THE SUBJECTIVE EXPERIENCE OF HIGHER STATES OF CONSCIOUSNESS AND THE MAHARISHI TECHNOLOGY OF THE UNIFIED FIELD: PERSONALITY, COGNITIVE, PERCEPTUAL, AND PHYSIOLOGICAL CORRELATES OF GROWTH TO ENLIGHTENMENT

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Experiences of higher states of consciousness are found to represent a natural and empirically distinct dimension of human experience which is progressively unfolded through the regular practice of the Transcendental Meditation and TM-Sidhi programme. The development of higher states of consciousness is shown to be accompanied by holistic improvements in mental and physical functioning.—EDITORS

The theory of human development described in the Vedic Psychology of Maharishi Mahesh Yogi is investigated in a series of studies using the State of Consciousness Inventory (SCI) (Alexander, 1982). This theory, drawn from the ancient classical science of the Veda, describes development of higher states of consciousness beyond the ordinary states of waking, dreaming, and sleeping. The SCI is a psychometric inventory designed to assess frequency of higher state of consciousness experience from subjective reports. It is composed of conceptual scales generated by experts to identify higher states of consciousness, normal waking consciousness, and neurotic and schizophrenic experience. Results of the studies supported the validity of the inventory and were consistent with the structure, frequency, and correlates of higher state of consciousness experience predicted by Vedic Psychology.

In both cross-sectional and longitudinal studies, practice of the Maharishi Technology of the Unified Field, which includes the Transcendental Meditation and TM-Sidhi program, was associated with enhanced frequency of higher state of consciousness experience in comparison to participation in other treatment or control groups. In turn, enhanced frequency of higher state of consciousness experience was found to be significantly correlated with decreased anxiety, aggression, depression, and introversion; increased self-actualization, as indicated by self-report and peer ratings; increased capacity for episodes of total attention or absorption; improved performance on measures of creativity and cognitive and perceptual skills; and with increased alpha and theta EEG coherence; faster H-reflex recovery; and periods of respiratory suspension during practice of the Transcendental Meditation technique. In terms of current developmental theory, the Maharishi Technology of the Unified Field is hypothesized to be an adult postconceptual developmental technology that unfreezes human development, typically fixed at the ordinary level of adult conceptual thought, allowing natural development to continue beyond the known endpoints postulated in current western psychology—beyond the conceptual level of formal operations and beyond the transitional peak experiences of self-actualization.
INTRODUCTION

Psychophysicologists have identified three major states of consciousness—waking, dreaming, and sleeping. During the past 15 years, a large body of further research (Orme-Johnson and Farrow, 1977; Chalmers, Clements, Schenkl, and Weenness, in press) has indicated that during practice of the Transcendental Meditation (TM) technique a fourth major state of consciousness referred to as transcendental consciousness (TC) is produced (Maharishi Mahesh Yogi, 1966; Wallace, 1970). Researchers have described this phenomenon as a state of restful alertness qualitatively distinct from the three ordinary states of consciousness. Subjects describe this experience as a condition of heightened inner wakefulness accompanied by a deep state of silence and physiological rest. Recent studies have indicated that periods in which subjects reported experiencing transcendental consciousness during practice of the TM technique (by pressing a button) are highly correlated with enhanced alpha and theta EEG coherence, suggestive of high alertness, and with periods of respiratory suspension, decreased heart rate, stable phasic GSR, and heightened basal GSR indicative of physiologic quiescence (Badawi, Wallace, Orme-Johnson, and Rouzeré, 1984; Farrow and Hebert, 1982).

HIGHER STATES OF CONSCIOUSNESS AND VEDIC PSYCHOLOGY—Such physiological and psychological correlates of the fourth state of consciousness have been predicted in the Vedic Psychology of Maharishi Mahesh Yogi, a comprehensive psychological theory and technology of human development based on the ancient classical science of the Veda which emphasizes the subjective approach to systematic investigation (Maharishi Mahesh Yogi, 1966; Orme-Johnson, Dillbeck, Alexander, Van den Berg, and Dillbeck, in press). According to Vedic Psychology, the fourth state of consciousness is subjective experience of the unified field of natural law as the Cosmic Psyche, and is the basis for development through higher stages of consciousness. Experiences of these higher stages have recently been reported by practitioners of the Maharishi Technology of the Unified Field, which includes the Transcendental Meditation and TM-Sidhi program.

The Transcendental Meditation technique is described as a simple, natural, mental procedure that allows the individual to experience less excited, increasingly refined levels of mental activity and to transcend to the least excited state of clear inner wakefulness without thoughts, transcendental consciousness. This state is held to be the most basic ground state of mental activity not bound by thoughts or perceptions, in which the knower, known, and process of knowing become unified into one unbounded wholeness of self-awareness. In contrast, in ordinary waking consciousness the knower perceives objects of experience as external and separate from his own self, and this division precludes the knower from knowing himself directly. The active, divided state of waking consciousness prevents direct self-knowledge because in this state the known cannot simultaneously be both observer and observed. The state of transcendental consciousness is a state of complete self-referral in which the individual psyche becomes identified with the unbounded unified field of consciousness at the basis of subjective and objective existence. Precise subjective descriptions in the Vedic literature of the structure and dynamics of this unified field of consciousness as the source of all the laws of nature are highly similar to the objective descriptions in modern physics of an infinite, unmanifest field of natural law at the basis of the physical universe. The most parsimonious explanation for this striking isomorphism, recently postulated by theoretical physicists, is that these are two descriptions of the same unified field viewed, respectively, from subjective and objective perspectives (e.g., Clements, Hagelin, Weenness, Sarma, and Badawi, in press; Hagelin, Clements, and Sarma, in press).

Because the unified field appears to display the properties of consciousness on an infinite scale and is held to be the source of the individual psyche as well as objective existence, this field is referred to in Vedic Psychology as the Cosmic Psyche (Orme-Johnson et al., in press). According to Vedic Psychology, the fourth state of consciousness is the subjective experience of the unified field of natural law as the Cosmic Psyche, and is the basis for development through higher stages of consciousness. Experiences of these higher stages have recently been reported by practitioners of the Maharishi Technology of the Unified Field, which includes the Transcendental Meditation and TM-Sidhi program.

Enlightenment has been described perennially in historical literature as an ultimate state of inner peace, fulfillment, and self-realization in which the individual psyche becomes identified with the unbounded unified field of consciousness at the basis of subjective and objective existence. Precise subjective descriptions in the Vedic literature of the structure and dynamics of this unified field of consciousness as the source of all the laws of nature are highly similar to the objective descriptions in modern physics of an infinite, unmanifest field of natural law at the basis of the physical universe. The most parsimonious explanation for this striking isomorphism, recently postulated by theoretical physicists, is that these are two descriptions of the same unified field viewed, respectively, from subjective and objective perspectives (e.g., Clements, Hagelin, Weenness, Sarma, and Badawi, in press; Hagelin, Clements, and Sarma, in press).

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knower experiences his own self directly by transcending the separateness of experience and experierencer. The purpose of the advanced TM-Sidhi program is to stabilize transcendental consciousness and accelerate development of still higher states of consciousness.

According to Vedic Psychology, alternation of transcendental consciousness with ordinary states of consciousness refines and habituates the nervous system to sustain a fifth major state of consciousness, referred to as cosmic consciousness. This stage includes the entire range of experience in waking, dreaming, and sleeping along with the permanent inner wakefulness of transcendental consciousness. Further refinement of the nervous system, facilitated by continued practice of the Maharishi Technology of the Unified Field, is said to develop the state of refined cosmic consciousness characterized by refinement of perceptual and affective processes, resulting in the ability to appreciate what is described as the finest level of subjective and objective existence. Vedic Psychology proposes that human development culminates in the seventh state of consciousness, unity consciousness. Unity consciousness is described as the highest state of enlightened development based upon optimal functioning of the nervous system. According to Vedic Psychology, in unity consciousness the entire range of objective and subjective creation is spontaneously experienced in terms of the infinite self-referral nature of the Cosmic Psyche.

