". One point apiece is scored for each anxiety-plus item checked and for each anxiety-minus item that is not checked. The direction of the scale runs low to high.

Depression and hostility scales were added to the AACL in 1965 (Zuckerman, Lubin, Vogel and Valerius, 1964). The depression scale, of 20 depression-plus and 20 depression-minus items, was constructed from a
study by Lubin (Zuckerman, et al., 1964). Psychiatric raters judged 95 patients to be moderately to severely depressed. A checklist of depressive adjectives was administered to these patients and 274 normal subjects. Items which significantly differentiated normal from depressed subjects were selected. Typical depression-plus words are "forlorn", "gloomy" and "hopeless". Depression-minus adjectives include items such as "alive", "enthusiastic" and "glad".

The hostility scale was developed from adjectives given by 22 freshmen college women in an hypnotically induced state of hostility. Hostility adjectives also include a plus category of items such as "angry", "bitter" and "offended", and minus words such as "friendly", "good-natured" and "cooperative". The final checklist is comprised of 132 items arranged in alphabetical order.

The reliability coefficient for internal consistency (split-half) for the anxiety scale of the MAACL General form was reported to be +.72. Test-retest (7 days) reliability was given as +.68. No reliability data was reported in the manual for MAACL General form.
depression and hostility scales.

Three college student samples involving a total of 328 subjects were used to test concurrent validity for the anxiety scale of the General form with the TMAS. Correlations between the TMAS and the MAACL were given as +.18, +.57 and +.58. Another college student sample (N=283) tested the MAACL General form anxiety scale and registered a correlation of +.65 with the Welsh Anxiety Scale. A similar college sample (N=246) showed a correlation of +.56 with the IPAT. In reverse, the MAACL General form anxiety scale correlated -.69 with a Security scale by Maslow. This involved a college sample of 283 subjects.

Correlations between the General MAACL anxiety scale and Gough's ACL scale were significant on most items. In an experiment relating the MAACL scales to clinical observation ratings of anxiety, depression and hostility, the General form scales had moderately positive correlations: anxiety, +.35, depression, +.32 and hostility, +.27.

Less research was conducted on the General form depression and hostility scales than on the anxiety
scale and conservative interpretation is advisable.

Several notes of caution were given by Kelly (1972). He felt there was some research basis for variance in scores being associated with the number of items checked. Subjects are instructed to check all items which describe their feelings and the actual number checked varies widely among S's. He also questioned whether the high intercorrelations among the 3 affects represented an inability of the checklist to discriminate, or a true intercorrelation between the emotions of anxiety, depression and hostility. He, nevertheless, recommended use of the MAACL for research purposes as a reasonable self-report measure of negative affect.

Fundamental Interpersonal Relations Orientation - Behavior - (FIRO-B)

Author Schutz (1967) stated that the primary purpose of the FIRO-B was "to measure how an individual acts in interpersonal situations" and "to provide an instrument that will facilitate the prediction of interaction between people" (p.4).

The FIRO-B was developed according to the Guttman
cumulative scale method. The theoretical principle underlying the Guttman technique involves selecting items for scales in an order of descending acceptability. When "...90% of all responses to all items can be predicted correctly from only a knowledge of how many items each person accepted, then the items are said to be reproducible ..." Schutz, 1967 (p. 3).

The design of the FIRO-B is based on 2 dimensions (expressed/wanted) across 3 interpersonal areas (inclusion/control/affection), a total of 6 scales.

The expressed (e) dimension is interpreted in the FIRO-B manual (p.4), as "the behavior an individual expresses towards others"; the wanted (w) dimension as "the behavior he wants others to express toward him". Inclusion (I) is considered to be interaction and association with others; control (C) is defined as power and influence; and affection (A) is interpreted as intimate and emotionally close. The 6 scales are:

- Inclusion/expressed behavior \( e^I \)
- Inclusion/wanted behavior \( w^I \)
- Control/expressed behavior \( e^C \)
- Control/wanted behavior \( w^C \)
- Affection/expressed behavior \( e^A \)
- Affection/wanted behavior \( w^A \)
There are 54 simple statements, 9 relating to each of the 6 scales with the statements judged and answered under 6 point keys. Response keys for 30 statements range from "usually", "often", "sometimes", "occasionally", "rarely" to "never", and the remainder are keyed "most people", "many people", "some people", "a few people", "one or two people" or "nobody".

Schutz (1967) maintained that the reproducibility of the FIRO-B Guttman scales was the best criterion of the tests internal consistency. The high reliability coefficients given were scale reproducibility scores and ranged from +.93 to +.94 testing over 1400 subjects per scale. Test-retest reliability coefficients were stated to be +.82(e'I), +.75 (w'I), +.74(e'C), +.71(w'C), +.73(e'A), and +.80(w'A), testing between 57 to 183 subjects on each scale. Intercorrelations between scales with 1340 subjects participating ranged from +.06 to +.47. A review by Bloxom (1972) and the manual stated that this may reflect relationships between the e and w dimensions of the I and A areas and between the I and A scales.

Concurrent validity was established according to
the manual through correlations with other personality measures and observations such as: changes in relationships during encounter workshops; use in marriage counseling; team teaching and therapy studies; and relating the FIRO-B to doctor-patient, teacher-student, salesman-customer relationships, social class, creativity and occupational groups.

Scores for each scale run from 0-9. Ryan (1971) suggested the following interpretations:

0-1 extremely low, compulsive quality to behavior
2-3 low, behavior is very characteristic
4-5 borderline, behavior may be similar to lower or higher descriptions
6-7 high, behavior is very characteristic
8-9 extremely high, compulsive quality to behavior

Inclusion: low e - moves away from people
high e - moves toward people
low w - selective
high w - strong need to be accepted

Control: low e - avoids decisions
high e - takes leadership role
low w - the person doesn't want others to control or make decisions for him
high w - dependency or tolerance of a situation

Affection: low e - cautious about initiating deep relationships
high e - becomes readily involved emotionally
low w - selective about people with whom affection is established
high w - the person wants others to establish close relationships with him

It was also noted by Ryan (1971) that the closer the e and w scores are within an interpersonal area, the more emotional congruence would be felt by the person, while the greater the discrepancy, the more frustration would be experienced. He also stated there might be relationships among the I, C and A areas. Orientation in one area might have bearing on other areas; affection being the most important, then control and inclusion.

Such interpretations permit a general understanding of individuals in most populations, according to Schutz. Only all extreme scores would denote possible pathology (Schutz, 1966). Other score combinations would reflect aspects of normal personality ranges, therefore, a "general norm" was not considered applicable. Instead, mean scores and standard deviations for 12 occupational groups were given in the manual.

Schutz (1970) and Ryan (1971) recommended use of the FIRO-B with high school, college students and adults
in counseling, and for exploring a variety of interpersonal situations. Bloxom (1972) suggested the best use at the present time for the FIRO-B was in research.

Data Collection

The STAI, MAACL-General form and FIRO-B inventories were placed together in a brown envelope as a kit. The inventories were written with simple standardized directions for self-administration. Because two populations were involved in different settings, S's were left to read their own instructions so that the testing situations could be kept as similar as possible. Individual questions were permitted from S's during testing if there was any confusion regarding the inventories. There was no time limit involved in taking the questionnaires which were completed in one sitting in college classrooms. Due to schedule conflicts, 18 MIU S's completed the forms outside the classroom which was permitted because the inventories were self-explanatory.

A short introductory sheet from the experimenter (E) was included in all kits. It explained that the purpose of the research "is to ascertain the affective
and interpersonal orientation" of the student population at MIU or OSU. Subjects were also instructed on the sheet that all information was to be held in strict confidence, and that there were no right or wrong answers. Subjects were asked to be "spontaneous and honest" in answering the forms. MIU meditators were asked, in addition, to mark on the sheet if they were teachers of TM, how long they had attended MIU, the length of their rounding time and their age. OSU subjects were requested to indicate age, sex, whether they practiced meditation and if they did, what form of meditation (so that any TM practitioners could be eliminated from the OSU sample).

Conclusion

Chapter III described the methodology, research design, statistical analysis of data, selection of subjects, instrumentation and data collection involved in this research study. Chapter IV will present the findings through discussion, charts and graphs.
CHAPTER IV

FINDINGS AND ANALYSIS

Presentation of the Data

Analysis of the data is presented in conjunction with corresponding research questions and hypotheses. Material is organized according to 4 divisions: 1) Time, 2) Sex Differences, 3) Interaction of Time with Sex Differences and 4) Correlation of Intrapersonal and Interpersonal Characteristics. Findings are discussed and illustrated with appropriate tables and graphs.

Time

Time was observed in 2 ways. One was by comparing a group (N=62) which had spent no time in meditation with a group (N=71) which had spent an average of 2.4 years in the practice. This assessment was related to question 1-A, conceptual hypothesis 1-A and null hypothesis 1.

The principal means of examining Time was a cross-sectional comparison of the meditators. The total meditating group was comprised of 3 sub-groups
consisting of 6 cells chosen through stratified random selection, resulting in 3 categories of Time (C1: 3-18 mo.; C2: 19-36 mo.; C3: 37-69 mo.) Selection was based on the population range of 3-86 months for the meditating S's. Question 1-B, conceptual hypothesis 1-B and null hypothesis 1 were the basis of the examination of the 3 Time levels. The following results are presented first for question and hypotheses 1 and 1-A and then for question and hypotheses 1 and 1-B.

