CALIFORNIA STATE UNIVERSITY, NORTH RIDGE

TRANSCENDENTAL MEDITATION:
A REVIEW, STUDY AND DISCUSSION

A thesis submitted in partial satisfaction of the requirements for the degree of Master of Arts in Education
by
Phillip Cutler Ferguson

June, 1973
The thesis of Phillip Cutler Ferguson is approved:

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Committee Chairman

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Phillip Cutler Ferguson
Santa Barbara, 1973
PREFACE

Education aims at culturing the mind of a man to enable him to accomplish all he would like to accomplish in the great field of life. Education should necessarily enable a man to make use of his full potential in the field of his body, mind and spirit. But it should also develop in him the ability to make the best use of his personality, surroundings and circumstances so that he may accomplish the maximum in life for himself and for all others. There are tremendous possibilities latent in these fields which are never fathomed or unfolded by young people during their student life, which is the most precious time for building up the career of man.

Maharishi Mahesh Yogi
ABSTRACT

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The Cattell Anxiety Scale, the Spielberger Anxiety Inventory and the Northridge Developmental Scale, a measure of self-actualization with sub-scales for aggression, depression and neuroticism, were administered to an experimental group (N = 31) of university students three days prior to their beginning a program of Transcendental Meditation, and to a control group (N = 19) of university students matched for age and sex. Six and one-half weeks later the three scales were again administered to both groups under conditions similar to the first testing. All subjects were within the norms on two validity scales on the Northridge Developmental Scale on both testings, indicating test results were valid. Meditators showed a significant decrease on the Spielberger Anxiety Inventory (P < .0005), the Cattell Anxiety Scale (P < .025), depression
(P < .005) and neuroticism (P < .01). Meditators also showed a significant increase in self-actualization (P < .025). The control group did not indicate any significant change on any of the scales.

The same three scales were then administered to a third group (N = 16) of long-term meditators (matched for age, sex and educational level) and their scores were compared to the short-term meditators. The long-term meditators (mean length of 43 months of meditating) were found to show significantly lower levels of anxiety on the Spielberger Inventory (P < .025) and on the Cattell Scale (P < .0005) and were also found to show significantly lower levels of depression (P < .01) and neuroticism (P < .005), as well as a significantly higher level of self-actualization (P < .0005) than the short-term meditators (mean length of six and one-half weeks meditating).

These results indicate increased psychological health with the length of time meditating. A review of the physiological and psychological literature shows that the present study replicates the findings of other investigators. Meditators are found not only to decrease negative personality characteristics, suggesting useful clinical applications, but they also grow in the qualities of self-actualization found in healthy, more creative members of society.

A discussion gave special consideration to a
neuro-physiological theory of Transcendental Meditation in relation to the improved physiological, psycho-physiological and psychological conditions noticed among practitioners of Transcendental Meditation. Clinical and non-clinical applications were suggested with special reference to educational systems studying the feasibility of incorporating Transcendental Meditation into their specific programs.
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CHAPTER 1

INTRODUCTION

Within the last few years there has been a growing interest concerning the Science of Creative Intelligence (SCI) and Transcendental Meditation (TM). This growing interest is not only being reflected by the increasing number of students and persons starting the practice of Transcendental Meditation\(^1\), but also by the increasing number of scientific, educational and medical publications\(^2\) reporting the results and findings of numerous studies indicating that Transcendental Meditation produces a unique combined psychological, physiological and sociological improvement among practitioners.

Governments, educational systems, therapeutic settings and the Armed Forces have increasingly, with warm and appealing attitudes, looked into, researched and incorporated the practice of Transcendental Meditation into

\(^1\)Over 11,000 per month, according to computer records kept by Maharishi International University, 1015 Gayley Avenue, Los Angeles, California, 90024.

their specific programs.  

School officials have reported that with students practicing Transcendental Meditation, they have noticed improved grades, relationships with teachers and peers, and social behavior improvements (Driscoll, 1972). Meditators almost unanimously report improvements in their clarity of thinking, increased creativity, perceptiveness, grades and learning abilities (Levine, 1972).

Several studies have indicated that practitioners of Transcendental Meditation show a marked decrease in the use of non-prescribed drugs (Benson, 1969; Benson & Wallace, 1970; Brautigan, 1971; Otis, 1972; Winquist, 1969).

**Study**

A study was designed to investigate the influence of Transcendental Meditation on the psychology of university students. Several studies have reported improved psychological health among practitioners of Transcendental Meditation (Ballou, 1973; Fehr, 1972; Hielle, 1972; Nidich et al., 1972a, 1972b; Orme-Johnson et al., 1973a, 1973b; Seeman et al., 1972; Shelly, 1973). These reported studies, however, have not measured the influence of Transcendental Meditation on the psychological variables of depression, aggression, neuroticism or self-actualization over a

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3For a general review, see Rubottom (1972), Sykes (1973) and the articles by Driscoll (1972) and Levine (1972) in PHI DELTA KAPPAN.
A study was designed to measure the influence that the practice of Transcendental Meditation has on the psychology of university students over a six and one-half week period.

Research Hypothesis

It was hypothesized that the regular practice of Transcendental Meditation would have a positive influence on the psychology of university students as measured by the Spielberger Anxiety Inventory (Trait-scale), the Cattell Anxiety Scale (Self-Analysis Form) and the Northridge Developmental Scale, a measure of self-actualization, with sub-scales for depression, aggression and neuroticism, developed by Gowan, over a six and one-half week period.

It was further hypothesized that university students regularly practicing the technique of Transcendental Meditation (average length of practice, about three years) would have a significantly improved psychological state (as measured by the above three psychological scales) as compared to those practicing the technique over a period of six and one-half weeks.

Importance of the Study

The importance of this study was to replicate the studies of Seeman et al. (1972) and Nidich et al. (1972a), which reputed increased self-actualization (using the Personality Orientation Inventory, developed by Shostroms) over an eight and ten week period, Ballou (1973) who
reported a decrease in trait anxiety (Spielberger scale) and Orme-Johnson (1973a, 1973b) who reported improved psychological health over a ten week period using the MMPI, for individuals practicing Transcendental Meditation.

Also of importance in this study was to test the effectiveness of Transcendental Meditation as an adjunct in the educational life of university students. It has long been reported that anxiety, depression and personality disorders have a definite dehabilitating influence on academic performance, complex learning tasks and psychomotor performance (Cattell, 1961; Olmedo, 1971; Sarason, 1960, 1964; Spielberger, 1966).

Also, many educational systems have been and are plagued with serious anti-social behavior, crime and delinquency. Transcendental Meditation has been reported to be effective in this area of improving social behavior (Fehr, 1972; Orme-Johnson, 1973a, 1973b; Shelly, 1973) and has been suggested as a program for improving social situations (Cox, 1972; Sykes, 1973). This study may well serve to provide useful information and data in this area.

Personal autonomy, self-development and increased psychological health have been a popular concern among educators and psychologists (Dinkmeyer, 1968; Gowan, 1972; Hill, 1965; Shertzer and Peters, 1965). Educational-psychologists have long discussed developmental methodologies to promote and develop personal emotional stability among
students during their academic life. This study may serve to provide useful information in this area of concern.

In addition, several studies have noticed a significant decrease (average decrease of 95%) in non-medical use of drugs among practitioners of Transcendental Meditation (Benson and Wallace, 1970; Brautigan, 1971; Otis, 1972; Winquist, 1969). Also, several publications have suggested the use of Transcendental Meditation as an alternative to drug abuse (Cox, 1972; Hussey, 1972; Marzetta et al., 1972; Sykes, 1973). This study may be important in assisting a reduction in drug abuse among university students and provide added information to drug abuse counselors and agencies.