UNFREEZING HUMAN DEVELOPMENT—We propose that the higher states of consciousness described in Vedic Psychology (Maharishi Mahesh Yogi, 1972; Orme-Johnson et al., in press a) are not in any sense mystical, but rather represent the logical continuation and extension of normal human development beyond the known endpoints postulated in current western psychology (Alexander and Oetzel, in press). Further, the Maharishi Technology of the Unified Field is considered to be a subjective adult developmental technology for unfreezing the ontogenetic or developmental process. The Transcendental Meditation and TM-Sidhi program is viewed as a postlanguage system as fundamental for promoting development beyond the ordinary language-based conceptual level of thought to postconceptual higher states of consciousness as language learning itself is for promoting development beyond the sensori-motor and preconceptual levels of early childhood to the conceptual level of ordinary adult thought (Alexander, 1982; Alexander and Boedeker, 1982). The capacity for language use, which may be inherent, is generally recognized to require informal and formal instruction to maximize its contribution to conceptual thought (e.g., Bruner, Oliver, Greenfield et al., 1966; Gardner, 1983). In the same manner the capacity to transcend the thinking process in the service of postconceptual development also may be inherent, and may be catalyzed by instruction in the TM and TM-Sidhi program.

Human development from birth through early adulthood unfolds in stages from more concrete to increasingly abstract or subtle states. It has been recognized that there is a correspondence between the level of maturation of the nervous system and the level of cognitive development. For example, growth spurts in the brain and proportional increases in EEG alpha production tend to correspond with shifts to higher levels of cognitive-structural development (Epstein, 1974, 1980; Matousek and Petersen, 1973). The structure and style of functioning of the nervous system appear to progress toward increasing differentiation and hierarchical integration (Werner, 1957). From the viewpoint of Vedic Psychology, this increasing functional integration of the nervous system permits it to transduce and utilize increasingly subtle levels of mind. The progressive enlivenment of each subtler level of mind may provide the "deep structure" for the unfoldment of each corresponding higher level of cognitive and psychological development.

The nature and sequence of each of the levels of mind described in Vedic Psychology have a close correspondence with the sequential unfoldment of stages of cognitive-structural development described by Piaget and others (Flavell, 1977; Piaget and Inhelder, 1969). Piaget has identified a sequence of four basic stages of cognitive development from birth through adolescence or early adulthood. The stages are a sensori-motor stage; a preoperational stage characterized by speech acts, simple mentation and perception; a concrete mental operations stage; and a level of abstract or reflective thought called formal operations. These stages correspond respectively to increasingly subtle levels of activity of the knower identified by Vedic Psychology—action, speech and perception, active thinking of the mind, and abstract discrimination of the intellect (Maharishi Mahesh Yogi, 1969; Orme-Johnson et al., in press a).

Fundamental cognitive, moral, and self-development typically come to plateau during late adole-
ence or early adulthood with stabilization of formal operations (Kohlberg, 1979; Redmore and Loevinger, 1979). This freezing of psychological development is generally believed to occur because the central nervous system stops developing during this period (e.g., Tanner, 1970). Up to adulthood, physiological maturation appears to drive psychological development, permitting activation and utilization of subtler levels of the mind for performance of more abstract conceptual thought. When the physical nervous system stops developing, fundamental psychological development also typically ceases.

The functional interrelationship of mind and body, however, suggests that not only can changes in the nervous system act to change one's level of awareness, but changes in level of awareness can in principle act back upon the nervous system—to influence physiological development. The Transcendental Meditation program can be viewed as a developmental technology for taking awareness to subtler levels of the mind, resulting in further physiological integration and hence unfreezing of the developmental process. Whereas development of the nervous system leads psychological development during the first two decades of life, the Maharishi Technology of the Unified Field may enable consciousness to subsequently lead further development of the nervous system and growth to higher states of consciousness.

Alexander and Oetzel (in press) have recently presented evidence that the Maharishi Technology of the Unified Field unfreezes the ontogenetic or developmental processes, allowing human development to continue beyond formal operations. A number of studies on the effects of the Maharishi Technology of the Unified Field on both structural stage development and cognitive-perceptual growth support this hypothesis. In two adult prison samples, adjusting for pretest score and relevant demographic covariates, both advanced TM (33 months' practice) and new TM subjects (17 months’ practice) showed a highly significant improvement of more than one full step on Loevinger's (1976) structural-developmental measure of self or ego development (Alexander, 1982; Alexander and Marks, in press). Such advances are not predicted in adulthood, nor in penal environments which tend to be particularly recalcitrant to change, and did not occur for wait-list controls or four other self-improvement groups over the same treatment interval. On the average, regular new meditators improved from a "conforming" stage (1-3) to a "self-aware" level (1-3/4) on Loevinger's development scale; regular advanced meditators improved from the self-aware level to a still more internalized "consciousness" stage (1-4).

The advance of one stage for the new meditators over a 1½ year period is equivalent to that of college students over a four-year period, and at an age (26 – 29) and education level (only ninth grade) where such changes are highly unlikely to occur. Assuming the advanced TM subjects started at a comparable level to the new TM group, they appeared to advance two full steps during less than three years, which suggested that there was no apparent upper boundary to their further growth. In fact, two of the advanced meditators attained to Loevinger's highest "integrated" stage, which is very rarely achieved in the normal population (less than 1%), and is described in similar terms to Maslow's level of "self-actualization" (Loevinger, 1976, pp. 26 – 27, 139 – 142).

Cross-sectional and longitudinal testing also indicate that the TM technique may facilitate development of moral reasoning in late adolescents and young adults (Nidich, 1976; Nidich and Nidich, in press). In addition, a number of cognitive processes which typically become fixed in early adulthood have been shown to be enhanced through practice of this technique. For example, longitudinal studies have indicated that, compared to controls, practitioners of the TM technique significantly improve on measures of fluid intelligence (Aron, Orme-Johnson, and Brubaker, 1981; Schecter, 1977; Tjoa, 1977a, 1977b), field independence (Pelletier, 1974; Orme-Johnson and Granieri, 1977) and perceptual flexibility (Dillbeck, 1982).

In another population typically resistant to change, the institutionalized aged, elderly subjects (mean age 81 years) were randomly assigned to a no-treatment group and to treatment groups identical in external structure and expectation-fostering features (Alexander, Davies, Newman, and Chandler, in press). Despite similarity between groups on pretest measures and expectation, the TM subjects improved significantly more than a no-treatment and a relaxation group on a variety of measures known to plateau in adulthood and decline with aging. The TM group showed more improvement on three measures of cognitive flexibility and learning, word fluency, systolic blood pressure, mental health, and self-rating of behavioral flexibility and aging. After three years, survival rate (longevity) for the TM group was 100%,
in contrast to lower rates for the other treatment conditions.

The Maharishi Technology of the Unified Field may not only unfreeze structural-developmental and cognitive-perceptual processes that have frozen prematurely or begun to decline. This technology may also directly facilitate further development of higher state of consciousness experiences which should in turn be meaningfully associated with a wide range of beneficial personality, cognitive, and physiological behaviors resulting from greater utilization of human potential. Vedic Psychology postulates that experiences of higher states of consciousness are not idiosyncratic byproducts of meditation, but rather reflect the unfoldment of natural higher stages of human development, the attainment of which can be more rapidly facilitated through the Maharishi Technology of the Unified Field. Although such experiences might occur with much less frequency among nonmeditators than meditators, the essential features and empirical structure of the experiences, as well as their behavioral correlates, should remain the same over time and be consistent across both different groups and cultures.

Method of Measurement:
The State of Consciousness Inventory (SCI)

In order to test these propositions, the State of Consciousness Inventory (SCI) (Alexander, 1978a, 1982) was designed to quantitatively assess frequency of higher state of consciousness experience as defined in Vedic Psychology (Maharishi Mahesh Yogi, 1972; Orme-Johnson et al., in press a).

The inventory was psychometrically modelled on Rest's Defining Issues Test (1975) questionnaire for measurement of principled moral reasoning. Three separate SCI scales were derived to represent sequentially the higher states of cosmic consciousness (CC), refined cosmic consciousness (RCC), and unity consciousness (UC) (Maharishi Mahesh Yogi, 1972). Following Jackson's (1970) model of item construction by experts in a field of investigation, items were derived primarily from first-person statements generated by a group of approximately 50 instructors of the Maharishi Meditation technique who not only reported frequent experience of such states but had a developed conceptual foundation for their interpretation. Items were also drawn directly from the Vedic literature and from contemporary western literature on this subject. The items were made more comprehensible and meaningful both to meditators and nonmeditators by editing to remove philosophical terminology and by adjusting word length and imbalances in social desirability. For comparative purposes, three additional scales were also constructed to assess waking state experience: a normal waking state scale, a neurotic experience scale, and a schizophrenic experience scale. Following Rest's design, a misleading item scale was also constructed to assess the subjects' tendency to endorse misleading or grandiose statements.