**Question 1-A:** Are there personality differences between meditators and non-meditators?

**Conceptual Hypothesis 1-A:** Meditators will exhibit lower anxiety, depression, hostility and control, and higher inclusion and affection than non-meditators.

**Null Hypothesis 1:** Mean scores from groups of subjects defined in terms of time spent in meditation will not differ significantly on the FIRO-B, STAI and MAACL.

Intrapersonal characteristics of anxiety, depression and hostility were examined through the STAI and MAACL. **TABLE 4** shows the outcome of comparing meditators with non-meditators through STAI and MAACL scores by means of multivariate
analysis of variance using the Wilks lambda criterion for the test of significance.

TABLE 4

2 x 2 MULTIVARIATE ANALYSIS OF VARIANCE FOR STAI AND MAACL SCORES RELATED TO TIME MAIN EFFECT

N=133

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DPHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 THROUGH 1</td>
<td>6.182</td>
<td>5.000</td>
<td>125.000</td>
<td>.001</td>
</tr>
</tbody>
</table>

The analysis of data from the STAI and MAACL did not confirm null hypothesis 1. A significant difference at the .001 level was found between meditator and non-meditator mean scores on the intrapersonal variables.

To ascertain in which intrapersonal area(s) significance occurred univariate F tests were run. TABLE 5 illustrates the findings.
TABLE 5
2 x 2 UNIVARIATE F TESTS FOR TIME MAIN EFFECT ON THE STAI AND MAACL

N=133

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>F(1, 129)</th>
<th>MS</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAI-X1</td>
<td>24.746</td>
<td>1947.987</td>
<td>.001</td>
</tr>
<tr>
<td>STAI-X2</td>
<td>23.822</td>
<td>1676.132</td>
<td>.001</td>
</tr>
<tr>
<td>MAACL-A</td>
<td>14.977</td>
<td>207.990</td>
<td>.001</td>
</tr>
<tr>
<td>MAACL-D</td>
<td>11.648</td>
<td>368.388</td>
<td>.001</td>
</tr>
<tr>
<td>MAACL-H</td>
<td>3.151</td>
<td>29.573</td>
<td>.078</td>
</tr>
</tbody>
</table>

All measures of anxiety registered significant differences between meditator and non-meditator mean scores at .001 levels of significance. The measure of depression also showed a marked difference between groups at the .001 level of significance. Hostility did not reach a significant degree of difference using p<.05 as a criterion.

Question 1-A was answered affirmatively regarding the intrapersonal characteristics of anxiety and depression. There were definite personality differences in the areas of anxiety and depression between the meditators and non-meditators in this study. Meditators were decidedly lower in anxiety and depression than non-
meditators as is shown in TABLE 8.

Interpersonal characteristics of inclusion, control and affection were assessed by means of the FIRO-B. The result of the test of significance using the Wilks lambda criterion is illustrated in TABLE 6.

TABLE 6

2 x 2 MULTIVARIATE ANALYSIS OF VARIANCE FOR FIRO-B SCORES RELATED TO TIME MAIN EFFECT

N=133

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DFHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 THROUGH 1</td>
<td>6.446</td>
<td>6.000</td>
<td>124.000</td>
<td>.001</td>
</tr>
</tbody>
</table>

Analysis indicated that significant differences did exist on FIRO-B mean scores between meditators and non-meditators at the .001 level. Null hypothesis 1 stating that such scores would not differ significantly was not supported.

Univariate F tests revealed that marked differences in interpersonal traits included inclusion expressed and control expressed. For these personality characteristics an affirmative answer was given to question 1-A. TABLE 8 illustrates that meditators
were decidedly lower than non-meditators in inclusion expressed and control expressed. There were, however, no significant differences between meditators and non-meditators regarding inclusion wanted, control wanted, or affection expressed and wanted. Information concerning F tests for FIRO-B scale scores is contained in TABLE 7.

**TABLE 7**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>F(1, 129)</th>
<th>MS</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRO-e1</td>
<td>24.913</td>
<td>101.033</td>
<td>.001</td>
</tr>
<tr>
<td>FIRO-w1</td>
<td>3.831</td>
<td>41.902</td>
<td>.052</td>
</tr>
<tr>
<td>FIRO-eC</td>
<td>4.205</td>
<td>22.309</td>
<td>.042</td>
</tr>
<tr>
<td>FIRO-wC</td>
<td>.223</td>
<td>1.080</td>
<td>.637</td>
</tr>
<tr>
<td>FIRO-eA</td>
<td>1.021</td>
<td>6.764</td>
<td>.314</td>
</tr>
<tr>
<td>FIRO-wA</td>
<td>.823</td>
<td>4.741</td>
<td>.366</td>
</tr>
</tbody>
</table>

Inspection of the group mean scores given in TABLE 8 reveals the nature of the personality differences investigated. Meditators were lower in anxiety, depression, inclusion expressed, and control expressed, than non-meditators. All of these personality variables were markedly lower statistically. This gave
support to that part of conceptual hypothesis 1-A which postulated that meditators would exhibit lower anxiety, depression and control, in this case, the expressed dimension of control.

It did not confirm, however, the supposition that meditators would show greater affection. Nor did it disclose lower hostility, and control wanted for meditators. No marked differences were noted between groups on these traits.

The findings on inclusion expressed and wanted were the reverse of the hypothesis. Meditators were not higher but were lower in these dimensions. TABLE 8 shows mean scores, standard deviations and differences between means for all of the intrapersonal and interpersonal scales.
TABLE 8

2 x 2 MEANS, STANDARD DEVIATIONS, AND DIFFERENCES BETWEEN MEANS FOR TIME MAIN EFFECT ON THE FIRO-B, MAACL, AND STAI

N=133

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MIU-TIME MEAN</th>
<th>MIU-TIME SD</th>
<th>OSU-NO-TIME MEAN</th>
<th>OSU-NO-TIME SD</th>
<th>DIFF. BETWEEN MEANS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIROe1</td>
<td>3.592</td>
<td>2.032</td>
<td>5.339</td>
<td>1.991</td>
<td>1.747 ***</td>
</tr>
<tr>
<td>FIROw1</td>
<td>4.085</td>
<td>3.341</td>
<td>5.210</td>
<td>3.344</td>
<td>1.125</td>
</tr>
<tr>
<td>FIROeC</td>
<td>2.211</td>
<td>2.097</td>
<td>3.032</td>
<td>2.548</td>
<td>.821 *</td>
</tr>
<tr>
<td>FIROwC</td>
<td>3.423</td>
<td>2.019</td>
<td>3.290</td>
<td>2.384</td>
<td>.133</td>
</tr>
<tr>
<td>FIROeA</td>
<td>4.225</td>
<td>2.456</td>
<td>4.677</td>
<td>2.678</td>
<td>.452</td>
</tr>
<tr>
<td>FIROwA</td>
<td>6.282</td>
<td>2.300</td>
<td>5.903</td>
<td>2.540</td>
<td>.379</td>
</tr>
<tr>
<td>MAACL-A</td>
<td>2.380</td>
<td>2.800</td>
<td>4.887</td>
<td>4.516</td>
<td>2.507 ***</td>
</tr>
<tr>
<td>MAACL-H</td>
<td>3.845</td>
<td>2.533</td>
<td>4.790</td>
<td>3.567</td>
<td>.945</td>
</tr>
<tr>
<td>STAI-X1</td>
<td>28.183</td>
<td>5.965</td>
<td>35.855</td>
<td>11.231</td>
<td>7.672 ***</td>
</tr>
<tr>
<td>STAI-X2</td>
<td>29.690</td>
<td>7.070</td>
<td>37.290</td>
<td>9.462</td>
<td>7.600 ***</td>
</tr>
</tbody>
</table>

*Significant at .05 level  **Significant at .01 level  ***Significant at .001 level
FIRO-B Score range: 0-9 MAACL Score range: 0-20+ STAI Score range: 20-80

Significant trait differences between groups are pictured in FIGURES 3 through 7.
FIGURE 3. Trait anxiety in meditators and non-meditators measured on the STAI.
FIGURE 4  Trait anxiety in meditators and non-meditators measured on the MAACL.
FIGURE 5 Depression in meditators and non-meditators measured on the MAACL.
FIGURE 6: Inclusion expressed in meditators and non-meditators measured on the FIRO-B.
FIGURE 7 Control expressed in meditators and non-meditators measured on the FIRO-B.
Question 1-B: Are there personality differences among meditators who have practiced varying lengths of time?

Conceptual Hypothesis 1-B: Meditators with longer practice in meditation will show lower anxiety, depression, hostility and control, and higher inclusion and affection, than meditators with shorter practice.

Null Hypothesis 1: Mean scores from groups of subjects defined in terms of time spent in meditation will not differ significantly on the FIRO-B, STAI and MAACL.

A cross-sectional approach was adopted to examine possible differences on personality variables among the meditators (N=71) who had been meditating short: 3-18 mo. (n=25), moderate: 19-36 mo. (n=23), and long: 36-69 mo. (n=23) lengths of time.