Definition of Terms

Science of Creative Intelligence (SCI): A systematic study of the nature, origin and development of creativity and intelligence.

Transcendental Meditation (TM): The technique of Transcendental Meditation is uniformly taught by teachers personally trained at Maharishi International University. It is described as enjoyable, easily learned in 4 one and one-half hour sessions, involving no belief, faith or requiring any mental control, effort or physical manipulation nor any change in life-styles. It consists of two

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4 Maharishi International University, 1015 Gayley Avenue, Los Angeles, California, 90024.
daily sessions of practice (15-20 minutes) as one sits comfortably with eyes closed.

The technique (purely a mental process) is defined as allowing the conscious attention to systematically experience finer, more subtle states of a particular mental thought or sound (mantra) until the attention transcends the finest experience of the thought, at which state the conscious attention is aware (experiences) the "source of thought" (pure consciousness, awareness itself).

**Principle of Transcendental Meditation**

The principle behind the technique is that during meditation, as one begins to refine mental activity (mental activity becomes minimized, reduced), the physiology of the body simultaneously reduces physiologic activity (metabolic rate is reduced). The occurring result is a deep state of physical relaxation, deeper than deep sleep.

Through the regular practice of Transcendental Meditation (a restful psychophysiological experience), the functioning of the nervous system begins to normalize and rids itself of the existing tensions, stresses and discordances (bio-chemical).

With the elimination of the stresses and tensions and abnormalities (which the rest of sleep does not afford), the occurring result is more efficient physiological and psychological functioning (psychophysiological stability),

* (See Figure A.)
improved social behavior and a natural increase in one's abilities and personal resources. A review of the literature provides firm support to this theory.
CHAPTER 2

REVIEW OF LITERATURE¹

The first report of a scientific investigation on the influences/effects of meditation/yoga was reported as early as 1933 when a French cardiologist, Therese Brosse, realized the possible therapeutic value of such practices while making physiological measurements in India (Brosse, 1946).

The first systematic physiological studies to be reported were in 1957 and 1961 when a team of doctors recorded a decreased respiratory rate and increased skin resistance during yogic mental and physical practices (Wenger, Bagghi and Anand, 1961a, 1961b).

One of the first successful clinical studies to be reported was by Datey (1969). Forty-seven hypertensive patients were taught a specific technique of yogic breathing. The majority of patients reported improved clinical conditions (less headaches, irritability and insomnia), while ten subjects showed significant decrease in mean blood pressure and nineteen showed a significant decrease in drug dosage.

¹See also Kanellakos and Lukas (1973) and Kanellakos and Ferguson (1973) for a more complete review of the literature.
The reports of yoga-meditation research have often been inconsistent. Many techniques (under the name of yoga or meditation) involve strenuous physical control and/or involve awkward physical positions or rigorous mental abilities; also, many practitioners claim to be "experts" in the technique. Magnitude of physiological changes are often dependent upon the number of years practicing the technique as well as the technique itself.

One technique of meditation has been found to offer consistent standardized conditions which has enabled systematic studies to be carried out on the physiological, psychological and sociological effects of the practice.

The technique, called "Transcendental Meditation," or the "Science of Creative Intelligence," has been taught to hundreds of thousands of individuals since its recent introduction into the world by His Holiness, Maharishi Mahesh Yogi in 1955* (Maharishi, 1966, 1969).

The practice is reported easily learned, involving no effort or concentration, nor any belief or change in one's life-style and provides a standardized population of "meditators."

One of the first scientific publications to appear reporting the possible benefits of Transcendental Meditation was in 1968 when an article appeared in a German medical journal, Hippokrates, (Vanselow, 1968). The author

* Although it was not introduced to the West until 1959.
reviewed techniques and methods of relaxation and eliminating tension/fatigue and stress and suggested that Transcendental Meditation provided a more effective means of dissolving and relieving tension, stress and anxiety.

In 1969 a letter appeared in the *New England Journal of Medicine* (Benson, 1969) which reported twenty practitioners of Transcendental Meditation who previously used non-prescription drugs and who stopped the abuse of drugs (marijuana, LSD, heroin and amphetamines). Benson reported all no longer took these drugs because the drug-induced experience became extremely distasteful compared to the feelings and benefits of the practice of Transcendental Meditation. This observation was the first report indicating that Transcendental Meditation might serve as a useful technique of modifying behavior in a positive direction.

The first systematic study to be undertaken on the effects of Transcendental Meditation was reported in 1970 (Allison, 1970). Allison recorded the respiratory changes that occur during the practice of Transcendental Meditation. He reported that during the practice, an average reduction in respiratory rate of between 6-8/per min was noticed. Allison found that this reduction in respiratory rate occurred immediately at the start of the meditation period.* Allison also noticed a significant reduction in the volume of air per/breath. This study was the first report to

* (See Figure B.)
indicate that Transcendental Meditation produces an influence on physiologic functioning.

The first comprehensive study to be conducted on the physiological changes that take place during the practice of Transcendental Meditation were done by R. K. Wallace. Wallace, a physiologist, measured twenty-seven practitioners of Transcendental Meditation on a variety of physiological indices. Wallace reported the results of his work at U. C. L. A. (and subsequently at Harvard Medical School with other subjects) in several publications (Wallace, 1970a, 1970b, 1971, 1971a, 1972).

Wallace recorded physiological variables before, during and after subjects practiced Transcendental Meditation. In summary, Wallace found that DURING the practice of Transcendental Meditation, the following changes were noticed:

**EEG:** electroencephalogram showed specific changes; increased regularity and amplitude of alpha waves (8-9 cycles per/sec) with occasional occurrence of low-voltage theta waves (5-7 cycles per/sec). Alpha blocking caused by a sound or light stimuli showed no habituation. These patterns indicate a state of restfulness and alertness (see Figure C).

**Cardiac Output:** decreased by an average of 30%. Cardiac output is the volume of blood pumped by the heart per-unit of time. During sleep there is a mean decrease in cardiac output of about 20% (see Figure D).

**Blood PCO2:** decreased slightly.

**Ph of Blood:** decreased slightly.

**Base Excess of Blood:** decreased significantly.
Base excess is a measure of the excess or deficit of non-volatile acid. Wallace suggest that this decrease in base excess could be the result of possible change in cellular metabolism.

**Blood Lactate Content:** decreased markedly (in some cases by 50%). This decrease was also noticed after meditation. High levels of blood lactate concentration have been associated with anxiety, neurosis and high blood pressure (Pitts, 1969) (see Figure E).

**Skin Resistance (GSR):** increased markedly (in some cases over 500%). Increased skin resistance indicates a physiological state of relaxation (see Figure F).

**Heat Rate:** mean decrease of 5/beats per/min.

**Blood Pressure:** no significant change in blood pressure, although the subjects had rather low resting systolic, diastolic and mean blood pressures (87/55).

**Blood Flow:** (in arm) increased by 32%, indicating a unique physiologic state: reduced blood pressure, reduced cardiac output, and yet improved efficiency of blood circulation.

**Oxygen Consumption:** significant decrease (about 17%), indicating a deep state of rest. After 6-7 hours of sleep, oxygen consumption usually decreases between 8-15%. This decrease in oxygen consumption indicates a reduction in the need for oxygen at a cellular level (see Figure A).