The development of the SCI was based on the assumption that individuals can have momentary experiences of higher state functioning before they are permanently established in the new stage. The development of higher states of consciousness may generally tend to be a gradual process in which experiences of higher-state functioning become more and more frequent until a final stable higher stage is reached. This is consistent with the Vedic description of development from a temporary experience of transcendental consciousness during TM practice to its eventual stabilization at all times along with waking, dreaming, and sleeping states in cosmic consciousness (Maharishi Mahesh Yogi, 1969).

A rigorous test to determine whether higher states of consciousness as measured by the SCI scales actually unfold in a sequential, irreversible order requires a major longitudinal investigation. However, the application of factor analytic procedures to cross-sectional data will at least permit a determination of whether higher state of consciousness experiences are not only conceptually but also empirically distinct from experiences of ordinary waking consciousness or pathological experiences. Factor analysis of the SCI should yield conceptually meaningful and empirically distinct factors corresponding to the above classes of experience by clustering of larger conceptual scales or by clustering of individual items that compose these scales.

Each SCI scale was based on a set of face-valid, conceptually consistent items generated by experts who drew upon their direct experiences of such states. Scale scores were derived by taking the mean of scale items. If the individual SCI items are taken as a pool of items and not assigned a priori to a conceptual scale, then these items should, ideally, empirically factor in a manner consistent with both the
a priori conceptual classification of items on scales and with subsequent higher-order factor analysis of these scales to form a smaller set of higher-order factors representing different classes of experience.

If factor analyses do yield conceptually meaningful empirical factors by both analyses of scales and items, the "substantive component" (Loevinger, 1979) of the construct validity of the SCI measure will have gained support. Substantive validity is concerned with whether the content of the items classed together makes coherent conceptual sense and whether the items appear to index the "putative trait" under investigation, in this case the class of higher state of consciousness experiences. Also, the empirical factors should remain relatively stable over time and across samples if they reflect consistent and universal underlying classes of experience. Demonstration of stability across time and samples would support the "structural validity" and generalizability of the SCI. Structural validity is indicated by the degree of homogeneity or internal statistical consistency of the test (Loevinger, 1979). Although factor analytic procedures cannot provide direct evidence of sequentiality of stages, the frequency distribution of experiences on the conceptual scales or empirical factors should be consistent with the developmental sequence proposed by Vedic Psychology.

OVERVIEW OF RESULTS
THE EMPIRICAL STRUCTURE OF HIGHER STATES OF CONSCIOUSNESS EXPERIENCE—In an initial study of nonmeditating college students (N = 70), a subset of SCI items primarily concerning cosmic consciousness experience were embedded in a questionnaire with additional normal waking state, neurotic, and schizophrenic experience items (Alexander, 1978b). Principal component factor analysis of these items employing a varimax rotation revealed that cosmic consciousness items weighted highly (λ = .57) on the first factor, which accounted for 33% of the variance among the items. This factor was orthogonal to two additional factors that clearly corresponded to a normal/neurotic factor, and a schizophrenic experience factor. The cosmic consciousness experiences were thus not only related to one another conceptually and clearly distinct from normal and pathological experience, but they were also highly interrelated statistically and distinct from empirical factors corresponding to the other two classes of experience.

In a cross-sectional study (N = 133) of prison inmates with approximately one-third TM meditators, principal component factor analysis with varimax rotation was performed on the scores for each of the face-valid conceptual scales of the SCI (Alexander, 1982). Three higher-order factors accounted for 89% of the variance: a higher state of consciousness factor on which the CC, RCC, and UC scales loaded at >.50; a neurotic waking state factor on which the neuroticism and normal waking state scales loaded at >.50; and a schizophrenic factor on which the schizophrenic scale alone loaded highly at >.50. Although all three higher consciousness scales loaded very highly on the same factor, this does not necessarily imply that they refer to the exact same set of experiences. The first-order correlations of the CC scale with the RCC and UC scales were .25 and .30, respectively; the correlation of RCC and UC was .40. This may suggest that the three scales represent empirically correlated though certainly not redundant sets of experience that share a common underlying factor structure relatively independent of the structures corresponding to waking, neurotic, or schizophrenic experience. It is possible that the common underlying structure is the "ground state" of transcendental consciousness said to underlie all higher states of consciousness (Maharishi Mahesh Yogi, 1978).

In a longitudinal study of the same inmate group, factor analysis of a subset of 35 items of the SCI was performed separately for the same subjects at pretest and posttest. A three-factor solution accounted for approximately 35% of the variance on the pretest and posttest items. In support of the structural validity of the SCI, the number of factors and the inherent structure of these three rotated factors were highly stable from pretest to posttest. The items that loaded highly on each of the three factors were virtually identical at pretest and posttest. When the 35 items from the SCI were treated as individual units with the item's loading on the SCI factors as the unit's score, then the loadings for these items on pretest factor 1 (the higher state factor, which accounted for approximately 16% of the total variance) correlated .82 with the loadings for the same items on posttest factor 1. Hence, the empirical structure of the higher state of consciousness factor proved highly stable from pretest to posttest over an average 15-month period.

The substantive validity of the SCI was supported by the finding that these three empirical factors
ALEXANDER ET AL.
DEVELOPMENT OF PERSONALITY: HIGHER STATES OF CONSCIOUSNESS — PAPER 312

(based on the statistical clustering of individual items) were highly consistent with the original three higher-order factors classifying the SCI conceptual scales derived during the initial cross-sectional testing described above. Eleven of the twelve face-valid conceptual items on higher states of consciousness weighted most highly on the empirical higher state of consciousness factor, at loadings from .46 to .66; the second and third factors corresponded to normal waking state and schizophrenic experiences, respectively. Consistent with our predictions, both cross-sectionally and longitudinally the higher state of consciousness face-valid items and scales were repeatedly found to form a highly consistent empirical factor that was conceptually and empirically distinguishable from waking and schizophrenic experience.

Finally, in Jedrzcak and Alexander's (in review a) sample of advanced TM and TM-Sidhi program participants (N = 104), scores on SCI conceptual scales for transcendental consciousness (TC), CC, and UC (RCC was excluded from the inventory) were also highly correlated, from \( r = .41 \) to \( r = .71 \). Further, relative frequency of experience of the three separate higher states of consciousness was consistent with the developmental sequence proposed by Vedic Psychology. Experiences of TC occurred with significantly greater frequency than did experiences of CC, which in turn occurred with greater frequency than did experience of UC \( (p < .001) \). Experiences of the next higher stage beyond the modal level for a subject appeared to occur with more frequency than did experiences of states that were still further removed from typical levels of experience.

In all of the above studies on states of consciousness that contained a waking state scale, usual waking state experiences occurred with greater frequency on the average than did higher state experiences. In the meditating samples, however, the relative ratio of higher stage experiences was higher, and there were some meditators who did experience higher states with greater frequency than usual waking state, and who also reported virtually no experiences on the negative dimensions.

EFFECT OF THE MAHARISHI TECHNOLOGY OF THE UNIFIED FIELD ON HIGHER STATE OF CONSCIOUSNESS EXPERIENCE—The consistent cross-sectional and longitudinal findings of positive associations between practice of the Maharishi Technology of the Unified Field and increased frequency of higher state of consciousness experience are summarized in table 1. In two longitudinal samples (total \( N = 80 \)) in an inmate population, higher state of consciousness experiences increased significantly in regular TM practitioners compared with a wait-list control, nonactive members, and nonmembers \( (p < .01 \) and \( p < .001 \)). In contrast to the two longitudinal TM samples, similar samples from each of two counseling programs and two other self-improvement groups did not improve relative to nonmembers of these respective programs (fig. 1).