A multivariate analysis of variance of the 3 meditating Time categories with the 2 Sex levels was run. The result of the Wilks lambda test of significance contained in TABLE 9 indicated there was no significant association between meditator Time and the anxiety, depression and hostility variables measured on the STAI and MAACL.
TABLE 9

2 x 3 MULTIVARIATE ANALYSIS OF VARIANCE
FOR STAI AND MAACL SCORES RELATED
TO TIME MAIN EFFECT

N=71

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DFHYP</th>
<th>DEERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 TO 2</td>
<td>1.124</td>
<td>10.000</td>
<td>128.000</td>
<td>.349</td>
</tr>
<tr>
<td>1 TO 2</td>
<td>1.073</td>
<td>4.000</td>
<td>84.500</td>
<td>.377</td>
</tr>
</tbody>
</table>

A closer look at each intrapersonal variable through univariate F tests confirmed that no significant relationships could be found. The 2 x 3 univariate F test results for Time are found in TABLE 10.
A survey of the interpersonal variables of the FIRO-B related to Time among meditators was achieved through a multivariate analysis of variance. As seen in TABLE 11 no significant relationship was indicated by the F test between these variables and meditator Time levels. The univariate F test results for each interpersonal variable listed in TABLE 12 verified this finding.
TABLE 11

2 x 3 MULTIVARIATE ANALYSIS OF VARIANCE 
FOR FIRO-B SCORES RELATED TO 
TIME MAIN EFFECT

N=71

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DFHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 TO 2</td>
<td>.261</td>
<td>12.000</td>
<td>126.000</td>
<td>.994</td>
</tr>
<tr>
<td>2 TO 2</td>
<td>.075</td>
<td>5.000</td>
<td>63.500</td>
<td>.996</td>
</tr>
</tbody>
</table>

TABLE 12

2 x 3 UNIVARIATE F TESTS FOR 
MAIN EFFECT ON THE FIRO-B 

N=71

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>F(2, 68)</th>
<th>MSHYP</th>
<th>MSERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRO-eI</td>
<td>.003</td>
<td>.012</td>
<td>4.252</td>
<td>.997</td>
</tr>
<tr>
<td>FIRO-wI</td>
<td>.216</td>
<td>2.470</td>
<td>11.420</td>
<td>.806</td>
</tr>
<tr>
<td>FIRO-eC</td>
<td>.074</td>
<td>.335</td>
<td>4.517</td>
<td>.929</td>
</tr>
<tr>
<td>FIRO-wC</td>
<td>.349</td>
<td>1.452</td>
<td>4.153</td>
<td>.706</td>
</tr>
<tr>
<td>FIRO-eA</td>
<td>.414</td>
<td>2.538</td>
<td>6.137</td>
<td>.663</td>
</tr>
<tr>
<td>FIRO-wA</td>
<td>.058</td>
<td>.314</td>
<td>5.437</td>
<td>.944</td>
</tr>
</tbody>
</table>

The means and standard deviations for the 3 mediator Time categories are shown in TABLE 13.
TABLE 13

2 x 3 MEANS AND STANDARD DEVIATIONS
FOR TIME MAIN EFFECT ON THE
FIRO-B MAACL AND STAI

N=71

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>C-1 (3-18 mo.)</th>
<th>C-2 (19-36 mo.)</th>
<th>C-3 (37-69 mo.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MEAN</td>
<td>SD</td>
<td>MEAN</td>
</tr>
<tr>
<td>FIRO-e1</td>
<td>3.600</td>
<td>2.309</td>
<td>3.565</td>
</tr>
<tr>
<td>FIRO-w1</td>
<td>4.120</td>
<td>3.678</td>
<td>4.391</td>
</tr>
<tr>
<td>FIRO-e2</td>
<td>2.120</td>
<td>1.878</td>
<td>2.174</td>
</tr>
<tr>
<td>FIRO-w2</td>
<td>3.560</td>
<td>2.200</td>
<td>3.130</td>
</tr>
<tr>
<td>FIRO-eA</td>
<td>4.080</td>
<td>2.308</td>
<td>4.609</td>
</tr>
<tr>
<td>FIRO-wA</td>
<td>6.400</td>
<td>2.141</td>
<td>6.174</td>
</tr>
<tr>
<td>MAACL-A</td>
<td>2.560</td>
<td>2.485</td>
<td>1.652</td>
</tr>
<tr>
<td>MAACL-D</td>
<td>6.880</td>
<td>3.745</td>
<td>4.696</td>
</tr>
<tr>
<td>MAACL-H</td>
<td>4.160</td>
<td>2.322</td>
<td>3.522</td>
</tr>
<tr>
<td>STAI-X2</td>
<td>29.000</td>
<td>6.096</td>
<td>30.130</td>
</tr>
</tbody>
</table>

NS: All $\bar{X}$ score differences

FIRO-B Score range: 0-9
MAACL Score range: 0-20+
STAI Score range: 20-80

Question 1-B was answered negatively. There were no personality differences noted among meditators compared on the Time factor. Conceptual hypothesis 1-B was not supported as no specific variables showed higher or lower change over Time.

Null hypothesis 1 was verified as it pertained to mean
score differences among meditator Time levels.
There were no significant differences.

**Sex Differences**

Sex differences as a main effect was viewed across the 2 x 2 and 2 x 3 designs.

The 2 x 2 design permitted the meditating and non-meditating groups (N=133) to be combined and to be assessed along the 2 Sex levels: male (N=69) and female (N=64). The 2 x 3 run concerned only meditators (N=71) and evaluated mean scores between males (N=37) and females (N=34) from that group. Question and hypotheses 2 related to both assessments.

**Question 2:** Are there personality differences between men and women.

**Conceptual Hypothesis 2:** Men and women will exhibit relatively the same amounts of anxiety, depression, hostility, inclusion, control and affection.

**Null Hypothesis 2:** There will be no significant differences between male and female mean scores on the FIRO-B, STAI and MAACL.

The 2 x 2 multivariate analysis of variance showed no significant relationships between sex gender and personality scores on the STAI and MAACL.
Univariate F tests confirmed this finding for each intrapersonal variable. The results are shown in TABLE 14 and TABLE 15.

**TABLE 14**

**2 x 2 MULTIVARIATE ANALYSIS OF VARIANCE FOR STAI AND MAACL SCORES RELATED TO SEX MAIN EFFECT**

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DFHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 THROUGH 1</td>
<td>.477</td>
<td>5.000</td>
<td>125.000</td>
<td>.793</td>
</tr>
</tbody>
</table>

**TABLE 15**

**2 x 2 UNIVARIATE F TESTS FOR SEX MAIN EFFECT ON THE STAI AND MAACL**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>F(1; 129)</th>
<th>MS</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAI-X1</td>
<td>.371</td>
<td>29.186</td>
<td>.544</td>
</tr>
<tr>
<td>STAI-X2</td>
<td>.046</td>
<td>3.221</td>
<td>.831</td>
</tr>
<tr>
<td>MAACL-A</td>
<td>.065</td>
<td>.879</td>
<td>.800</td>
</tr>
<tr>
<td>MAACL-D</td>
<td>.005</td>
<td>.151</td>
<td>.945</td>
</tr>
<tr>
<td>MAACL-H</td>
<td>.880</td>
<td>8.257</td>
<td>.350</td>
</tr>
</tbody>
</table>

The results for the FIRO-B scores offered the same pattern as the STAI and MAACL scores.
associated with Sex. There were no marked differences between the sexes on the interpersonal variables. The results of the 2 x 2 statistical analysis of Sex with FIRO-B scores are given in TABLE 16 and TABLE 17. The 2 x 2 means and standard deviations by Sex levels is shown for all personality variables in TABLE 18.

TABLE 16

2 x 2 MULTIVARIATE ANALYSIS OF VARIANCE FOR FIRO-B SCORES RELATED TO SEX MAIN EFFECT

N=133

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DPHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 THROUGH 1</td>
<td>1.121</td>
<td>6.000</td>
<td>124.000</td>
<td>.354</td>
</tr>
</tbody>
</table>
TABLE 17

2 x 2 UNIVARIATE F TESTS FOR SEX MAIN EFFECT ON THE FIRO-B

N=133

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>F(1, 129)</th>
<th>MS</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRO-B eI</td>
<td>.002</td>
<td>.090</td>
<td>.882</td>
</tr>
<tr>
<td>FIRO-B wI</td>
<td>.691</td>
<td>7.554</td>
<td>.408</td>
</tr>
<tr>
<td>FIRO-B eC</td>
<td>3.043</td>
<td>16.142</td>
<td>.083</td>
</tr>
<tr>
<td>FIRO-B eC</td>
<td>.133</td>
<td>.644</td>
<td>.716</td>
</tr>
<tr>
<td>FIRO-B eA</td>
<td>.770</td>
<td>5.102</td>
<td>.382</td>
</tr>
<tr>
<td>FIRO-B wA</td>
<td>3.625</td>
<td>20.873</td>
<td>.059</td>
</tr>
</tbody>
</table>
TABLE 18

