

MEDITATION AS AN ALTERED STATE
OF CONSCIOUSNESS:
CONTRIBUTIONS OF WESTERN
BEHAVIORAL SCIENCE*

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In our modern world it has always been assumed . . . that in order to observe oneself all that is required is for a person to "look within." No one ever imagines that self-observation may be a highly disciplined skill which requires longer training than any other skill we know.... The ... bad reputation of "introspection" ... results from the particular notion that all by himself and without guidance and training, a man can come to accurate and unmixed observations of his own thought and perception. In contrast to this one could very well say that the heart of the psychological disciplines in the East and the ancient Western world consists of training at self-study.

Jacob Needleman

Most research on meditation carried out in Western Laboratory and field settings has focused on physiological and overt behavioral changes: meditation as a self-regulation strategy (Shapiro, 1982). Recently, however, Western investigators have begun to call for a more detailed phenomenology of the meditation experience in order to assess subjective changes during meditation more precisely (Tart, 1975; Shapiro & Giber, 1978; Shapiro, 1980; Walsh, 1980; Brown & Engler, 1980; Earle, 1981; Shapiro & Walsh, 1983, in press): meditation as an altered state of consciousness.

*meditation
as an
altered
state*

There are several reasons why Western investigators are now taking this task more seriously. First, several research

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*importance
of
subjective
differences*

studies which have focused primarily on the physiological and overt behavior changes resulting from meditation have found no differences between meditation and other self-regulation strategies (e.g., Michaels, Huber & McCann, 1976; Beiman *et al.*, 1983, in press; Marlatt *et al.*, 1983 in press). However, in some cases, although there have been no physiological or overt behavioral differences between meditation and other self-regulation strategies, subjects have reported their experiences of meditation as more profound, deeper, and/or more enjoyable than the comparative control groups (Morse *et al.*, 1977; Cauthen & Prymak, 1977; Travis *et al.*, 1976; Curtis & Wessberg, 1975-76). Thus, even though there may not be overt behavioral and/or physiological differences between meditation and other self-regulation strategies, subjective differences occur, and from a clinical or research standpoint these may be critical.

*internal
and
covert
behaviors
of
meditation*

Second, although there are many different conceptual definitions as well as types of meditation, it seems important to attempt to identify what "covert behaviors" actually occur during meditation. In other words, what kinds of thoughts and images does a person have while meditating? What kinds of statements does a person make prior to and after meditating? By investigating these questions, the "internal behaviors" of meditation may be compared with the "covert behaviors" of other cognitive self-regulation strategies to determine where similarities and differences exist.

Third, from a social learning or cognitive psychology standpoint, the role of internal events, thoughts, and images has become an increasingly important area of study (Homme, 1965; Mahoney & Thoresen, 1974; Meichenbaum & Cameron, 1974; Ellis, 1962; Shapiro & Zifferblatt, 1976a, b; Shapiro, 1983, in press). Since meditation is a technique purported to bring about strong subjective experiences in practitioners, experiences which involve radically new perceptions of their relationship with themselves, others, and the world around them, it becomes crucial to understand what goes on "internally."

THE PHENOMENOLOGY OF MEDITATION

Those involved with the psychology of religion (Smith, 1965; Stace, 1960) and those who have studied spontaneous religious experiences (e.g., William James, 1901) note that often during times of meditation there are powerful subjective experiences which individuals claim have radically al-

tered their lives, given them a new sense of meaning and purpose, new values, and a new relationship not only with themselves, but with other people and the world around them. In Eastern traditions some of these are referred to as *satori*, *kensho*, *samadhi*. Many of the phenomenological qualities of these meditation induced religious experiences are described in the classical texts such as the *Abhidhamma* and the *Visuddhimagga* (Brown, 1977; Goleman, 1972).