Cross-sectionally \( (N = 103) \), active long-term TM practitioners scored higher than subjects interested and subjects not interested in learning the TM practice \( (p < .0001) \). In both the above longitudinal and cross-sectional studies, any demographic differences between the groups found to be empirically correlated with higher state of consciousness experience were adjusted for via analysis of covariance. The above findings were statistically significant even after controlling for potential self-selection factors that may otherwise have biased the outcome. Additionally, regularity in meditation correlated significantly with greater frequency of higher state experi-

FIG. 1. THE TREATMENT EFFECT (EXRESSED AS A POINT BIVARIAL CORRELATION ASSOCIATED WITH ACTIVE PARTICIPATION IN THE TRANSCENDENTAL MEDITATION (TM) PROGRAM, TWO COUNSELING PROGRAMS, AND TWO OTHER SELF-IMPROVEMENT PROGRAMS WAS ASSESSED OVER AN AVERAGE 15-MONTH PERIOD IN AN INMATE POPULATION, ADJUSTING FOR RELEVANT DEMOGRAPHIC COVARIATES. Active practitioners of the TM program increased significantly in frequency of higher state of consciousness experience in comparison to a wait-list control group and a not-interested group. In contrast, the active members of the other four programs did not change significantly relative to comparable control groups.

2. Items reflecting experience of TC were added to the SCI for the purposes of this study.
enences \((r = .54, N = 40, p < .0005)\) (Alexander, 1982).

The most unambiguous criterion in experiential report data for identifying the state of CC is the report of “witnessing” deep sleep—experiencing the inner wakefulness of transcendental consciousness along with deep sleep—which is considered by Vedic Psychology to be an important indicator that transcendental consciousness is becoming stabilized. Although there are some descriptions in the psychological literature of “lucid dreaming” or awareness during dreaming (Brown, 1936; LaBerge, 1980; Tart, 1979), it is unclear from such reports whether dreaming is being witnessed in the sense referred to in Vedic Psychology. It seems more likely that these reports describe transitional states between waking and dreaming, such as hypnagogic sleep, which may involve some degree of waking consciousness mixed with dreaming rather than the witnessing state associated with transcendental consciousness. Reports describing specifically the experience of witnessing deep sleep have apparently not appeared in the psychological literature.

Orme-Johnson and Edwards (1982) recently obtained reports of witnessing deep sleep in a survey given to a group of volunteers who were practicing the TM and TM-Sidhi program \((N = 235)\). Out of this

<table>
<thead>
<tr>
<th>EXPERIMENTAL DESIGN</th>
<th>EFFECT SIZEa</th>
<th>(p) LEVELb</th>
<th>TOTAL df</th>
<th>STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive longitudinal (13 months) change on HSCE in active TM members vs. wait-list controls, nonactive members, and nonmembers (sample 1)</td>
<td>(r_{pb} = .30)</td>
<td>&lt;.01</td>
<td>66</td>
<td>Alexander, 1982</td>
</tr>
<tr>
<td>Positive longitudinal (17 months) change on HSCE in active TM members vs. wait-list controls, nonactive members, and nonmembers (sample 2)</td>
<td>(r_{pb} = .35)</td>
<td>&lt;.001</td>
<td>66</td>
<td>Alexander, 1982</td>
</tr>
<tr>
<td>Cross-sectional comparison on HSCE in active long-term TM members vs. subjects interested and not interested in learning TM</td>
<td>(r_{pb} = .37)</td>
<td>&lt;.0001</td>
<td>96</td>
<td>Alexander, 1982</td>
</tr>
<tr>
<td>Association of regularity of TM practice with HSCE</td>
<td>(r = .54)</td>
<td>&lt;.0005</td>
<td>38</td>
<td>Alexander, 1982</td>
</tr>
<tr>
<td>Association of length of time practicing TM and TM-Sidhi program with frequency of HSCE</td>
<td>(r = .20)</td>
<td>&lt;.025</td>
<td>102</td>
<td>Jedrczak and Alexander, in review a</td>
</tr>
<tr>
<td>(r = .29)</td>
<td>&lt;.01</td>
<td>74</td>
<td>Jedrczak and Alexander, in review a</td>
<td></td>
</tr>
<tr>
<td>Cross-sectional comparison of frequency of HSCE in long- and short-term TM groups and a nonmeditating control group</td>
<td>(\epsilon = .67^{a})</td>
<td>&lt;.0001</td>
<td>2, 41</td>
<td>Jedrczak and Alexander, in review b</td>
</tr>
<tr>
<td>(\epsilon = .56^{d})</td>
<td>&lt;.0005</td>
<td>2, 41</td>
<td>Jedrczak and Alexander, in review b</td>
<td></td>
</tr>
<tr>
<td>Frequency of HSCE in long-term TM (10.2 years) in comparison to their reported level prior to learning TM</td>
<td>(r_{pb} = .91)</td>
<td>&lt;.0001</td>
<td>14</td>
<td>Jedrczak and Alexander, in review b</td>
</tr>
<tr>
<td>(r_{pb} = .92)</td>
<td>&lt;.0001</td>
<td>14</td>
<td>Jedrczak and Alexander, in review b</td>
<td></td>
</tr>
<tr>
<td>Frequency of HSCE in short-term TM (2.5 years) in comparison to their reported level prior to learning TM</td>
<td>(r_{pb} = .70)</td>
<td>&lt;.0005</td>
<td>13</td>
<td>Jedrczak and Alexander, in review b</td>
</tr>
<tr>
<td>(r_{pb} = .61)</td>
<td>&lt;.01</td>
<td>13</td>
<td>Jedrczak and Alexander, in review b</td>
<td></td>
</tr>
</tbody>
</table>

a. Though specific statistical tests employed included \(t\)-tests, ANOVA, and ANCOVA, all outcomes not already expressed as correlations are converted into point biserial correlations \((r_{pb})\), or their equivalents, which provide a measure of “effect size” independent of sample size, and hence permit comparison of treatment effect sizes across studies. The \(r_{pb}\) is equivalent in its statistical interpretation to the Pearson correlation coefficient. An \(r_{pb} > .37\) is considered a large effect size in the behavioral sciences, an \(r_{pb} > .24\) a medium effect size, and \(r_{pb} > .10\) a small effect size (Cohen, 1977).

b. Due to the clear directionality of prediction in the context of this review, all tests of significance are consistently reported as one-tailed.

c. Excluding any subjects with misleading responses.

d. Epsilons \((\epsilon)\) were computed for \(F\)-tests with more than one degree of freedom in the numerator. \(\epsilon\) bears the same relationship to \(F\) that \(r_{pb}\) bears to \(t\).

e. Cosmic consciousness (CC) experiences.

f. Unity consciousness (UC) experiences.
sample, 7.6% reported "regular" experiences of clear inner awareness (transcendental consciousness) throughout a night's sleep, 7.4% reported "frequent" experiences, 40.4% reported "occasional" experiences (once a week or sporadically), 27.2% reported having the experience once or twice, and 17.4% reported either vague or no experiences of witnessing deep sleep.

In a large sample of advanced practitioners of the Maharishi Technology of the Unified Field from Great Britain (Jedrczak and Alexander, in review a), number of months' practice of the Transcendental Meditation and TM-Sidhi program was significantly correlated with frequency of experience of higher states of consciousness, as measured by an SCI short form \( r = .20, N = 104, p < .025 \); \( r = .29, N = 76, p < .01 \), if all subjects with misleading responses are eliminated.

A second cross-sectional study using an SCI short form with another British sample (Jedrczak and Alexander, in review b) compared the frequency of higher state of consciousness experience in long-term practitioners of the Maharishi Technology of the Unified Field (\( N = 15, 10.2 \) years' TM technique and 5.6 years' practice of the advanced TM-Sidhi program) with the frequency of such experiences in shorter-term practitioners (\( N = 14, 2.5 \) years' TM technique and three weeks' TM-Sidhi participation) and in a nonmeditating control group (\( N = 15 \)). The groups were matched on gender and were similar in age and education. According to retrospective report, the baseline level of experience of higher states of the two TM groups before having learned the practice was similar to that indicated by the nonmeditating baseline control. Further, the meditating groups and control group did not significantly differ in their low level of response to misleading items.

As predicted, these groups significantly differed in their rate of reporting experiences of higher states. There was a highly significant difference between the frequency of CC and UC higher state experiences by the long-term and shorter-term meditators and the nonmeditating controls (\( p < .0001 \) and \( p < .0005 \), for CC and UC experiences, respectively). Also, the advanced TM group reported significantly more frequent experiences of both CC and UC than the shorter-term group (\( p < .005 \)), who in turn had more frequent experiences of CC (\( p < .01 \)) and a trend toward more UC experiences (\( p < .1 \)) than the nonmeditating control. In comparison to their retrospectively reported baseline levels of experience before learning the TM technique, the long-term and short-term TM groups increased significantly in frequency of experiences of higher states, such as CC experiences (\( p < .0001 \) and \( p < .005 \), respectively) (fig. 2).