2 x 2 MEANS, STANDARD DEVIATIONS FOR SEX MAIN EFFECT ON THE FIRO-B, MAACL AND STAI

N=133

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MEAN</td>
<td>SD</td>
</tr>
<tr>
<td>FIRO-eI</td>
<td>4.377</td>
<td>2.170</td>
</tr>
<tr>
<td>FIRO-wI</td>
<td>4.377</td>
<td>3.557</td>
</tr>
<tr>
<td>FIRO-eC</td>
<td>2.928</td>
<td>2.457</td>
</tr>
<tr>
<td>FIRO-wC</td>
<td>3.449</td>
<td>2.246</td>
</tr>
<tr>
<td>FIRO-eA</td>
<td>4.246</td>
<td>2.563</td>
</tr>
<tr>
<td>FIRO-wA</td>
<td>5.725</td>
<td>2.612</td>
</tr>
<tr>
<td>MAACL-A</td>
<td>3.463</td>
<td>3.716</td>
</tr>
<tr>
<td>MAACL-D</td>
<td>7.275</td>
<td>5.496</td>
</tr>
<tr>
<td>MAACL-H</td>
<td>4.043</td>
<td>2.943</td>
</tr>
<tr>
<td>STAI-X1</td>
<td>31.290</td>
<td>8.277</td>
</tr>
<tr>
<td>STAI-X2</td>
<td>33.275</td>
<td>8.848</td>
</tr>
</tbody>
</table>

NS: All X score differences

FIRO-B Score range: 0-9
MAACL Score range: 0-20+
STAI Score range: 20-80

When sex differences were evaluated for the meditating group (N=71) through the 2 x 3 analysis, no significant differences were found for the interpersonal variables of anxiety, hostility and depression. The finding from the Wilks lambda test of significance is given in TABLE 19.
and the univariate F test results for the STAI and MAACL scales are listed in TABLE 20.

TABLE 19

2 x 3 MULTIVARIATE ANALYSIS OF VARIANCE
FOR STAI AND MAACL SCORES
RELATED TO SEX MAIN EFFECT

N=71

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DFHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 THROUGH 1</td>
<td>1.367</td>
<td>5.000</td>
<td>65.000</td>
<td>.248</td>
</tr>
</tbody>
</table>

TABLE 20

2 x 3 UNIVARIATE F TESTS FOR SEX
MAIN EFFECTS ON THE STAI AND MAACL

N=71

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>F(1, 69)</th>
<th>MSHYP</th>
<th>MSERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAI X-1</td>
<td>.478</td>
<td>17.831</td>
<td>35.838</td>
<td>.483</td>
</tr>
<tr>
<td>STAI X-2</td>
<td>.124</td>
<td>6.264</td>
<td>50.622</td>
<td>.726</td>
</tr>
<tr>
<td>MAACL-A</td>
<td>.183</td>
<td>1.451</td>
<td>7.932</td>
<td>.670</td>
</tr>
<tr>
<td>MAACL-D</td>
<td>.066</td>
<td>1.333</td>
<td>20.139</td>
<td>.798</td>
</tr>
<tr>
<td>MAACL-H</td>
<td>2.373</td>
<td>14.936</td>
<td>6.300</td>
<td>.128</td>
</tr>
</tbody>
</table>

Inclusion, control and affection were not decidedly different between male and female meditators.
These FIRO-B variables registered no marked relationship to sex gender as is noted in TABLE 21 and TABLE 22. F tests did not disclose any significant differences.

**TABLE 21**

2 x 3 MULTIVARIATE ANALYSIS OF VARIANCE FOR FIRO-B SCORES RELATED TO SEX MAIN EFFECT

\[ N = 71 \]

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DFHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 THROUGH 1</td>
<td>.914</td>
<td>6.000</td>
<td>64.000</td>
<td>.491</td>
</tr>
</tbody>
</table>

**TABLE 22**

2 x 3 UNIVARIATE F TESTS FOR SEX MAIN EFFECT ON THE FIRO-B

\[ N = 71 \]

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>F(1, 69)</th>
<th>MSHYP</th>
<th>MSERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRO-e^1</td>
<td>.688</td>
<td>2.855</td>
<td>4.149</td>
<td>.410</td>
</tr>
<tr>
<td>FIRO-w^1</td>
<td>.594</td>
<td>6.673</td>
<td>11.229</td>
<td>.443</td>
</tr>
<tr>
<td>FIRO-e^C</td>
<td>.659</td>
<td>2.912</td>
<td>4.419</td>
<td>.420</td>
</tr>
<tr>
<td>FIRO-w^C</td>
<td>.155</td>
<td>0.640</td>
<td>4.126</td>
<td>.695</td>
</tr>
<tr>
<td>FIRO-e^A</td>
<td>.500</td>
<td>3.039</td>
<td>6.078</td>
<td>.482</td>
</tr>
<tr>
<td>FIRO-w^A</td>
<td>2.259</td>
<td>11.340</td>
<td>5.197</td>
<td>.137</td>
</tr>
</tbody>
</table>
The means and standard deviations on all scale scores for male and female meditators is listed in TABLE 23.

### TABLE 23

2 x 3 MEANS, STANDARD DEVIATIONS FOR SEX MAIN EFFECT ON THE FIRO-B, MAACL AND STAI

N=71

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MALE MEAN</th>
<th>MALE SD</th>
<th>FEMALE MEAN</th>
<th>FEMALE SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRO-e1</td>
<td>3.784</td>
<td>2.149</td>
<td>3.382</td>
<td>1.907</td>
</tr>
<tr>
<td>FIRO-w1</td>
<td>4.378</td>
<td>3.538</td>
<td>3.765</td>
<td>3.134</td>
</tr>
<tr>
<td>FIRO-eC</td>
<td>2.405</td>
<td>2.061</td>
<td>2.000</td>
<td>2.146</td>
</tr>
<tr>
<td>FIRO-wC</td>
<td>3.514</td>
<td>1.967</td>
<td>3.324</td>
<td>2.099</td>
</tr>
<tr>
<td>FIRO-eA</td>
<td>4.027</td>
<td>2.630</td>
<td>4.441</td>
<td>2.272</td>
</tr>
<tr>
<td>FIRO-wA</td>
<td>5.892</td>
<td>2.503</td>
<td>6.706</td>
<td>2.008</td>
</tr>
<tr>
<td>MAACL-A</td>
<td>2.243</td>
<td>2.823</td>
<td>2.529</td>
<td>2.809</td>
</tr>
<tr>
<td>MAACL-D</td>
<td>5.892</td>
<td>4.364</td>
<td>5.618</td>
<td>4.619</td>
</tr>
<tr>
<td>MAACL-H</td>
<td>3.405</td>
<td>2.432</td>
<td>4.324</td>
<td>2.590</td>
</tr>
<tr>
<td>STAI X-1</td>
<td>27.703</td>
<td>5.617</td>
<td>28.706</td>
<td>6.365</td>
</tr>
<tr>
<td>STAI X-2</td>
<td>29.405</td>
<td>7.263</td>
<td>30.000</td>
<td>6.950</td>
</tr>
</tbody>
</table>

NS: All X score differences

FIRO-B Score range: 0-9
MAACL Score range: 0-20+
STAI Score range: 20-80

The answer to question 2 related to the S's in this study was that there were no marked differences in personality due to sex gender.
Conceptual and null hypotheses 2 were both confirmed because the men and women in this project did not reveal any significant differences in levels of anxiety, depression, hostility, inclusion, control, or affection related to Sex.

**Interaction of Time with Sex Differences**

The interaction of Time with Sex was observed through the 2 x 2 and 2 x 3 designs. Both examinations were related to question and hypotheses 3.

**Question 3:** Do males and females interacting with variations in Time differ in response?

**Conceptual Hypothesis 3:** The magnitude and direction of male-female response will be the same over Time.

**Null Hypothesis 3:** FIRO-B, STAI and MAACL means from groups of subjects defined jointly in terms of Time and Sex will not differ significantly from the means expected by the simple addition of the main effects.

The 2 x 3 analysis examined the action of Time and Sex associated with the 4 cell groups of the design:

1) Time males (n=37) 2) Time females (n=34)
3) No-Time males (n=32) and 4) No-Time females (n=30).
For the variables of anxiety, depression and hostility, the F test using the Wilks lambda criterion did not denote any significant interaction. The univariate F tests for the individual STAI and MAACL scales reported no action for any of them. The data for these tests of significance on the STAI and MAACL mean scores are recorded in TABLE 24 and TABLE 25.