*powerful
subjective
experiences*

These experiences, although of high salience for the individual, are sometimes spoken of as ineffable. Those who experience them have difficulty communicating these experiences to others (Frank, 1977), which presents a dilemma to the researcher who needs some kind of verbal or symbolic representation to help quantify, label, and describe them. Often the task of experimentally validating these experiences has seemed so difficult that some researchers have dismissed the experiences themselves as epiphenomena at best or at worst artificial schizophrenia with complete withdrawal of libidinal interest from the outside world (e.g., Alexander, 1931; GAP Report, 1977). Dismissing the experiences as epiphenomena is based not only on the difficulty of describing the phenomena, but also involves a paradigm clash between the Western model of physicalistic science and the internal, experiential nature of the altered state phenomena (Walsh, 1980). As Tart (1975) has noted, "The philosophy of physicalism is a belief system stating that physical reality-physical data are the only data that are ultimately 'real.' Therefore, internal or experiential phenomena, being inherently unreliable and unreal, must be reduced to physiological data to become reliable. If they cannot be so reduced, they are generally ignored" (p. 21, 24-25).

*philosophy
of
physicalism*

The second attitude-that these experiences are like psychotic episodes or schizophrenia-can again be a function of a paradigm clash, overlaying a Western paradigm on an experience within a different context and value system. Just as it may be a mistake to assume *a priori* that all altered state of consciousness (ASe) experiences are unilaterally examples of higher or enlightened consciousness, it may similarly be a mistake to dismiss them *a priori* as delusional. What truly is needed is a precise study of these so-called altered-state phenomena. Again, as Tart (1975) noted, "Given the great complexity of spiritual phenomena and discrete altered states of consciousness phenomena and their significance, the need for replication by trained observers to form a data base for future research is of exceptional importance (p. 21)." How might we go about this? First, we need a definition.

*a
paradigm
clash*

As a basis for our discussion, we will use the general definition of altered states proposed by Tart (1975). He suggested that:

*a discrete
altered
state*

Our ordinary discrete state of consciousness is a *construction* built up in accordance with biological and cultural imperatives for the purpose of dealing with our physical, intrapersonal, and interpersonal environments. A discrete altered state of consciousness is a radically different way of handling information from the physical, intrapersonal, and interpersonal environments, yet the discrete altered state of consciousness may be as arbitrary as our ordinary discrete state of consciousness (p. 24).

Note that this definition is value free. It allows us to study a discrete altered state of consciousness without *a priori* judgment.

At this point, further clarification should be made about my use of the phrase "altered state of consciousness." These are some problems with this phrase which merit comment. First, the problem of defining meditation by its effects needs to be considered. As noted in a previous work (Shapiro & Giber, 1978), we need to distinguish whether meditation as an altered state is conceptualized as an independent variable (causing certain subsequent behavioral change in a person) or a dependent variable (*i.e.*, what are the altered-state effects of meditation?). The phrase "meditation as an altered state" does not make that distinction.

Second, the phrase seems to imply a uniform "altered state" unique to meditation. Although there may be certain experiences common to meditation practice (Osis *et al.*, 1973; Kohr, 1977), there are certainly many different types of altered-state experiences which may occur as a result of a specific meditation technique, as well as across different techniques. Further, there are many different methods to attain ASe experiences similar to those which occur in meditation. I have tried to be as precise as possible in discussing these issues throughout the text. As noted earlier (Shapiro & Giber, 1978), the phrase "meditation as an altered state of consciousness" is intended primarily to help researchers differentiate what aspect of meditation they are studying—c-r.e., its self-regulation qualities, or altered-state qualities.

Given the above definition and discussion, how might we go about studying these altered state phenomena? What are

the problems inherent in this undertaking? Tart's comments on *this* issue are the best to date and are summarized here. The first two problems relate to the nature of the state itself: its ineffability and the problem of state-dependent learning. Another problem is that the person doing the investigation must often be subject, observer, and experimenter.

The first problem, as noted above, is the fact that many of the experiences of an ASe are described as ineffable and therefore beyond conceptualization. Second, there is a problem, seldom mentioned in the literature, of the generalizability of an ASe. We know from research on the state-dependent learning that what is learned in one state, say inebriation (Fischer, 1971), *is not always recalled in the uninebriated state* although it may be *stored* and recallable when once again drunk; learning therefore does not necessarily generalize to other states of consciousness. Again, as Tart noted, for reasons we know almost nothing about, the experiences of discrete altered states of consciousness eventually may be transferable to a different state of consciousness.

