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## LA THÈSE A ÉTÉ MICROFILMÉE TELLE QUE NOUS L'AVONS REÇUE

# PERSONALITY VARIABLES ASSOCIATED WITH EXPERIENCE IN ANANDA MARGA MEDITATION

by

Trula Diane O'Haire

B.A., Florida Presbyterian College, 1971

A THESIS SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in the Department

of

Psychology



SIMON FRASER UNIVERSITY

July 1978

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ABSTRACT

Personality differences between Ananda Marga meditators and non-meditators were investigated. A fairly broad spectrum of personality variables was used: creativity; ego-strength; introversion-extraversion; sensing-intuiting; thinking-feeling; judging-perceiving; neuroticism; and hemispheric dominance. The measures of these dependent variables were: Torrance Tests of Creative Thinking; Barron's Ego Strength Scale; Myers-Briggs Type Indicator; Eysenck Personality Inventory; and the Bakan test for lateral eye movement. In addition, a biographical index was constructed.

Three groups of subjects were used: individuals having no experience in meditation but an expressed interest in learning it; individuals with 6 months to 3 years experience in meditation; and individuals with more than three years experience in meditation. A total of 146 subjects, 82 males and 64 females ranging in age from 18 to 33 years were administered a questionnaire booklet containing all the measures; they were then given the Bakan test for lateral eye movement individually.

The following personality differences between meditators and non-meditators were found. Women with no meditation experience had higher scores on one creativity measure: figural originality. Experienced meditators expressed a preference for a judging (as contrasted with a perceiving) approach to phenomena; all three groups, having in common at least an interest in

meditation, were characterized as preferring introversion, intuition, feeling, and judging. (The foregoing descriptions are based upon the Myers-Briggs test, a Jungian-oriented measure.) Experience in meditation was also associated with low neuroticism scores - the more extensive the meditation experience, the lower the scores. On the biographical index, significantly fewer individuals with meditation experience reported eating meat, fish or eggs than did those with no such experience; they also reported significantly less sleep need.

This study was exploratory and seen as suggesting hypotheses for future study. Methodological concerns with the comparability of groups and the problem of fitting meditation into the Western Empirical method were discussed.

Several overall result patterns were observed and suggested hypotheses for future research. Specifically, meditation experience seemed to have a "balancing effect" on individuals, bringing into prominence hitherto unexpressed personality components. There seemed, also, to be a levelling-off tendency; "new" meditators differed more on many variables from non-meditators than they did from experienced meditators. A number of sex differences were found and discussed with respect to the hypothesized "balancing effect" and its differential effects on men and women.

Some additional limits to the generalization of these results in terms of longitudinal effects are discussed and

further directions for research suggested.

## DEDICATION

This thesis is dedicated to Michael Coupland whose love, friendship, patience, confidence, and understanding gave me the strength to persevere in this study and also to Shrii Shrii Anandamurtiji, my Guru, whose love and guidance are forever present.

## ACKNOWLEDGEMENTS

I wish to thank all the members of my committee for their time, direction, and encouragement. I am especially thankful to Jim Marcia, my senior supervisor, whose guidance and patience was invaluable. I am also most grateful to Bill Glackman for his patient and extremely helpful statistical and computer assistance and to Paulette Seggie for her careful typing.

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# Chapter 1: Introduction

> Our normal waking consciousness...is but one special type of consciousness, whilst all about it, parted from it by the filmiest of screens, there lie potential forms of consciousness entirely different. We may go through life without suspecting their existence; but apply the requisite stimulus, and at a touch they are all there in all their completeness, definite types of mentality which somewhere have their field of application and adaptation. No account of the universe in its totality can be final which leaves these other forms of consciousness quite disregarded. How to regard them is the question - for they are so discontinuous with ordinary consciousness... at any rate, they forbid a premature closing of our accounts with reality.
>
> William James (1902, p. 298)

In recent years much interest has been shown in certain Eastern methods of consciousness expansion - one of which is meditation. The practice of meditation predates recorded history and there are numerous writings which claim effects ranging all the way from increased relaxation and happiness to union with God.

Although there are many different types of meditation, the actual practice generally includes sitting quietly in a relaxed position and focusing awareness on a single point, such as one's breathing or a particular sound vibration ("mantra") given by one's teacher. The word mantra literally translates "mind liberation". Mantras are usually from the Sanskrit language and are said to be empowered to help "raise consciousness" both through their meaning and through the actual sound vibration of the word.

Meditators are usually instructed to sit in meditation for

thirty minutes to an hour once or twice each day at a regular time. The beginning meditator is told to concentrate on the mantra and, when distracted with thoughts, to watch the flow of consciousness and gently bring awareness back to the mantra. Through practice it becomes increasingly possible to concentrate awareness solely on the mantra. The many different specific techniques and methods of meditation vary with their underlying philosophies or "paths", but the ultimate goal of enlightenment ("samadhi") remains the same. This experience of the dissolution of individual self (union with God or Cosmic Consciousness) is elaborated on by James (1902, p. 321):

> This overcoming of all the usual barriers between the individual and the Absolute is the great mystic achievement. In mystic states we both become one with the Absolute and we become aware of our oneness. This is the everlasting and triumphant mystical tradition, hardly altered by differences of clime or creed. In Hinduism, in Neoplatonism, in Sufism, in Christian Mysticisim, in Whitmanism, we find the same recurring note, so that there is about mystical utterance an eternal unanimity which ought to make a critic stop and think, and which brings it about that the mystical classics have, as has been said, neither birthday nor native land. Perpetually telling of the unity of man with God, their speech antedates languages, and they do not grow old.

Diekman (1963) refers to the technique of meditation as a "deautomatization" of normal consciousness. He also states (1966) that meditation and mystical experiences develop the second mode of consciousness: a holistic perception of unity as contrasted with normal sequential perception.

Maupin (1969) states that meditation is primarily a deep passivity combined with awareness. Meditation is the classical

way of developing a receptive attitude and increasing awareness, thus allowing a detached look at self. He sees the primary goal of meditation as the systematic exploration of prelogical, deeply unconscious archetypal experience. White (1974, p. 137) comments:

> ....meditation's core experience is an altered state of consciousness in which our ordinary language - based, culturally reinforced, and quite narrow sense of "I" -the ego- is diminished while a larger sense of self-existence - merged - with - the - cosmos comes into awareness.

Naranjo and Ornstein (1971) emphasize the importance of the meditator's attitude as both the path and goal since the subtle "how to meditate" is really a simplified version of "how to be". The essence of meditation is an utterly simple situation which cannot co-exist with the usual complexity of ordinary activity. Thus the practice of meditation requires a persistent effort to free the mind, body, and emotions from conditioning and habitual responses. Naranjo states that meditation is a dwelling of the individual upon his deepest identity; it is a practice of centeredness, of being oneself and knowing oneself. He points out that meditation develops a unity in multiplicity and is "a practice in awareness, intensiveness, self-abasement, love, and in attunement to a regularity, which we may choose to regard as God's law or as the law of our own being (p.27)".

In view of the general theory of meditation and based upon his success using meditation in psychotherapy, Kretschmer (1969) reports that "Meditation has a good chance of eventually becoming

one of the leading therapeutic techniques (p.233)".

## Research on Various Forms of Meditation

Research on meditation may be categorized according to physiological, perceptual, or personality variables. Most of the research has been physiologically oriented. Since these studies are only tangential to this thesis they will be reported briefly.

### Physiological Studies

Most research using the EEG has shown a greater frequency of alpha and theta activity during meditation (Stewart 1974; Wallace 1970; Woolfolk 1975; Benson, Beary and Carol 1974; Gellhorn and Kiely 1972; Kiely 1974; Benson 1975). These studies have also indicated that during mediation there is a decrease in oxygen consumption, heart rate, and blood pressure and an increase in skin resistance and muscle relaxation. Benson (1975) reported a decrease in blood lactate level during meditation. Blood lactate is produced by skeletal muscle metabolism and is associated with anxiety. These studies may be summarized as demonstrating that meditation is associated with physiological relaxation.

An interesting controversy concerning the alpha blocking response indicates that different forms of meditation have different results. Normally, alpha is blocked by an external stimulus; but the blocking habituates so that there is less

interference with alpha with recurrance of the stimulus. In a study using experienced practitioners of Zen, Kasamatsu and Hirai (1966) found that both alpha and theta activity were blocked upon presentation of an auditory stimulus. This blocking did not habituate in the Zen practitioners, although alpha habituation occurred rapidly for non-meditating control subjects. In a study of yoga meditation Anand, et al. (1961) found that during the control (non-meditation) period all stimulation blocked alpha activity; but the blocking failed to habituate in the meditators. Moreover during actual meditation there was no blocking of the alpha rhythm. Woolfolk (1975) reports that "failure of alpha blocking to habituate has been hypothesized to reflect both heightened perceptual sensitivity and some degree of cortical excitation (p.1327)." Banquet (1973) reported that during Transendental Meditation (T.M.) alpha activity was not blocked, although theta activity was blocked by stimuli. This study also found some beta activity associated with TM subjects experience of "profound meditation." The beta activity was not blocked by stimuli.

These somewhat different findings may reflect the different philosophies underlying different forms of meditation. Many yoga techniques focus on withdrawing the senses from the world, while Zen teaches the practitioners to be fully sensitive to the world. In a comprehensive review, Woolfolk (1975) stated that "the majority of studies show meditation to be a wakeful state accompanied by a lowering of cortical and autonomic arousal

(p.1326)." He also states that scientific investigation has not yet demonstrated a clearly defined or integrated set of responses which are common to all forms of meditation.

## Perceptual Studies

Perceptual studies on meditation are twofold; experimental and experiential. Investigating the former, Pelletier (1974) found that subjects demonstrated increased ego distance and field independence as measured by the autokinetic test, the embedded figures test (EFT) and the rod-and-frame test (RFT) after three months instruction in TM meditation. He stated that

> "Since deployment of attention is the critical factor in determining performance on these perceptual tasks and since it is the expressed goal of meditation to achieve an inward, focused attention, it is suggested that these observed differences can be attributed to an alteration in the individual's deployment of attention due to meditative practice (p.1033)."

In a study using children, Linden (1973) found that after an 18 - week period of meditation practice, subjects became more field independent, and less test anxious, He also suggested that meditation be considered as a technique for learning to focus attention and to volitionally alter one's feeling state by shifting one's attention. Another study (Davidson, 1977) showed that "Significant increases in absorption and hypnotizability scales and a decrease in anxiety were observed in a continuum from controls to long term meditators (p.1)."

These studies are experiential rather than experimental.

Of equal importance are studies reporting on the experience of internal focusing of attention during meditation. Grim (1975) reported the personal experience of a flash of insight as a merging with an object itself stripped of mere connotation. It was reported that "With all bodily reactions stopped at the moment of looking, images became neutral and language was reduced to a truly abstract symbol system." He goes on to say that the most intriguing aspect of the concentration experience was that "it was accompanied with the feeling that had concentration been complete - for just an instant - anything could have been known about the object on which it was focused (p.129)." Deikman (1963) reported that while taking a vase as a meditation object he experienced a breakdown of the usual subject-object differentiation. "The phenomena are consistent with the hypothesis that through contemplative meditation de-automatization occurs and permits a different perceptual and cognitive experience (p.341)." There are similar reports of loss of ego - boundaries in Lilly (1975), Yogananda (1969), and Merrell-Wolff (1976). Lesh (1970) reported that meditation experience increased counsellors' ability to attend to and be mindful of the affective experiences of clients. Shimano and Douglas (1975) state:

> "We can summarize the arduous discipline of the zazen process as an evolution of a type of consciousness analogous to that experienced when waking from dreams. The old life of reactive symbiosis, of myriad perceptual and appetitive attachments, is progressively replaced by spontaneous wholeness, a change so profound

that its simplicity can be misleading (p.1300)."