In the large cross-sectional British sample, CC experiences occurred with greater frequency than UC experiences; whereas, in the smaller British sample the apparent rates of CC and UC experiences were relatively similar within groups. This latter finding could be due to measurement error or may be specific to the small sample under investigation and the particular items selected from the SCI to reflect states of consciousness. Nevertheless, the possibility cannot be excluded that some subjects may be having experiences that span several levels of higher development simultaneously. In the measurement of self and moral development in the usual waking state range, it is often found that individual scores span several levels although they are typically modally distributed about one central stage (e.g., Loevinger, 1976; Rest, Turiel, and Kohlberg, 1969). This may be especially the case for subjects whose rate of development through higher states of consciousness is being rapidly enhanced through the Maharishi Technology of the Unified Field. The advanced TM-Sidhi program is designed not only to stabilize transcendental consciousness in CC, but to simultaneously promote growth to UC by enhancing coherence in the various channels of mind-body coordination and accelerating the integration of transcendental consciousness with thought and behavior. Nevertheless, it would be predicted that the stages would fully stabilize according to the predicted sequence.

In the United States samples, the practitioners did not score higher than the nonmeditators on the misleading items scale, nor did they score higher on an independent lie scale measure. In the first Great Britain study with the larger sample, results were more statistically significant after data for subjects who scored relatively high on the misleading items scale were removed. In a second Great Britain study, the meditating groups and nonmeditating groups had similar scores on misleading items. It is therefore unlikely that a tendency to respond to misleading or grandiose statements inflated the response rate of TM practitioners relative to nonmeditators.

PERSONALITY, COGNITIVE-PERCEPTUAL, AND PHYSIOLOGICAL CORRELATES OF HIGHER STATE
FIG. 2. FREQUENCY OF REPORTED HIGHER STATE OF CONSCIOUSNESS EXPERIENCES INCREASED SIGNIFICANTLY WITH LENGTH OF TIME PRACTICING THE TRANSCENDENTAL MEDITATION AND TM-SIDHI PROGRAM, IN COMPARISON TO RETROSPECTIVE REPORTS OF FREQUENCY OF THESE EXPERIENCES BEFORE STARTING THE PROGRAM AND REPORTS FROM A NONMEDITATING CONTROL GROUP. Long-term TM practitioners (10.2 years' average) reported more frequent higher state of consciousness experiences than did short-term (2.2 years' average) practitioners, who in turn reported more frequent higher state experiences than did nonmeditators.

FIG. 3. ENHANCED FREQUENCY OF HIGHER STATE OF CONSCIOUSNESS EXPERIENCES (FROM TRANSCENDENTAL CONSCIOUSNESS THROUGH UNITY CONSCIOUSNESS) HAS BEEN SIGNIFICANTLY CORRELATED WITH INCREASED SELF-ACTUALIZATION AND INTERNAL LOCUS OF CONTROL; ENHANCED CAPACITY FOR ABSORPTION; DECREASED SYMPTOMS OF STRESS; IMPROVED PERFORMANCE ON MEASURES OF CREATIVITY AND COGNITIVE, PERCEPTUAL, AND MOTOR SKILLS; FASTER HOFFMAN REFLEX RECOVERY; INCREASED ALPHA AND THETA EEG COHERENCE; AND PERIODS OF RESPIRATORY SUSPENSION DURING PRACTICE OF THE TRANSCENDENTAL MEDITATION TECHNIQUE.
OF CONSCIOUSNESS EXPERIENCES—An important question that remains to be clarified is whether increased frequency of higher state of consciousness experiences is meaningfully related to a network of enhanced behavioral performances as predicted by Vedic Psychology. As will be shown in the following sections, the answer to this question is clearly affirmative. Both in meditating and nonmeditating samples, frequency of higher state of consciousness experiences is significantly correlated with higher performance levels on a wide range of personality, cognitive-perceptual, and physiological measures (fig. 3 and table 2).

**Personality correlates of higher state experience:** For nonmeditating college student samples, frequency of higher state of consciousness experience has been significantly and positively associated with a series of personality variables. Higher self-actualization, as independently judged by peers, was observed

### TABLE 2
**PERSONALITY, COGNITIVE-PERCEPTUAL, AND PHYSIOLOGICAL CORRELATES OF FREQUENCY OF HIGHER STATE OF CONSCIOUSNESS EXPERIENCE (HSCE)**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>CORRELATION WITH FREQUENCY OF HSCE</th>
<th>( p ) LEVEL</th>
<th>df</th>
<th>SAMPLE COMPOSITION</th>
<th>STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-actualization (peer rated)</td>
<td>( r_{pb} = .39 )</td>
<td>&lt;.05</td>
<td>21</td>
<td>non-TM</td>
<td>Alexander, 1979</td>
</tr>
<tr>
<td>Self-actualization (Personal Orientation Inventory, POI)</td>
<td>( r = .83 )</td>
<td>&lt;.005</td>
<td>12</td>
<td>non-TM</td>
<td>Gomes, 1981</td>
</tr>
<tr>
<td>Self-actualization (POI)</td>
<td>( r_{pb} = .26 )</td>
<td>&lt;.01</td>
<td>88</td>
<td>combined TM and non-TM</td>
<td>Davies, 1974</td>
</tr>
<tr>
<td>Maintenance of inner sense of self during stressful situations</td>
<td>( r = .33 )</td>
<td>&lt;.005</td>
<td>68</td>
<td>non-TM</td>
<td>Alexander, 1978b</td>
</tr>
<tr>
<td>Internal locus of control (Rotter)</td>
<td>( r = .34 )</td>
<td>&lt;.05</td>
<td>31</td>
<td>non-TM</td>
<td>Vogelman, 1978</td>
</tr>
<tr>
<td>Capacity for absorption and total attention (Tellegen's Absorption Scale, TAS)</td>
<td>( r = .48 )</td>
<td>&lt;.0001</td>
<td>68</td>
<td>non-TM</td>
<td>Alexander, 1978b</td>
</tr>
<tr>
<td>Capacity for absorption and total attention (TAS)</td>
<td>( r = .39 )</td>
<td>&lt;.0001</td>
<td>91</td>
<td>TM and non-TM</td>
<td>Alexander, 1982</td>
</tr>
<tr>
<td>Hypnotizability (Harvard scale)</td>
<td>( r = .03 )</td>
<td>NS</td>
<td>68</td>
<td>non-TM</td>
<td>Alexander, 1978b</td>
</tr>
<tr>
<td>Participation in constructive social and work activities</td>
<td>( r = .27 )</td>
<td>&lt;.005</td>
<td>101</td>
<td>TM and non-TM</td>
<td>Alexander, 1982</td>
</tr>
<tr>
<td>Plans to participate in additional constructive social and work activities</td>
<td>( r = .46 )</td>
<td>&lt;.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lower levels of:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trait anxiety (State-Trait Anxiety Inventory)</td>
<td>( r_{pb} = .34 )</td>
<td>&lt;.001</td>
<td>88</td>
<td>TM and non-TM</td>
<td>Davies, 1974</td>
</tr>
<tr>
<td>Anxiety (Special Hospital Assessment of Personality and Socialization, SHAPS)</td>
<td>( r = .29 )</td>
<td>&lt;.005</td>
<td>100</td>
<td>TM and non-TM</td>
<td>Alexander, 1982</td>
</tr>
<tr>
<td>Aggression (SHAPS)</td>
<td>( r = .29 )</td>
<td>&lt;.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression (SHAPS)</td>
<td>( r = .27 )</td>
<td>&lt;.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introversion (SHAPS)</td>
<td>( r = .28 )</td>
<td>&lt;.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cognitive and Perceptual Skills</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creativity (Wallach and Kogan's Test of Improbable Situations)</td>
<td>( r = .55 )</td>
<td>&lt;.0005</td>
<td>31</td>
<td>non-TM</td>
<td>Vogelman, 1978</td>
</tr>
<tr>
<td>Fluency (Torrance Test of Creative Thinking, TTCT)</td>
<td>( r = .38 )</td>
<td>&lt;.0001</td>
<td>102</td>
<td>TM and TM-Sidhi</td>
<td>Jedrezak and Alexander, in review a</td>
</tr>
<tr>
<td>Fluency (TTCT)</td>
<td>( r_{pb} = .54 )</td>
<td>&lt;.005</td>
<td>20</td>
<td>TM and TM-Sidhi</td>
<td>Orme-Johnson and Haynes, 1981</td>
</tr>
</tbody>
</table>