*transferability
of
experiences
between
states
of
consciousness*

So some people may have a spiritual experience occurring only in a particular discrete altered state of consciousness for a while, but then find it becomes part of their ordinary discrete state of consciousness. We know almost nothing scientifically about the degree to which such transfer can take place, the conditions favoring or hindering it, or the fullness of the transfer (1975, p, 25).

Here we may need to look to the social learning theorist for the laws of generalization and discrimination training (Bandura, 1977).

Additional problems derive from the need for individuals to sometimes be subject, observer, and experimenter. Tart suggested that this requires special training *in* order to develop a true phenomenology of the spiritual experience. Even such trained observers need to be cautious of experimenter bias (Rosenthal, 1962). They need to be aware of the demand characteristics of the training experimental situation (Orne, 1962). Further, Tart noted that the "individual who follows a spiritual path or tries to reach truth in a discrete altered state of consciousness may settle for the feeling of certainty rather than pressing on with his investigations" (1975, p. 48). In other words, the person may feel that they have an obvious perception of the truth and therefore not want to question that perception. (It should be noted that this phenomenon is not at all unique to altered-state-of-consciousness research.) In fact, as Tart noted, the

*requisite
for
trained
observers*

individual may be building fantasy worlds that seem real to that person, and therefore they create a reality which they believe to be a truthful *a priori* reality, without questioning the belief systems they brought to the situation.

*state-specific
sciences*

In summary, Tart noted that state-specific sciences are possible, though difficult. These state-specific sciences would involve, in the true scientific tradition, a) observing, b) making public the nature of the observation: consensual validation, c) forming logical hypotheses based on the material, d) testability: the looking for testable consequences.

Given these problems, as well as the importance of the phenomena, what approaches might be available to us?

OVERVIEW OF APPROACHES TO STUDYING THE PHENOMENOLOGY OF MEDITATION: ADVANTAGES AND PROBLEMS

*use of
classical
texts*

There have been several ways that previous researchers have tried to gather information about the phenomenology of meditation. One way to gather information is by looking at the classical texts, such as the *Abhidhamma* and its summary by Buddhaghosa, the *Visuddhimagga* (Goleman, 1972, 1977), and the classical root texts of the Mahamudra tradition (Brown, 1977). These texts provide phenomenological reports of the experience of advanced meditators.

*subjective
reports to
independent
investigators*

A second experimental methodology is to have individuals meditate and then to give them the opportunity to describe their meditation experience. In this approach the meditator and the experimenter/investigator are different individuals. This methodology has been used by several investigators (Van Nuys, 1973; Kubose, 1976). They had individuals push a button during the meditation experience to determine frequency of thought intrusion, and later asked subjects about the nature of their thoughts. Corby *et al.* (1978) looked at physiological changes and compared those changes with the subjects' accounts of their subjective experiences. Banquet (1973) had subjects push buttons signaling different types of subjective experience and tried to correlate that with EEG data.

*retrospective
analyses*

Other techniques used to understand phenomenological content include a retrospective content analysis of the meditation experience in terms of thought intrusions (Kanas & Horowitz, 1977); rater coding of the meditation experience (Maupin, 1965; Kornfield, 1979; Lesh, 1970); a factor analysis of self-reports about the meditation experience (Osis *et*

al., 1973; Kohr, 1977); and verbal report from the client after meditation focus (Deikman, 1966).

A third approach involves having the subject be both the meditator and the experimenter. This approach, suggested by Tart (1971), involves training individuals in behavioral science skills and then having them be their own subjects in an experiment to look at internal experiences. Tart himself has utilized this approach (Tart, 1971), describing a one-year experience with Transcendental Meditation, and Walsh (1977; 1978) has utilized this approach describing a two-year meditation experience; and Shapiro (1980), based on this model, has done a content analysis of nature and type of thought during his meditation practice.

*subject
as
mediator
and
experimenter*

Each of these approaches has advantages and disadvantages. The experience of long-term, proficient meditators described in the classical texts is useful because it provides first-hand accounts of individuals who have had extensive meditation experience. However, one of the potential limitations of this approach is these individuals' lack of behavioral science skills and the resultant inattention to non-specific placebo effects such as expectation effects and demand characteristics.