In eastern thought, the "mind" is seen as a machine for processing responses to sensations while another hypothesized perceptual and cognitive apparatus the "Self" is considered to transcend mind. The "Self" is claimed to be capable of observing "mind" and continuing in its absence. (Yogananda, 1969; Anandamurti, 1973). One implication is that the "Self" perceives in a parapsychological sense (Grim, 1975). An interesting study by Hilgard (1973) postulates a concept, the "hidden observer" of mind, that parallels this notion. One final caution pointed out by Shimano and Douglas (1975) is that researchers can gain valid understanding of the perceptual differences and experiences of reality associated with meditation only by practicing meditation.

## Personality Studies

Even though the benefits of meditation have been expounded upon in various writings over the past several thousand years, only recently has meditation research focused on personality variables.

Penner, Zingle, Dyke, and Truch (1973) administered the Omnibus Personality Inventory (OPI) to TM meditators and non-meditators before and after a 22 day meditation course. In both the pre-test and post-test results, the TM subjects scored significantly lower on anxiety than did the control subjects. TM subjects considered themselves to be less tense, less high

strung, and happier. Before the experiment the TM subjects described themselves as considerably more inclined to express their feelings, as more interested in social activities, and as more liberal in their religious orientation than did the control subjects. In the post-test session, following practice in meditation, these TM subjects responded more like the control group on these personality variables. On some subscales of the OPI TM subjects responded quite differently from the control subjects both before and after the experiment. The TM subjects appear to be highly imaginative, free-thinking, intellectually oriented, self-determining, considerate of others, and feminine (operationally defined as less scientific, more esthetic, and more socially oriented). Although these results are interesting, this study was flawed by several control problems; lack of a matched control group that did not learn meditation and the possibility of experienced meditators attempting to please the researchers.

Several studies have shown meditation is associated with lessening anxiety (Cowger, 1973; Otis, 1974; Benson, 1975; Blanz, 1974). In addition, Chung (1969) pointed out that while psychotherapy usually aims to alleviate only abnormal anxiety, leaving normal anxiety untouched, the Eastern meditational approach can alleviate normal anxiety as well. In a study comparing TM meditators, Gurjieffian meditators, and non-meditator controls, Kirschner (1975) found that TM meditators had the lowest neuroticism scores on the Eysenck Personality

Inventory.

Another personality variable studied in relation to meditation has been self-actualization. Longitudinal studies using the Personal Orientation Inventory (POI) in a pre and post-test design showed significant differences between scores of subjects taught meditation and control subjects in the predicted direction of greater self-actualization for the former group (Nidich, Seeman, and Dreskin, 1973; Seeman, Nidich, and Banta, 1972; Cowger 1973; Blanz, 1974). Nidich, Seeman And Dreskin (1973) reported that the meditators' POI subscale scores were significantly higher for Inner Directed, Time Competence, Existentiality, Acceptance of Aggression, Self Regard, Feeling Reactivity, Self-Acceptance, and Capacity for Intimate Contact. Studies have also shown that subjects who learned meditation had higher self-concepts than did control subjects (Johnson, 1974; Blanz, 1974; Valois, 1976). Johnson found additionally that meditating subjects made greater gains in conflict resolution and emotional adjustment.

Benson and Spilka (1973) suggested that the higher an individual's self-esteem, the more likely he was to have an image of God as "loving". This is of interest since most yoga and Buddhist traditions teach the meditator to perceive his or herself as "a part of God" and to "let go of fear and guilt and embrace love". In general, the God image is presented as loving and positive.

In two studies, Hood (1974) correlated psychological

strength with subjects' reports of intense religious experience. In the first study a significant negative correlation was found using Barron's Ego Strength Scale (BESS). This correlation was reduced to insignificance, however, when the religion subscale was removed from the scale. Hood also reported that his Religious Experience Episodes Measure (REEM) was significantly and negatively correlated with the religious subscale of the BESS. He reasoned that these findings reflected Barron's bias in constructing the BESS; viz., that fundamentalist religious committment and intense personal religious experiences indicated a lack of ego strength. The BESS is a psychoanalytically oriented measure and treats religious mystical experiences as indicative of a weak ego (Hood, 1974).

The second study by Hood (1974) correlated scores on the REEM with scores on Stark's Index of Psychic Inadequacy. This ego strength measure is based on theories of personality which counter the BESS's psychoanalytic view of mystical experience as regression. it focuses instead on positive aspects of intense experiential states (Szasz 1970; Laing, 1967). In this study intense religious experience was more frequent among persons high on Stark's (1971) measure of psychological strength. Hood argues that only a strong ego can be relinquished nonpathologically.

Maupin (1965) studied individual differences in response to a Zen meditation excercise. He reported that capacity for regression and tolerance for unrealistic experience as measured by the Rorschach significantly predicted response to meditation

while attention measures did not.

There is very little research on the effects of meditation on creatitivity. Cowger (1973) found that Zazen meditation experience did not change individual creative thinking abilities as measured by Torrance Tests of Creative Thinking.

## Summary

Research on meditation has generally supported the claim that the practice of meditation lessens anxiety and promotes psychological and physical health. However, there is no clear empirical evidence that meditation is itself therapeutic. Smith (1975) reported that neither the subjects' expectations of relief nor effects of the repeated practice of "just sitting" have been controlled for. Indeed as Goleman (1972) suggests, the proper parameters of meditation may as yet be unknown.

A problem peculiar to research on meditation is that it is very difficult, if not impossible, for one to assess the strongest effects of meditation without practicing it. (Shimano, 1975; Goleman, 1972; Tart, 1969). To study meditation it is not absolutely necessary to be a meditator. However, without experience of this state of consciousness, experimenters are likely to fall into explanation by false analogy (Shimano, 1975). A further complicating factor in this research is the variety of types of meditation, each seeking somewhat different goals (Goleman, 1972; Stewart, 1974; Mills and Campbell, 1974;

Woolfolk, 1975).

Ananda Marga Meditation

The present study deals with one particular form of meditation; Ananda Marga. Ananda Marga (The Path of Bliss) is an international socio-spiritual organization founded in India in 1955 by the followers of Shrii Shrii Anandamurtijii. Ananda Marga meditation is an intuitional practice that involves concentration on a particular 'chakra' or gland and mental repetition of an individual mantra. The mantra and chakra are specific for an individual and based upon their psychic state as assessed by the acharya or teacher during initiation. Anandamurti (1967) says that this assignment of individual mantra and chakra, rather than a general mantra and chakra makes Ananda Marga meditation unique. After initiation there are six lessons of progressively advanced practices which are given by the acharya as the student is deemed ready.

In Ananda Marga, meditation is only part of a complex set of practices including strict adherence to moral principles, social service, and yoga postures. Considerable personal committment is expected of members and there is an emphasis on the ongoing relationship between meditator and Guru or spiritual master. Ananda Marga comes from the tradition of Tantric Yoga which is characterized by an ongoing struggle to achieve the experience of ultimate union or samadhi.

Ananda Marga meditation or 'sadhana' differs from other forms of meditation such as TM or Zen in several ways. First, since Ananda Marga comes from Tantra, there is a focus on ongoing struggle rather than general relaxation. Anandamurti (1970) stated that "to become self-purified one has got to make some efforts - this effort is what is known as sadhana (p.51)." He goes on to say that the struggle to overcome the obstacles on the path is the essence of sadhana or meditation. A second difference is the focus on performing social service. In order to advance in one's meditation, an internal activity, it is necessary to perform service, an external activity. This balance between internal devotion through meditation and external social service is basic to Ananda Marga. Another major differentiating factor is that initiation and instruction in Ananda Marga are free of charge.

There has been very little research on Ananda Marga Meditation. Studies that have been done seem to indicate that Ananda Marga meditation yields results different from other forms of meditation. Elson, Hauri, and Cunis (1977) found that Ananda Marga meditators were able to maintain a stable alpha-theta state during meditation, while controls, in the same environment, fell asleep. This contradicts findings from a somewhat questionable study of TM meditators by Pagano, Rose, Stivers, and Warrenburg (1976). They reported that experienced practitioners of TM spent "appreciable parts of meditation sessions in sleep stages 2, 3, and 4 (p. 308)." Elson, et al. also found that the most

experienced Ananda Marga meditator, a yoga teacher, spent considerably more time in theta activity than did the other meditators. This is consistent with results of Zen meditation as reported by Kasamatsu and Hirai (1966) who found a significant positive relationship between experience and ability in meditation and changes in EEG activity to alpha and theta. Elson, et. al. also found an increase in basal skin resistance and a decrease in respiratory rate for meditators but not for controls. These researchers concluded that: "Ananda Marga meditation produces a physiological effect different from that produced in non-meditating controls who try to relax (with eyes closed) for the same length of time (p.57)."

In another study of Ananda Marga Meditation, Corby, Roth, Zarcone, and Kopel (1978) found that meditation was clearly distinguishable from states of deep relaxation. In this study autonomic measures of heart rate and skin resistance showed a trend toward increased autonomic arousal during meditation, increased frequency of spontaneous skin resistance, decreased base level skin resistance during meditation, and increases in alpha and theta frequencies - with the expert group of meditators having more theta. This latter difference was most significant in the 'normal consciousness' condition of the study. Ananda Marga subjects generally had lower skin resistance responses to orienting stimuli presented in each condition. In this study a "near-samadhi" experience was observed which was characterized by a dramatic increase in sympathetic activation without evidence of

EEG activation.

Studying Ananda Marga meditation Ghista, Nandagopal, Ramamurthi, Das, Mukherji, and Srinivasan (1976) showed that during meditation alpha and theta activity increased and blood levels of glucose, lactate, and pyruvate decreased. They stated that Ananda Marga meditation is characterized as a "wakeful hypometabolic physiological state (p.209)." A long term follow-up study by these same investigators revealed that regular practice of meditation enabled chronically hypertense subjects to bring and keep blood pressure down to a normal leve; it also aided cigarette and drug addicts in giving up their addictions.

Only one study relating Ananda Marga Meditation to personality variables has been reported in the literature. Stein (1973) found significantly lower scores for Ananda Marga meditators on Eysenck's measure of neuroticism.

In summary, studies on forms of meditation other than Ananda Marga have shown that meditation is related to relaxation, a better self-concept, higher self-esteem, increased self-acutalization, internal locus of control, lower anxiety, and overall emotional adjustment. Studies on Ananda Marga meditation have shown that although the practice of this type of meditation produces some results similar to those produced by other forms of meditation (increased alpha and theta), it, by contrast, may be clearly different from a state of deep relaxation - yielding increased rather than decreased autonomic arousal. This is a debatable point since two out of the three physiological studies

on Ananda Marga meditation say that it does not produce arousal. Corby, et al (1978) says that it does produce arousal. Corby's findings could reflect methodological difficulties. Ananda Marga meditation was also found to be associated with lower scores on neuroticism.