2433
TABLE 2 (Continued)

PERSONALITY, COGNITIVE- PERCEPTUAL, AND PHYSIOLOGICAL CORRELATES
OF FREQUENCY OF HIGHER STATE OF CONSCIOUSNESS EXPERIENCE (HSCE)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>CORRELATION WITH FREQUENCY OF HSCE</th>
<th>p LEVEL</th>
<th>df</th>
<th>SAMPLE COMPOSITION</th>
<th>STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cognitive and Perceptual Skills (Continued)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creativity (TTCT):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novel uses</td>
<td>$r = .65$</td>
<td>&lt;.005</td>
<td>13</td>
<td>TM and TM-Sidhi</td>
<td>Orme-Johnson et al., 1977</td>
</tr>
<tr>
<td>Fluency</td>
<td>$r = .56$</td>
<td>&lt;.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Originality</td>
<td>$r = .51$</td>
<td>&lt;.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility</td>
<td>$r = .37$</td>
<td>NS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhanced TM-Sidhi performance (mind-body coordination)</td>
<td>$r = .67$</td>
<td>&lt;.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceptual speed (Ekstrom's matching objects test)</td>
<td>$r = .25$</td>
<td>&lt;.01</td>
<td></td>
<td>TM and TM-Sidhi</td>
<td>Jedrczak and Alexander, in review a</td>
</tr>
<tr>
<td>Psychomotor speed (opposites test on Schaele's Test of Behavioral Rigidity, TBR)</td>
<td>$r = .24$</td>
<td>&lt;.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility (TBR)</td>
<td>$r = .23$</td>
<td>&lt;.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor speed (Botwinick's line crossing test)</td>
<td>$r = .23$</td>
<td>&lt;.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonverbal intelligence (WAIS digit symbol test)</td>
<td>$r = .21$</td>
<td>&lt;.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual recognition memory (Ekstrom's shape memory task)</td>
<td>$r = .17$</td>
<td>&lt;.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physiological (TC experiences during TM)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory suspension</td>
<td>$\epsilon = .96$</td>
<td>&lt;.0001</td>
<td>2, 14</td>
<td>TM and TM-Sidhi</td>
<td>Farrow and Hebert, 1982</td>
</tr>
<tr>
<td>Decreased heart rate</td>
<td>$\epsilon = .41$</td>
<td>&lt;.0001</td>
<td>17, 170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alpha EEG coherence</td>
<td>$\epsilon = .37$</td>
<td>&lt;.001</td>
<td>17, 170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theta EEG coherence</td>
<td>$\epsilon = .30$</td>
<td>&lt;.01</td>
<td>17, 170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta EEG coherence</td>
<td>$\epsilon = .67$</td>
<td>&lt;.0001</td>
<td>17, 170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher basal GSR</td>
<td>$\epsilon = .41$</td>
<td>&lt;.01</td>
<td>17, 170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased phasic GSR</td>
<td>$\epsilon = .41$</td>
<td>&lt;.01</td>
<td>17, 170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bifrontal alpha EEG coherence</td>
<td>$r = .43$</td>
<td>&lt;.025</td>
<td>21</td>
<td>TM and TM-Sidhi</td>
<td>Haynes et al., 1977</td>
</tr>
<tr>
<td>Faster rate of Hoffman reflex recovery</td>
<td>$r = .65$</td>
<td>&lt;.005</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total alpha EEG coherence</td>
<td>$r_{pb} = .69$</td>
<td>&lt;.0005</td>
<td>20</td>
<td>TM and TM-Sidhi</td>
<td>Orme-Johnson and Haynes, 1981</td>
</tr>
<tr>
<td>Total theta EEG coherence</td>
<td>$r_{pb} = .50$</td>
<td>&lt;.01</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total alpha EEG coherence</td>
<td>$r_{pb} = .64$</td>
<td>&lt;.005</td>
<td>13</td>
<td>TM and TM-Sidhi</td>
<td>Orme-Johnson et al., 1977</td>
</tr>
<tr>
<td>Simultaneous slow-wave and rhythmic beta during light sleep</td>
<td></td>
<td></td>
<td></td>
<td>TM and TM-Sidhi</td>
<td>Banquet and Sallahan, 1977</td>
</tr>
<tr>
<td>Simultaneous delta and alpha spindles during deep sleep</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homolateral left alpha EEG coherence</td>
<td>$r = .32$</td>
<td>$p = .015$</td>
<td>35</td>
<td>TM</td>
<td>Orme-Johnson et al., 1977</td>
</tr>
<tr>
<td>Homolateral right alpha EEG coherence</td>
<td>$r = .30$</td>
<td>$p = .02$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Outcomes not already expressed as correlations are generally converted into point biserial correlations ($r_{pb}$), or their equivalents, which provide a measure of "effect size" independent of sample size, and hence permit comparison of effect sizes (i.e., degree of association between frequency of HSCE and other variables) across studies. The $r_{pb}$ is equivalent in its statistical interpretation to the Pearson correlation coefficient. An $r_{pb} > .37$ is considered a large effect size in the behavioral sciences, an $r_{pb} > .24$ a medium effect size, and an $r_{pb} > .10$ a small effect size (Cohen, 1977).

b. Due to the clear directionality of prediction in the context of this review, all tests of significance are consistently reported as one-tailed.

c. Cosmic consciousness (CC) experiences.

d. Transcendental consciousness (TC) experiences.

e. Each cognitive, perceptual, and motor skill (Jedrczak and Alexander, in review a) was, typically, significantly correlated with more than one SCI higher state scale (TC, CC, UC scales were included). Only the highest SCI scale correlation is reported in table 2.

f. Epsilons ($\epsilon$) were computed for F-tests with more than one degree of freedom in the numerator. $\epsilon$ bears the same relationship to F that $r_{pb}$ bears to t.
in subjects who reported the CC experience of witnessing dreaming compared to those who did not ($r_{pb} = .39, N = 23, p < .05$) (Alexander, 1979). Similarly, subjects ($N = 10$) who reported at least one experience of witnessed dreaming, as measured by selected SCI items, attained superior overall self-actualization scores ($r$, equivalent $= .83, p < .005$) on the Personal Orientation Inventory (Shostrom, 1966), as indicated by higher average score than subjects with no such experience ($N = 10$) on the subscales for inner-directedness, self-actualizing value, existentially, feeling reactivity, spontaneity, self-regard, synergy, acceptance of aggression, and capacity for intimate contact (Gomes, 1981).

In a separate study (Alexander, 1978b), more frequent experience of higher states was significantly associated with increased capacity for absorption or episodes of total attention, and expanded perception of the self, as indicated by higher score on Tellegen’s Absorption Scale (Tellegen and Atkinson, 1974) ($r = .48, N = 70, p < .0001$); and increased self-report of inner stability of self even when physically or emotionally in a potentially stressful situation with others ($r = .33, N = 70, p < .005$). Frequency of higher state experiences (Vogelman, 1978) was also associated with lower scores on self-report measures of disharmony, lack of spontaneity, lack of humor, and with a higher score on Rotter’s (1966) measure of internal locus of control ($N = 33, p < .05$ in all cases). In both the Alexander (1978b) and Vogelman (1978) studies, the higher state of consciousness items, which mainly dealt with CC experiences (Maharishi Mahesh Yogi, 1966), formed an empirical factor that was distinct from and clearly negatively associated with schizophrenic experience items.

Interestingly in the Alexander (1978b) study, higher state of consciousness experience was found to be uncorrelated with hypnotizability ($N = 70, r = .03$, NS) as measured by the Harvard scale (Shor and Orne, 1962), even though both higher state experience and hypnotizability tend to be associated with capacity for absorption. Subjects who experience higher states more frequently appear to have a greater capacity for absorption, but apparently do not have a desire or tendency to allow their capacity for episodes of total attention to translate into a susceptibility for hypnotic suggestion.

In a study of college students ($N = 90$) in Australia (Davies, 1974) that included new TM meditators (28%), greater frequency of self-reported experience of transcendental consciousness was found to be correlated with higher self-actualization scores on the Personal Orientation Inventory ($r_{pb} = .26, p < .01$) and lower trait anxiety ($r_{pb} = .34, p < .001$) on the State-Trait Anxiety Inventory (Spielberger, Gorsuch, and Lushene, 1970). Frequency of nonordinary high imagery experiences or “complete relaxation” were not significantly correlated with these measures ($r > .1$).

