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## ABSTRACT

Recent evidence purporting that stress contributes to the development of disorders ranging from depression to cancer to general immunological dysfunction suggests that a concise understanding of stress and stress management techniques is needed in order to develop efficacious interventions. What is needed is an effective, easy-to-learn technique that promotes self-growth while reducing stress. Meditation has been acknowledged as a technique that may fulfill the requirements. Current research on meditation has begun to emphasize the importance of individual differences in cognitive analysis of stress and stress management. In recent years, a number of investigators have reported data indicating profound physiological changes resulting from the practice of meditation. Meditation appears to have several distinct advantages as an aid to personal change. It is a natural and easily learned technique that requires only occasional supervision, which therefore has potential for implementation within the stress management curriculum for college students. The goals of meditation appear to be theoretically similar to Maslow's model of the self-actualized person. While research has indicated a positive relationship between self-actualization and meditation, several methodological problems have been expressed in that research and must be resolved before adequate conclusions can be reached. Since studies report that practitioners of meditation have gained increased emotional stability and reductions of stress as benefits, it may be appropriate to include the instruction of meditation within health education curricula at the university level. (NB)

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**THEORETICAL FOUNDATIONS OF YOGA MEDITATION:  
A CONTRIBUTION TO SELF-ACTUALIZATION  
AND STRESS MANAGEMENT**

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## INTRODUCTION

Recent evidence purporting that stress contributes to the development of disorders ranging from depression ( Nezu, Saraydarian, Kalmar, & Roman, 1986) to cancer (Sklar & Anisman, 1981) to general immunological dysfunction (Borysenko, 1984) suggests that a concise understanding of stress and stress management techniques is needed in order to develop efficacious interventions. Stress is operationally defined as being related to a person's perceptions of the magnitude of environmental risks (e.g., challenges, demands, threats) that must be faced, relative to perceptions of his or her personal resources for coping. If such a risk/resource ratio is believed to be high (i.e., coping responses are considered to be ineffective) or if the ratio persists over time (i.e., coping responses have been insufficient), stress is increased, as are the chances for deleterious physical and psychological consequences (Lazarus, 1982). In spite of the contributions of many theorists and researchers, the current theoretical models (Lazarus, 1982; Klinger, 1977) have questionable predictive efficacy when applied to individual stress management (Silver & Wortman, 1980). The bulk of these theoretical models suggest that individuals respond to stressors with predictable, normative response patterns, and that these responses occur in sequences of stages. However, empirical studies of reactions to stressors find extreme variability in both the responses observed and the time periods during which these responses occur (Silver & Wortman, 1980).

As a result of the research, a consensus has been reached regarding the view that stress is cognitively mediated (Forsyth & Compas, 1987; Singer, 1986). According to Lazarus (1982), stress is seen as being related to a person's perceptions of the magnitude of environmental risks (e.g., challenges, demands, threats) that must be faced, relative to perceptions of his/her personal resources for coping.

Meichenbaum (1977) emphasizes the role of cognitive processes in stress and focuses on the role of internal dialog and self-statements in mediating responses to potentially stressful situations. Nezu et al. (1986) indicate that stress events intrinsically

account for only a small amount of variance in predicting physical and mental disorders, and that much of the remaining variance can be explained by the person's level of problem-solving ability.

In general, the foremost theories of stress and their corresponding approaches to stress management have been criticized as paying insufficient attention to individual differences (Lazarus, 1982). The bulk of these theoretical models suggest that individuals respond to stressors with predictable, normative response patterns, and that these responses occur in sequences of stages (Lazarus, 1982). Though each of these authors has examined the important aspects of the cognitive processes involved in stress reactions; they have not emphasized the importance of individual differences in cognitive analysis of stress and stress management. "In the management of the issue of stress in society, it has become apparent that internal factors within individuals, such as internal events, thoughts, and images may be a more important factor in the problem than the external elements" (Ellis, 1962). Many stress management clinicians concur that this internal reality can be controlled when one begins to meditate (Nuernberger, 1990).