TABLE 24

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DFHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 THROUGH 1</td>
<td>.702</td>
<td>5.000</td>
<td>125.000</td>
<td>.623</td>
</tr>
</tbody>
</table>

N=133
Inclusion, control and affection were evaluated for the interaction of the Time and Sex variables. While the F test using Wilks lambda criterion did not register significance (p<.173), the univariate F tests indicated a small degree of action in the interpersonal scales. A survey of the FIRO-B scale scores revealed interaction of the Time and Sex variables related to one dimension: inclusion wanted (p<.05). TABLE 26 and TABLE 27 disclose these findings.
TABLE 26

2 x 2 MULTIVARIATE ANALYSIS OF VARIANCE FOR FIRO-B SCORES RELATED TO TIME AND SEX INTERACTION

N=133

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DFHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 THROUGH 1</td>
<td>1.531</td>
<td>6.000</td>
<td>124.000</td>
<td>.173</td>
</tr>
</tbody>
</table>

TABLE 27

2 x 2 UNIVARIATE F TESTS FOR TIME AND SEX INTERACTION ON THE FIRO-B

N=133

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>F(1, 129)</th>
<th>MS</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRO-e₁</td>
<td>1.926</td>
<td>7.811</td>
<td>.168</td>
</tr>
<tr>
<td>FIRO-w₁</td>
<td>4.132</td>
<td>45.193</td>
<td>.044</td>
</tr>
<tr>
<td>FIRO-e₃</td>
<td>.610</td>
<td>3.236</td>
<td>.436</td>
</tr>
<tr>
<td>FIRO-w₃</td>
<td>.020</td>
<td>.098</td>
<td>.887</td>
</tr>
<tr>
<td>FIRO-e₄</td>
<td>.003</td>
<td>.019</td>
<td>.958</td>
</tr>
<tr>
<td>FIRO-w₄</td>
<td>.003</td>
<td>.017</td>
<td>.957</td>
</tr>
</tbody>
</table>

The means and standard deviations of the 4 cells of the 2 x 2 design are recorded for all the intrapersonal and interpersonal variables in TABLE 28.
The significant F on the $w^I$ scale was due primarily to the female group of the No-Time level. This group was decidedly higher than the 3 other groups which were similar to each other.

Females with Time in the practice were markedly lower (3.765) than females with No-Time (6.100). Females with Time were also relatively close to both male groups which showed similar means for the Time level (4.378) and the No-Time level (4.375). Females showed a significant interaction with the Time variable.

Question 3 was answered affirmatively and the conceptual and null hypotheses 3 were not supported for inclusion wanted. Males and females interacting with variations in Time differed in response. The magnitude of the Sex response on the $w^I$ scale measure was not the same from one Time level to the other. The joint action of the Time variable with the female Sex influenced the $w^I$ mean scores to a greater extent than what had been expected by combining the 2 variables. The combination had been hypothesized to parallel the interaction scores of the Time variable with the male Sex.
### TABLE 28

2 x 2 MEANS AND STANDARD DEVIATIONS FOR TIME AND SEX INTERACTION, SHOWING CELL GROUP SCORES ON THE FIRO-B, MAACL AND STAI

N=133

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>TIME</th>
<th>NO-TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MALE</td>
<td>FEMALE</td>
</tr>
<tr>
<td>FIRO-eI</td>
<td>M</td>
<td>3.784</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.149</td>
</tr>
<tr>
<td>FIRO-wI</td>
<td>M</td>
<td>4.378</td>
</tr>
<tr>
<td>*</td>
<td>SD</td>
<td>3.538</td>
</tr>
<tr>
<td>FIRO-eC</td>
<td>M</td>
<td>2.405</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.061</td>
</tr>
<tr>
<td>FIRO-wC</td>
<td>M</td>
<td>3.514</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.967</td>
</tr>
<tr>
<td>FIRO-eA</td>
<td>M</td>
<td>4.027</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.630</td>
</tr>
<tr>
<td>FIRO-wA</td>
<td>M</td>
<td>5.892</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.503</td>
</tr>
<tr>
<td>MAACL-A</td>
<td>M</td>
<td>2.243</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.823</td>
</tr>
<tr>
<td>MAACL-D</td>
<td>M</td>
<td>5.892</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>4.364</td>
</tr>
<tr>
<td>MAACL-H</td>
<td>M</td>
<td>3.405</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.432</td>
</tr>
<tr>
<td>STAI X-1</td>
<td>M</td>
<td>27.703</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>5.617</td>
</tr>
<tr>
<td>STAI X-2</td>
<td>M</td>
<td>29.405</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>7.263</td>
</tr>
</tbody>
</table>

* Significant at .05 level
The marked difference in the way females interacted with the Time variable is illustrated in FIGURE 8.

**FIGURE 8** Interaction of Time and Sex variables related to inclusion wanted measured on the FIRO-B for the 2 x 2 design.
An assessment of the STAI and MAACL cell mean scores established that no interaction occurred in the 2 x 3 design for meditators. This finding is noted in TABLE 29. Univariate F tests, whose results are recorded in TABLE 30 disclosed no interaction in any intrapersonal variable for the meditating groups.

**TABLE 29**

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DFHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 TO 2</td>
<td>1.279</td>
<td>10.000</td>
<td>122.000</td>
<td>.250</td>
</tr>
<tr>
<td>2 TO 2</td>
<td>1.012</td>
<td>4.000</td>
<td>61.500</td>
<td>408</td>
</tr>
</tbody>
</table>
TABLE 30
2 x 3 UNIVARIATE F TESTS FOR TIME AND SEX INTERACTION ON THE STAI AND MAACL

N=71

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>F(2, 65)</th>
<th>MSHYP</th>
<th>MSERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAI X-1</td>
<td>0.065</td>
<td>2.454</td>
<td>37.685</td>
<td>.937</td>
</tr>
<tr>
<td>STAI X-2</td>
<td>1.527</td>
<td>77.923</td>
<td>51.035</td>
<td>.225</td>
</tr>
<tr>
<td>MAACL-D</td>
<td>1.821</td>
<td>35.329</td>
<td>19.400</td>
<td>.170</td>
</tr>
<tr>
<td>MAACL-H</td>
<td>2.031</td>
<td>12.626</td>
<td>6.127</td>
<td>.139</td>
</tr>
</tbody>
</table>

When the FIRO-B scores were examined through the 2 x 3 analysis the F test with Wilks lambda criterion gave no indication of interaction as can be seen in TABLE 31. However, a review of each interpersonal variable through univariate F tests revealed a small degree of action in the set. One scale, control wanted, showed interaction between Time and Sex at the .05 level of significance. These findings are given in TABLE 32.
TABLE 31

2 x 3 MULTIVARIATE ANALYSIS OF VARIANCE FOR FIRO-B SCORES RELATED TO TIME AND SEX INTERACTION

N=71

<table>
<thead>
<tr>
<th>TEST OF ROOTS</th>
<th>F</th>
<th>DFHYP</th>
<th>DFERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 TO 2</td>
<td>1.360</td>
<td>12.000</td>
<td>120.000</td>
<td>.195</td>
</tr>
<tr>
<td>2 TO 2</td>
<td>.117</td>
<td>5.000</td>
<td>60.500</td>
<td>.988</td>
</tr>
</tbody>
</table>

TABLE 32

2 x 3 UNIVARIATE F TESTS FOR TIME AND SEX INTERACTION ON THE FIRO-B

N=71

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>F(2, 65)</th>
<th>MSHYP</th>
<th>MSERR</th>
<th>P LESS THAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRO-e^I</td>
<td>.225</td>
<td>.983</td>
<td>4.374</td>
<td>.799</td>
</tr>
<tr>
<td>FIRO-w^I</td>
<td>.995</td>
<td>11.411</td>
<td>11.471</td>
<td>.375</td>
</tr>
<tr>
<td>FIRO-e^C</td>
<td>.033</td>
<td>.153</td>
<td>4.680</td>
<td>.968</td>
</tr>
<tr>
<td>FIRO-w^C</td>
<td>4.671</td>
<td>17.715</td>
<td>3.792</td>
<td>.013</td>
</tr>
<tr>
<td>FIRO-e^A</td>
<td>.691</td>
<td>4.316</td>
<td>6.248</td>
<td>.504</td>
</tr>
<tr>
<td>FIRO-w^A</td>
<td>2.544</td>
<td>12.992</td>
<td>5.107</td>
<td>.086</td>
</tr>
</tbody>
</table>

The means and standard deviations for the 6 male and female cell groups of the 3 cross-sectional Time categories for meditators (N=71) are shown in TABLE 33.
Males (n=12) in the first Time level C1, practicing between 3 and 18 months, had a control wanted mean score of 2.667. This was lower than females (n=13) in the same C1 level who had a control wanted mean score of 4.385.

For meditators who had practiced between 19 to 36 months a shift can be seen in control wanted scores. Female (n=12) scores in the C2 level dropped to a mean of 2.417 which is lower than the C1 female mean and the C2 male (n=11) mean of 3.909. The male mean rose 1.2 scale points while the female mean dropped 2.0 scale points. Meditators practicing between 37 to 69 months at the C3 level, exhibited control wanted mean scores which were close. The mean for males (n=14) was 3.929, for females (n=9) it was 3.000.

The direction of the mean scores of Time and Sex variables interacting was different for each Sex in Time levels C1 and C2. The movement of male scores went up from C1 to C2 within the FIRO-B low score range (2-3). Female scores dropped between C1 to C2 from the middle score range (4-5) into the low score
range. Females also showed more change than males.

Interaction of the Time variable with each Sex took place in C1 and C2. No interaction occurred in C3 where male and female mean scores leveled off and were close, remaining in the FIRO-B low score range.

