THE EFFECTS OF THE TRANSCENDENTAL MEDITATION PROGRAM ON SHORT-TERM RECALL PERFORMANCE

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The following is an abbreviated version of the author's original master's thesis presented to the Graduate Faculty of the Department of Education, Wilkes College, in partial fulfilment of the requirements for the degree of Master of Science in Education.

This study examined the influence of the Transcendental Meditation technique upon the short-term recall ability of a group of meditating college students compared to a similar group of students using a control period of prescribed rest. The Wechsler Digit Span test was administered in a pre- and posttest design to 20 practitioners of the TM technique and 20 nonpractitioners at Wilkes College. Between tests the experimental group practiced the TM technique; the control group simply rested with closed eyes. Statistical analysis indicated no significant difference between the groups in the pretest and significantly better performance of the meditators in the posttest ($p < .05$).

INTRODUCTION

The recent emergence of the Science of Creative Intelligence and its practical aspect, the Transcendental Meditation program, has generated an avalanche of inquiry into the application and effectiveness of the technique in many areas of life. The acceptance and use of the Transcendental Meditation (TM) technique continues to expand geometrically.

The basic tenet of the Science of Creative Intelligence is that there exists, deep within the mind, at the source of thought, a limitless reservoir of energy, creativity and intelligence which can be contacted by any individual, through the Transcendental Meditation technique and thereby find expression in all fields of life. Experience has demonstrated that successful use of the TM technique does not depend upon age, sex, socio-economic background or any particular mental talent or physical trait.

The technique itself is a simple, easily learned, effortless process of quickly establishing a physiological state of extremely deep rest. No belief or faith is necessary. No type of hypnosis, autosuggestion or mind control is involved. The technique does not utilize concentration or contemplation.

The Transcendental Meditation technique is taught all over the world in an extremely precise, uniform manner by teachers personally trained by Maharishi Mahesh Yogi. Because of the unique, personal and delicate manner in which the TM technique is imparted, and because of its comprehensive
and unique effects upon the human nervous system, the reader should not consider this study to deal with any other method of mental or physical development than the Transcendental Meditation technique as taught by Maharishi Mahesh Yogi.

The Science of Creative Intelligence holds that problems have their source in weakness—the inability of man to fulfill his desires. This weakness exists on a basic neurophysiological level. Stress and strain in the nervous system, as a result of frequent overloads of experience, is held to be the cause of man’s miniscule use of his potential.

The marked drop in metabolic rate experienced during the Transcendental Meditation technique (27) is thought to be responsible for release and dissolution of deep-seated stress, strain and fatigue. This gradual normalization of the nervous system, with regular practice of the TM technique, then finds expression in the multitude of benefits apparently available.

The idealistic aspirations of the Science of Creative Intelligence for education begin with the root meaning of the word education. The Latin word “educere” has as its basic meaning the idea of “leading out.” The long-standing goal, then, of education has been to “lead out” or draw out or develop the unique and best part of human nature. Development of one’s full potential is put forth as the highest ideal of education.

A definition of the “full potential of the individual” by the Science of Creative Intelligence would include:

1. Expansion of the ability to learn
2. Maximum motivation and achievement of learning
3. Optimum physical and mental health of the learner
4. Elimination of the social problems which impair the process of learning, i.e., delinquency, drug abuse, “generation gaps,” interpersonal blocks among students, teachers, parents, etc.
5. A unifying basis for all branches of knowledge in the curriculum so that students can see the parts in relation to the whole—that is, a provision for “meaning” and “relevance” (21, p. 1)

The first of these objectives refers to the subjective development of the learner in terms of process, as distinguished from content, i.e., facts, events, formulas. What we find is that content for education exists in mushrooming abundance. The need of our time is best served in the subjective development of the knower. Equipping him to be of maximum benefit to himself and society is surely one of the most profound of pedagogic ideals.

If the practical aspect of the Science of Creative Intelligence, the Transcendental Meditation program, can provide this missing dimension in education (development of the knower), its implication will reverberate through every level of educational endeavor. The continuing need for research in this most fundamental and far-reaching area of education has generated the direction of this study.

STATEMENT OF THE PROBLEM—This study was designed to examine whether there is any significant difference between the short-term learning ability (recall) of students practicing the Transcendental Meditation technique and students not practicing the TM technique.

REVIEW OF LITERATURE—The nature of the Transcendental Meditation technique is such that it easily lends itself to scientific inquiry. The past five years have seen well over 300 research studies completed in at least 28 different countries (10).

The majority of the research on the Transcendental Meditation technique deals with measurement of changes in physiology during the 20-minute period of the technique itself and the cumulative changes in psychology resulting from regular practice. Wallace (26) reported that the physiologic state induced by the TM technique reflects a significant decrease in metabolism and anxiety, indicating a state of extraordinarily deep physical rest. Yet this state is differentiated from sleep by continued wakeful alertness.