What is needed then is an effective, easy to learn technique that promotes self-growth while reducing stress. Meditation has been acknowledged as a technique that may fulfill the requirements. Current research on meditation has begun to emphasize the importance of individual differences in cognitive analysis of stress and stress management (Nezu, 1986). Meditation researchers have tended to investigate meditation as a technique for enhancing relaxation responses or decreasing anxiety (Shapiro, 1982). However, the primary literature on the theoretical and phenomenological works from Eastern sources, within the disciplines of Hinduism, Buddhism, and Zen, does not mention relaxation or anxiety reduction as goals of meditative practice (Harvey, 1988). While increased relaxation and decreased anxiety may be effects of extensive practice of meditation, periods during the training also exist that are characterized by intense conflict and anxiety (Kapleau, 1965).

Ferguson (1976) has described meditation as a "technique to actualize and integrate the personality of humankind to those higher fulfilled states of personal integration" (p.16). In contrast to the usual dependent variables investigated in the Western literature, Eastern sources describe a goal for meditation that might be best described as the optimization of mental health (Brown & Engler, 1980). A close theoretical counterpart to this goal in western psychology would be Maslow's concept of self-actualization (Schultz, 1975).

Maslow (1971) defines self-actualization as "the full use and exploitation of one's talents, capacities, potentialities, etc." (p 150). Of the need for self-actualization, he says:

In one individual it may take the form of the desire to be an ideal mother, in another it may be expressed athletically, and in still another it may be expressed in painting pictures or in inventions. (p.46)

One can presumably find self-actualizing people, then, simply by looking for athletes, artists, or musicians who are performing to the best of their ability. And clearly, there are many young people, including college students, who by this criterion are self-actualizing. Yet Maslow, after screening 3,000 college students, claimed to find only one self-actualizing subject (1971, p. 150). In an attempt to disentangle the question of what constitutes self-actualization and thereby produce a more satisfactory categorization of subjects, Maslow revised his definition of self-actualization. Specifically, he equated self-actualization with being a "mature, fully-human" person "in whom the human potentialities have been realized and actualized" (1970, p. xx). In other words, self-actualization is not merely a matter of fulfilling one's own particular talents; it also involves actualizing those potentialities that one has as a human being. The self-actualizing person satisfies most of their basic needs for safety, love, respect, belongingness, and self-esteem while demonstrating a healthy balance between inner- and other-directed being, living in the present, interpersonal sensitivity, self-acceptance, capacity for spontaneous behavior and a positive belief in the nature of humankind. Self-actualizing is an active process of being and becoming increasingly inner-directed and integrated at the levels of thinking, feeling, and bodily response. It is, therefore not an end point, but a process of moving from normal manipulation toward growth, development, and the unfolding of human potential

(Shostrom, 1976). The potentials that Maslow lists also include the capacity to become autonomous, realistic, patient, compassionate, wise, and courageous (1970, p. xx). However, even if one naturally developed a degree of autonomy, courage, compassion, etc., there was no way of knowing how much autonomy, courage, and compassion a given individual has a natural tendency to acquire.

In response to the need for an instrument to measure self-actualization among various populations Shostrom (1964) developed the Personal Orientation Inventory (POI); a widely-used 12 scale measure based on the work of Maslow, Riesman, May, and Perls. Numerous personality inventories, including Shostrom's POI, have been used in an array of studies to investigate the influence of meditation on self-actualization. However the measure of self-actualization most often selected for use in meditation research is Shostrom's POI. The POI is a 150-item two-choice inventory which purports to measure the values and behaviors related to effective personal functioning or self-actualization. The POI is divided into two independent scales, the Time Competent scale and the Inner Directed scale. The Time Competence scale (Tc) measures the degree to which one is "present" oriented instead of preoccupied with the past or being anxious about the future and consists of 23 test items. The Inner-Directedness scale (I) assesses whether the individual's source of direction in daily life comes primarily from an inner sense of self or from external influences and consists of 127 items. The test-retest reliability coefficients for Tc and I are .71 and .77, respectively, which is considered comparable to that of other leading personality inventories (Shostrum, 1964).

Several authors have reported significant changes in some, or most of Shostrom's 12 POI subscales after several months of meditation, compared with pre-initiation levels and compared with controls who showed no significant changes. For instance, Seeman, Nidich, and Banta (1972) examined the effects of a Transcendental Meditation (TM) program on self-actualization. The POI was administered to an experimental group of 15 college students and a control group of 20 two days prior to the start of the program and two months after initiation. Significant mean changes in a positive direction were obtained

for the experimental group on the major scale of inner directedness and and the subscales of self-actualizing value, capacity for intimate contact, self-regard, acceptance of aggression and spontaneity. No changes were significant for the control group.