Wallace summarizes and cites evidence for the conclusion that these patterns clearly distinguish the physiologic state produced by Transcendental Meditation (the "wakeful physiologic hypometabolic state") from commonly encountered states of consciousness such as waking, dreaming, deep sleep, sleep, and altered states of consciousness such as hypnosis, conditioning and autosuggestion (1971a, 1972a).
Of importance is that these reported physiologic patterns indicate a highly relaxed physiological state and yet mental alertness or wakefulness (shown by EEG patterns). Studies by Banquet (1972), Fougere (1971) and Brown (1972) also report these same EEG patterns during Transcendental Meditation.

Physiological modifications produced by Transcendental Meditation were very similar to those that have been observed in highly trained experts in Yoga and Zen monks with 15-20 years of meditation experience (Wallace and Benson, 1972a). Some of Wallace's subjects had only practiced Transcendental Meditation for one week (or a month), indicating the relative ease with which Transcendental Meditation can be learned.

Wallace concludes that Transcendental Meditation produces a fourth major state of consciousness representing a quiescence of the sympathetic nervous system, specific physiological and biochemical changes which suggest practical and useful clinical applications.

One particular interesting point to notice from these physiological patterns associated with Transcendental Meditation is the integrative response which the practice produces. This complex of responses indicates a deeply relaxed state mediated by the central nervous system which is unlike the single specific responses which are associated with operant conditioning.
Perhaps one of the most impressive series of studies to be reported on the physiological influence of Transcendental Meditation was done by Orme-Johnson (1971, 1973a,b).

In one study (1971) Orme-Johnson recorded the habituation rate of a group of meditators and matched control subjects (non-meditators) to a stressful auditory stimulus using the GSR as the measuring indice of the response pattern. Orme-Johnson found that meditators habituated faster and had fewer secondary (multiple) responses to the stimulus than non-meditators. The indicates that those practicing Transcendental Meditation have a more stable functioning of the nervous system (autonomic stability).*

Orme-Johnson also found that meditators as compared to controls and the average population norms made significantly fewer spontaneous GSRs, another indication of increased autonomic stability.**

Orme-Johnson suggests that the regular experience or the deeply rested state produced by Transcendental Meditation (hypometabolic state) reduces resting levels of sympathetic activity, thus deterring psychosomatic disease and maintaining good health.

Of particular interest to the author's study were the studies that indicate that individuals with stabler

* (See Figure G.)

** (See Figure H.)
autonomic activity (as reflected by fewer spontaneous GSR, faster habituation rates and fewer secondary responses) have been found to be more able to withstand stress (Silverman et al., 1959; Zuckerman, 1964; Burch et al., 1942), to be less impulsive in carrying out motor tasks (Lacey and Lacey, 1958), to score higher on Ego Strength measures (Alexander et al., 1963), less defensiveness (Rappaport et al., 1967) to be less conditionable by Pavlovian procedures (Stern et al., 1961; Martin, 1960), and to have quicker perceptions (Embedded Figures Test) (Hustmyer et al., 1964).

In another study by Orme-Johnson (1973a), twelve narcotics addict prisoners from a federal penitentiary were measured on spontaneous GSR and the Minnesota Multiphasic Personality Inventory (MMPI) before beginning Transcendental Meditation, and two months later they were compared to a control group of prisoners measured at the same time. Below is the author's abstract reporting the results:

The results of three groups were compared: regular meditators (meditated at least half of the prescribed times), irregular meditators and control subjects. The percent decrease on spontaneous GSR was significantly greater for regular meditators than for irregular meditators (P<.0005) or control subjects (P<.05). The correlation between the number of times meditated in the two-month period and percent decrease in spontaneous GSR was also significant (r = .74, N = 12, P<.01). On the MMPI regular meditators decreased significantly more than controls on scales 7 (psychasthenia, P<.025) and scale 10 (social introversion, P<.05). They decreased more than irregular meditators on scale 7 (P<.05).

There was a significant correlation between the decrease in spontaneous GSR and decrease in scale 7, obsessive-compulsiveness, of r = .68.
A reduction in compulsiveness indicates an increase in behavioral flexibility. Thus we see a very interesting relationship: the more a subject meditated, the more he simultaneously gained in physiological stability and behavioral flexibility, accompanied by increased social outgoingness. This leads us to conclude that meditation provides a very profound physiological and psychological basis for the rehabilitation of prisoners and that regularity of meditation is crucial to its effectiveness.

Orme-Johnson's findings indicate and suggest that it is the regular practice of Transcendental Meditation that stabilizes the nervous system and improves the psychology of practitioners.

Orme-Johnson (1973b) in another study investigated the influence of Transcendental Meditation on the psychology of Drug Abuse Counselors. The results are summarized below in the author's abstract:

Staff members of the Fort Bliss drug abuse program were tested on the MMPI and other tests before beginning the course in Transcendental Meditation and 10 weeks later. They were compared with a comparable group of non-meditating staff members measured at the same time. After 10 weeks, the experimental group (meditators) showed significantly greater decreased in Manifest Anxiety (Taylor) ($P < .05$), Hypochondria ($P < .05$) and Schizophrenia ($P < .02$) than controls. Meditators also showed greater overall reduction in MMPI scales ($P < .01$). These results indicate that subjects practicing Transcendental Meditation produce measurable reduction in the psychological symptoms of anxiety, more maturity and more organized thought and behavior.

Orme-Johnson suggests (1972) that Transcendental Meditation is "an effective agent in reducing tension, eliminating accumulated stresses, and bringing a person into a healthier, more responsive interaction with others and
Seeman et al. (1972) administered the Shostrom Personal Orientation Inventory (POI) to an experimental group two days prior to beginning Transcendental Meditation and a control group of university students. Two months later following regular practice of Transcendental Meditation by the experimental subjects, the POI was again administered to both groups. On six of the twelve POI variables, significant differences in the direction of "self-actualization" were found for the meditators.

Nidich et al. (1972a) in a replication study found significant scores on ten of the twelve POI variables in the direction of "self-actualization" after ten weeks of Transcendental Meditation.

These two studies indicate and support Orme-Johnson's findings. One problem with these two studies (Nidich, Seeman) is that the experimental subjects were self-selected and thus these subjects expecting an improved psychological change may have influenced the results.

Hjelle (1972) in a study to test for this effect administered the Bendig's Anxiety Scale, Rotter's Locus of Control Scale and the POI to fifteen long-time meditators (mean length, 22 months) and to a group of twenty-one subjects who planned to start Transcendental Meditation in a few days. This design attempts to control for the criticism of the above two studies and is commonly referred to as the "criterion group" method. Hjelle found that the
experienced meditators scored significantly ($P < .001$) better (increased psychological health) on both the Rotter Scale and the Bendig Anxiety Scale. (The Locus of Control Scale purports to measure the extent that one is an effective agent in controlling and guiding their life.) Similarly, regular meditators scored significantly higher on seven of the twelve POI scales ($4$ at the $P < .001$ level) than the control group or those planning to start Transcendental Meditation.

Hjelle's findings support the findings of Orme-Johnson, Seeman and Nidich, and indicate that Transcendental Meditation does improve the psychology of practitioners.

A criticism may be raised to the question that regular meditators (in the Hjelle study) tried to "fake good" on their responses on the POI in order to put themselves in "a better light." Such interpretation can be rejected since Pouls and Warechime (1971) have shown that subjects deliberately trying to "fake good" on the POI scored significantly lower on ten of twelve POI scales.