In a sample that included approximately one-third meditators drawn from an inmate population (Alexander, 1982), superior score on the higher state of consciousness experience factor was positively correlated with Tellegen’s measure of capacity for absorption ($r = .39, N = 93, p < .0001$); and increased participation in constructive social and work activities ($N = 103, r = .27, p < .005$) or plans to join such activities ($N = 103, r = .46, p < .0001$). Higher score on the consciousness factor ($N = 102$) was also correlated with lower score on anxiety ($r = .29, p < .005$), aggression ($r = .29, p < .005$), depression ($r = .27, p < .005$), and introversion ($r = .28, p < .005$), as measured by the Special Hospitals Assessment of Personality and Socialization (Blackburn, 1971). Finally, the higher state of consciousness factor was orthogonal to the normal waking state factor and clearly negatively associated with the schizophrenic experience factor and the SCI neuroticism scale.

Cognitive and perceptual correlates of higher state of consciousness experience: In the only study of cognitive variables in a nonmeditating sample, Vogelman (1978) found that an SCI consciousness factor that weighted highly on such experiences as inner silence and unbounded awareness was highly correlated ($r = .55, N = 33, p < .0005$) with a performance measure of creativity, Wallach and Kogan’s Test of Improbable Situations (Wallach and Kogan, 1965).

In Jedrczak and Alexander’s (in review a) sample of advanced Transcendental Meditation and TM-Sidhi participants ($N = 104$), frequency of higher state of consciousness experiences on the SCI (which included TC, CC, and UC scales) was significantly correlated, typically on more than one higher state scale, with several performance measures of cognitive skill. (The highest SCI scale correlation with each cognitive measure is reported below.) Frequency of higher state experience was most highly correlated with fluency score for unusual uses on Torrance’s (1974) Test of Creative Thinking ($r = .38, p < .0001$). Frequency of higher state experiences was also pos-
itively associated with perceptual speed on the matching objects test (Ekstrom, French, Harman, and Derman, 1976) \( (r = .25, p < .01) \); psychomotor speed \( (r = .24, p < .01) \) and flexibility \( (r = .23, p < .01) \) on the opposites tests of the Test of Behavioral Rigidity (Schaie and Parham, 1975); the line crossing test of motor speed (Botwinick and Storandt, 1973) \( (r = .23, p < .01) \); score on the WAIS Digit Symbol Task of nonverbal intelligence \( (r = .21, p < .025) \); and visual recognition memory for meaningless shapes (Ekstrom et al., 1976) \( (r = .17, p < .05) \).

In another sample of advanced participants in the TM and TM-Sidhi program \( (N = 22) \), self-report experience of clarity of transcendental consciousness was highly associated with the fluency subscale of Torrance’s Test of Creative Thinking \( (r = .54, p < .005) \) (Orme-Johnson and Haynes, 1981). In a second sample \( (N = 15) \), drawn from the same population of primarily young adults who were advanced participants in the Maharishi Technology of the Unified Field, self-report of growing experience of CC, as indicated by frequency of witnessing of deep sleep, was positively correlated with self-report of clarity of transcending during meditation \( (r = .77, p < .0001) \) as well as with four subtests of the Torrance Test of Creative Thinking, including novel uses \( (r = .65, p < .005) \), fluency \( (r = .56, p < .01) \), originality \( (r = .51, p < .05) \), and flexibility \( (r = .37, NS) \); and with more frequent experiences of the TM-Sidhi performances \( (r = .67, p < .005) \) such as development of intuition, refinement of sensory thresholds, and enhanced mind-body coordination (Orme-Johnson, Clements, Haynes, and Badaoui, 1977).

**Physiological correlates of higher state of consciousness experiences:** In a sample of primarily European and American young adult long-term participants in the Maharishi Technology of the Unified Field \( (N = 40) \), experiences of pure awareness or transcendental consciousness (as indicated by button press during the practice) was highly time correlated (subsample \( N = 11, p < 10^{-10} \)) with periods up to 53 seconds long of natural respiratory breath suspension (Farrow and Hebert, 1982). In contrast, periods of respiratory suspension were rarely observed among relaxing control subjects. In an extensive repeated measures investigation of a single advanced TM meditator (Farrow and Hebert, 1982), periods of transcendental consciousness were also significantly associated with alpha \( (p < .0001) \), theta \( (p < .001) \), and beta \( (p < .01) \) EEG coherence, decreased heart rate \( (p < .0001) \), heightened basal GSR \( (p < .0001) \), and more stable phasic GSR \( (p < .0001) \) (see table 2).

The results of the Farrow and Hebert study were supported and extended in another investigation employing European and American advanced practitioners of the TM program \( (N = 54) \), a nonmeditator relaxation control group \( (N = 31) \), and a voluntary breath-holding group \( (N = 30) \) (Badawi et al., 1984). Again it was found that subjective report of transcendental consciousness during TM practice tended to be associated with periods of natural respiratory suspension. These periods of respiratory suspension were accompanied by a significant increase in total EEG coherence over all frequency bands in comparison to immediately prior and subsequent periods during meditation \( (p < .005) \). The voluntary breath-holding group did not significantly change in level of EEG coherence during forced periods of breath holding.

Haynes, Hebert, Reber, and Orme-Johnson (1977) found that reports of clear experience of transcendental consciousness were associated with higher bi-frontal alpha EEG coherence \( (r = .43, N = 23, p < .025) \) and faster rate of Hoffman (H) reflex recovery considered as a measure of neurological efficiency \( (r = .65, N = 15, p < .005) \). Similarly, Orme-Johnson and Haynes (1981) found that subjects who reported clear experience of transcendental consciousness and the TM-Sidhi performances \( (N = 12) \) showed significantly higher alpha \( (r_{pb} = .69, p < .0005) \) and theta \( (r_{pb} = .50, p < .01) \) EEG coherence in frontal and central regions than did subjects \( (N = 10) \) who did not report such experiences. In another study, Orme-Johnson, Wallace, Dillbeck, Alexander, and Ball (in press b) found CC experience as measured by the SCI to be significantly correlated with homolateral left alpha EEG coherence \( (r = .32, N = 37, p = .015) \) and homolateral right alpha EEG coherence \( (r = .30, N = 37, p = .02) \).

Self-report experience of the CC experience of witnessing during sleep was also found to be highly correlated with alpha coherence \( (r = .64, N = 15, p < .005) \) averaged across bi-frontal, bi-central, right frontal-central, and left frontal-central areas of the brain (Orme-Johnson et al., 1977). In turn, bi-frontal alpha coherence has been found to be significantly correlated with measurement of a postulated highest stage of moral reasoning (Nidich, Ryncarz, Abrams, Orme-Johnson, and Wallace, 1983). Frontal-central EEG coherence was significantly correlated with enhanced verbal and figural creativity (Torrance,
Alexander et al.
Development of Personality: Higher States of Consciousness

...1974), fluid intelligence (Wechsler, 1955), principled moral reasoning (Rest, 1975), and decreased neuroticism (Alexander, 1982) in advanced TM practitioners (Orme-Johnson et al., in press b).

Finally, there is evidence for a qualitative difference in EEG during sleep for advanced TM participants who report CC experiences. Some of the subjects in a sleep experiment exhibited slow wave activity and rhythmic beta simultaneously during light sleep; many also displayed delta waves and alpha spindles simultaneously during deep sleep (Banquet and Sailhan, 1977). Both of these findings were associated with the subjects' reports of the CC experience of inner wakefulness or witnessing during sleep. Also, dream phases became shorter and less frequent for these subjects, and they were observed to require far less sleep than is typical for adults.

**DISCUSSION**

The following ten points summarize the above findings on the subjective experience of higher states of consciousness as measured by the SCI, and demonstrate their consistency with the theory of Vedic Psychology and the unfreezing human development hypothesis.

First, the higher state experience items of the SCI did form a conceptually meaningful factor that was empirically distinct from waking or pathological classes of experiences, and that remained relatively stable across time and different samples. These findings support the substantive and structural validity of the SCI, and hence contribute to establishing the validity of the underlying constructs that the SCI attempts to measure. Although the results of the largest cross-sectional study (Jedrczak and Alexander, in review b) are consistent with the developmental sequence proposed in Maharishi's Vedic theory of seven states of consciousness, a rigorous test of the sequentiality of higher states awaits a major longitudinal investigation.