In regard to the \(W^C\) scale of the FIRO-B, question 3 was answered affirmatively and conceptual and null hypotheses 3 were not confirmed. The direction and magnitude of response were different for male and female meditators across Time. The action of the independent variables was greater than what had been expected for their combination.
TABLE 33

2 x 3 MEANS AND STANDARD DEVIATIONS FOR TIME AND SEX INTERACTION, SHOWING CELL GROUP SCORES ON THE FIRO-B, MAACL AND STAI

N=71

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>C1 (3-18 mo.)</th>
<th>C2 (19-36 mo.)</th>
<th>C3 (37-69 mo.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MALE</td>
<td>FEMALE</td>
<td>MALE</td>
</tr>
<tr>
<td>FIRO-e1</td>
<td>M</td>
<td>4.000</td>
<td>3.231</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.336</td>
<td>2.315</td>
</tr>
<tr>
<td>FIRO-w1</td>
<td>M</td>
<td>5.167</td>
<td>3.154</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>3.857</td>
<td>3.363</td>
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<tr>
<td>FIRO-eC</td>
<td>M</td>
<td>2.250</td>
<td>2.000</td>
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<tr>
<td></td>
<td>SD</td>
<td>2.006</td>
<td>1.856</td>
</tr>
<tr>
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<td>M</td>
<td>2.667</td>
<td>4.385</td>
</tr>
<tr>
<td></td>
<td>*SD</td>
<td>1.303</td>
<td>2.567</td>
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<tr>
<td>FIRO-eA</td>
<td>M</td>
<td>4.250</td>
<td>3.923</td>
</tr>
<tr>
<td></td>
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<td>2.290</td>
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<tr>
<td></td>
<td>SD</td>
<td>2.425</td>
<td>1.908</td>
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<tr>
<td>MAACL-A</td>
<td>M</td>
<td>1.750</td>
<td>3.308</td>
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<tr>
<td></td>
<td>SD</td>
<td>2.050</td>
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<tr>
<td>MAACL-D</td>
<td>M</td>
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<td>7.846</td>
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<td>3.670</td>
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<td>4.846</td>
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<tr>
<td></td>
<td>SD</td>
<td>2.065</td>
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<td>SD</td>
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<tr>
<td></td>
<td>SD</td>
<td>4.735</td>
<td>6.581</td>
</tr>
</tbody>
</table>

* Significant at .05 level
FIGURE 9 pictures the shift between C1 and C2 male and female scores denoting interaction, with a leveling off of scores in C3 indicating no interaction in that level.

FIGURE 9. Interaction of Time and Sex variables related to control wanted measured on the FIRO-B for the 2 x 3 design.
For the majority of variables measured through the $2 \times 2$ and $2 \times 3$ designs, question 3 was answered negatively and conceptual and null hypotheses 3 were confirmed. Males and females interacting with variations in Time did not differ in direction or magnitude of response and the result of the combination of the Time and Sex variables was not greater than that expected from their simple addition. The data supported this conclusion for anxiety, depression, hostility, inclusion expressed, control expressed, affection expressed and affection wanted.

**Correlation of Intrapersonal and Interpersonal Characteristics**

To assess what relationship anxiety, depression and hostility might have with social traits, an $11 \times 11$ correlation matrix, involving all S's ($N=133$), was examined through the SPSS computer program using Pearson product-moment correlation coefficients.

The results were viewed in conjunction with
question and hypotheses 4.

**Question 4:** What are the relationships between the intrapersonal and interpersonal variables?

**Conceptual Hypothesis 4:** Inclusion and affection will increase and control will decrease as anxiety, depression and hostility decrease. Anxiety, depression and hostility will have a positive correlation with control and a negative correlation with inclusion and affection.

**Null Hypothesis 4:** There will be no significant correlations between the intrapersonal and interpersonal mean scores.

It was found that inclusion showed no significant relationship with any of the 3 intrapersonal variables of anxiety, depression or hostility.

Control expressed registered positive correlations with anxiety and hostility, and control wanted had a positive correlation with anxiety.

Affection expressed and wanted exhibited negative correlations with all 3 traits of anxiety, depression and hostility, and affection wanted was negatively correlated with depression. TABLE 34 and TABLE 35 list the personal and social trait scale correlations.
TABLE 34

STAI, MAACL AND FIRO-B
PERSONAL AND SOCIAL TRAIT
RELATIONSHIPS

<table>
<thead>
<tr>
<th>SOCIAL SCALE</th>
<th>DIRECTION</th>
<th>PERSONAL SCALE</th>
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<tr>
<td>FIRO $e^I$</td>
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<td></td>
</tr>
<tr>
<td>FIRO $w^I$</td>
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<td></td>
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<tr>
<td>FIRO $e^C$</td>
<td>+</td>
<td>STAI X-2 **</td>
</tr>
<tr>
<td>FIRO $e^C$</td>
<td>+</td>
<td>MAACL-H *</td>
</tr>
<tr>
<td>FIRO $w^C$</td>
<td>+</td>
<td>STAI X-2 *</td>
</tr>
<tr>
<td>FIRO $e^A$</td>
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<tr>
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<td>MAACL-A ***</td>
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</tr>
<tr>
<td>FIRO $w^A$</td>
<td>-</td>
<td>MAACL-D *</td>
</tr>
</tbody>
</table>

* $r(p < .05)$
** $r(p < .01)$
*** $r(p < .001)$
TABLE 35 shows the r coefficients for the 4 personal trait scales correlated with the 6 social trait scales.

TABLE 35

PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENTS FOR PERSONAL AND SOCIAL TRAIT SCALES OF THE STAI, MAACL AND FIRO-B

<table>
<thead>
<tr>
<th></th>
<th>STAI X-2</th>
<th>MAACL-A</th>
<th>MAACL-D</th>
<th>MAACL-H</th>
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<tr>
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<td>.0265</td>
<td>-.0557</td>
<td>-.0936</td>
<td>-.1116</td>
</tr>
<tr>
<td>FIRO w I</td>
<td>.0025</td>
<td>-.1270</td>
<td>-.1505</td>
<td>-.1136</td>
</tr>
<tr>
<td>FIRO e C</td>
<td>.2469**</td>
<td>.1374</td>
<td>.1079</td>
<td>.1827*</td>
</tr>
<tr>
<td>FIRO w C</td>
<td>.1730*</td>
<td>.1072</td>
<td>.0613</td>
<td>.0228</td>
</tr>
<tr>
<td>FIRO e A</td>
<td>-.1705*</td>
<td>-.2816***</td>
<td>-.2776***</td>
<td>-.2776***</td>
</tr>
<tr>
<td>FIRO w A</td>
<td>-.1675</td>
<td>.1401</td>
<td>-.1883*</td>
<td>-.0957</td>
</tr>
</tbody>
</table>

* r(p < .05)
** r(p < .01)
*** r(p < .001)

In answer to question 4, the statistical analysis disclosed that there were some significant relationships between intrapersonal and interpersonal traits although the r coefficients were not strong.
Findings, however, did not verify negative correlations between the inclusion dimensions and anxiety, depression or hostility as was contended in conceptual hypothesis 4.

Data did confirm negative correlations between affection expressed and anxiety, depression and hostility, as well as between affection wanted and depression. Conceptual hypothesis 4 was confirmed in this regard. There was additional confirmation concerning control. As postulated, control expressed was positively correlated with anxiety and hostility, and control wanted had a positive correlation with anxiety.

Null hypothesis 4 was not supported. There were significant correlations between most intrapersonal and interpersonal variables.

**Summary of Statistical Analysis**

Reviewed here is a summary of the research findings which were explored in this chapter.

Meditators were found to be significantly lower than non-meditators in anxiety, depression,
inclusion expressed, and control expressed.

There were no significant differences between meditators and non-meditators in hostility, inclusion wanted, control wanted or affection expressed and wanted.

There were no significant differences between the 3 meditating Time groups (in practice an average of 1.1, 2.2 and 3.9 years) on any of the personality variables.

There were no significant differences between male and female scores on any of the personality variables.

Significant interaction occurred for inclusion wanted in the 2 x 2 design analysis and for control wanted in the 2 x 3 design analysis.

There were no significant correlations between inclusion expressed, inclusion wanted and anxiety, depression or hostility.

Control expressed had a significant positive correlation with anxiety and hostility. Control wanted was positively and markedly correlated with anxiety.

Affection expressed showed a negative and significant correlation with anxiety, depression and hostility. Affection wanted displayed a negative correlation with depression.

Chapter V will present a summary of the study followed by implications and recommendations.
CHAPTER V

SUMMARY, IMPLICATIONS AND RECOMMENDATIONS

Summary

The reduction of anxiety, depression and hostility are among the major goals of personal counseling. Such intrapersonal characteristics may also be associated with social traits such as the desire for and expression of inclusion with others, control and affection. Both dimensions of the individual are a legitimate concern of the counselor.

Various relaxation techniques have been used over the years in the counseling professions to aid the individual in coping with anxiety, depression and hostility and directly and/or indirectly with interpersonal relationships.

Although early sporadic research commencing in the 1930's suggested that various methods of Eastern meditation could produce profound relaxation, it was not seriously considered in the West as a feasible counseling technique until the 1970's.

160.
This was due to the growth in the United States of the first Eastern (yogic) method of meditation to be adapted for Western life styles and uniformly taught, known as Transcendental Meditation (TM). The majority of meditation research in this country since 1970 has involved TM practitioners.

This growing body of research has indicated that TM creates a deep state of psychobiological rest. Other studies and self-reports have revealed an association between general anxiety reduction and the practice of meditation as well as other psychological benefits; although a few contraindications have been noted which suggested professional supervision and/or individual adjustment of daily time in the practice for some people.