In a replication of their earlier study, Nidich, Seeman and Dreskin (1973) employed the same testing procedures on an experimental group and a control group, each consisting of nine college students. The period between pre-testing and post-testing was lengthened to ten weeks. Eight of the 12 POI scales, including the major scales of inner-directedness and time competence, demonstrated a significant difference between experimental and control subjects in the direction of self-actualization.

In another study, Compton and Becker (1983) worked with a subject pool of 36 experienced Soto Zen meditators. Using a modified POI they found that experienced meditators had significantly higher scores than inexperienced meditators (meditating less than one year), or non-meditating controls; that inexperienced meditators did not differ from the controls, and that the experienced group had higher scores than either group on the inner directed scale. Experienced subjects also had significantly higher scores than controls, but not inexperienced subjects on the time competence scale (living in the present). However, due to the cross-sectional design of this study, it can not be established whether these results are due to zen meditation, or to subject self-selection.

A unique comparison of regular meditators with beginning meditators using Bendig's Anxiety Scale, Rotter's Locus of Control Scale, and the POI was reported by Hjelle (1974), in an attempt to minimize demand characteristics (subjects expect personality to change as a result of practicing meditation). The regular meditators averaged nearly two years of practice at the time of testing. The beginning meditators were tested one week prior to receiving the usual instruction for TM. Analysis of the results showed that the regular meditation group, compared to the beginning group, exhibited significantly more internal control on Rotter's scale, less anxiety on the Bendig scale, and more time competence, inner-directedness, feeling reactivity, self-actualizing value, self-regard, spontaneity, and capacity for intimate contact on the POI.

Shapiro (1975) studied the effects of TM on self-actualization (Northridge Development Scale, NDS), negative personality dimensions (depression, aggression, neuroticism), and anxiety (State-Trait Anxiety Inventory, STAI). One-hundred-eighty subjects were tested before the initiation of TM and four months after. The results indicated significant improvement on self-actualization, reduced depression, aggression, neuroticism, and anxiety. A significant correlation was established between regularity of practice and changes in self-actualization.

In a comparison of mindfulness meditation and cognitive self-observation among college students, Green and Hiebert (1988) found reliable increases in several dimensions of self-actualization. A cohort of twenty-four college students learned either a meditation or a cognitive self-observation procedure. Both groups displayed equal increases in self-actualization as measured by the POI, and a reduction in stress-related symptoms. The results support previous findings that increased self-awareness of mental processes appears to be accompanied by an increase in mental and physical well-being. The investigators further proposed that the training methods used may have been of secondary importance to the training of attention. Since both training methods involved some kind of attention training, with insight as a central component, its development may have been a more important factor in improvements in health, well-being, and self-actualization.

In a comparison of the psychological effects of meditation and progressive relaxation, Throll (1981) administered the State-Trait Anxiety Inventory, Eysenck Personality Inventory (EPI), and two questionnaires on health and drug use to 39 subjects before learning TM or progressive relaxation. Post-testing at five, 10, and 15 week intervals revealed significant decreases in state and trait anxiety. However, the meditation group displayed more significant and comprehensive results on the EPI than did the relaxation group. Within the meditation cohort, significant decreases in neuroticism/stability, extroversion/introversion, and drug use were recorded.

Turnball and Norris (1982) administered a role construct repertory grid and the Eysenck Personality Questionnaire (EPQ) to seven college students prior to transcendental



meditation (TM) instruction and twice prospectively. A comparison group, without meditation instruction, were assessed at the same time and in the same manner. Both groups were equivalent prior to testing. The results of the role construct repertory grid revealed a significant and systematic pattern of change over the three tests among the meditation cohort. Meditators also developed a significantly stronger concept of their actual-selves, which they viewed as being proximate to their ideal self. EPQ results indicated a significant change for meditators on the extroversion scale. The comparison cohort failed to demonstrate any significant changes. It was concluded that "...subjects practicing TM appeared to have experienced consistent and definable changes of a generally beneficial nature" (p. 955).