The Present Study: Personality Variables Associated with Experience in Ananda Marga Meditation.

This study investigated a fairly broad spectrum of personality variables: creativity, ego-strength, introversion-extraversion, sensing-intuiting, thinking-feeling, judging -perceiving, neuroticism, and hemisphere laterality. Interest in meditation was held constant.

Creativity: Meditation has been said to increase the creative energy of the individual (Anandamurti, 1973). Measures of creativity employed in this study were the figural and verbal parts of the Torrance Tests of Creative Thinking (TTCT). According to Torrance (1966), the attempt to find one overall validity coefficient for tests of creative thinking is grossly inappropriate. He views creative thinking as a process involving a number of separate abilities; hence, his measure has several sub-tests. Two advantages of Torrance's Tests are that they can be used at all educational levels, and that they are content free (1966). Haven (1964,1965) found a significant, but relatively

small, correlation between the measure of originality on Torrance's Verbal Test and scores on a checklist of creative achievements. As one indication of the measure's construct validity, Torrance (1965 , and 1966) and Sommers (1961) reported increased scores on various sub-tests as a function of subjects' experiences in various creative activities. Additionally, several studies have shown that children scoring high on the TTCT prefer open-ended instructional methods and self-initiating study opportunities (Clark, 1964; Hamburg, 1974; MacDonald and Raths, 1964). Although Cowger (1973) failed to find a relationship between meditation and creativity using the TTCT, he did not use Ananda Marga meditation in his study. The TTCT was chosen for this study because it covers a broader scope than most measures of creativity. It was hypothesized that experience in meditation would be significantly related to higher scores on creative thinking.

Ego Strength: Barron's Ego Strength Scale (BESS) was used as a measure of the orthodox psychoanalytic concept of ego strength. Barron (1953) reported that high scores on the BESS are positively correlated with intelligence, tolerance, lack of ethnic prejudice and success in psycho-therapy; and they are negatively correlated with ethnocentrism and psychopathology. Based upon Hood's (1974) work cited earlier, it was hypothesized that experience in meditation, which is associated with intense religious experiences, though not with traditional religious

beliefs, would be negatively related to the Attitudes Toward Religion subscale and negatively related to overall ego strength as represented by this measure.

Jungian Types: The Myers Briggs Type Indicator (MBTI) was used as a measure of Jungian personality components. The MBTI (Myers, 1962) yields scores on four bi-polar variables: extraversion or introversion (EI), judging or perceiving (JP), thinking or feeling (TF), and sensing or intuiting (SN)). An individual's preferred personality alternatives provide the basic structure for his personality according to Jung's theory (1923). MBTI scores on EI, TF, and SN correlate highly with the corresponding Gray-Wheelwright Psychological Type scores which are similarily based on Jungian Types (Myers, 1962). Myers stated that introverts are more complicated, less communicative, and harder to understand. It was also hypothesized that subjects more experienced in meditation would score higher on introversion than extraversion. Since both the philosophy and practice of Ananda Marga meditation encourage adherence to a strict moral code it was hypothesized that subjects more experienced in meditation would score higher on judging than perceiving. MacKinnon (1962) reported that the greatest common factor for creative individuals is that 96% to 97% of them are intuitive. Myers (1962) reported that the frequency of "intuitives" in the general population is 25%. Myers also reported that preferences for introversion, intuition, and judging are associated with

scholastic aptitude. She found that "a very substantial part of the superior scholastic achievement of the IN types as compared with the ES types cannot be attributed to their intelligence...(p.43)." Their performance also was not attributable simply to their working harder. Since meditation has been described as part of a "science of intuition" (Anandamurti, 1973), it was hypothesized that subjects more experienced in meditation would score higher on intuition than sensing. Myers (1962) also reported that intuiting-feeling (NF) types are more likely to be religious, creative, imaginative, and subjective and higher on judging than perceiving.

Extraversion and Neuroticism: Another measure of introversion-extraversion, The Eysenck Personality Inventory (EPI), was used; it also yields a score for neuroticism. Substantial validity has been established for this measure. Lynn and Gorden (1961) found introverts to be more persistent. Eysenck (1967) found that introversion and stability characterize successful businessmen. Lynn (1959) and Lynn and Gorden (1961) also found that good academic achievers were characterized by high neuroticism scores and low extraversion scores (introversion). Bakan (1959) found that extraverts did poorly on vigilance tasks while Lynn and Gordon (1961) reported a significant positive correlation between introversion and cognitive persistence. Knapp (1965) obtained significant negative correlations between neuroticism, and scores on the

Personal Orientation Inventory (Shostrom, 1963), a measure of mental health and self-actualization. In an unpublished honors thesis, Stein (1973) found that Ananda Marga meditators scored significantly lower on neuroticism than did non-meditators. In the present study it is hypothesized that meditators will score significantly lower on both neuroticism and extraversion than non-meditators.

Hemisphere Laterality: Bakan's Lateral Eye Movement (LEM) test was used as a measure of hemispheric dominance (Bakan, 1971), left lookers having more dominant right brain hemispheres and right lookers having more dominant left brain hemispheres. Day (1964) first showed that the transition from external to internal direction of attention was related to a lateral eye movement. Duke (1968) has shown that this eye-movement phenomenon is consistent within subjects. He found that it is less consistent with females, that there is no overall group preference for either right or left lateral eye-movements, and that the phenomenon is not related to eye-dominance. According to Bakan (1971) the phenomenon of lateral eye movement suggests a difference of cognitive styles between right movers and left movers. He hypothesizes a double dominance theory of cerebral hemisphere control, meaning that each hemisphere plays a dominant role for different functions. Right movers (left hemisphere dominant) tend to have more facility with such tasks as linear information processing, logic and verbal activities. Right

lookers also have greater quantitative ability and are more likely to major in science or quantitative areas. Day described left lookers as more inclined to focus attention on internal subjective experience. Bakan (1969, 1971) reported that left lookers are more hypnotically susceptible, show more alpha in their EEG's, have greater verbal skills, and are more likely to chose classical or humanistic areas of major study. Left lookers also tend to have more vivid imagery, are more sociable, more emotional and intuitive, and report themselves to be more musical and religious (Bakan, 1971). He also stated that left lookers (right hemisphere dominant) are more skilled at processing patterns of information and spatial activities. Consistent with these previous findings it was hypothesized that left lookers may be more interested in meditation, an internally focused, religious activity.

Although hypotheses have been formulated, the present study is primarily a descriptive and exploratory venture rather than an attempt to rigorously test specific hypotheses. The aim of this investigation then, is to determine whether or not there are differences on the personality variables chosen between Ananda Marga meditators and non-meditators holding interest in Ananda Marga meditation constant.

# Chapter 2: Method

## Subjects

Three groups of subjects were used: Subjects with no experience in meditation who had expressed interest in learning meditation; Subjects with 6 months to 3 years experience in meditation; and Subjects with more than three years experience in meditation. Subjects in group 1 were recruited at Simon Fraser University. Subjects in groups 2 and 3 were recruited at an Ananda Marga Convention in the United States. Subjects ranged in age from 18 to 33 years old with the exception of one female 48 year old subject. The majority of Subjects in all groups were in their early twenties. A total of 146 subjects were used. The sex and group distribution is shown in Table 1. However a two way analysis of variance did show a significant age difference between groups at the .001 level. The age means, modes, and standard deviations are shown in Table 2 below. A two-way analysis of variance showed no significant age differences by sex. Two way analysis of variance also showed a significant education difference between groups at the $p < .05$ level. The group means and standard deviations for the highest year of school completed are shown in Table 3.

## Measures

### Biographical Information

Self-report biographical information such as age, sex,

experience in meditation, diet preference, and sleep need was obtained on all subjects.

Table 1

Experience in Meditation and Sex of Subject

| | Experience in Meditation | Male | Female | |
|---|---|---|---|---|
| Group 1 | 0 | 19 | 13 | |
| Group 2 | 6 mos. to 3 yrs. | 39 | 39 | |
| Group 3 | > 3 yrs. | 24 | 12 | |
| | Total | 82 | 64 | = 146 |

Two by three chi square analyses showed that sex was not significantly related to group membership using a $p < .05$ significance level.

All subjects received payment of $3.00 and in all cases subject anonymity was assured.

Table 2

Means, Modes, and Standard Deviations on Age.

Females

| | Mean | Mode | Standard Deviation |
|---|---|---|---|
| Group 1 (N=13) | 23.62 | 20 | 3.00 |
| Group 2 (N=39) | 23.26 | 22 | 2.61 |
| Group 3 (N=12) | 28.08 | 28 | 6.81 |

Males

| | Mean | Mode | Standard Deviation |
|---|---|---|---|
| Group 1 (N=19) | 23.16 | 19 | 3.96 |
| Group 2 (N=39) | 23.13 | 21 | 3.36 |
| Group 3 (N=24) | 25.04 | 27 | 3.37 |

Table 3

Means and Standard Deviations for Groups on Education, Years of University Completed.

| | | Females | Males | Total |
|---|---|---|---|---|
| Group 1 | M | 2.00 | 2.053 | 2.031 |
| no meditation | S.D. | 1.225 | .911 | 1.031 |
| | n | 13 | 19 | 32 |
| Group 2 | M | 2.410 | 2.026 | 2.218 |
| 6 mos to 3yrs med. | S.D. | 1.874 | 1.547 | 1.718 |
| | n | 39 | 39 | 78 |
| Group 3 | M | 3.250 | 2.792 | 2.944 |
| more than 3yrs med. | S.D. | 2.221 | 2.226 | 2.203 |
| | n | 12 | 24 | 36 |
| Total | M | 2.484 | 2.256 | |
| | S.D. | 1.852 | 1.684 | |
| | n | 64 | 82 | |

## Torrance Tests of Creative Thinking (TTCT)

Torrance Tests of Creative Thinking, (TTCT) Form B (Torrance, 1966) include both figural and verbal components. The Figural Tests involve three tasks; picture construction, incomplete figures, and repeated figures. The picture construction test requires a subject to create a picture in which a jelly bean shaped piece of colored paper with adhesive backing is an integral part. The incomplete figures test requires the subject to complete ten figures which are partially drawn. The repeated figures test requires a subject to draw as many objects as possible using 40 circles. Picture construction is scored only on originality and elaboration. The other two figural activities are scored for fluency, flexibility, originality and elaboration.

The Verbal Tests consist of seven activities; asking, guessing causes, guessing consequences, product improvement, unusual uses, unusual questions, and "just suppose." Ask and Guess, the first three activities, require the subjects to ask questions and guess causes and consequences of happenings based on a drawing. The Product Improvement test requires a subject to list interesting and unusual ways to improve a toy monkey which is sketched and described. The Unusual Uses test requires the subjects to think of as many interesting and unusual uses as possible for tin cans. The Unusual Questions test requires the subjects to think of as many unusual questions about tin cans as

possible. The "Just Suppose" requires the subjects to list as many ideas and guesses as possible about what would happen if a great fog were to fall over the earth and all we could see of people would be their feet. Each verbal activity is scored for fluency, flexibility and originality.

Torrance (1966) has complicated scoring guides for both Figural and Verbal Tests. Originality is weighted as to its categorical frequency of response in the original subject pools which are based on Ns ranging from 233 to 588. Originality scores are recorded for each response and are summarized as to their fluency (number of different categories into which responses fall). In the Figural Tests elaboration is scored by counting the number of details added to the original figure.