*advantages
and
disadvantages
of above
approaches*

The second approach—with the experimenter and subjects separate—gives some useful information about subjective experiences, but those experiences are susceptible to certain contaminating variables. First, they are retrospective accounts (except in Banquet, 1973) and thus subject to the vagaries of *post hoc* subject "memory." Second, the subjects' experiences are filtered through hypotheses generated by different individual experimenters who may or may not be sensitive to subtle nuances of meditation experience. Further, as with factor analytic research (Osis *et al.*, 1973; Kohr, 1977), the factors are an artifact of and are limited by the experimenter's initial coding questionnaire.

The third approach, having an individual subject/experimenter, has the advantage of allowing for immediate access of material between subject and experimenter, though presenting a greater potential for problems of experimenter bias (Rosenthal, 1962) and demand characteristics (Orne, 1962). This is the primary reason Tart recommends that the experimenter be someone well trained in the behavioral sciences.

Subjective Experiences During Meditation

As noted, one approach to gaining information about subjective experiences during meditation involves only slight variations on the traditional scientific experiment in which the experimenter tries to gather information from the subjects. The first group of these studies to be completed are interesting primarily from a heuristic standpoint.

*Maupin's
five-point
response
scale*

Maupin (1965) had ordinary subjects focus on breathing for nine sessions. These subjects' meditation experiences were rated on a five-point scale by "blind" judges. Based on *their* self-report data, described after each session, six of the twenty-eight subjects were rated as high experiencers. A high experiencer was one who reported at least one Type Five experience (concentration and detachment). Ten subjects were rated as having moderate responses to meditation: *i.e.*, no Type Five experience but at least one Type Three or Type Four experience (pleasant body sensations or vivid breathing). Twelve subjects were rated "low response" because they reported nothing more than relaxation (Stage Two) or dizziness (Stage One). Maupin (1965, p. 145) notes that his five-point response scale does not register all observed responses.

Subjectively felt benefits similar to those resulting from relaxation therapies were reported by several subjects. Subjects in the high and moderate response group occasionally mentioned the emergence of very specific and vivid effects other than anxiety while they were practicing. These included hallucinoid feelings, muscle tension, sexual excitement, and intense sadness (p. 145).

Lesh (1970) also had subjects practice Zen breath meditation; he adapted Maupin's five-point scale slightly but found essentially the same results.

*external
concentration
study*

In a study using external concentration, Deikman (1966) had subjects focus on a blue vase, and he also found strong subjective changes in ordinary subjects' phenomenological perceptions. Every subject noted an alteration in perception of the vase, a shift to a deeper and more intense blue: brighter, more vivid, luminous. Further, subjects noted instability in the vase's shape or size: a loss of the third dimension, a diffusion or loss of perceptual boundaries. One subject noted feelings of merging with the vase, as though "it were almost part of me." Another subject noted complete loss of body feelings (Deikman, 1966).

Kanas & Horowitz (1977) used a content analysis questionnaire devised by Horowitz (1969; 1970) to gain information about subjective experiences during meditation. Subjects were shown a stress film and then asked to estimate the percentage of time spent thinking about the stress film, the experimental task, life issues, fantasies, mantra (where appropriate), other thoughts, and no thoughts, during the ten minutes they meditated or rested.

*content
analysis
questionnaire*

Kornfield (1979) gathered extensive data from meditators at five two-week and one three-month retreats for intensive insight meditation (Vipassana). Kornfield's data came from reports which the meditators gave their teachers every two or three days and from answers to a series of three questions about 1) sleep/food intake; 2) changes in clarity of perception, concentration, mindfulness; 3) what was currently predominant in meditation experience; any unusual experiences. Although Kornfield's study generated an enormous amount of rich information, the interpretation of these data must be tentative, since the coding instrument was made *post hoc* as a way of sorting the data, rather than prior to the experiment to test the hypotheses. However, this type of heuristic study is necessary initially to give us information about the phenomenology of meditation experience.