The need to explore meditation as a possible new relaxation method feasible for counseling was the underlying reason for the current research. The major goal was to assess meditator personality traits across time in the practice. This was followed by a group comparison of the meditators with non-meditators. The additional factor included was sex differences, in order to ascertain if any sex gender traits interacted with
Time as well as to contribute to the mainstream of sex difference research, another valuable field of knowledge for the counselor.

Meditators (N=71) and non-meditators (N=62) were compared on anxiety, depression, hostility, inclusion, control and affection to assess if there were differences between persons who had spent Time in meditation and those who had not.

This total group (N=133) was also surveyed on the same personality characteristics as males (N=69) and females (N=64), and the interaction of Time and Sex was analyzed. The design used was a 2 x 2 factorial design.

A cross-sectional study using a 2 x 3 factorial design was made of the meditating sample (N=71) related to the above personality variables, to determine if traits were different among meditators practicing various lengths of Time. Six male-female cell groups comprised 3 Time level sub-samples: C1, 3-18 months (n=25), C2, 19-36 months (n=23) and C3, 37-69 months (n=23). The 2 x 3 factorial design also permitted comparison of meditator males (n=37) with meditator females (n=34) as well as the interaction
of Time and Sex associated with the cells.

The Fundamental Relations Orientation-Behavior (FIRO-B) questionnaire measured levels of inclusion, control and affection. The State-Trait Anxiety Inventory (STAI) and the Multiple Affect Adjective Check List (MAACL) assessed anxiety, depression and hostility.

The self-explanatory questionnaires were assembled in a kit and were administered in lecture halls to meditating undergraduate S's (N=71) at Maharishi International University (MIU) in Fairfield, Iowa and to non-meditating undergraduate S's (N=62) at The Ohio State University (OSU) in Columbus, Ohio.

Evaluation of the relationships between the intrapersonal and interpersonal variables involved the use of an 11 x 11 correlation matrix.

Statistical analysis was performed at Vogelback Computing Center, Northwestern University, Evanston, Illinois using the MANOVA and SPSS programs. Tests of significance for the factorial designs were the multivariate F test with Wilks lambda criterion.
followed by univariate F tests. Correlational significance was determined by Pearson product-moment correlation coefficients. Significance for all tests was accepted at the .05 level of significance.

Results are given in conjunction with 1) Time 2) Sex 3) Time and Sex Interaction and 4) Personal-Social Trait Correlations.

**Time**

Hostility, inclusion wanted, control wanted and affection expressed and wanted registered no significant differences, between meditators and non-meditators.

There was a significant difference at the .001 level between meditators and non-meditators in the 2 x 2 factorial study for anxiety, depression and inclusion expressed, and at the .05 level for control expressed. Meditators were significantly lower on all of the above variables. The null hypothesis that there would be no significant differences between Time groups was not confirmed for the norm group comparison.

No marked differences for Time were noted for intrapersonal and interpersonal variables among the
three meditator Time levels in the 2 x 3 factorial examination. The null hypothesis that there would be no significant differences between Time levels was supported.

**Sex**

There were no significant differences on personality mean scores between men and women in either the 2 x 2 or 2 x 3 assessments. The null hypothesis that there would be no significant differences on mean scores due to Sex was confirmed by the findings.

**Time and Sex Interaction**

Interaction was recorded at the .05 level for inclusion wanted in the 2 x 2 factorial study involving meditators and non-meditators. Females combined with no-time in meditation to produce a high ($\bar{X}=6.1$) score on need for affiliation according to FIRO-B score interpretations. Combined with time in meditation, the female mean score for inclusion wanted dropped decidedly into the low score range ($\bar{X}=3.8$). This moderately low mean score then corresponded more closely to the male mean scores, both
of which were the same across Time ($\bar{X}'s = 4.4$).

In the 2 x 3 cross-sectional examination of the 3 meditator Time levels, interaction was noted for control wanted at the .05 level.

Female scores dropped between the short-term and moderate term meditators, $\bar{X}=4.4$ to $\bar{X}=2.4$. Male scores went up, $\bar{X}=2.7$ to $\bar{X}=3.9$. After this shift, long-term male and female scores for control wanted or tolerated became close ($M\bar{X}=3.9$ and $F\bar{X}=3.0$) in the low range. The null hypothesis that joint Time and Sex score means would not differ significantly from the means expected by their simple addition was not supported.

**Personal-Social Trait Correlations**

Correlations between the intrapersonal and interpersonal variables did not show any significant relationship between inclusion expressed-wanted and anxiety, hostility or depression.

Significant and positive correlations did exist between control expressed and anxiety at the .01
level and between control expressed and hostility at the .05 level. Control wanted had a positive and significant association at the .05 level with anxiety.

Affection expressed showed negative and significant correlations with 2 measures of anxiety at the .05 and .001 levels; a negative and significant association with depression at the .001 level; and a negative and significant relationship with hostility at the .001 level. Affection wanted was negatively and significantly correlated with depression at the .05 level.

The null hypothesis that there would be no significant correlations between intrapersonal and interpersonal scores was not confirmed.

**Implications**

Following are implications drawn from the data of the current study, set in context with existing research, for the counselor considering meditation as a counseling adjunct.

**Time**

The findings of this study revealed that mediators were significantly lower on all 3 anxiety scales
than non-meditators. This replicated the results of previous studies which compared meditators and non-meditators on anxiety (Doucette, 1971; Fehr, et al., 1975; Glueck & Stroebel, 1975a; Hjelle, 1974). These data offer a continuing base of support for the pre-posttest control group assessments, all of which to date have disclosed significant reductions in anxiety for S's who learned to meditate, but not for controls (Ballou, 1973; Ferguson & Gowan, 1975; Lazar, et al., 1972; Nidich, Seeman and Seibert, 1973; Orme-Johnson, et al., 1975; Shecter, 1975). The combined evidence seems to imply that time spent in the practice of TM may have bearing on reducing general anxiety and its symptoms.

If this is the case, the counselor may want to know in what manner one could expect anxiety reduction to operate across time.

The present cross-sectional examination of a meditating population across Time, assessed meditators who had practiced anywhere from 3 to 69 months with measurements taken among 3 categories representing $1.1 \bar{X} \text{ years}$, $2.2 \bar{X} \text{ years}$ and $3.9 \bar{X} \text{ years}$ in TM. Mean
scores for these 3 categories were approximately the same but significantly lower than the non-meditators.

From this data, put in context with previous research, a possible pattern emerges. Pre-posttest studies (Ballou, 1973; Ferguson and Gowan, 1975; Lazar, et al., 1972; Nidich, Seeman and Seibert, 1973; Shecter, 1975) disclosed a significant reduction in anxiety for meditators over controls anywhere from 1 to 14 weeks depending upon the time the posttest(s) was administered. Glueck and Stroebel (1975a) also reported a drop in general anxiety "immediately and dramatically" among patients, with most symptoms disappearing by 8 weeks. These data indicate that somewhere between the first week up to 3 months the majority of meditators tested experienced a dramatic drop in general anxiety feelings and symptoms over non-meditators.

The present examination of anxiety levels across 3 categories of Time measured time levels representing over 3 months practice. No significant movement of scores was noted from the first category of Time,
1.1X through 3.9X years. Anxiety levels were consistently low across that total length of time in the practice.

Putting these results in conjunction with the Ferguson and Gowan study it can be noted that the 1.1X year meditators in the present research obtained a STAI A-trait score of 29. This is similar to the score of 28 recorded on the same scale for Ferguson and Gowan's 3.6X year meditators who in turn were significantly lower in anxiety compared to a 6-1/2 week meditating group.

It is possible that a marked decrease in anxiety occurs progressively for meditators early in the practice, between 1 to 14 weeks, with a further significant progressive reduction coming within 1.1X years. This anxiety reduction may operate in the same way that Benson, et al. (1974) concluded hypertensive symptoms operated when related to regular meditation practice. High or neurotic anxiety levels may be reduced, like hypertension, to appropriate levels for individual functioning and remain at appropriate levels with continued regular meditation practice.
For all practical purposes the counselor may find a noticeable reduction of general anxiety feelings and symptoms commencing early in the practice of TM, and a lower level of anxiety continuing to be maintained if practice in meditation is continued, a conclusion to which the current cross-sectional Time data lends credence.

It could be questioned: How much value is there in another marked reduction of anxiety after the progressive reduction in the first year? Meditator STAI trait scale mean scores for the 3 Time categories in the present examination ranged from 29 to 30 with a possible score range of 20-80. It may be that the meditator mean scores disclosed in this study are already at a low enough level to indicate a lack of neurotic anxiety and a condition which provides benefit to the individual, while allowing for appropriate expressions of state anxiety and physiological stress when the occasion demands.
The pattern presented of anxiety scores through the current study in conjunction with existing research may not resemble a psychological growth curve. It may be plausible to understand such a curve, however, as representing a physiological process. This may be likely in view of the existing physiological research which indicates that a state of psychophysiological relaxation takes place during TM which is hypometabolic and runs counter to biologic stress in the body and nervous system. At the same time it enables anxiety producing thoughts to surface in a calm state.