The range of scores on fluency and flexibility are contingent on the number of figures or lines used, for verbal responses, on each test activity. The range varies for each test activity from 0 - 10 to 0 - 50. The picture construction activity does not generate scores for fluency and flexibility because there is only one figure. Originality scores are weighted for each response. Scores range from 0 - 5 for the picture construction activity; 0 - 4 for the unusual questions activity and 0 - 2 for all other activity responses. Elaboration scores range from 0 to infinity.

The TTCT has been used to measure potential for creative thinking and to differentiate between types of creative thinking in numerous studies with subjects ranging in age from

Kindergarden to graduate school (Torrance, 1966). Interscorer and intrascorer reliability of the measure is reported by Torrance to generally exceed .90.

## Barron's Ego Strength Scale (BESS)

Barron's Ego Strength Scale (BESS) is a 68 item true false questionnaire taken from the Minnesota Multiphasic Personality Inventory. Items were chosen which correlated with improvement in psychiatric treatment. The BESS is reported to measure such aspects of effective personal functioning as adaptability and personal resourcefulness; attributes usually subsumed in the term "ego strength". The BESS includes eight sub-scales; 1) physical functioning and physiological stability, 2) psychasthenia and seclusiveness, 3) attitudes toward religion, 4) moral posture, 5) sense of reality, 6) personal adequacy and ability to cope, 7) phobias and infantile anxieties, 8) miscellaneous (Barron, 1953). A sample item is "My way of doing things is apt to be misunderstood by others." The subscales were determined by their face validity alone (Barron, 1953). Neither construct validity nor reliability data are available for the sub-scales of the BESS. This lack of construct validity, as well as the small number of items in each subscale, make any interpretation of results hazardous. Thus they are not considered, except in the discriminant analysis presented in the Results section.

The BESS is scored from a Key. The range of scores on the

overall variable of ego strength is 0 - 68. Barron (1953) reports an odd-even reliability of .76 and a test-retest reliability of .72.

## Myers Briggs Type Indicator (MBTI) Form B

The Myers Briggs Type Indicator (MBTI) is a 166-item multiple choice questionnaire purporting to measure an individual's Jungian personality components conceptualized as polar alternatives. These components are; introversion or extraversion, judging or perceiving, thinking or feeling, and sensing or intuition. Jung's (1923) theory accounts for human behavior in terms of certain basic differences in the way people prefer to use perception and judgement. In his terms perception is the process of becoming aware of things, people, occurrences, or ideas; judgement is the process of coming to conclusions about what has been perceived. The MBTI is comprised of four separate indices for determining basic preferences which, according to this theory, structure an individual's personality (Myers, 1962). A sample item is "Is it higher praise to call someone (A) a man of vision, or (B) a man of common sense?"

The Extraversion or Introversion (EI) index measures the extent to which one directs his perception and judgement toward an internal world of ideas or towards the external environment. The Judgment or Perception (JP) index shows the person's preference for either a judging or perceiving attitude in dealing

with external or internal stimuli. Judging involves coming to conclusions while perceiving is simply the process of sensate awareness. The Thinking or Feeling (TF) index indicates which of these forms the individual relies upon in order to make judgements. Thinking involves reliance upon a primarily rational, theoretical discrimination between true and false while feeling implies discrimination based upon personally valued and not valued. The Sensing or Intuition (SN) index measures which of these two types of perception one relies upon. Sensing implies relying upon one of the senses or sensations and intuition implies relying upon the indirect perception of meaning or significance and involves unconscious processes.

The MBTI is hand scored from a key. The total number of points for each alternative is entered on a score sheet and the difference between the scores is transformed into a preference score from the table in the scoring manual. For statistical purposes preference scores are transformed into continuous scores. For an I, N, F or P score, the continuous score is 100 plus the preference score. For an E, S, T or J score, the continuous score is 100 minus the preferred score. The range of continuous scores for I, N, F or P is 101 - 161; and for E, S, T or J it is 33 - 99. Split - half reliability for this measure is .82 (Myers, 1962).

## Eysenck Personality Inventory (EA)

The Eysenck Personality Inventory (EPI) is a 57 item forced choice questionnaire measure of the two orthogonal factors of Extraversion (E) and Neuroticism (N). Extraversion, in contrast to Introversion, refers to the uninhibited, outgoing, and sociable inclinations of an individual. Neuroticism refers to emotional overresponsiveness and liability to neurotic breakdown under stress. These scales have been shown to be independent of intelligence but related to overall emotional adjustment and to outgoingness (Eysenck and Eysenck, 1968). Sample items are "Would you rather plan things than do things?" and "Do you find it hard to fall asleep at bedtime?"

The EPI is scored from a key. The score for each scale is the sum of appropriate responses for each category on the questionnaire. The range of scores is 0 - 24 for both extraversion and neuroticism and 0 - 9 for the lie scale. Test - retest reliabilities are reported between .84 and .94; split - half reliabilities for the combined scales vary from .71 to .91 (Eysenck, 1968).

## Bakan's Lateral Eye Movement

Bakan's Test for Lateral Eye Movement (LEM) involves reading a list of 20 proverbs to subjects who are instructed to report what the proverb means to them. The first lateral eye movement

made by a subject, upon breaking eye contact with E, is recorded.

Raw scores consisting of the number of left movements, right movements, and middle movements are transformed into a percentage of left movement scores. Subjects who score 70% or more are defined as left lookers; those with 30% or less are right lookers. The range of scores is 0 - 100%. Reliability of this measure is reported to be .78 (Bakan and Strayer, 1973).

## Procedure

Subjects in groups 2 and 3 were recruited from meditators attending the National Ananda Marga Retreat in Oklahoma, June 29 - July 5, 1974. During registration, E advertised for subjects to participate in a study of psychological differences between meditators and non-meditators for a fee of $3.00. A sign-up sheet was provided for prospective subjects. The 35 page questionnaire was administered to a group of approximately 50 subjects on two consecutive mornings in a large room equipped with tables and chairs at the university headquarters of the retreat. The measures were given in the following order; Biographical Information, Torrance Tests of Creative Thinking, Barron's Ego Strength Scale, Myers-Briggs Type Indicator, Eysenck Personality Inventory. The questionnaire took approximately two to two and a half hours to complete. Upon completion of the questionnaire all subjects were asked to report to another room upstairs for short individual interviews (the LEM).

Interviews were described as a new technique for determining social attitudes, and were administered by four trained assistants. Each subject faced a curtain drawn across the entire room, eliminating distractions and affording symmetrical right and left views. The exact instructions given to subjects are shown in appendix A. Each subject was interviewed by a same sexed E. The E read a list of twenty short proverbs while keeping eye contact with the subject and then noting the direction of the first eye movement as the subject attempted to say what the proverb meant. E made notes of subjects' explanations of proverbs. At the completion of the interview subjects were paid $3.00, asked to sign a receipt, and thanked for their participation in the study. All assistant Es were blind to hypotheses of the study and to their subject's experience in meditation.

Subjects for group 1 were recruited from persons who had signed up for free introductory classes in Ananda Marga meditation at Simon Fraser University, 1975 and 1976, and who had agreed to participate in the study. Participation in the free classes was in no way contingent upon being part of this study. Persons who had registered for introductory classes were asked by E if they would volounteer to participate in this study. About 50% of the persons registered for the classes volounteered. In this way, using only Ss interested in Ananda Marga, E attempted to control for interest in meditation across all subjects. The week before the meditation classes started, subjects filled out the questionnaire either alone or in groups of two or three in a

quiet classroom on campus. Subjects were then interviewed by one of the assistant Es following the same procedure as for the meditation groups.

## Coding and Scoring

After all the data were collected, E removed the first page of each questionnaire which contained the biographical information and assigned a code number to all subjects. Then all measures were separated for each subject and compiled for scoring. Two assistant Es hand scored all questionnaires without knowledge of subjects' group membership or E's hypotheses. Data were then compiled by E on data sheets for key punching and analysis.

# Chapter 3: Results

Before considering the results it is important to note that groups were not equivalent in age and education and may have differed on other variables since subjects in group 1 were recruited at Simon Fraser University while subjects in groups 2 and 3 were recruited from a North American sample at the Ananda Marga Convention. Additionally, group 1 is not completely representative of "interested non-meditators at Simon Fraser University" since only half of the meditation students volounteered. However, this 50% participation was in part because some of the "meditation students" were children and some of them that expressed interest in the study did not have time to volounteer. However, there was some demonstrated similarity between group 1 and group 2 on age and education.

## Biographical Information

Empirical support for the validity of separating groups into "no meditation", "six months to three years meditation.", and "more than three years meditation" was found in such biographic indices as Ss' diet and need for sleep. Two by three chi squares showed that significantly fewer males and females in groups 2 and 3 ate meat, fish, or eggs than did Ss in group 1 ($p<.001$, $df=2$). (Maintenance of a vegetarian diet is one goal of Ananda Marga meditation. The only sex difference for diet was in use of milk products; fewer females in group 3 used milk than did males

($p<.001$, $df=1$).

A two-way analysis of variance showed significant differences by groups ($p = .001$) and by sex ($p = .040$) for self reported sleep need. From group 1 to 3 progressively fewer hours of sleep per day were reported. (Less sleep need is another goal of Ananda Marga meditation). Females reported greater sleep need in all groups. The means and standard deviations are presented in Table 4 and the analysis of variance results are summarized in Table 5.

Post hoc analyses on sleep using a Scheffe Test at the $p < .05$ significance level indicated a significant difference between groups 1 and 2.

Torrance Tests of Creative Thinking (TTCT)

It was hypothesized that subjects with greater experience in meditation would attain higher scores on creative thinking than those with less experience. A two-way analysis of variance showed no significant difference by groups for scores on the verbal and figural measures of the TTCT. There was a significant sex difference on two of the verbal tests, flexibility and originality, with females having a higher mean score than males on both. These results are presented in Tables 6 and 7. Additionally, there was a significant two-way interaction, sex by group, for figural originality, with females in group three having a substantially higher mean score than any other group.

Table 4

Means and Standard Deviations for Groups and Sex
Hours of sleep per 24 hour day

| | | Sex | | |
|---|---|---|---|---|
| | | Females | Males | Total |
| Group 1 | M | 8.308 | 7.695 | 7.944 |
| No meditation | S.D. | .879 | .900 | .929 |
| | n | 13 | 32 | 32 |
| Group 2 | M. | 6.882 | 6.654 | 6.768 |
| 6 mos to 3yrs med. | S.D. | 1.194 | 1.089 | 1.141 |
| | n | 39 | 39 | 78 |
| Group 3 | M. | 6.567 | 6.146 | 6.286 |
| More than 3 yrs med. | S.D. | .756 | .938 | .894 |
| | n | 12 | 24 | 36 |
| Total | M. | 7.112 | 6.746 | |
| | S.D. | 1.221 | 1.144 | |
| | n | 64 | 82 | |

Table 5

Analysis of Variance for Sleep

| variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| sex | 4.470 | 1 | 4.470 | 4.182 | .040 |
| group | 49.431 | 2 | 24.716 | 23.120 | .001 |
| sex by group | 0.861 | 2 | .431 | .403 | .999 |
| residual | 149.660 | 140 | 1.069 | | |
| total | 204.772 | 145 | 1.412 | | |

Table 6

Analysis of Variance of TTCT
Verbal Flexibility

| Source of Variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| sex | 244.233 | 1 | 244.233 | 4.811 | .028 |
| group | 177.832 | 2 | 88.916 | 1.751 | .175 |
| sex by group | 146.035 | 2 | 73.017 | 1.438 | .239 |
| residual | 7107.469 | 140 | 50.768 | | |
| total | 7636.801 | 145 | 52.668 | | |

Table 7

Analysis of Variance of TTCT
Verbal Originality

| Source of variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| sex | 1369.413 | 1 | 1369.413 | 7.242 | .008 |
| group | 132.823 | 2 | 66.412 | .351 | .999 |
| sex by group | 189.325 | 2 | 94.663 | .501 | .999 |
| residual | 26473.727 | 140 | 189.098 | | |
| total | 28108.250 | 145 | 193.850 | | |

These results are presented in Tables 8 and 9.