Accompanying this rather unusual combination are unique patterns of electroencephalographic activity. Research related to the TM technique and intelligence, learning ability and academic performance is grounded in EEG studies.

Banquet (2) reported that brain waves induced during the practice of the TM technique are markedly synchronous and coherent, indicating superior integration and coordination of brain areas. In a later study he noted the continuity of such synchrony
after the meditation period (3). These findings were supported in a later experiment (12). An independent study by an English researcher (28) corroborates and extends the work of Banquet and Levine et al., indicating more stable brain rhythms during TM than for control subjects. These stable rhythms have been associated with stable awareness and superior performance. It was again found that this effect persists after the meditation period.

Cognitive theorists have long held that expansion of learning ability depends upon refinement of perceptual ability and development of awareness. This type of neurological stability was noted (14) in meditators’ greater improvement (34%) in the ability to focus attention. It was also found that meditating subjects exhibited a significantly greater ability to focus attention without being distracted by the environment after the first three months of using the TM technique (15). Increased auditory (17) and visual (4) perceptual ability were observed in meditators immediately following the TM technique as compared to control subjects simply relaxing with closed eyes. In Pirot’s study (17), meditators also used a control period of relaxation compared to their practice of the TM technique. Superior performance was noted following the technique.

There seems to be an inverse relationship between anxiety level and intelligence/learning ability (23). Three separate studies (7, 9, 22) using different instruments, indicated a significant decrease in the anxiety level of subjects after starting the TM technique.

In Hjelle’s study (9), the decrease in anxiety as measured by Bendig’s Anxiety Scale was accompanied by higher internal locus of control (Rotter’s Internal/External Locus of Control Scale). High internal locus of control has been associated with the ability to effectively extract and make use of information from a complex environment.

In a study involving 80 students at a public high school in Canada (20) those who practiced the Transcendental Meditation technique showed a significantly greater decrease in anxiety after 14 weeks of the TM program (Attitudes Towards Specific Situations Test) than the control group. The decrease in anxiety was shown to be primarily due to the effects of the practice of the TM technique itself, and not simply to intellectual involvement with the theory underlying it, as presented in an accompanying Science of Creative Intelligence course. After the same 14-week period, the test scores of students practicing the TM technique also showed significantly greater gains in intellectual ability (Raven’s Progressive Matrices Test, Set II) than did the non-meditators’ scores.

A similar study revealed significant decreases in state and trait anxiety coupled with significant increases in overall academic performance as measured by grade point average in meditating high school students. A control group exhibited no significant change in either variable (11).

In two retrospective studies on academic performance utilizing grade point average (GPA), researchers found sharp improvement after students began the TM technique. Collier (6) compared GPA for a minimum of two semesters before the students began the TM program to their GPA for a minimum of one semester after they began the program. Heaton and Orme-Johnson (8) compared individuals participating in the TM program with a matched control group of nonparticipants.

Tjoa’s (25) initial study showed greater increases in intelligence among high school students practicing the TM technique than among controls. A corresponding reduction in neuroticism was also noted. These results were confirmed in a second study which indicated that a group of university students and adults who practiced the TM technique regularly increased significantly more in intelligence than those whose practice was irregular over the 16-month period after they began the TM technique (24). Using a standardized IQ battery, researchers found a significant increase in the IQ of Indian athletes practicing the TM technique for six weeks, compared to that of the control athletes (19). Miskiman (13) found that individuals practicing the TM technique significantly increased their speed in solving arithmetic problems accurately.

Learning ability as measured by memory is a complex process in which storage, recognition and retrieval are involved. Evidence of clustering in performance indicates that the material has been economically organized for efficient retrieval (5). After the first 40 days of the Transcendental Meditation program, individuals practicing the TM technique increased markedly in their tendency to spontaneously organize memorized material (Index of Clustering in recall). Members of the control group,
who relaxed twice daily by sitting with eyes closed, did not change significantly (13). Miskiman also found that over a two-to-six-minute interval the efficiency of recall of individuals practicing the TM technique decreased only 3% while that of controls decreased 38%.

Both short- and long-term meditators were tested for short- and long-term recall as well as paired-associate learning. Those practicing the TM technique performed significantly better than nonmeditators in all three tests. Additionally, there was a trend toward progressive improvement in the long-term recall ability of subjects practicing the TM technique (1).

HYPOTHESIS—A survey of research regarding the influence of the Transcendental Meditation program upon intelligence, learning ability and academic performance is greatly supportive of significant improvement in all three areas.

Based upon the research findings, the following hypothesis was examined: A group of college students who practice the Transcendental Meditation technique (meditators) will exhibit significantly better performance on a reliable test of short-term recall ability after practicing the TM technique than will a similar group of college students (nonmeditators) who simply rest with closed eyes.