Second, nonmeditating samples with apparently no prior intellectual or experiential exposure to Vedic Psychology do report experience of higher states, although much less frequently than do practitioners of the Maharishi Technology of the Unified Field. When different higher state of consciousness experiences are found to consistently weigh highly on the same distinctive underlying factor even for nonmeditating samples, it is unlikely that this empirical outcome is due to the subjects' prior intellectual exposure to, or belief in, the Maharishi Technology of the Unified Field. This finding supports the claim that such experiences are naturally occurring states that do not require adoption of a particular intellectual belief system for their experience.

Third, the efficacy of the Maharishi Technology of the Unified Field appears to be in its ability to systematically increase the frequency of experience of these higher states, even among populations otherwise unlikely to have such experiences, such as adult prisoners. Several cross-sectional and longitudinal studies indicated that regular practice of the Maharishi Technology of the Unified Field enhanced frequency of experience of higher states in comparison to participation in other treatment and control groups.

Fourth, higher state of consciousness experiences occur not only in meditating and nonmeditating samples in the United States, but also in different cultural groups. The studies reviewed above also included samples from Europe and Australia, as well as adult prison samples. The latter clearly represent a rather divergent subculture with a lower socio-economic profile and a higher rate of ethnic minorities. These findings, along with results indicating that the Maharishi Technology of the Unified Field appears to produce similar effects across widely differing cultural and geographical locations (Orme-Johnson and Farrow, 1977; Chalmers et al., in press), are consistent with the proposition that higher stages of consciousness are universally available to human experience and development.

The fifth point is that frequency of higher state of consciousness experience is correlated with a wide range of beneficial personality, cognitive-perceptual, and physiological effects that would be expected to be associated with advanced human development. If subjects were simply attempting to fake good scores or provide socially desirable results on the SCI, this should have attenuated the relationship of high scores on the SCI with other meaningful behaviors such as performance measures of creativity or of nonverbal intelligence. Encouraging were the findings that TM practitioners did not score higher than nonmeditators on the misleading items (M) scale for pseudo higher state experience and the fact that significant correlations between higher state experience and beneficial behaviors were still observed even when controlling for level of M-response.

2437
If higher states of consciousness do reflect post-conceptual development beyond the ordinary endpoint of cognitive growth, the level of formal operations proposed by Piaget, then especially those aspects of cognition that concern originality and fluency in creative thinking would be promoted. Arlin (1975) has proposed that, although formal operational thought is devoted to logical solutions to already posed problems, postformal operational thought would be capable of "problem finding": originality in the posing of new problems and perspectives. In fact, in four different studies, performance measures of creativity were found to be significantly associated with more frequent experience of higher states.

In addition to the findings on creativity, the two findings on enhanced capacity for absorption support the view that experience of higher states may be associated with a postconceptual orientation. The capacity for absorption scale clearly links capacity for episodes of total attention to "nonpropositional" modes of processing information (Tellegen and Atkinson, 1974). Many of the items are concerned with the ability to process conceptual information visually or through other sensory modes, and to respond to others and to the larger environment on an intuitive or feeling level. However, this does not imply that individuals who more frequently have higher state experiences lose the ability to reason analytically. Rather, this ability appears to become supplemented by and integrated with new modes of gaining knowledge of the world. For example, it has been shown repeatedly that the TM technique promotes intelligence growth rate, a measure which is related to analytic reasoning, as well as increased creativity.

Sixth, several studies have demonstrated that the higher state of consciousness experience factor is completely distinct from a factor associated with pathological experience. Also, negative or stress-related symptoms were consistently found to be lower in subjects who reported more frequent experiences of higher states. Increased frequency of higher state experience was correlated with lower anxiety, disharmony, and aggression, and less frequent neurotic and schizophrenic experiences. These findings support the prediction from Vedic Psychology that accumulation of stress, measured psychologically or physiologically, will tend to block further human development, and the neutralization of stress will help to unfreeze human development.

Seventh, the prediction that growth to higher states of consciousness should be accompanied by further development of the self is supported by the three results on enhanced self-actualization; the two outcomes on increased capacity for absorption (which is believed to be associated with expanded conception of the self); and the findings of a higher level of internal locus of control and maintenance of an inner sense of self under stressful conditions among subjects who more frequently experience higher states.

Eighth, the finding that frequency of higher state experience in nonmeditating as well as meditating samples is correlated with self-actualization is consistent with the notion that self-actualization as studied by Maslow (1970) and others may represent transitional experiences between ordinary adult waking state and higher states of consciousness. Maslow postulated self-actualization as the optimal state of self-development. The self-actualized individual has supposedly achieved the highest level of individual attainment, motivation, and self-regard, and has a tendency toward peak or transcendental experience (Maslow, 1962, 1970). Vedic Psychology describes the basis of higher states of consciousness as the stabilization of transcendental consciousness, the inner experience of an unbounded, universal sense of Self beyond the boundaries of the individual self (Maharishi Mahesh Yogi, 1969; see also Orme-Johnson et al., in press a). The first stabilized higher state of consciousness, cosmic consciousness, is characterized by permanent stabilization of transcendental consciousness and a shift to primary identification with it as the Self rather than with individual thoughts, feelings, or percepts, no matter how elevated they may be. The Maharishi Technology of the Unified Field appears to unfreeze and facilitate development through the self-actualization transition en route to stabilized higher states of consciousness (see Alexander, 1982, reviewed above). Also, a large number of studies have consistently indicated that practice of the TM program is directly associated with enhancement of self-actualization, as measured by standardized scales (for example, Davies, 1977; Ferguson and Gowan, 1976; Hjelle, 1974; Nidich, Seeman, and Dreskin, 1973; Seeman, Nidich, and Banta, 1972).

The ninth point is that marked enhancement of EEG coherence generated across frequency and hemispheric location during the Maharishi Technology of the Unified Field (e.g., Dillbeck and Bronson,
experience of higher states of consciousness reported in the above studies—for example, increased creativity.

This proposition is further supported by the repeated finding of higher EEG coherence in subjects who more frequently report the experience of higher states, and especially by marked coherence during subperiods of TM practice that correspond to the subjective report of transcendental consciousness. There is already growing evidence that enhanced EEG coherence in meditators is associated with postmeditation behaviors clearly indicative of further human development, including enhanced fluid intelligence, principled moral reasoning, concept formation, and creativity, as well as clearer experience of TM-Sidhi performances and more frequent higher state of consciousness experience.

Finally, the goal of the Maharishi Technology of the Unified Field is to simultaneously neutralize accumulation of stress and promote rapid development to higher stages of consciousness. To the extent that this technology succeeds in achieving these goals, the outcomes associated with the practice should be identical to those accompanying experience of higher states of consciousness in nonmeditating subjects. Indeed, this has been shown to be the case. All of the beneficial behaviors associated with more frequent experience of higher states of consciousness reported in the above studies—for example, increased creativity and self-actualization, and decreased anxiety and aggression—have also been repeatedly shown in a large body of related research to directly result from regular practice of the Transcendental Meditation and TM-Sidhi program (Orme-Johnson and Farrow, 1977; Chalmers, Clements, Schenklunh, and Weinless, vols. 2–4, in press).

CONCLUSION

The above points summarize the findings on the empirical structure, frequency, and behavioral correlates of higher state of consciousness experiences as assessed by the SCI and their relationship to regular practice of the Maharishi Technology of the Unified Field.

The reported findings demonstrate the potential usefulness of the SCI for research purposes. Nevertheless, if a researcher is attempting to identify a criteria group that displays higher states of consciousness for the purposes of more intensive investigation, it is recommended that multiple measures be applied in the estimation process. In addition to the SCI, the investigator might take into account resting or meditation level of bi-frontal and frontal-central alpha EEG coherence and measures of physiological quiescence such as respiratory suspension, as well as peer report. It will be the intensive and extensive investigations of such subjects that will definitively identify the physiological, psychological, and behavioral profile of each higher state of consciousness.

The findings reported here do, however, demonstrate that the empirical structure and frequency of higher state of consciousness experiences and their association with a network of positive behavioral correlates are consistent with the theoretical orientation of the Vedic Psychology of Maharishi Mahesh Yogi. Further, these results support the hypothesis that the Maharishi Technology of the Unified Field acts to unfreeze human development, and promotes the natural development of higher states of consciousness beyond the known endpoints postulated in current western psychology.

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2442