Nidich (1972b) in another study examined the influence of Transcendental Meditation on state anxiety. The State-Trait Anxiety Inventory (A-state scale) developed by Spielberger was administered to two groups of subjects under normal and relaxed conditions. The experimental group consisted of eight students who took the questionnaire two days prior to beginning a program of Transcendental Meditation. The control group took the questionnaire under
similar conditions. Both groups were re-administered the questionnaire six weeks later after they were requested to carry out a demanding task followed by instructions for the controls to "sit with eyes closed" and the experimental group to "begin meditation" for fifteen minutes. The results show that Transcendental Meditation influenced the STAI A-state scale in a positive direction (P < .05).

Ballou (1973) in an interesting study using the State-Trait Anxiety Inventory administered the two scales to a group of prison inmates at the Stillwater State Prison. The two control groups consisted of those desiring to begin Transcendental Meditation (but did not) and those not desiring. After the second administration to both control groups, the third group (the experimental group) was trained in Transcendental Meditation. The results of this study indicate that:

1) Initially there is no significant difference in anxiety levels between those who want to be instructed in TM and those who were not interested in learning the practice.
2) Within a few days of practice, the meditating group shows significantly reduced levels of both momentary and general anxiety below those of the control group.
3) Anxiety in the meditators does not show a gradual decline but is reduced quickly and remains at a low level.

This study supports Orme-Johnson's prison study (1973a) and the Nidich study on anxiety (1972b).

In Germany, Fehr (1972), a psychologist at the University at Cologne, administered the Freiburger Personality Inventory (a personality scale similar to the MMPI)
to forty-nine practitioners of Transcendental Meditation.

Fehr divided the group into two groups: those practicing Transcendental Meditation for an average of 2.9 years and those for an average of 7.1 years.

Results showed significant differences on two of the nine scales as compared to population norms for the first group of meditators (2.9 years):

- decreased irritability ($P < .05$)
- decreased inconsistence ($P < .01$)

In the second group (7.1 years), Fehr found significant differences between meditators and population norms on the following scales:

- decreased nervousness ($P < .01$)
- decreased depression ($P < .01$)
- decreased irritability ($P < .01$)
- decreased inconsistence ($P < .01$)
- decreased emotional instability ($P < .01$)
- decreased inhibition ($P < .01$)
  
  and

- increased sociability ($P < .02$)
- increased self-assuredness ($P < .01$)
- increased self-reliance ($P < .01$)

These findings again indicate that the regular practice of Transcendental Meditation improves the psychological state of practitioners, and further, that the longer the length of time meditating, the increased improvement in psychological health noticed.
Shelly (1973) at Kansas State University has carried out several studies investigating the psychology of practitioners of Transcendental Meditation.

Shelly consistently finds that meditators (as compared to matched controls) are more happy and relaxed than non-meditators. Shelly finds that meditators achieve a high level of satisfaction in life with fewer environmental resources than comparable non-meditators, and further, that meditators experience enjoyment more often and develop deeper personal relationships than comparable controls.

Shelly also finds that those starting Transcendental Meditation appear to be somewhat less happy than the average person and presents several studies indicating that the practice of Transcendental Meditation provides a direct means of developing personal growth, satisfaction and happiness.

In a study from Holland, Tjoa (1972) administered a neuroticism test (Wilde's) and an intelligence test (Forkema's) to twenty high school students. Then fourteen students started Transcendental Meditation. One year later Tjoa administered the same two scales to seven regular meditators and six non-meditators. Tjoa found a significant increase in intelligence ($P < .05$) and a significant decrease in neuroticism ($P < .05$) in the experimental group.*

* (See Figure I.)
also indicates that Transcendental Meditation can be usefully used by high school students.

Fougere (1971) has reported a significant decrease in self-ideal discrepancy among fifteen practitioners of Transcendental Meditation over a four-month period.

Gellhorn and Kiely (1972) suggest that:

Transcendental Meditation, an easily learned technique in contrast to the rigorous training involved in Zen and Yoga exercises, may be useful in the treatment of psychosomatic tension states, anxiety and phobic reactions. Its application in the theory of disorders such as essential hypertension, bronchial asthma, "brittle" juvenile diabetes mellitus, and a number of other psychosomatic disorders would likewise suggest itself.

Of significance is that Gellhorn suggested that Transcendental Meditation may be useful in the clinical treatment of psychosomatic disorders from his review of only one study reviewing the physiologic and biochemical changes that take place during Transcendental Meditation (Wallace, 1970a) and not the psychological studies reviewed within this paper. Others (Orme-Johnson, 1971; Goleman, 1971; Wallace, 1970b) also have suggested the clinical use of Transcendental Meditation from a review of the physiology of Transcendental Meditation.

Boudreau (1972) has reported the use of Transcendental Meditation in successful therapeutic intervention of two psychiatric cases, one of claustrophobia, the other of profuse perspiration.

Bowers (1973), a psychiatrist, has reported the use of Transcendental Meditation as a successful adjunct to
psychotherapy. She reports that "with every patient who has been faithful in Transcendental Meditation, the improvement has been at least twice the expected rate...."

Wilson et al. (1972) has reported the successful use of Transcendental Meditation in the treatment of asthmatic patients. The works of Wallace (see above) and Orme-Johnson (see above) support improved psychosomatic conditions among practitioners of Transcendental Meditation.

Benson and Wallace (1972b) report the successful use of Transcendental Meditation to decrease blood pressure in hypertensive patients (P<.001 for systolic and P<.005 for diastolic).

These four studies just reviewed (Boudreau, Bowers, Wilson, and Benson and Wallace) support clinically the suggestion by Gellhorn et al. (1972) that the neuro-physiological patterns associated with the practice of Transcendental Meditation suggest useful application of the mental technique in the clinical treatment of psychosomatic conditions. 2

Abrams (1972) in a pilot study involving learning abilities of experienced practitioners of Transcendental Meditation as compared to novice meditators and "non-meditator" subjects investigated the rate of acquisition and retention (both short-term and long-term recall). All three groups were given paired associate lists. The results

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2Gellhorn et al. (1972), a well-known neuro-physiologist, reviewed the trophotropic and ergotropic systems of autonomic-somatic integration, and their relation to the neuro-physiological patterns associated with Transcendental Meditation.
showed support for a "direct relationship between Transcendental Meditation and quicker acquisition and higher recall performance."*

Show and Kolb (1971) have reported meditators to have faster reaction times (ore-point) than controls (30% faster). Also reported by Shaw and Kolb is the finding that meditators' performance on a reaction time test improved after twenty minutes of Transcendental Meditation (by 12%), whereas the control group (non-meditators) performance on reaction times worsened after fifteen to twenty minutes of rest (by 10%).**

Brown (1971) in another pilot study has also reported this same pattern of improved perceptual threshold (i.e., four-point reaction time test) for meditators after fifteen to twenty minutes of Transcendental Meditation, whereas controls worsened after an equal amount of resting time.

Of interest here is the evidence that Transcendental Meditation affords a deeper state of rest (as reported by Wallace (see above or Figure A), and yet the behavior and perceptual performance after such unique rest is improved, indicating useful applications.

Blasdell (1971) in a pilot study has found meditators to perform better on the Mirror Star-Tracing Test

* (See Figure J.)  
** (See Figure K.)
than controls, and again, that such performance improves after twenty minutes of Transcendental Meditation.*

Graham (1971) in a study from England has found meditators' auditory discrimination ability (both frequency and amplitude) improved after twenty minutes of Transcendental Meditation, whereas control subjects' (non-meditators) performance slightly decreased after reading a book for twenty minutes.**

The neuro-physiology of Transcendental Meditation reviewed by Gellhorn (1972), given by Wallace et al. (1972a), and reported by Orme-Johnson (1971, 1973a) support improved psychomotor functioning and increased perceptual abilities among subjects practicing Transcendental Meditation.