While researchers in this area have frequently reported that increases in self-actualization are associated with regular meditation practice; some studies have failed to note significant increases in self-actualization scores (Carson, 1975; Moles, 1977; & Krueger, 1980). The pre-test to post-test intervals in the above studies tended to be short (6-10 weeks), and as such one cannot rule out placebo effects. It has been suggested that longer studies will have to be undertaken to control for such effects. Predisposition to, and expectations of, meditation may thus explain these findings. People who take up meditation may be motivated to 'improve' themselves, and this desire may manifest itself in increased self-actualization scores. Brown (1980) indicates that one of the most obvious themes in the eastern literature is a longitudinal emphasis. However, the only experimental studies of meditation that have used Zen meditators with more than 12 months' experience have been Davidson, Goleman and Schwartz (1976) and the studies out of Komazawa University in Tokyo (Akishige, 1977). According to Compton and Becker (1983) the apparent lack of investigations that study the effects of long-term meditation may be extremely relevant to conclusions drawn from experimental studies.

### Stress Management and the Educational Setting

Historically, Americans have viewed education as a vehicle to success and happiness. However, in the pursuit of higher education many students have noted and ranked the relative amount of stress experienced in meeting educational requirements that require behavioral adjustments (Rahe, 1972). Holmes and Rahe (1972) have developed a scale of stressful events identifying the relative amount of adjustment required to meet certain events of life. Among the series of events precipitating a stress response which may affect college students are: death of a family member, change in financial state, beginning or ending school, change in residence, change in schools, exams, etc. In assessing college students' personal choices and attitudes about stress management, it was reported that a majority of the 300 students surveyed (60.1%) indicated that they did not relax a sufficient amount. And about one-third (33.0%) of the sample believed that the way they handled stress was a serious problem. Of those who did not relax a sufficient amount, 81.6% intended to relax more in the near future (Page, 1987).

In an attempt to improve the quality of life, society and education has placed in its priorities the improvement of external elements and factors; external behaviors such as lifestyles and occupation, as well as the acquisition of cognitive knowledge. In the management of the issue of stress in society, it has become evident that internal factors within individuals, such as internal events, thoughts, and images may be a more important factor in the problem than the external elements (Ellis, 1962).

The recent interest of health educators in the systematic management of stress coincides with the increasing role of stress in modern life and its rising toll in terms of national health. There is evidence that psychosocial stress is associated with increased morbidity (Selye, 1973) as well as with increased utilization of health care (Roghamann, & Haggerty, 1973). The U.S. Public Health Service's Centers for Disease Control estimates that half of the mortalities from the ten leading causes of death can be linked to behavior and life-style (Matarazzo & Weiss, 1984). Stress is considered a major factor in psychosomatic illness and a contributing factor in a number of other psychiatric conditions.

Despite the desire to control stress, access to the vast numbers of people who suffer from stress is difficult to realize in standard clinical settings, where intervention occurs at a relatively advanced stage and treatment is limited to those who define themselves as patients. However, the educational setting offers a unique opportunity for preventive stress-control measures. A majority of children, adolescents, and young adults spend the major portion of their waking hours at school, and educational institutions provide at centralized locations a large number of individuals who are available for stress prevention programs, whether or not they are classified as patients or students.

Stress management programs are widely offered on college campuses today. They are sponsored by such varying campus units as student health services, counseling centers, student life programs, residence halls, employee assistance programs, student governments and academic departments, such as health education, health science, psychology, physical education and nursing (Nicholson, Belcastro, & Duncan, 1989). These programs most often are based upon the assumption that maladaptive cognitions and the stress response can be modified. In addition, the emerging field of psychoneuroimmunology suggests that the use of relaxation techniques may enhance immune response to infection (Borysenko, 1984).

Meditation may also enhance health. Numerous benefits are claimed to result from the practice of meditation; among them have been positive changes in psychological inventories (Ferguson, & Gowan, 1976) which collectively have been regarded as support towards the development of the healthy adult personality.

In a recent field study Orme-Johnson (1987) analyzed 5 years of medical care utilization statistics from a major health insurance carrier on a self-selected group of approximately 2000 participants in the Transcendental Meditation (TM) program compared with a normative data base of 600,000 members of the same insurance carrier. The TM group had 53.3% fewer inpatient admissions per 1000 and 44.4% fewer outpatient visits per 1000. Admissions per 1000 were lower for the TM group than the norm for all of 17 major medical treatment categories, including -55.4% for benign and malignant tumors, -87.3%

for heart disease, -30.4% for all infectious diseases, -30.6% for all mental disorders, and -87.3% for diseases of the nervous system.