Since differences in age and education parallel differences in level of meditation experience, an analysis of co-variance was preformed with age and education of Ss as the co-variates on the figural originality scale of the TTCT. The interaction of sex by group was still found to be significant. This analysis is presented in Table 10.

Barrons Ego Strength Scales (BESS)

It was hypothesized that those subjects more experienced in meditation would score lower on the ego strength scale, than Ss less experienced in meditation. A two-way analysis of variance showed no significant differences by group for ego strength ($F = 1.319$, $df = 2$, $p = .270$).

Myers Briggs Type Indicator (MBTI)

It was hypothesized that Ss experienced in meditation would score higher on introversion than on extraversion, higher on judging than on perceiving, and higher on intuition than on sensing. A two-way analysis of variance showed no significant differences by group in scores on introversion-extraversion (IE) or on thinking feeling (TF). However, all group means on IE were greater than 101, indicating preference for introversion according to Myers (1962). A significant difference by group was

Table 8

Means and Standard Deviations for Groups and Sex on TTCT Figural Originality

| | | Sex | | |
|---|---|---|---|---|
| | | Females | Males | Total |
| group 1 | M. | 74.615 | 92.500 | 85.234 |
| no meditation | S.D. | 46.882 | 59.767 | 54.814 |
| | n | 13 | 19 | 32 |
| group 2 | M. | 83.882 | 96.641 | 90.262 |
| 6 mos. to 3 yrs. med. | S.D. | 50.997 | 59.465 | 55.405 |
| | n | 39 | 39 | 78 |
| group 3 | M. | 133.000 | 87.729 | 102.819 |
| more than 3yrs. med. | S.D. | 43.315 | 44.649 | 48.664 |
| | n | 12 | 24 | 36 |
| total | M. | 91.209 | 93.073 | |
| | S.D. | 52.322 | 55.077 | |
| | n | 64 | 82 | |

Table 9

Analysis of Variance of TTCT Figural Originality

| Source of variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| sex | 17.303 | 1 | 17.303 | .006 | .999 |
| group | 5797.555 | 2 | 2898.777 | .040 | .358 |
| sex by group | 22021.805 | 2 | 11010.902 | 3.949 | .021 |
| residual | 390355.250 | 140 | 2788.252 | | |
| total | 418299.500 | 145 | 2884.824 | | |

Table 10

Analysis of Co-Variance for TTCT

Figural Originality

| Source of variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| covariate age | 21.806 | 1 | 21.806 | .008 | .930 |
| covariate educ. | 5600.125 | 1 | 5600.125 | 2.007 | .159 |
| sex | 81.425 | 1 | 81.425 | .029 | .865 |
| group | 3781.877 | 2 | 1890.938 | .678 | .510 |
| sex by group | 22541.805 | 2 | 11270.902 | 4.038 | .020 |
| residual | 385150.000 | 138 | 2790.942 | | |
| total | 418299.625 | 145 | 2884.825 | | |

found on judging-perceiving (JP); group one preferred a perceiving approach, while groups two and three seemed to prefer a more judging approach. A significant difference by group was found for the sensing-intuiting (SN) scale with group 1 scoring highest on intuition. As with introversion-extraversion, all the group means on SN were greater than 101 indicating a preference for intuition in all groups. Means and standard deviations are presented in Table 11; analyses of variance are presented in Tables 12 and 13.

Post hoc analyses on MBTI Judging - Perceiving and Sensing-Intuiting using a Scheffe Test at the $p < .05$ significance level indicated no significant differences between meditators in groups 2 and 3; however significant differences were found between groups 1 and 2 and between group 1 and groups 2 and 3 combined with the latter scoring lower. There were also significant differences between groups 1 and 3 on Judging-Perceiving. On the Sensing-Intuiting Scale, however, the difference between groups 1 and 3 was not significant. The results on the MBTI J-P and S-N scales are presented in graphic form in Figure 1.

Since differences in age and education parallel differences in level of meditation experience, an analysis of co-variance was preformed with age and education of Ss as the co-variates on both the judging-perceiving and sensing - intuiting scales of the MBTI. The group differences on judging - perceiving and sensing-intuiting were still found to be significant. These

Table 11

Means and Standard Deviations for MBTI Sensing - Intuiting and Judging - Perceiving Scales.

| | | Myers Briggs Scale Sensing-Intuiting (SN) | Judging-Perceiving (JP) |
|---|---|---|---|
| group 1 | M. | 122.500 | 121.062 |
| no meditation | S.D. | 16.932 | 21.351 |
| (n = 32) | | | |
| group 2 | M. | 109.013 | 97.154 |
| 6 mos. to 3yrs. med. | S.D. | 21.593 | 25.780 |
| (n = 78) | | | |
| group 3 | M. | 113.278 | 95.833 |
| more than 3yrs. med. | S.D. | 17.864 | 18.276 |
| (n = 36) | | | |

Table 12

Analysis of Variance for MBTI Judging - Perceiving (JP)

| Source of variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| sex | 907.903 | 1 | 907.903 | 1.700 | .191 |
| group | 14641.113 | 2 | 7320.555 | 13.704 | .001 |
| sex by group | 1303.156 | 2 | 651.578 | 1.220 | .298 |
| residual | 74784.375 | 140 | 534.174 | | |
| total | 91823.625 | 145 | 633.266 | | |

Table 13

Analysis of Variance for MBTI Sensing - Intuiting (SN)

| Source of variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| sex | 957.810 | 1 | 957.810 | 2.453 | .115 |
| group | 4431.422 | 2 | 2215.711 | 5.675 | .004 |
| sex by group | 341.424 | 2 | 170.712 | .437 | .999 |
| residual | 54658.789 | 140 | 390.420 | | |
| total | 60088.711 | 145 | 414.405 | | |

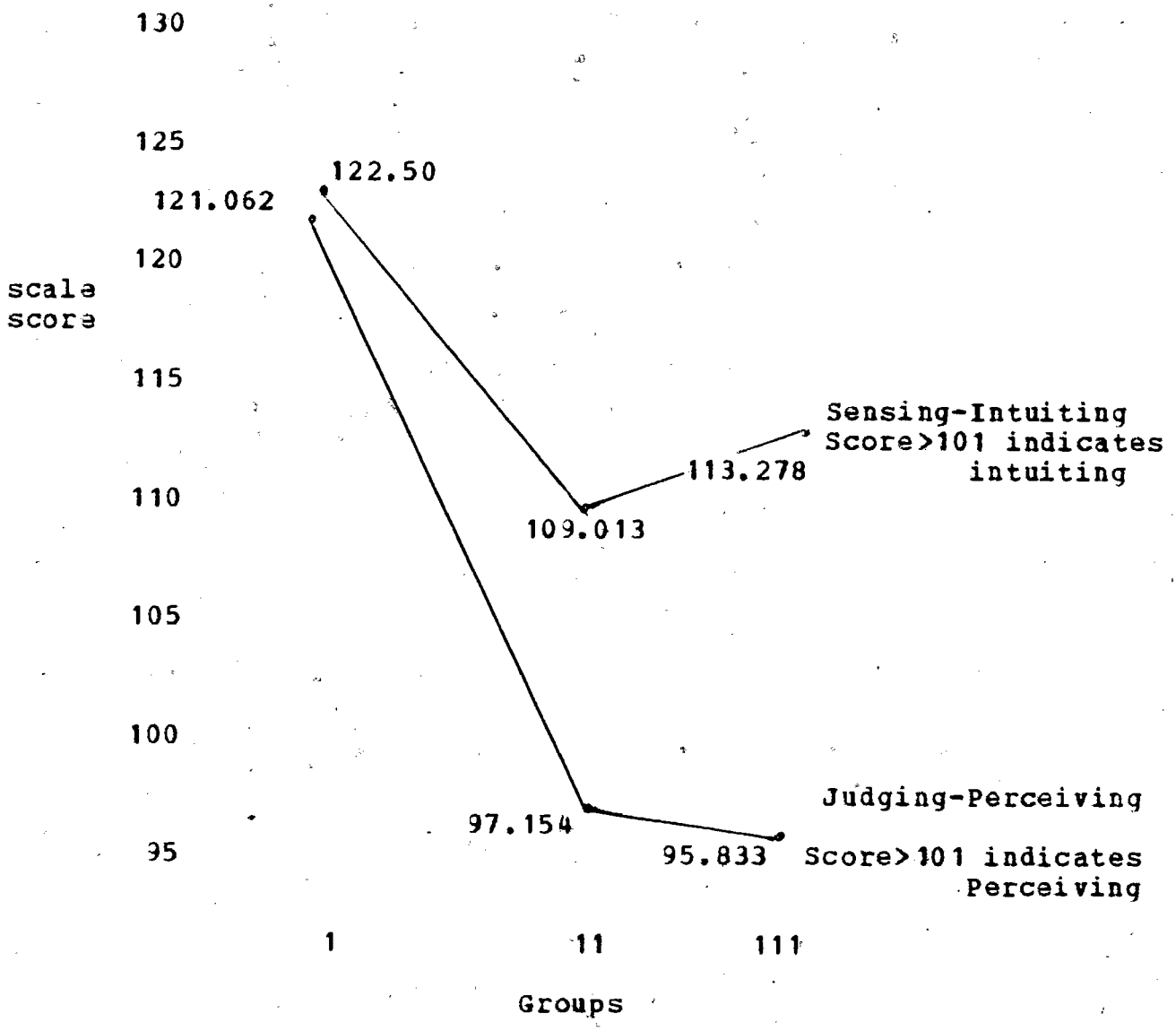


Figure 1. Mean group scores on Myers Briggs Type Indicator Judging - Perceiving and Sensing - Intuiting

analyses are presented in Tables 14, 15, 16 and 17.

Post hoc analyses on MBTI Judging - Perceiving and Sensing - Intuiting, using a Scheffe Test at the $P < .05$ significance level indicates that the difference between groups 1 and 2 are still significant after covarying out education.

Eysenck Personality Inventory (EPI)

It was hypothesized that Ss experienced in meditation would score lower on extraversion and neuroticism than Ss with no meditation experience. A two-way analysis of variance showed no significant differences on extraversion scores.

The two-way analysis of variance did show a significant difference in neuroticism scores by groups, with experienced meditators scoring lower as hypothesized. A two-way interaction of sex by groups was also found; males in group 3 (considerable meditation experience) had the lowest neuroticism scores.