Also, several studies (Benson, 1969; Benson and Wallace, 1970; Brautigan, 1972; Otis, 1972; Winquist, 1961) indicate a decrease of the use of non-prescribed drugs among practitioners of Transcendental Meditation. Several publications have recommended and urged the use of Transcendental Meditation as a useful alternative to drug abuse (Cox, 1972; Marzetta, et al., 1972; Orme-Johnson, 1973c; Williams, 1972; Sykes, 1973).

Of interest here is that Transcendental Meditation acts as a rehabilitation and preventative agent in reducing drug abuse as a side effect of the practice itself, and not

* (See Figure L.)

** (See Figure M.)
the specific influence. It seems that the practice of Transcendental Meditation eliminates the mental stressors, tensions and discordance and improves and promotes (physiologically, psychologically and sociologically) more harmonious behavior; thus, the need for such shortcuts to satisfy the mind (i.e., drugs) no longer pledges the individual.

Other studies have indicated a marked decrease in the use of prescribed drugs as well as alcohol and smoking among practitioners of Transcendental Meditation (Otis, 1972; Benson and Wallace, 1970).

Summary of Review of Literature

Reviewing the literature, the studies consistently indicate that the practice of Transcendental Meditation produces a distinct and unique psycho-physiologic experience. It further indicates that those who regularly practice this restful "psychophysiologic experience" (the "wakeful hypometabolic physiologic state") reduce the resting levels of sympathetic activity of the autonomic nervous system, improving physiologic functioning. This improved physiologic condition, suggesting a guidepost to better health, is also reflected by numerous studies indicating marked increases in psychological health among practitioners of Transcendental Meditation. Further, studies indicate improved perceptual ability, learning ability and intelligence with the practice of Transcendental Meditation. Finally, surveys indicate a marked decrease in the use of non-prescribed drugs.
among practitioners of Transcendental Meditation, along with case-histories and research studies attesting to its effectiveness as a drug rehabilitation and preventive agent.
CHAPTER 3

DESIGN

Subjects and Procedures

1st Study: The control group consisted of 16-19 university students enrolled in an upper-division education course at the California State University at Northridge. They were first administered the three psychological scales in an informal classroom setting with the tester and the class instructor present. Students were asked to fill out the scales truthfully and frankly. They were informed that this testing was part of a research project and that it was important. Students (subjects) were told that the results of the tests would be kept confidential and that this research project was independent of the regular classroom procedure. Subjects were all voluntaries; a few students in the class did not partake in the project.

Subjects were readministered the scales six and one-half weeks later under similar conditions, using the same testing procedures. Because not all subjects took all three scales, the number of subjects varies in respect to the three scales:

Cattell's Anxiety Scale: \( n = 16 \), males 7, females 9, mean age 24.70
Spielberger Anxiety Inventory: \( n = 19 \), males 9, females 10, mean age 24.74

Northridge Developmental Scale: \( n = 17 \), males 7, females 10, mean age 25.00

NOTE: Originally there were 23 subjects, but on the day of the second administration a few subjects were absent.

The experimental group (#1) consisted of 30-31 students* at California State University at Northridge who had attended a lecture on the principles and practice of Transcendental Meditation (given by a qualified teacher of Transcendental Meditation as taught by Maharishi Mahesh Yogi) at the above university. Subjects were seated in a lecture hall and asked if they would like to take part in a research project. All students agreed and were then informed that this research project would involve their taking three short psychological tests and that this testing procedure was independent of their starting the practice of Transcendental Meditation. Subjects were instructed to take the tests home and fill them out and return them to the examiner before personal instruction into the actual technique of Transcendental Meditation (three days from the night of the lecture). All subjects who took the tests returned them prior to beginning the practice of Transcendental Meditation.

* A few subjects were not enrolled in school but had been within the last six months.
Subjects were then instructed into the practice of Transcendental Meditation. Subjects received the usual 30-60 minutes of individual instruction on the initial instruction day. For three successive days, verification and further instruction in the technique of Transcendental Meditation were given in a group situation. All three evening meetings lasted about two hours. Subjects were then instructed to meditate twice daily (15-20 minutes). This procedure of learning Transcendental Meditation is the standard procedure for learning Transcendental Meditation as taught by the Students International Meditation Society.

Experimental subjects were mailed the three scales six weeks later and asked to again take the tests and mail them or bring them to the experimenter. (See Appendix A for a copy of the letter that was sent with the three tests.) Because not all subjects took all three tests (one subject did not), the number of subjects varies:

Cattell's Anxiety Scale: \( n = 31 \), males 19, females 14, mean age 23.57

Spielberger Anxiety Inventory: \( n = 31 \), males 19, females 14, mean age 23.57

Northridge Development Scale: \( n = 30 \), males 18, females 14, mean age 23.68

NOTE: Originally there were 43 subjects who took the test on first administration, but only 37 subjects returned them. Out of the 37 who returned them, 3 tests were invalid (filled out incorrectly) and 5 subjects
testified (on the questionnaire, see Appendix A) that they were not practicing the technique or were highly (over 50% of the prescribed time) irregular in the practice.

Also, the experimental group consisted of three separate groups of individuals who were tested and started the practice of Transcendental Meditation two weeks apart of each other. Dates and time schedules of the first administration and second administration of the scales follows below. All four groups were readministered the scales 6-7 weeks after the first administration and were re-tested under similar conditions and testing procedures as the first administration.

<table>
<thead>
<tr>
<th>No. of Ss</th>
<th>First Testing</th>
<th>Second Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>19</td>
<td>Oct. 12, 1972</td>
</tr>
<tr>
<td>Experimental B</td>
<td>15</td>
<td>Nov. 8, 1972</td>
</tr>
<tr>
<td>Experimental C</td>
<td>7</td>
<td>Nov. 22, 1972</td>
</tr>
</tbody>
</table>

NOTE: Personal instruction followed 3 days after lecture.

The subjects in the experimental groups were combined to form the experimental group. These 30-31 subjects represent those subjects who returned the test and who were regularly practicing Transcendental Meditation for a period of six and one-half weeks.

Also, the Students International Meditation Society (one of the four organizations which teach Transcendental
Meditation) offers this course for a small fee (course tuition). The usual fee for college students is $45.00. In the three courses that were offered to the subjects in this study, because of the time the subjects would spend taking the tests and the research project conditions (which are not a standard procedure for the thousands who start Transcendental Meditation every month across the United States), the teacher of Transcendental Meditation decided to reduce the course fee to $35.00. It was made clear to the subjects that this course was allowing a simple research study to be conducted on those who started Transcendental Meditation. All students who were planning to start the practice did so, and therefore the sample represents a 100% sample of those subjects intending to start Transcendental Meditation. All subjects agreed to fill our the test again in six weeks and were informed that this would be done via mail, and further, that since they were to receive a $10.00 reduction in the course fee, they would be expected to comply with the request (see Appendix A).

2nd Study:

The experimental group (#2) consisted of a group of university students (or student who had attended college/university within the past six months) and who regularly practiced Transcendental Meditation. Subjects were attending a weekly meeting for meditators and voluntarily agreed to take the three scales and return them (via mail or
personally) to the experimenter. They were instructed to be honest, frank and truthful. Again, not all subjects took all three tests and thus the number of subjects taking each test varies:

Cattell's Anxiety Scale: \( n = 15, \) males 8, females 7, mean age 24.33

Spielberger Anxiety Inventory: \( n = 17, \) males 7, females 10, mean age 24.35

Northridge Development Scale: \( n = 16, \) males 7, females 9, mean age 24.83

Average length of time subjects had practiced Transcendental Meditation was 43.11 months.