METHOD

The methodology of this study involved the comparison of two similar groups of college students in their performance on a test of short-term memory after one of the groups has practiced the TM technique. The experimental design is similar to that of numerous psychological and physiological inquiries into the effects of the TM program.

STATEMENT OF DEFINITIONS—Meditators. For the purposes of this study, the term meditators refers to the members of the experimental group. Meditators had been regularly practicing the TM technique for a minimum of six weeks prior to testing. This six-week minimum period was arrived at primarily because of the decisions of other researchers to allow a comparable time for the individual to gain sufficient experience with the technique. During this time they had not been utilizing any other form or technique of purported mental development.

Nonmeditators. Nonmeditators had never used the TM technique and had not used any other form or technique of purported mental development for at least six weeks prior to testing.

STUDY SAMPLE—The study sample was composed of 20 meditating and 20 nonmeditating undergraduate college students. A shortage of meditators at Wilkes College necessitated the inclusion of 3 meditators from King's College, a nearby liberal arts college with nearly identical entrance requirements to those of Wilkes. All other subjects were full-time Wilkes students.

All students tested were sophomores, juniors or seniors ranging in age from 20 to 22 years. Ten of the meditators were education majors, while 14 of the nonmeditators were education majors. The remainder of both groups' majors was distributed among the various arts and sciences. Twelve of the 20 meditators were female. Fourteen of the 20 nonmeditators were female. All subjects were tested of their own volition.

RESEARCH DESIGN—In order to examine the effectiveness of the TM technique in short-term recall ability, the experimental and control groups were first compared on two previous measures of learning ability: the most recent high school SAT and the Wechsler Digit Span (the pretest). T-tests of nonrelated sample means were conducted to discover whether any significant difference in learning ability (according to these tests) existed between the meditators and the nonmeditators. When it was determined that there was no significant difference in the performance of the groups on both the SAT (table 1) and the pretest (table 2) the t-test comparing group performance on the posttest could be made (table 3). According to standard statistical procedure, the hypothesis was accepted at the .05 level of probability.

INSTRUMENTATION AND PROCEDURES—The Wechsler Digit Span test was chosen because of its proven reliability as a measure of short-term recall ability and attention (18). It is easily administered and results are immediately available. The pretest is the Digit Span test which constitutes part of the standard Wechsler intelligence battery. The posttest
is procedurally the same as the pretest; the digits have been changed, but exist in the same fashion (nonrepeating and nonsequential) as they appear in the pretest. This alteration of the standard Digit Span test in no way changes the efficiency of the instrument (16), and was effected to eliminate the possible interference of long-term recall.

All testing was done by the author on a one-to-one basis according to the explicit and exacting instructions contained in the Wechsler manual. Tests were carried out in a relatively quiet place with comfortable chairs: a quiet corner of the library or an unoccupied office or classroom. All subjects were tested between the hours of 12 noon and 4:00 P.M. This was done to add to the uniformity of the procedure and to avoid testing a meditator soon after his regular morning or afternoon meditation period.

In order to reduce demand character subjects were not told the exact design of the study or that they would be retested following their meditation or rest period. Upon completion of the pretest, meditators were asked to meditate as they usually do, with the assurance that the author would return in 15 to 20 minutes. The posttest was administered a few minutes following the meditation period. Nonmeditators were asked to relax with eyes closed following the pretest. After 15 to 20 minutes, the posttest was given. Both pre- and posttest scores were immediately recorded on the test sheet.

The most recent SAT scores for each subject were obtained from official student records at the registrars’ office at Wilkes and King’s colleges. The data consisting of SAT and pretest scores were recorded on data processing cards. One t-test compared the means of the SAT scores for the meditators and the nonmeditators (table 1). Means of the pretest scores for both groups were compared with the other t-test (table 2). Upon discovering the nonsignificant results of both t-tests, a third t-ratio was calculated to determine if a significant difference existed between group performance at the .05 level of probability (table 3).

Statistical analysis was carried out on a Honeywell 2030 computer using a program housed at the Wilkes College Computer Center.

**DISCUSSION**

**ANALYSIS—**Three t-tests of nonrelated sample means were used in this study.

One t-test was utilized to determine if the meditators and nonmeditators, as groups, differed significantly in a previous measure of learning ability: the most recent SAT score. Analysis of the data showed that the means of the groups’ SAT scores were statistically homogeneous. The t-ratio showed no significant difference (table 1).

A second t-test was performed to discover if any significant difference existed between the meditator and nonmeditator groups in their performance on the pretest (Wechsler Digit Span). Analysis of these scores showed a very small difference between group means and the t-ratio indicated that no significant difference existed (table 2). Therefore, the groups were judged to be homogeneous on their initial performance on the Wechsler Digit Span test.