The implication from the combined data suggests that the counselor using TM may be dealing with a technique which cues a physiological process into operation, quickly reducing anxiety symptoms and encouraging an appropriate level of anxiety outside the meditation period in daily activity.

It may be that reduction of depression associated with Time follows a similar pattern. The findings of this study revealed a significant difference between meditators and non-meditators on the
depression scale. Meditators were lower and displayed similar and consistently low levels of depression across Time.

The comparison with non-meditators on depression replicates the findings of Fehr, et al. (1975), and gives some support to the research of Ferguson and Gowan (1975) and Van den Berg and Mulder (1975) which reported meditators significantly lower than non-meditators in depression from pretest to posttest.

Data implies that meditation may benefit the depressed person. For the counselor, psychotherapist Carrington (1977) qualifies that opinion, drawing from case histories and clinical experience. She notes that meditation may be effective with "chronic low grade" and "agitated" depressions, but may be resisted by "severe" cases until the client desires to come out of the depression. For any temporary setback in depression engendered by tension release, she recommends reducing the time in meditation, and adjusting it to individual needs for however long is necessary—a principle adopted from autogenic relaxation therapy.
The lower level of hostility found for meditators in the present study, consistent across the three meditating Time categories, did not show the significant difference reported by Boese and Berger (1972) and Fehr, et al. (1975). No strong implications can currently be drawn concerning the relationship of Time in meditation and hostility.

In accordance with the theoretical construction of the FIRO-B, social orientation is viewed through an integrated profile of affection - control - inclusion as recommended by Ryan (1971). This reverse order is interpreted by Ryan as being the order of influence and importance of one social variable upon the other, beginning with affection as the most important area in social orientation.

Data implies that the meditator in the current study may initiate an average amount of close intimacy, and . desire others to initiate close intimate relationships with him, similar in both dimensions to the non-meditator. Neither meditators nor non-meditators seem to want others to control them or make decisions for them; however, meditators seem less disposed to dominate...
others or to control decisions in personal relationships. Meditators also seem less inclined to be as interested in superficial social contacts as non-meditators, exhibiting more selectivity in relationships and less need to belong and be accepted. This profile was the same for meditators in all three Time categories.

The profile is in line with the assessment of affection by Hagberg which concluded that meditators have the same desire for intimacy and deep personal relationships compared to non-meditators but it does not support studies which found meditators higher than the norm, (Hjelle, 1974; Landrith, 1972; Nidich, Seeman and Dreskin, 1973; Seeman, et al., 1972; Shelly, 1976, 1973, 1971).

It also supports the finding of Fehr, et al. (1975) that meditators have less tendency to dominate others. Other existing research has noted more spontaneity (Hjelle, 1974; Seeman, et al., 1972) and tolerance (Shecter, 1975) for meditators as well as having the same ability to be enterprising and to exhibit leadership as others (Van den Berg and Mulder, 1975). Putting these elements together, a possible picture
emerges in regard to control. It may be that meditators are less dominating, more spontaneous and tolerant in personal relationships while being as capable of leadership as non-meditators.

Lower inclusion scores for meditators from the present study would not support a concept of increased sociability (Fehr, et al., 1975; Tjoa, 1975) in all circumstances. The present data gives support to Shelly who found that although meditators sought social contact as often as non-meditators, they also spent more time alone and avoided contacts in crowded or noisy places. The current data of this study further qualifies this description discovering that while meditators seem to be sociable they may be more discriminating in their contacts and may have less need to belong and be accepted. This lends some credence to the conclusions of Hjelle (1974); Nidich, Seeman and Dreskin (1973); Pelletier (1974); Seeman, et al. (1972); and Shelly (1976, 1973, 1971) that meditators may need less environmental stimulation for satisfaction and are more independent and inner directed.
For the counselor considering meditation as a counseling technique, a possible implication on social orientation emerges from the combined data. If time is spent in the practice of meditation, it may have bearing on being a person who is a) as desirous of close relationships as the average person b) tolerant and less dominating c) less interested in superficial social contacts d) more selective in personal relationships and e) less needful of belonging and being accepted.

**Sex**

No significant differences were found on anxiety, depression, hostility, inclusion, control or affection between men and women in the current study.

This lent weight to a substantial amount of existing research (50%) which also found no difference between males and females in anxiety represented by such studies as Bendig (1960, 1954) and Taylor (1953).

It did not support the clinical admittance statistics of more depressed female patients reported by
Chester (1972) as being representative of the general population.

The findings from the current research on hostility would offer some support to the smaller group of studies which found no differences in aggression between men and women although the majority of data did. The hostility scale measured general affect. It may be that the hostility scale represents a broad overview of aggression. A measure of overall hostility feelings would not show differences in kind. Research such as Bennett and Cohen (1959) and Devi (1967) has suggested there are differences in kind with females reporting more covert aggression and males more overt aggression. Perhaps men and women can feel similar amounts of hostility but when related to aggression the female may be more covert and the male more overt. This is feasible considering the suggestion of Maccoby and Jacklin (1974) that men may be more overtly aggressive since it is also true of other primates; it appears to be cross-cultural and sex hormones are known to influence
aggression levels.

The greater amount of research, especially older studies before 1970, suggests that women are more interested in affiliation and personal relationships. Although some recent data continues to follow this trend, increasing numbers of the more current studies beginning in the later 1960's and continuing into the 1970's, are indicating no essential differences between males and females. The present finding of no significant difference on inclusion adds weight to this growing body of no difference results which may suggest cultural change.

The no significant difference noted in this study's examination of control runs counter to older assessments which found women more compliant. It supports the majority of later data which found no differences in compliance and dominance. This too may indicate a growing cultural change. Maccoby and Jackson also point out that control in personal relationships is a complex and shifting dynamic, often depending upon which person has the more effective skills for particular situations.
There were no marked differences between males and females on the FIRO-B affection dimensions. This lent weight to the greater amount of existing research data in the area of affection which has found no essential differences due to sex gender.

The implication that can be drawn for the counselor is that men and women may have few significant differences in anxiety, depression, hostility, inclusion, control and affection. This may have to be qualified in some areas where more traditional cultural patterns may appear such as in dependency, compliance and affiliation. Another exception could be the display of more overt aggression and hostility for the male which may have a biological basis. These conclusions are supported by the data of this study set in context with the existing sex difference research.

**Time and Sex Interaction**

The impact of the Time factor allied with inclusion wanted by women was great enough to show a contrast between female meditators and female non-meditators. The affiliation needs of women
meditators were lower and closer to the levels of men across Time.

This could imply that while some non-meditating women may exhibit higher, more traditional feminine affiliation needs, women who have spent Time in the practice of meditation may have a lower level of inclusion wanted than the traditional.

This pattern also may be true for women in meditation concerning the amount of outside control from others that is wanted or tolerated. Short-term female meditators who had practiced 3-18 months were higher (in the middle score range) than women who had meditated 19-36 months and were in the low range. Between 37-69 months practice, women meditators continued to display a low level of outside control wanted close to the level for men meditators. The shift for men occurred within the low score range. This implies that higher more traditional feminine levels of dependence and compliance may become lower for women when allied to longer Time in meditation.

**Personal-Social Trait Correlations**

Anxiety and hostility were related to the amount of control or dominance expressed over others
for the subjects of this study. There was a positive correlation. It may be that anxiety and/or hostility are factors which contribute to a need to dominate situations or others in order to feel less anxious and more secure.

The amount of control wanted or tolerated from others was also positively correlated with anxiety. It is possible that dependency needs may go down when the individual is less anxious.

Affection expressed had a negative relationship with anxiety, depression and hostility as did affection wanted with depression. This could imply that people may have less inclination to want or express affection when they are depressed and that reducing depression may increase the ability to have deep personal relationships. It could also imply that as levels of anxiety and hostility are lowered the expression of affection and close intimate contact may go up.

Low levels of anxiety and depression related to Time in meditation were noted in this study and others. The counselor may wish to consider
meditation as a counseling adjunct which may help to facilitate more satisfying personal and social relationships.

Recommendations for Further Research

Listed below are some suggestions for additional research.

1) This study involved results related to Transcendental Meditation. The term meditation can cover a varied and growing number of procedures. It is recommended that physiological and psychological research be continued with TM and that comparable investigations be carried out with other forms of meditation, especially those now being developed in clinical and laboratory settings. Related specifically to the current study, this would mean continued research on the relationship and/or effects of meditation and Time in meditation to anxiety, depression, hostility, inclusion, control and affection.

2) It is suggested that factorial investigations on meditation be expanded to test alternative hypotheses and to learn of any additional influence and/or interaction played by independent variables besides sex differences.
This might include such factors as:

a) age  
b) expectancy  
c) motivation  
d) biofeedback and other mind techniques  
e) personal belief systems  
f) counseling  
g) physical exercise  
h) diet and nutrition  
i) participation in meditation centers and organizations

3) It is recommended that longitudinal and additional cross-sectional studies be initiated to expand the present cross-sectional data in assessing the effects of meditation over Time.

The subject matter of this study and the suggestions for further research are limited to investigating the association of meditation to basic and practical aspects of human functioning. Such assessments may not reveal the full extent of meditation's relationship to the expansion of psychophysiological states of consciousness and human potential. The practical studies can, however, form a base and threshold for exploring the further reaches of the mind.
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