Measurements

Cattell's Anxiety Scale (IPAT). This well-known anxiety scale has been used for over fifteen years in clinical research. It takes 5-10 minutes to administer and purports to measure "free anxiety level." The construct or concept validity is reported to be +.85 to +.90; internal consistency reliability, +.80; and dependability-reliability (test-retest, one week) +.93, (test-retest, two weeks) +.87 (Cattell, 1963).

Spielberger State-Trait Anxiety Inventory (A-Trait). This scale purports to measure "transitory anxiety." The test-retest reliability has been reported at: one hour, +.81; 20 days, +.82; 104 days, +.75) for college students.

Correlation between the Spielberger Scale (Trait)
and the Cattell Scale has been reported to be +.75 and +.76 with college students (Spielberger, 1970).

**Northridge Developmental Scale (NDS).** A personality test of 90 items developed by Dr. J. C. Gowan for use in screening the emotional maturity and psychological soundness of candidates for a Master's degree in Guidance and Counseling. It contains a major scale, much like the SAV (self-actualizing value) scale of the POI, two validating scales and three subscales for aggression, depression and neuroticism.

**Statistical Analysis**

A one-way *t*-test and *P*-values were obtained from the comparisons.
CHAPTER 4

RESULTS

Results presented in Table 1 show statistically significant changes in the direction of increased mental health on five of the six indices measured for the two experimental groups (short and long-time meditators), whereas no significant change occurred in the control group. In each case where there was a change from pretest to posttest in experimental group #1 (short-time meditators of six and one-half weeks), the direction of that change continued for the long-time meditators and their scores were significantly different from those of the short-term meditators of six and one-half weeks of regular meditation practice.

Specifically, the experimental group (#1) showed a decrease on the Spielberger Anxiety Inventory ($P < .0005$) and a decrease on the Cattell Anxiety Scale ($P < .025$) over the six and one-half week period. Subjects (meditators) also showed a significant decrease in depression ($P < .005$), aggression ($P < .10$) and neuroticism ($P < .01$). On the self-actualization scale the meditators showed a significant increase at the .025% level. At the same time, the pre-test posttest changes on the controls were non-significant.

Comparing the scores of the short-term meditators
(of six and one-half weeks of regular meditation practice) to the long-time meditators of a few years' practice of Transcendental Meditation showed significantly lower levels of anxiety for the long-time meditators on the Spielberger scale \((P < .025)\) and on the Cattell scale \((P < .0005)\). Long-time meditators also showed significantly lower levels of depression \((P < .01)\) and neuroticism \((P < .005)\) and showed a significantly higher level of self-actualization \((P < .0005)\) than the short-time meditators. (Results are shown diagramatically in Figure N.)

A comparison between the control group and the experimental group \((#1)\) on the pre-test showed a statistically significant difference on the Cattell Scale; and on the depression scale on the NDS at the .05% level, the experimental group (those intending to start Transcendental Meditation) indicated a worse psychological condition.

As indicated in Figure N, the experimental group \((#1)\) improved their psychological health to a level beyond the control group (even in the two cases where there was a significant difference between the control and the experimental \((#1)\) subjects on the pre-test in the direction of a worse psychological state for the experimental subjects).

One might raise the question (hypothesis) that the experimental subjects \((#1)\) might have tried to "fake good" on the second post-test. This question might well apply to the experimental subjects in group #2 as well (the long-time meditators).
The Northridge Developmental Scale has two validating scales built into the test. All of the subjects scored within norms on both pre- and post-testing sessions, indicating that results are valid. Also, the long-time meditators could have just as much as a motive to "fake good" as the short-time meditators, and thereby one would assume the same group score means if in fact there was not a true difference between the means.

This, added to growing body of physiological and psychological evidence would tend to nullify such a hypothesis.

One might add that the literature reviewed supports a definite physiological basis for the improved psychological conditions noticed among practitioners of Transcendental Meditation. (See the works of Orme-Johnson especially.)

The results obtained in this study indicate a true difference of the means and the research hypothesis is confirmed: the practice of Transcendental Meditation has a positive effect on the psychology of university students over a six and one-half week period and further, students practicing Transcendental Meditation for a few years show a progressive increase in psychological/mental health as compared to those practicing Transcendental Meditation for a few weeks.

Five subjects did not continue the practice regularly. An analysis of these five subjects did not show any significant difference on their pre-test scores as
compared to the regular meditators' pre-test scores.

Summary of Results

The results agree with the previously cited literature and indicates that the practice of Transcendental Meditation, for as little as six weeks, lowers anxiety, depression, and neuroticism levels and increases self-actualization. It further shows that those practicing Transcendental Meditation for a longer period of time show increased psychological health over those practicing Transcendental Meditation for a shorter period of time.
CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

Several researchers have offered neuro-physiological theories to account for the over-all improved physiological-psychological conditions found in practitioners of Transcendental Meditation (Wallace, 1970b; Gellhorn et al., 1972; Kanellakos et al., 1973).

Wallace (1970b) suggests that Transcendental Meditation acts directly upon the hypothalamus and the reticular activating system and thereby influences the parasympathetic and sympathetic nervous systems.*

Gellhorn and Kiely (1972) have reviewed trophotropic and ergotropic systems of autonomic-somatic integration and their relationship to the meditative state of consciousness and the physiology of Transcendental Meditation.

Kanellakos and Lukas (1973) have suggested (as do most Transcendental Meditation researchers) that Transcendental Meditation functions very much like dreaming and sleep do. Deprivation of sleep will cause a complete loss of physiologic and psychologic functioning within 4-5 days (inducing delirium and biochemical changes inducing a "collapse" of the nervous system) (Kleitman, 1963; Foulkes,

* (See Figure 0.)

Both of these biological functions (rhythms) act to restore, normalize and relieve tensions (mental and physical). Transcendental Meditation is hypothesized to add to this "normalization" process, improving the efficiency of the body to maintain a healthy condition.

Transcendental Meditation provides the optimal condition for allowing the nervous system to normalize itself: the "wakeful hypo-metabolic physiologic state." In this state (the proposed fourth state of consciousness) the nervous system is no longer engaged in interacting with the external environment (or thinking), but is in a purely self-rejuvenating style of functioning characterized by deep physiologic rest and mental alertness. In this calm quietness, the body is allowed to carry out with exceptional efficiency repairs and adjustments which are not possible during activity and which are not accomplished during the duller form of rest obtained during deep sleep.

The occurring result is improved physiologic functioning, improved psycho-physiologic stability, improved psycho-motor and perceptual performance and improved psychological integration, as well as improved social behavior. All of these areas of concern have been reported to improve with the practice of Transcendental Meditation.
This is quite interesting: that a specific mental technique could and does consistently report to improve so many areas of concern.

One extremely interesting phenomenon has recently been reported concerning the neurology of Transcendental Meditation. Dr. Bernard Glueck, Director of Research at the famous Institute of Living (and member of the American Psychiatric Association's task force studying the interface of Transcendental Meditation and psychiatry), has been studying and investigating the use of Transcendental Meditation with mentally disordered patients, as well as looking at the physiological correlates of Transcendental Meditation.

Besides the preliminary reports on marked improvement in patients, Dr. Glueck has noticed that during the meditation period a most unique neurological phenomenon often takes place, a phenomenon which has never been reported before in all of the neuro-physiological literature: that the brain wave patterns (EEG) of both hemispheres of the brain (left and right) will synchronize together and act as one unit.