Of supplementary interest, a Pearson's Product moment Correlation of .609 ($p = .001$, $df = 144$) was found between the Extraversion -Introversion scales on the EPI and the MBTI, suggesting some concurrent validity for these measures.

Means and standard deviations are presented in Table 18 and the analysis of variance is summarized in Table 19.

Post hoc analyses in EPI Neuroticism using a Scheffe Test at the .05 significance level indicated no significant differences between meditators in groups 2 and 3 but a significant difference

Table 14

Analysis of Co-variance for MBTI
Judging - Perceiving (JP)

| Source of variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| covariate age | 4130.277 | 1 | 4130.277 | 8.047 | .005 |
| sex | 569.146 | 1 | 569.146 | 1.109 | .295 |
| group | 13495.426 | 2 | 6747.711 | 13.147 | .001 |
| sex by group | 2034.918 | 2 | 1017.459 | 1.982 | .139 |
| residual | 71340.937 | 139 | 513.244 | | |
| total | 91823.625 | 145 | 633.266 | | |

Table 15

Analysis of Co-variance for MBTI
Sensing - Intuiting (SN)

| Source of variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| covariate: age | 68.868 | 1 | 68.868 | .175 | .999 |
| sex | 919.760 | 1 | 919.760 | 2.339 | .124 |
| group | 4401.230 | 2 | 2200.615 | 5.596 | .005 |
| sex by group | 329.521 | 2 | 164.760 | .419 | .999 |
| residual | 54658.316 | 139 | 393.225 | | |
| total | 60088.711 | 145 | 414.405 | | |

Table 16

Analysis of Co-Variance for MBTI
Judging - Perceiving (JP)

| Source of variation | SS | df | MS | F | Signif. of F. |
|---|---|---|---|---|---|
| covariate educ. | 2701.853 | 1 | 2701.853 | 5.120 | .025 |
| sex | 716.323 | 1 | 716.323 | 1.357 | .246 |
| group | 13530.016 | 2 | 6765.008 | 12.819 | .000 |
| group by sex | 1349.6321 | 2 | 674.816 | 1.279 | .282 |
| residual | 73354.813 | 139 | 527.732 | | |
| total | 91823.688 | 145 | 633.267 | | |

Table 17

Analysis of Co-Variance for MBTI
Sensing - Intuiting (SN)

| Source of variation | SS | df | MS | F | Signif. of F. |
|---|---|---|---|---|---|
| covariate educ. | 1644.846 | 1 | 1644.846 | 4.313 | .040 |
| sex | 741.271 | 1 | 741.271 | 1.944 | .165 |
| group | 4611.445 | 2 | 2305.723 | 6.047 | .003 |
| group by sex | 295.654 | 2 | 147.827 | .388 | .679 |
| residual | 53005.102 | 139 | 381.332 | | |
| total | 60088.719 | 145 | 414.405 | | |

Table 18

Means and Standard Deviations for Groups and Sex on EPI Neuroticism

| | | Sex | | |
|---|---|---|---|---|
| | | Females | Males | Total |
| group 1 | M. | 11.923 | 14.842 | 13.656 |
| no meditation | S.D. | 6.435 | 4.475 | 5.457 |
| | n | 13 | 19 | 32 |
| group 2 | M. | 8.308 | 8.436 | 8.372 |
| 6 mos. to 3yrs. med. | S.D. | 4.583 | 4.083 | 4.313 |
| | n | 39 | 39 | 78 |
| group 3 | M. | 9.917 | 6.792 | 7.833 |
| more than 3yrs. med. | S.D. | 3.476 | 4.653 | 4.501 |
| | n | 12 | 24 | 36 |
| total | M. | 9.344 | 9.439 | |
| | S.D. | 4.977 | 5.275 | |
| | n | 64 | 82 | |

Table 19

Analysis of Variance for EPI Neuroticism

| Source of variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| sex | .000 | 1 | .000 | .000 | .999 |
| group | 750.192 | 2 | 375.096 | 17.983 | .001 |
| sex by group | 144.217 | 2 | 72.108 | 3.457 | .003 |
| residual | 2920.206 | 140 | 20.859 | | |
| total | 3814.940 | 145 | 26.310 | | |

between group 1, non-meditators, and groups 2 and 3 combined. A significant difference was also found between groups 1 and 2 and between groups 1 and 3. Further Scheffe Tests showed a significant difference between males in groups 1 and 3. These results are graphically presented in Figure 2.

A two-way analysis of variance also showed a significant difference on lie scale scores by groups with experienced meditators scoring higher. The means and standard deviations are presented in Table 23; the analysis of variance is summarized in Table 24. However, it should be born in mind when interpreting these data that significance here is based on an average raw score difference of less than one additional item in the meditation group. The average lie score for non meditators is about 1 (out of a possible 9), while that for meditators is about 1.7.

A Scheffe Post hoc analysis showed no significant difference between group 1 and 3 although there was a significant difference between group 1 and 2.

As a further check on the reliability of the neuroticism scale findings an analysis of co-variance was preformed using lie scale scores as the co-variate. The group differences on neuroticism were still found to be significant. This analysis is presented in Table 22.

An analysis of co-variance was also preformed using age and education scores as co-variates. The group differences were still found to be significant. This analysis is presented in

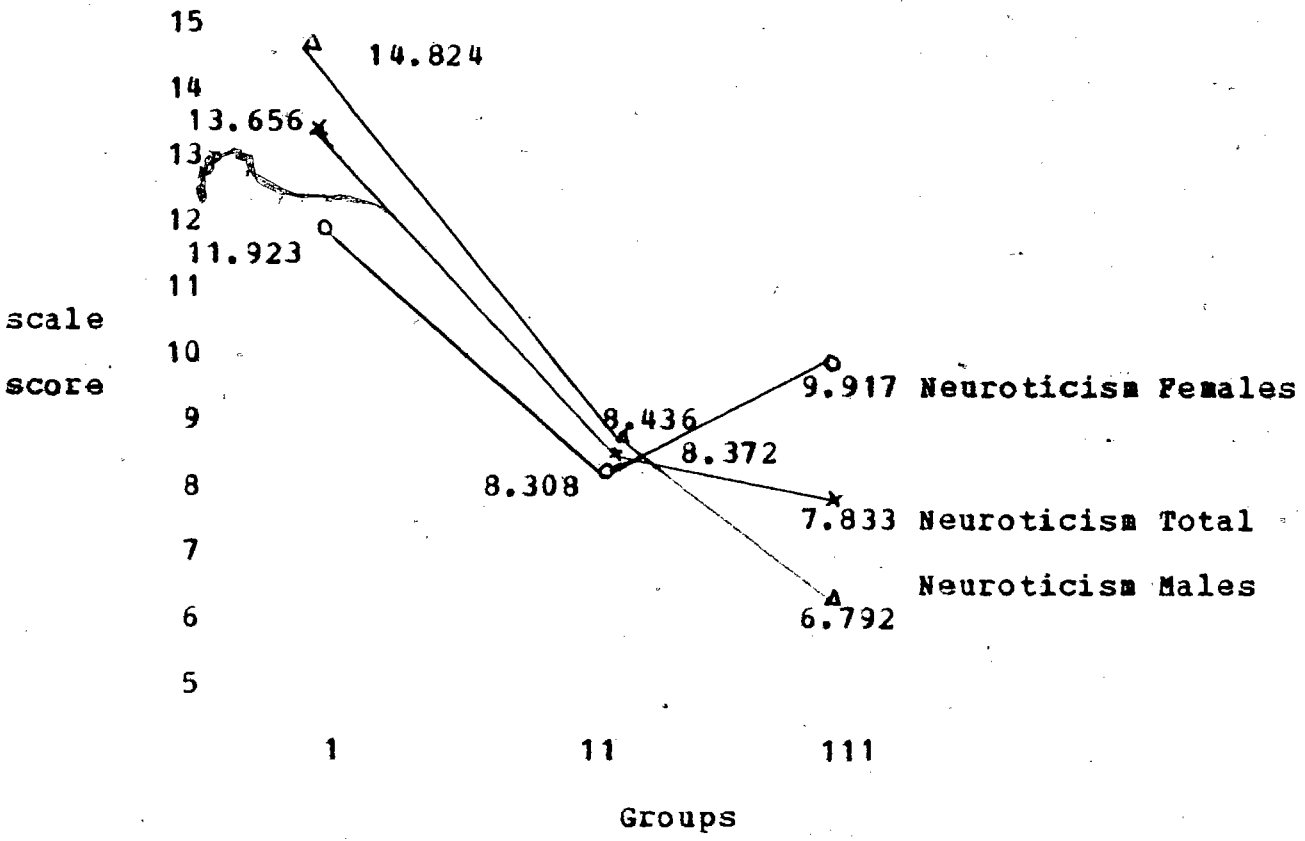


Figure 2. Group mean scores on Eysenck's Personality Inventory Neuroticism

Table 20

Means and Standard Deviations for Groups and Sex on EPI Lie Scale

| | | Sex | | |
|---|---|---|---|---|
| | | Females | Males | Total |
| group 1 | M. | 1.462 | .684 | 1.000 |
| no meditation | S.D. | 1.198 | .820 | 1.047 |
| | n | 13 | 19 | 32 |
| group 2 | M. | 1.897 | 1.615 | 1.756 |
| 6 mos. to 3yrs. med. | S.D. | 1.683 | 1.067 | 1.407 |
| | n | 39 | 39 | 78 |
| group 3 | M. | 1.333 | 1.708 | 1.583 |
| more than 3yrs. med. | S.D. | 1.073 | 1.546 | 1.402 |
| | n n | 12 | 24 | 36 |
| total | M. | 1.703 | 1.427 | |
| | S.D. | 1.498 | 1.238 | |
| | n | 64 | 82 | |

Table 21

Analysis of Variance for EPI Lie Scale

| Source of variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| sex | 2.051 | 1 | 2.051 | 1.159 | .283 |
| group | 12.350 | 2 | 6.175 | 3.489 | .032 |
| sex by group | 5.289 | 2 | 2.644 | 1.494 | .226 |
| residual | 247.780 | 140 | 1.770 | | |
| total | 268.163 | 145 | 1.849 | | |

Table 22

Analysis of Co-Variance for EPI Neuroticism

| Source of variation | SS | df | MS | F | Signif. of F |
|---|---|---|---|---|---|
| covariate lie | 557.844 | 1 | 557.844 | 29.427 | .001 |
| sex | 2.718 | 1 | 2.718 | .143 | .999 |
| group | 529.540 | 2 | 264.770 | 13.967 | .001 |
| sex by group | 89.213 | 2 | 44.606 | 2.353 | .097 |
| residual | 2635.004 | 139 | 18.957 | | |
| total | 3814.940 | 145 | 26.310 | | |

Table 23

Analysis of Co-Variance for EPI Neuroticism

| Source of variation | SS | df | MS | F | Signif. of F. |
|---|---|---|---|---|---|
| covariate age | 3.547 | 1 | 3.547 | .168 | .683 |
| covariate educ. | 4.208 | 1 | 4.208 | .199 | .656 |
| sex | .004 | 1 | .004 | .000 | .990 |
| group | 739.117 | 2 | 369.558 | 17.472 | .000 |
| sex by group | 145.384 | 2 | 72.692 | 3.437 | .035 |
| residual | 2918.854 | 138 | 21.151 | | |
| total | 3814.942 | 145 | 26.310 | | |

Table 23.