In general, hundreds of studies have examined the effects of a variety of relaxation techniques in reducing the effects of stress and improving physical and mental health. In a systematic effort to integrate the literature in such a way that objective conclusions could be drawn, Eppley, Abrams, and Shear (1989) performed a quantitative meta-analysis to examine the effects of various relaxation techniques on a single outcome measure, trait anxiety. "Trait" anxiety refers to the general tendency to be anxious as distinguished from "state" anxiety, the degree of anxiety at a particular moment. Trait measures are more reliable in the sense that they are more stable over time. The authors were particularly interested in comparing the effectiveness of various somatic techniques, such as muscular relaxation, and various cognitive techniques, such as meditation. As a result of their meta-analysis, the authors found that the Transcendental Meditation (TM) technique produces larger effects than other meditation and relaxation procedures in the reduction of trait anxiety. A difference appeared too large to be accounted for by expectations or placebo effects.

An interesting question is whether the larger TM effect on trait anxiety also is found on other measures. Ferguson's (1981) study suggested that TM may also produce larger effects than other meditation treatments on other self report instruments. A meta-analysis by Dillbeck and Orme-Johnson (1987) found a larger TM effect on a number of physiological measures, but only examined comparisons to unstructured relaxation. A tally of the results of all studies found in which TM was compared to other treatments gives some preliminary evidence of a larger TM effect on behavioral/performance measures and possibly on physiological measures (Eppley, Abrams, & Shear, 1989).

### Meditation and Self-Actualization

In recent years a number of investigators have reported data indicating profound physiological changes resulting from the practice of meditation (Delmonte, 1988). Research has also clarified some of the questions concerning the states of consciousness and their corresponding effects on one's mental health (Kanellakos, 1969).

Regarding the concept of self-actualization; research has indicated a positive relationship between self-actualization and meditation (Harvey, 1988) yet several problems have been inherent within the research area that must be resolved before adequate conclusions can be reached. In Smith's (1976) review of meditation research, he cites two main areas of difficulty that are not controlled for: (1) the subjects' set or expectation of relief, and (2) the regular practice of sitting quietly which may be the crucial therapeutic variable rather than the meditation exercise. Smith concluded that the therapeutic potential of meditation remains to be demonstrated. A review of the literature by Shapiro (1982) acknowledges that meditation research had advanced sufficiently in design sophistication and control to result in a general consensus that meditation does bring about positive changes in psychophysiological well-being. However, the author emphasizes that Smith's earlier criticisms of claims that meditation brought about positive changes in psychological health or self-actualization should not be entirely dismissed.

Meditation appears to have several distinct advantages as an aid to personal change (Schultz, 1975). It is a natural and easily learned technique that requires only occasional supervision, which therefore has potential for implementation within the stress management curriculum for college students. Furthermore, the goals of meditation appear to be theoretically similar to Maslow's model of the self-actualized person. "It is our fullest 'humanhood,' the fullest use of what it means to be human, that is the goal of meditation," (LeShan, 1974).

### Mantra Meditation

Meditation has also become increasingly popular as a self-control, self-awareness and personal growth technique, as well as becoming a more prominent feature in psychotherapeutic intervention within clinical settings (West, 1980; Delmonte, 1988). This is primarily the case with the mantra based techniques of Transcendental Meditation (TM) and other non-cultic derivatives such as Clinically Standardized Meditation (CSM). Mantra - a sanskrit word meaning "thought form" is often included in traditional meditation techniques. The repetition of the mantra is believed to vibrate various subtle energy centers which correspond with nerve plexuses along the spine (starting at the base of the spine and ascending to the top of the head in a line approximately midway through the body) referred to as "chakras," (from the Sanskrit language of India meaning "wheels," said to resemble whirling vortices of subtle energies which is reported to be associated with a particular type of psychic perceptual functioning). If intoned correctly, mantras promote beneficial meditation effects (Carrington, 1977).

Shapiro (1982) described three broad groupings of attentional strategies in meditation: a focus on the whole field as in mindfulness meditation, a focus on a specific object within a field as in concentrative meditation, and a shifting back and forth between the two. Of these, concentrative meditation is the most widely practiced in the West. The systems of meditation, in which focused attention plays a large role (such as TM, Zen Meditation and their clinically-adapted derivatives), have formed the basis of most meditation studies.