Dr. Glueck comments that this phenomenon indicates a unique new style of functioning and most likely a more developed style of neurological functioning.

Several research teams² in America and abroad are studying these physiological variables. Of unique importance to the various research teams are the biochemical changes (in blood chemistry and psycho-neuro-chemistry) that most researchers hypothesize account for the physiological changes.*

This new interest in the physiology of individuals practicing Transcendental Meditation has been termed the "Physiology of an Evolving Man," (Kanellakos and Lukas, 1973) and most likely will open up a whole new field in terms of medicine, humanistic psychology, counseling, psychiatry and education.

Application

The review of the literature consistently reports improved conditions of physiological and psychological health among practitioners of Transcendental Meditation. The findings of these studies indicate that improved psychological conditions do result from the regular practice of Transcendental Meditation and are accepted by this researcher because:

1. Independent studies in several cases replicate the studies of other researchers.

2. Studies include high school student populations

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²Research Index, a publication of Maharishi International University, listing researchers engaged in Transcendental Meditation research; over 240 listings.

* (See Figures E and O.)
as well as college and adult populations.

3. Both studies in America and abroad show and support the findings of others that positive changes do take place.

4. Research teams include meditators as well as non-meditating researchers and find the same positive results.

5. A correlation has been established between regularity of the practice and increased improvements on specific variables looked at as well as improved conditions (of the variables looked at), with an increase of length of meditation practice.

6. Unique and definite physiological and neurological changes do take place during the practice of Transcendental Meditation.

7. A correlation has been established between improved physiologic functioning (percent of improvement) and improved psychological changes.

The application of the practice of Transcendental Meditation has been suggested and applied in clinical counseling settings (Boudreau, 1972; Kanellakos et al., 1973b; Gellhorn and Kiely, 1972; Hjelle, 1972; Seeman et al., 1972; Wallace et al., 1971a, 1972), penal institutions (Cox, 1972; Sykes, 1973; Orme-Johnson et al., 1973b), drug rehabilitation programs (Benson, 1969; Cox, 1972; Marzetta et al., 1972; Williams, 1972), and educational settings.
Insofar as the practice of Transcendental Meditation consistently reports to improve physiological, psychological, academic/educational and sociological behavior, is easily learned, involving no belief or special mental abilities, its application in criminal justice reform, drug rehabilitation, educational settings, therapeutic settings and society in general is likewise suggested.

The application of Transcendental Meditation in educational settings is especially suggested. The tremendous potentials and possibilities latent in students which are never fathomed or unfolded reflects a weakness in our educational methodologies. Transcendental Meditation provides a most unique opportunity to integrate and culture a student's life. Not only does this culturing, growth and improvement take place on the mental-intellectual plane of life, but neurologically, physiologically, psychologically and sociologically as well. Considering the research evidence presented (in this limited report), educationalists should be strongly encouraged to study the feasibility of incorporating Transcendental Meditation into their specific programs. (See Appendix B for a copy of a House Resolution of the State of Illinois.)

Future Research

More comprehensive longitudinal studies should be
undertaken. Studies involving personality factors, academic performance, psycho-physiologic and psychomotor performance variables should be undertaken in order to replicate the various reported studies. Several researchers are engaged in such projects both in America and abroad.3

Conclusion

The results reported within this research report add to the literature on Transcendental Meditation and should encourage more comprehensive studies to be undertaken on Transcendental Meditation in order to gain a more complete scientific understanding of the influences that the practice of Transcendental Meditation produces.

3Research Index, available from Maharishi International University.

*Adapted from *Scientific Research on Transcendental Meditation*, a publication of the Maharishi International University Administration Center, 1015 Gayley Ave., Los Angeles, Calif. 90024.
During TRANSCENDENTAL MEDITATION breath rate decreases significantly indicating a more relaxed and rested state of the nervous system.

REFERENCE:
THE LANCET
APRIL 1970
ALLISON/ENGLAND
RESTFUL ALERTNESS
changes in brain wave pattern

During TRANSCENDENTAL MEDITATION there is a spreading of 8-9 cycles per second waves to the more frontal areas of the brain with the occasional occurrence of prominent and synchronized 5-7 cycles per second waves.

These patterns are different from those seen in other states of consciousness — waking, dreaming and sleeping — and indicate a state of restful inner alertness.

REFERENCE:
AMERICAN JOURNAL OF PHYSIOLOGY
SEPTEMBER 1971
WALLACE, BENSON AND WILSON/USA
During TRANSCENDENTAL MEDITATION, cardiac output markedly decreases, indicating a reduction in the work load of the heart.

REFERENCE:
Ph.D. THESIS
UNIVERSITY OF CALIFORNIA
LOS ANGELES
JUNE 1970
WALLACE/USA
High concentration of lactate in the blood has been associated with anxiety neurosis, anxiety attacks, and high blood pressure. During transcendental meditation the concentration of blood lactate markedly decreases. Reference: *Scientific American*, February, 1972.

*Adapted from *Scientific Research on Transcendental Meditation*, a publication of the Maharishi International University Administration Center.*
STATE OF RELAXATION
change in skin resistance

During stress or anxiety,
skin resistance decreases.

During TRANSCENDENTAL MEDITATION
skin resistance increases significantly
indicating deep relaxation,
reduction of anxiety
and emotional disturbances.

REFERENCE:
SCIENTIFIC AMERICAN
FEBRUARY 1972
WALLACE, BENSON/USA
Meditators recover from stress more quickly than non-meditators. This is demonstrated by rapid habituation of the galvanic skin response to a stressful stimulus. This faster habituation has been correlated with a more evolved style of functioning of the nervous system. In addition, meditators show a more stable response to the stressful stimulus than non-meditators.

The smoother graph of the meditator indicates a more stable functioning of the nervous system. The practice of TRANSCENDENTAL MEDITATION strengthens the individual's nervous system and allows him to interact more effectively with his environment.

REFERENCE:
PSYCHOSOMATIC MEDICINE
(IN PRESS) 1973
ORME-JOHNSON/USA
INCREASED STABILITY
fewer spontaneous galvanic skin responses

TRANSCENDENTAL MEDITATION stabilizes the nervous system as shown by fewer spontaneous galvanic skin responses. This stability continues to be maintained after meditation.

Fewer spontaneous galvanic skin responses indicate:

- More resistance to environmental stress, psychosomatic disease and behavioral instability.
- Efficiency in the activity of the nervous system and therefore more energy for purposeful activity.

REFERENCE:
PSYCHOSOMATIC MEDICINE (IN PRESS) 197
ORME-JOHNSON/USA
The Effects of Transcendental Meditation on Neuroticism and Intelligence

Dr. A. S. Tjoa
Valeriusplein 13
Amsterdam, Holland
June, 1972.
Studies show that meditators perform better on recall tests and learn more quickly than non-meditators. Meditators also show significantly better results on more difficult material. The relation between the practice of meditation and recall ability indicates that TRANSCENDENTAL MEDITATION improves memory and learning ability.

REFERENCE:
UNIVERSITY OF CALIFORNIA
BERKELEY
FEBRUARY 1972
ABRAMS/USA
TRANSCENDENTAL MEDITATION speeds up reaction time, indicating increased alertness, improved coordination of mind and body, reduced dullness and improved efficiency in perception and performance.

REFERENCE:
UNIVERSITY OF TEXAS
AUSTIN
APRIL 1971
SHAW AND KOLB/USA
Subjects who practice TRANSCENDENTAL MEDITATION perform faster and are more accurate in a complex perceptual motor test.