Post hoc analyses on EPI neuroticism using the Scheffe Test at the $p < .05$ significance level showed that the difference between groups 1 and 2 was still significant after covarying out age and education.

Bakan's Lateral Eye Movement

It was hypothesized that more experienced meditators would be left lookers rather than right lookers. Three by three chi square analyses showed no significant differences by groups in lateral eye movement for either females or males. However, frequency distributions for females and males showed more left lookers than right lookers in most groups. These results are presented in Tables 24 and 25. Two by three chi square analyses showed that significantly more middle lookers were females in group three ($p = .007$, $df=2$).

Discriminant Analysis

Discriminant analysis is a statistical technique for determining the maximum separation of groups through the construction of functions by a linear combination of variables which are weighted according to their relative contributions. Using a direct method, in which all the independent variables are concurrently entered into the analysis, two functions were formed

Table 24

Frequency Distribution for Lateral Eye Movement in Females

| | left lookers | middle lookers | right lookers | total |
|---|---|---|---|---|
| group 1, no meditation | 6 | 7 | 0 | 13 |
| group 2, 6 mos. to 3yrs. med. | 11 | 21 | 7 | 39 |
| group 3, more than 3yrs. med. | 2 | 9 | 1 | 12 |
| total | 19 | 37 | 8 | 64 |

Table 25

Frequency Distribution for Lateral Eye Movement in Males

| | left lookers | middle lookers | right lookers | total |
|---|---|---|---|---|
| group 1, no meditation | 8 | 5 | 6 | 19 |
| group 2, 6 mos. to 3yrs. med. | 12 | 13 | 14 | 39 |
| group 3, more than 3yrs. med. | 14 | 5 | 5 | 24 |
| total | 34 | 23 | 25 | 82 |

to discriminate group membership with level of meditation experience as the criterion. As indicated by discriminant coefficients presented in Table 26 the optimal discriminating variables for function 1 were Eysenck's neuroticism, Torrance's figural fluency, sleep, and Barron's attitudes toward religion sub-scale. Variables contributing most to function 2 were Torrance's verbal elaboration, Torrance's figural flexibility, Torrace's figural originality, age, sleep, and Barron's psychasthenia and seclusiveness. This prediction system correctly classified 84.4% of the subjects in group 1 with no meditation experience, 70.5% of the subjects in group 2 with 6 months to 3 years meditation experience, and 69.4% of the subjects in group 3 with more than 3 years meditation experience.

The salience of the predicting variables in the direct discriminant analysis was further validated using a stepwise discriminant analysis. This method seeks to select the most useful subset of variables to achieve satisfactory discrimination by maximizing the Mahalonobis distance between the two closest groups. Using this procedure the variables contributing the most to function 1 were Myers Briggs introversion - extraversion, Myers Briggs judging-perceiving, Eysenck's neuroticism, sleep, and Barron's attitudes towards religion. The best set of predicting variables for function 2 were Myers Briggs judging - perceiving, Torrance's figural flexibility, age, sleep, and Barron's physical functioning and physiological stability. This prediction equation correctly classified 81.3% of the subjects in

Table 26

Discriminant Analysis, direct method
Standardized Discriminant Function Coefficients

| | Function 1 | Function 2 |
|---|---|---|
| MBIE | -0.14811 | 0.22968 |
| MBSN | 0.07953 | 0.17456 |
| MBTF | -0.21530 | -0.19815 |
| MBJP | 0.24041 | -0.03186 |
| EYSE | 0.07758 | 0.23697 |
| EYSN | 0.38160 | 0.03627 |
| EYSL | -0.03079 | -0.00921 |
| TORVFLU | 0.06552 | -0.20962 |
| TORVFLE | 0.09594 | 0.20614 |
| TORVOR | -0.10368 | -0.14770 |
| TORVELAB | 0.02927 | 0.40329 |
| TORFFLU | 0.42046 | 0.12310 |
| TORFFLE | -0.24118 | 0.69996 |
| TORFOR | 0.26511 | -0.74407 |
| PLL | 0.02495 | 0.16829 |
| AGE | -0.05389 | 0.67574 |
| EDUC | -0.03449 | 0.00467 |
| SLEEP | 0.33589 | 0.42997 |
| B RELIG | 0.29777 | -0.04078 |
| B PHOB | -0.16843 | -0.13340 |
| B ADEQ | -0.05089 | 0.02133 |
| B REAL | 0.00457 | 0.02259 |
| B MORAL | 0.11268 | 0.13141 |
| B SECLUS | -0.03782 | -0.38561 |
| B PHYS | -0.13990 | -0.29879 |
| B MISC | -0.19070 | -0.19380 |
| B EGO | 0.12205 | 0.25953 |

group 1 with no meditation experience, 65.4% of the subjects in group 2 with 6 months to 3 years experience in meditation, and 66.7% of the subjects in group 3 with more than 3 years experience in meditation. The stepwise discriminant analysis is presented in Table 27.

Table 27

Discriminant Analysis, stepwise method

| | Function 1 | Function 2 |
|---|---|---|
| MBIE | 0.24647 | 0.01556 |
| MBTF | 0.20194 | -0.18758 |
| MBJP | -0.29328 | 0.24244 |
| EYSN | -0.40334 | 0.05390 |
| TORFFLE | 0.14455 | 0.34007 |
| AGE | 0.09035 | 0.71500 |
| SLEEP | -0.40908 | -0.36706 |
| B RELIG | -0.34771 | 0.19067 |

# Chapter 4: Discussion

## Biographical Information

Comparability of groups was a concern with this study. Indeed significant differences were found on both age and level of education of subjects in the three groups. There was some demonstrated similarity between subjects in groups 1 and 2 on age and education. An additional concern was that subjects in group 1 were recruited at Simon Fraser University while subjects in groups 2 and 3 were recruited from a North American sample at the Ananda Marga Convention. Committment to Ananda Marga and to meditation also was not controlled. Subjects in groups 2 and 3 had travelled to a national convention on Ananda Marga meditation showing considerable committment while subjects in group 1 had merely signed up for an introductory class. Furthermore only about half of the meditation students volounteered for this study, so group 1 is not completely representative of interested non-meditators at Simon Fraser University.

However, it is equally important to consider ways in which all subjects were comparable. Even though a significant difference by age was found it is important to note that age differences for males and females in groups 1 and 2 are less than one year. The most significant results in this study were between groups one and two. Similarly the differences in education level are less than one year from group 1 to group 3.

All subjects had also clearly demonstrated an interest in Ananda Marga meditation. Thus interest and type of meditation were controlled for. All subjects also volountered to participate in this study.

The degree to which the groups were comparable makes it interesting and valuable to note the differences on diet, sleep, and personality variables.

The significant differences in dietary content and need for sleep reported by meditators and non-meditators are commonly predicted in references on yoga philosophy and teachings (Chandra, 1977; Yogananda, 1969). The finding that subjects with experience in meditation reported eating less meat, fish, and eggs than those without meditation experience is consistent with the Ananda Marga philosophy which both encourages a vegetarian diet as an aid to meditation and holds that the desire to eat meat will diminish with increased experience in meditation (Anandamurti, 1975; Nadita and Devodatta, 1971). However, in the present study it is not possible to say whether experience in meditation preceded choice of a vegetarian diet or vice versa.

Progressively fewer hours of sleep per day were reported by subjects as their experience in meditation increased. This finding supports those of Goleman (1971) and Forem (1976). In the present study subjects not experienced in meditation slept about eight hours a day, the generally accepted average, while the most experienced meditators slept about six hours per day.

Again, as with vegetarian diet, it is not possible to say

that meditation experience preceded a diminished need for sleep. However, both findings are meaningful in that they offer further validation for separation of subjects into the particular groups used in this study. They also offer some support for an interrelationship among meditation experience, vegetarian diet, and less sleep need.

Torrance Tests of Creative Thinking (TTCT)

The general expectation that subjects with more experience in meditation would score higher on measures of creative thinking was not confirmed. However, females highly experienced in meditation did score significantly higher on figural originality than did females unexperienced in meditation. On this specific measure, females with no meditation experience scored lower than any other group (male or female) while females with more than three years experience scored the highest of all groups. This sex by group difference was highlighted by the finding that males in group one scored higher on this measure than did males in group three; thus, the pattern for females (a progressive increase) was reversed for males (a progressive decrease).

There are several possible explanations for this finding. The first has to do with the social service component of Ananda Marga. Ananda Marga has a well-developed pre-school program and many women advanced in meditation are involved with these programs. Advanced women meditators may have developed figural

originality skills as an adjunct to some of teaching activities connected with their day care work. A second explanation for these findings might be that meditation helps to balance out traditional sex roles in individuals. Women, traditionally, are thought to place more emphasis on the emotional and social aspects of their personality while men are thought to consider the rational, cognitive aspects of their personality as more important. The effects of experience in meditation may have permitted hitherto unexpressed cognitive skills involved in figural originality to emerge for women; similarly consistent with the "balancing" notion, meditation may have de-emphasized somewhat the importance of these areas for men. A third explanation might be that these scores are an artifact of the test. Torrance (1966) reports higher normative sample scores for female than male arts college sophomore and high school seniors on figural originality. However, this would not explain improvement on the test for females.

Significant differences by sex were also found on two of the verbal tests, flexibility and originality, with females across meditation groups scoring higher on both. Although normative sample scores are not reported separately for males and females on these tests (Torrance, 1966), perhaps, as with figural originality, females tend to score higher on these verbal tests.

The popular claim that meditation increases creative thinking ability (Forem, 1976) remains generally unsupported both by the present study and by Cowger (1973) who used the TTCT with

zazen meditators. Creative thinking seems to be a sufficiently complex process that it is difficult to know whether the lack of significant differences between meditators and non-meditators exists, in fact, or reflects insensitivity of the existing measures. All that can be said on the basis of the present research is that experience in meditation seems to be related to improved performance, for women only, in a fairly delimited area of creative thinking: figural originality.

## Barron's Ego Strength Scale (BESS)

The hypothesis that subjects with greater experience in meditation would score lower on the ego strength scale was not confirmed. This hypothesis was formulated based on Hood's (1974) research and the consideration that the BESS is based on the psychoanalytic hypothesis that intense religious or mystical experiences may indicate pathological regression hence low ego strength.

## Myers Briggs Type Indicator (MBTI)

A brief review of the Myers Briggs Type Indicator may facilitate a clearer understanding of the results. The four scales which comprise this measure, Extraversion or Introversion (EI), Judging or Perception (JP), Thinking or Feeling (TF), and Sensing or Intuiting (SN), reflect preferred

opposites. Each individual's score consists of four letters; these indicate the individuals preferred direction and mode of perception and judgement. The extraversion or introversion scale yields information about individual preference in direction of perception and judgement either toward the environment or toward the world of ideas. The judgement or perception scale reflects individual preference for either a judging or perceiving attitude toward his experiences. The thinking or feeling scale reflects the basis upon which an individual relies in forming judgements; and the sensing or intuiting scale shows which type of perception an individual relies upon.

There was no significant difference by group on the introversion extraversion scale. However, all groups indicated a preference for introversion. The percentage of individuals preferring introversion in the different groups was as follows: for females 46% in group 1, 51% in group 2, and 58% in group 3; for males 68% in group 1, 69% in group 2, and 63% in group 3. This contrasts markedly with Myers (1962) normative sample of liberal arts students among whom only 42% indicated a preference for introversion. It is unfortunate, in the present study, that there was not a control group who were both non-meditators and uninterested in meditation. It can only be concluded here that individuals interested in meditation in 1974 tend more toward introversion than did college students in general around 1960.