### Self-Actualization and Relaxation

Alexander, Rainforth and Gelderloos (1991) presented an exhaustive statistical meta-analysis of all existing studies (42 treatment outcomes) on the effects of Transcendental Meditation (TM) and other forms of meditation and relaxation on self-actualization. The effect size in standard deviation units of TM, compared to a no-treatment control group, on

overall self-actualization ( $ES = .78$ ) was approximately three times as large as that of other forms of meditation (.26) and relaxation (.27), controlling for duration of treatment and strength of experimental design ( $p < .002$ ). Factor analysis of the 12 scales of the POI revealed three independent factors, labeled: "affective maturity," "integrative perspective on self and world," and "resilient sense of self." On these three factors as well, the effect of TM was three times as large ( $p = .0001$ ,  $.005$ , and  $.005$  respectively) as the effect of other meditation and relaxation techniques. On the two major composite POI scales - Inner-Directedness and Time Competence - the TM subjects improved respectively by 30 and 22 percentile points compared to norms over an average intervention period of 12 weeks. The magnitude of these consistent differential effects indicated that such changes were not merely due to relaxation, expectation or other motivational effects - suggesting that regular TM practice was the key factor contributing to the results.

### Conclusion

The eastern sources describe a goal for meditation that might be best described as the optimization of mental health (Brown & Engler, 1980). A close theoretical counterpart to this goal in western psychology would be Maslow's concept of self-actualization (Schultz, 1975).

Maslow (1968) states that a healthy person is primarily motivated by the desire for self-actualization, that being the full development of one's talents and capacities. Among the objectively describable and measurable characteristics of the healthy person, Maslow mentions the following notable qualities: increased clarity of thought, greater efficiency in perception of reality, increased integrity and wholeness, increased spontaneity and liveliness, a firm self-identity, autonomy, and the ability to love.

What is needed then is an efficacious, easy to learn technique that promotes self-growth while reducing stress. Meditation has been acknowledged as a technique that may fulfill the requirements. A substantial body of research literature has indicated significant differences between meditators and nonmeditators in measures of ego-strength, self-

esteem, self-actualization, anxiety, and well-being. These differences involve not only the reduction of negative qualities such as neuroticism and depression, but also an increase in the more fundamental qualities of an integrated and satisfying life.

Whereas a review of the literature has indicated a positive relationship between self-actualization and meditation, several methodological problems have been expressed in that research and must be resolved before adequate conclusions can be reached. Meditation often requires an investment of time which necessitates motivation in order for significant results to develop. Eastern disciplines maintain that systematic training along with regular and persistent meditation practice is essential for success. Carrington (1980) noted that frequent meditation practice (8.4 sessions/week) as opposed to infrequent practice (twice per week or less) results in improvements in self-actualization, intelligence test scores, and reductions in trait anxiety. In contrast, the results of brief intervention meditation studies often indicate that occasional practice fails to produce significant increases in self-actualization.

Also, significant results in the research of meditation is often fragmented due to brief intervention designs. In a Western culture that places great emphasis on activity, performance, tangible and material success, there may be a social stigma associated with just sitting around rather than doing something constructive and economically viable, and these elements together may form limitations within meditation research and outcome studies. Few Westerners are able to adopt the corresponding Eastern philosophy of meditation theory, which by traditional standards is rarely separate from meditation technologies. More importantly, the absence of the philosophical constructs provided by comprehensive meditation systems results in a fragmented technique without a supportive conceptual framework.

Studies may be designed to control for the methodological difficulties discussed above by the inclusion of a clinically standardized meditation technique such as Carrington's (1977), which is derived from a comprehensive philosophical system of yoga meditation while incorporating meditation instruction from the same source. More specifically,



meditation/self-actualization studies in college populations should attempt to critically examine the issues of: (1) whether meditation practice in modern cultures can generate positive changes in self-actualization; and (2) whether meditation produces any measurable changes in stress reduction among college students and (3) to determine whether meditation training results in significant increases in relaxed behavior.

A recommendation for future meditation research should also attempt to investigate the phenomenological mapping of altered states and meditative responses such as perceptual enhancement which challenge Western measurement technologies in lieu of the more commonly measured outcomes such as improvements in physiology or well-being. Finally, future research should focus on the multi-dimensional analysis of the stimulus-response mechanisms in meditation. Related questions should include, "Are meditative stimuli additive, inhibitory, or synergistic?," and "What is the optimum combination of stimuli for which effect?"

Since related studies report that practitioners of meditation have gained increased emotional stability and reductions of stress as benefits, it may be appropriate to include the instruction of meditation within health education curricula at the university level.

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