Good performance indicates:
- Greater coordination between mind and body.
- Greater flexibility.
- Increased perceptual awareness.
- Greater efficiency.
- Neuromuscular integration.

REFERENCE:
UNIVERSITY OF CALIFORNIA
LOS ANGELES
DECEMBER 1971
BLASDELL/USA
INCREASED PERCEPTUAL ABILITY

Improvement of auditory ability indicates increased clarity and refinement of perception following TRANSCENDENTAL MEDITATION.

REFERENCE:
UNIVERSITY OF SUSSEX
JUNE 1971
GRAHAM/ENGLAND
FIGURE N

SELF-ACTUALIZATION SCALE

AGGRESSION SCALE

DEPRESSION SCALE

NEUROTICISM SCALE

SPIELBERGER ANXIETY INVENTORY (STAI-Trait Scale)

CATTELL ANXIETY SCALE

Experimental group (SOLID LINE)
Control group (DOTTED LINE)
Long-time meditators (TRIANGLE)
FIGURE 0

TRANSCENDENTAL MEDITATION

Specific changes in EEG activity of the central and frontal regions of the brain.

THALAMUS

HYPOTHALAMUS

RETICULAR ACTIVATING SYSTEM

AUTONOMIC AND SOMATO NERVOUS SYSTEMS

CENTERS IN THE MEDULLA OBLONGATA

ADRENAL MEDULLA

DECREASED EPINEPHRINE OUTPUT

Decrease in arterial lactate concentration

REDUCTION OF ANXIETY SYMPTOMS

Decrease in base excess

Decrease in \( O_2 \) consumption, cardiac output, heart rate, respiration rate and blood pressure. Increase in skin resistance.

CHANGE IN CELLULAR METABOLISM
TABLE 1

<table>
<thead>
<tr>
<th>N</th>
<th>GROUP</th>
<th>M1</th>
<th>SD</th>
<th>M2</th>
<th>SD</th>
<th>Change/Difference</th>
<th>P-value</th>
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<td>8.78</td>
<td>+13.11</td>
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<td></td>
<td><em>(Aggression)</em></td>
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<tr>
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<td>-1.51</td>
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<td><em>(Depression)</em></td>
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<td><em>(Neuroticism)</em></td>
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<tr>
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<td>1.93</td>
<td>1.91</td>
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NOTE:— Abbreviations: M1 = Means of first testing (before Transcendental Meditation); M2 = Means of second testing (after six and one-half weeks of regular meditation practice for the experimental), except for the long-term meditators who were tested only once (M2).

*— t-test (one-way) for independent samples.
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APPENDIX A

Phillip C. Ferguson
C/O MIU-ICR
1015 Gayley Av.
Los Angeles, CA 90024

Dear Friend:

You may remember that about 6 weeks ago you took part in a study, in which you took 3 short psychological tests before taking the course in Transcendental Meditation. As was agreed, because of the consideration of time (taking the tests) there was a $10 reduction in the course fee.

In order that the study be completed, PLEASE FILL out these tests as SOON as possible and return to the above address.

This study is part of my Master's thesis program and is extremely important that you return it as soon as possible, (within two or three days).

The results of the entire study will be available in late January. The analysis of the results will be looked at from a total group score so you shouldn't feel that your score is being personally analyzed.

If you are interested in the results of the study (what the tests measured and the nature of the study) send a stamped self-addressed envelope and I will see to it that you receive a copy of the results. If you have any questions, please don't hesitate to call me (phil 477-4537)

Please answer all the questions truthfully and frankly (as to how you generally feel now).

USE PENCILS

Please answer these three questions and return this portion of the page with the tests.

1. Have you been regular in the practice? YES NO (circle one)

2. About how many meditations do you miss per week? (circle one)

   0 1 2 3 4 5 6 7 8 9 10 11 12 more

3. How many times within the last 6 weeks have you attended an advanced meeting or had your meditation checked?

   0 1 2 3 4 5 6 7

   NOTE: Place your name on each test.

THANK YOU
APPENDIX B

STATE OF ILLINOIS
SEVENTY-SEVENTH GENERAL ASSEMBLY
HOUSE OF REPRESENTATIVES

HOUSE RESOLUTION NO. 677

Offered by Mr. Murphy

WHEREAS, Transcendental Meditation is a simple natural technique of gaining deep rest and relaxation which is easily learned by everyone; and

WHEREAS, School officials have noted a lessening of student unrest and an improvement in grades and student-parent-teacher relationships among practitioners of Transcendental Meditation; and

WHEREAS, Transcendental Meditation offers an alternative to drug abuse and studies indicate that it shows promise of being the most positive and effective drug prevention program being presented in the world today; and

WHEREAS, Physiological experiments provide evidence that through the regular practice of T.M. (twice daily for 15–20 minutes) the main causes of hypertension, anxiety, high blood pressure, cardiac arrest, and other psychosomatic illnesses are removed; and

WHEREAS, Through the efforts of the Students International Meditation Society, a non-profit educational organization, credit courses in the Science of Creative Intelligence, the practical aspect of which is T.M., have been offered at many of the largest universities throughout the United States; and

WHEREAS, Under a World Plan, 350 teaching centers of the Science of Creative Intelligence are being founded in the largest cities throughout the United States and the world, one of which is to be located in Chicago, Illinois; and

WHEREAS, The purpose of these centers is the training of teachers to accomplish the objectives of the Science of Creative Intelligence which are:

(1) to develop the full potential of the individual,
(2) to improve governmental achievements,
(3) to realize the highest ideal of education,
(4) to solve the problems of crime, drug abuse, and all behavior that brings unhappiness to the family of man,
(5) to maximize the intelligent use of the environment,
(6) to bring fulfillment to the economic aspirations of individuals and society,
(7) to achieve the spiritual goals of mankind in this generation; and

WHEREAS, The whole thrust of the programs of the Students International Meditation Society and the International Meditation Society is to aid in the practical development of happy and productive citizens through their teaching of Transcendental Meditation as taught by Maharishi Mahesh Yogi throughout the world; therefore, be it

RESOLVED, By the House of Representatives of the Seventy-seventh General Assembly of the State of Illinois, that all educational institutions, especially those under State of Illinois jurisdiction, be strongly encouraged to study the feasibility of courses in Transcendental Meditation and the Science of Creative Intelligence (SCI) on their campuses and in their facilities; and be it further

RESOLVED, That the Department of Mental Health of the State of Illinois, Drug Abuse Section, be encouraged to study the benefits of T.M. and insofar as the Drug Abuse Section deems it to be practical and medically wise, to incorporate the course in T.M. in the drug abuse programs; and be it further

RESOLVED, That the State of Illinois give all possible cooperation to the new Center for the teaching of the Science of Creative Intelligence to be founded in Chicago, Illinois; and be it further

RESOLVED, That a copy of this resolution be sent to: The Superintendent of Public Instruction; The Deans of all State Universities; The Department of Mental Health, State of Illinois to inform them of the great promise of the programs herein mentioned; and be it further

RESOLVED, That copies of this resolution also be sent to the Students International Meditation Society and to his Holiness, Maharishi Mahesh Yogi, founder of the Science of Creative Intelligence, and to William J. Murphy and John J. Murphy, students and teachers of Transcendental Meditation, trained by his Holiness, to encourage them in their endeavors, and advise them of our interest in their program.

Adopted by the House of Representatives May 24, 1972.

[Signature]
Speaker of the House

[Signature]
Clerk of the House