Myers (1962) defines perception as the process of becoming aware and judgement as the process of coming to conclusions about

what has been perceived. The hypothesis that subjects experienced in meditation would score higher on judging than perceiving was confirmed. Subjects in group one indicated a preference for perceiving, while subjects in groups two and three indicated an increasing preference for judging. Since the mean scores for all groups indicate a preference for introversion it will be helpful to consider the judging-perceiving preference within the context of introversion. Myers (1962) reports that introverts are not only less communicative but also much more complicated than extraverts. Myers states that when judging is the dominant process in an introvert, as it is for subjects in groups two and three, the individual does not outwardly act like a judging person. His judgement is concerned mainly with his own inner life and may not be outwardly apparent until something important to his inner life arises. He deals with his outer life mainly with the perceptive attitude. The opposite is true when the introvert's dominant process is perception, as it is for subjects in group one. In this case he behaves outwardly as a judging person and his perceiving is concerned primarily with his inner life.

The thinking-feeling scale deals with the preferred mode of judging. Although there were no hypothesized or observed differences between groups on the thinking-feeling (TF) scale, feeling was found to be the preferred mode for males and females in all groups. Thus out of sixteen possible types, feeling and intuition was the predominant pattern for each group. The

percentage of subjects preferring feeling over thinking was as follows: for females 92% in group 1, 95% in group 2, and 92% in group 3; for males 89% in group 1, 95% in group 2, and 92% in group 3. Myers (1962) says that intuitive feeling types may be described as religious, creative, imaginative, and subjective.

The sensing-intuiting scale measures the preferred mode of perceiving. The hypothesis that subjects experienced in meditation would score higher on intuiting than on sensing was not confirmed. The only significant group difference showed group one scoring higher on intuition than group two. A levelling-off effect was observed with the difference between groups one and three being insignificant. It should be noted that the same overall consistency for groups was found here as on the IE scale; all group means indicated a preference for intuition over sensng as a method of perception. The percentage of indivudals preferring intuition was as follows: for females 100% in group 1, 74% in group 2, and 92% in group 3; for males 89% in group 1, 59% in group 2, and 75% in group 3. This finding is interesting since Myers (1962) reported that in the general population only about 25% were intuitives. Myers further notes that intuition is the most common factor among creative individuals; with 96% to 97% of them being intuitive types. She further states that preference for intuition and introversion, those attributes characterizing our population of individuals interested in or practicing meditation, is associated with higher scholastic aptitude and that "the greater concept mastery

resulting from (this combination)...is relevant to the scholastic preformance of the IN..types (p. 38)." "The introverted intuitive is the outstanding innovator in the field of ideas, principles, and systems of thought (Myers, 1962, p. A-8)." She adds that this type of individual often shows single minded concentration. From the meditation side, Anandamurti (1973) refers to sadhana or meditation as intuitional practice. In meditation practice, one initially becomes more keenly aware of sensations, and then, with more experience, learns to transcend them. Thus beginning meditators with a preference for intuition may, at first, become more in touch with their sensing side and then, through meditation experience transcend this level of increased sensate awareness.

In general, INFJ constitutes a characterization of subjects interested in or practicing meditation. Since all groups in this study showed a preference for introversion and intuition (IN) it is important to further consider judging in this context. Myers (1962) points out that well developed judgement is particularily important for the IN individual in order that he be able to criticize his own inner views and thus, to remain really open to judgements from outside without rejecting them out of hand. Without well developed judgement, the individual would not be able to put his inspirations and ideas into efective action and might appear as only a visionary or crank. The association of meditation experience with preference for a judging mode is probably influenced by the extensive moral teachings of purity in

thought, word, and action that provide a philosophical basis for Ananda Marga (Anandamurti, 1973). The most experienced meditators were characterized by INFJ, while individuals with no experience in meditation were characterized by INFP.

Eysenck Personality Inventory (EPI)

The hypothesis that subjects experienced in meditation would score lower on extraversion was not confirmed. All group mean scores are similar to those of the normal population and English students (Eysenck, 1968). However, it is interesting to note that extraversion scores on the EPI have a .61 correlation, significant at the $p < .001$ level, with extraversion scores on the Myers Briggs Type Indicator.

The expectation that meditators would score lower on neuroticism than non-meditators was supported. Females in group three, with significant experience in meditation, showed mean scores slightly higher than the mean scores for group two, yet lower than those for group one. For males, the mean scores, which were higher for men than for women in group one, progressively decreased from group one to group three so that men's scores in group three were lower than women's scores. Eysenck (1968) reported that the mean neuroticism score for 239 university students was 11.4 and for normal adults was 10.5. In the present study, males and females in group one, non-meditators, scored higher on neuroticism than these norms,

with males scoring highest (14.82). The mean score for male and female meditators in groups two and three were lower than these norms with males in group three scoring the lowest (6.79). The overall mean for group three was 7.83.

Neuroticism according to Eysenck is a general emotional overresponsiveness and a liability to breakdown under stress. He says that neurotics are significantly less self-accepting and less self-aware than normals. Patanjali stated in Sutra 11 that "yoga aims, first, last, and always, at freedom from mental disturbances (Bahm, 1964, p.35)." Lesh (1970), Goleman (1971), and Shafii (1973) reported that meditators were more self-aware and self-accepting than non-meditators. Benson (1975) and Davidson (1977) reported that meditation decreases anxiety, and Kirschner (1975) and Stein (1973) found meditators scored lower on Eysenck's neuroticism scale than non-meditators. The present results provide further support for these views.

The sex differences found in the present study may reflect a balancing effect of meditation specifically on men, increasing both their awareness and emotional stability. In our society men have traditionally been encouraged to place less emphasis on interpersonal relationships and feelings than have women. Many of the items on the Eysenck neuroticism scale focus on quality of relationships and acceptance of feelings. Maupin (1969) stated that meditation is a deep passivity combined with increased awareness and that practice in meditation helps an individual develop his receptive attitude , and increase his awareness

enabling a detached look at self. Meditation experience may help men balance their personalities in terms of significantly lowering their scores on neuroticism. Women with no experience in meditation did not score substantially higher than the normative means. This may account partially for the less dramatic effects of meditation on their neuroticism scores. It may also be the case that the practice of meditation does not contrast as strongly with traditionally reinforced feminine attitudes as it does with traditional masculine ones. In any case, results of this study suggest that meditation 'effects' neuroticism differently in men and women.

A significant difference by group was also found on the lie scale with experienced meditators scoring highest. However, as was pointed out earlier, the difference was less than one item, with experienced meditators scoring only 1.7 out of a possible 9. Eysenck (1968) states that the lie scale cut-off point is a score of 4 or 5, which indicates that "faking good" has occurred. Eysenck reports mean lie scores for American College norms at 1.1 for form B used in this study; hence, experienced meditators were somewhat above this norm. When an analysis of co-variance was preformed using lie scale scores as the co-variate, the group differences on neuroticism were still found to be significant.

Bakan's Lateral Eye Movement

The hypothesis that more experienced meditators would be

left lookers rather than right lookers was not confirmed. Frequency distributions of subjects in this study showed more female left and middle lookers than right lookers and more male left lookers than right lookers. A chi square analysis showed that significantly more middle lookers in group three were females. This finding is consistent with Duke's (1968) statement that there are more female than male middle lookers.

Bakan (1971) reported that left lookers tend to have more vivid imagery, and more alpha waves, and to consider themselves more religious. These characteristics are consistent with an interest in meditation and might explain the somewhat larger number of left lookers as compared with right lookers across all groups. Certainly more research is needed on lateral eye movement; especially interesting would be a longitudinal study of the effects of meditation on hemisphere dominance. Also, base rates from normative sampling data are needed. If these were available, we would be able to compare the frequency of left looking (right hemisphere dominance) in our subjects with that in the general population.

## Discriminant Analysis

Each discriminant analysis differed somewhat in its estimate of the importance of dependent variables; however, across both analyses, those variables contributing most to discriminating functions for males, females, and all subjects were Eysenck's

neuroticism scale, Torrance's figural fluency, figural flexibility, and figural originality, and sleep.

## Summary

The present study has generated valuable hypotheses and also suggests a possibility of some interesting personality differences between meditators and non-meditators and between individuals interested or involved in meditation and the general population. Specifically, in this study, subjects experienced in meditation reported a preference for vegetarian diet, less sleep need, higher scores on figural originality (for women), judging as the preferred mode of experiencing, and lower scores on neuroticism.

One hypothesis for future research is that meditation may have a "balancing effect" on individuals, bringing into prominence hitherto unexpressed personality components, thus producing slightly different effects for males and females. Another hypothesis is that there may be a levelling off effect of meditation with more experienced subjects. That is, across several different measures, similiar to those used in this study, the effects of meditation may be seen to asymptote at around 2 to 3 years.

It is impossible to draw conclusions from this study about the longitudinal effects of meditation. One cannot say whether the obtained differences are the actual result of meditation

practice or reflect the self-selection of individuals who do and do not persevere with Ananda Marga meditation over time. In fact, the different degrees of committment, per se, in the groups may account for the results rather than the actual experience in meditation. Only longitudinal studies will furnish a definitive description of the long term effects of meditation on personality variables.

This study also suffered from some additional problems. While interest in meditation was controlled across groups, it would have been very useful to have had a second control group who had neither experience nor interest in meditation. Even though the results remained significant with age and level of education co-varied out, these variables needed to be more tightly controlled so that groups were more similar. Since the main differences were found between groups 1 and 2, it would also have been useful to break group two down into several smaller time spans such as six months to one year, one to two years, and two to three years experience in meditation.

Certainly all the above considerations would benefit future research. The present author suggests that the personality variables which appeared to be important in this study be more rigorously examined in a longitudinal study. Since the effects of meditation on personality appear to be pervasive it would also be valuable to look at areas such as ego identity status and the effects of meditation practice on the meditators life as a whole. Since the aim of meditation practice is indeed to qualitatively

change the meditators experience of life, it would also be interesting to look at real life situations to see the difference between meditators and non-meditators in areas such as tolerance for and recovery from stress and anxiety.

Another important concern in studying "effects" of meditation is the methodology problem. Meditation is basically a personal experience and the results of practicing meditation are best understood and evaluated subjectively by individual experience. Attempting to publically validate these effects using objective western scientific methodology is at best difficult. In fact the most important variables concerning individual change through meditation experience may not be known as yet. The philosophy underlying meditation is non-dualistic and syncretic, while the philosophy of Western science is analytic and causal. These fundamental philosophical differences create difficulties in studying meditation with the traditional scientific method.

Certainly the information provided to date, including the present study affirm that practicing meditation has some meaningful effects on individuals' personalities and perceptions. Rather than eschewing empirical research in this relatively new and somewhat controversial area, increased study is necessary in order to understand more fully there effects and how they are mediated.

# Appendix A

## Instructions Given to Subjects in the Lateral Eye Movement Interview

Hello, please be seated right there. This is a short interview to try a new idea in determining social attitudes. I'm going to read a short list of proverbs to you. After each one I would like for you to briefly say what that proverb means to you. Just give your first response.

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