The t-test used to test the hypothesis compared group performances on the posttest. The purpose of this test was to determine whether the use of the TM technique by the meditators produced a significantly better performance on the posttest compared to the

**TABLE 1**

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<th>MEANS, STANDARD DEVIATIONS AND t-RATIO FOR MEDITATORS’ AND NONMEDITATORS’ SAT SCORES (N = 40)</th>
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<th>MEANS, STANDARD DEVIATIONS AND t-RATIO FOR MEDITATORS’ AND NONMEDITATORS’ INITIAL WECHSLER DIGIT SPAN TEST (PRETEST) (N = 40)</th>
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**TABLE 3**

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<th>MEANS, STANDARD DEVIATIONS AND t-RATIO FOR MEDITATORS’ AND NONMEDITATORS’ SECOND DIGIT SPAN TEST (POSTTEST) (N = 40)</th>
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*p < .05
FIG. 1. SHORT-TERM RECALL ABILITY RESULTS. The means for the Wechsler Digit Span test is shown for meditators and nonmeditators at pretest and posttest. The posttest was administered a few minutes following either Transcendental Meditation or a relaxation period. A significantly higher performance by the meditating group \( p < .05 \) indicates superior short-term recall ability and greater ability to focus attention.

The results of the present study seem to substantiate the findings of most other researchers who examined the relationship between the practice of the TM technique and learning ability. Results are consistent with those of Abrams (1), who, using different instrumentation, found both short- and long-term recall ability to be significantly better in meditators than nonmeditators.

Because the Wechsler Digit Span test is also a measure of attention, this finding supports the significantly greater ability to focus attention noted in meditators by Pelletier (14, 15). Good performance on the Digit Span demands the ability to spontaneously organize (cluster) material. Superior ability of this nature was noted in meditators by Miskiman (13) in a study involving efficiency of recall over a two-to-six-minute interval. This longitudinal study comparing the TM technique and relaxation indicated significant improvement in meditators \( p < .001 \), analysis of variance).

The Digit Span test is part of a battery of tests used to measure intelligence developed by David Wechsler. It would seem logical that other IQ tests should also indicate significant improvement by meditators. This was the case in studies by Reddy, Bai and Rao (19) using the Bhattia IQ Battery, and Tjoa (24) employing the Figural Reasoning Subtest of the Differential Aptitude Test.

In summary, data from the present study appear to support earlier investigations which indicated the positive influence of the use of the TM technique upon performance of recall and intelligence tasks.

**SUMMARY AND CONCLUSIONS**

**SUMMARY**—The purpose of this study was to compare the effect of the use of the Transcendental Meditation technique by a group of college students on a measure of short-term recall ability with a similar group of nonmeditating students using a control period of simple rest.

The two groups of undergraduates at Wilkes College, Wilkes-Barre, Pennsylvania were found not to differ significantly on a previous measure of learning ability: the most recent SAT scores. A \( t \)-test of nonrelated sample means was employed.

It was also determined by a \( t \)-test that the groups did not differ significantly in their initial performance on the Wechsler Digit Span test, the instrument of the study. Following a 15-20 minute period of practice of the TM technique for the experimental group and a 15-20 minute period of rest with closed eyes for the control group, the Digit Span test was again administered. Analysis of the data by another \( t \)-test indicated a significantly higher performance.
in posttest results by the experimental group ($p < .05$) compared to the control group.

CONCLUSION—Given the results of the study, it would appear that the practice of the Transcendental Meditation technique significantly improved short-term recall ability in the meditating group of students.

The author cannot offer a comprehensive explanation as to the basis for the success of the TM technique in fostering improved recall ability. Perhaps the answer lies in the reduction in anxiety (22) or coherence of brain wave activity (12) or a combination of these and other psychophysiological effects induced by the technique. It is apparent, however, even from a cursory glance at the multifarious avenues of human performance where the TM technique has generated improvement that,

a) the technique operates at a very fundamental level of human experience, and

b) its effects are more profound than those of mere relaxation.

RECOMMENDATIONS—Because this is a relatively new area of investigation, many other avenues of inquiry into the relationship between the Transcendental Meditation program and learning ability exist and are worthy of pursuit. However, since the results of this study are consistent with the literature review, it would seem ploddingly conservative to delay the widespread implementation of this technology. Educational scientists face a unique situation in successfully integrating SCI and the TM technique into the framework of modern education. This is not to imply that the critical and skeptical approach that is necessary to safeguard scientific progress be abandoned. The necessity of ongoing research utilizing large samples and longitudinal designs (a few are now in progress) will be continuous. But this should not prevent education from taking maximum advantage of a tool with real promise of fulfilling the goal of education: the fostering of a fully developed man.

REFERENCES