*intensive
insight
mediation*

These five studies involve having subjects report on their experiences at the completion of the meditation session or, in Kornfield's case, at intervals. In Deikrnan's (1966) and Kornfield's (1979) studies the reports were made directly to the experimenters/teachers, who grouped and reported the data; in the Maupin (1965) and Lesh (1970) studies, raters coded the experiences on a five-part scale, a methodological improvement, *after* sufficient heuristic information has been accumulated via previous studies.

A second group of studies to obtain reports of meditators' experiences involved having subjects push buttons *during* the meditation session whenever certain thoughts or feelings occurred (Van Nuys, 1973; Banquet, 1973; Kubose, 1976).

*reports
of
meditator's
experiences*

Van Nuys had subjects push a button every time they became aware of an intrusive thought. The nature of intrusions reported by subjects in the post-meditation interview included: itches, aches, and other bodily feelings of discomfort; thoughts about the nature and purpose of the experiment; and thoughts about roommates, girlfriends, courses and other current concerns. In addition, many subjects reported such subjective responses as vivid visual experiences, feelings of paranoia, feelings of being "turned on," dreamlike experiences, temporary loss of orientation in time

or space, primary-process perceptual distortions (Van Nuys, 1973, p. 67).

*analysis of
thoughts
during
meditation*

Kubose (1976) debriefed meditators after their experience with a questionnaire asking them to divide the thoughts they had into the following categories: a) thoughts about bodily sensations; b) thoughts relating themselves to the present situation; c) thoughts relating themselves to past events; d) thoughts about the future; e) thoughts about ideas and things that did not have a strong time component. His data revealed that subjects in the meditation group categorized most of their thoughts along a present-time dimension, whereas subjects in the control group categorized their thoughts as past and future. As Kubose noted, meditation seemed to minimize the intrusion of distracting thoughts, and relative to a control group, when thoughts did occur, they tended to be categorized as oriented toward the present rather than the past or future.

*difficulties
with
intrusive
procedures*

Banquet (1973) had individuals push buttons to signal thoughts or feelings. He refined the technique of Kubose and had five different buttons for the individuals to push, depending on the category of events during the meditation experience: bodily sensations, involuntary movement, visual images, deep meditation, and transcendence (deepest part of meditation). However, as with any intrusive procedure, there may be difficulties in having a person push a button while in a state of transcendence and attempting to maintain that state.

Finally, two other studies, still within the same scientific tradition of an experimenter trying to gain information from subjects, was undertaken by Osis *et al.* (1973), and later replicated by Kohl' (1977). These studies involved asking meditators to respond to a questionnaire after their sessions, and then performing a factor analysis. Osis *et al.*'s (1973) research is described in some detail here because it is an interesting application of multivariate statistical analysis to the issue of meditation experience. He gave subjects a pre-meditation mood questionnaire and a post-meditation questionnaire before and after four different sittings. Both questionnaires were used in the same factor analysis to determine how closely the subjects' meditation and pre-meditation states were related. Subjects came from a variety of different religious traditions, including Unitarian, Zen, Raja Yoga, Hassidic Judaism, Catholicism. There was an attempt to determine the extent to which meditation experience would cut across different disciplines and different orientations. Osis posited that in most religions the central

concept is a belief in a spiritual reality felt to be larger and more valuable than (and often inclusive of) the personal self. The issue of self-selection was mentioned and even maximized; then experimenters tried to select subjects "to whom meditation was a kind of quest for meaning and growth in their lives" (Osis *et al.*, 1973, p. 113). It was found in both the Osis and later the Kohl' studies that there was almost no correlation between initial mood and meditation experience, suggesting that meditation did produce a state of consciousness different from the state of consciousness which the person brought to the practice of meditation.

Six factors were replicated in at least three of the meditation experiences: self-transcendence and openness; mood brought to the session (both appeared in all four experiments); intensification and change of consciousness; meaning dimension; forceful exclusion of images; and general success of meditation. Self-transcendence and openness involved the following core items: a feeling of merging with others, unity with the group, oneness with the external. For mood brought to the session, the core items were elation, freedom from anxiety, content with self, and greater vitality. The next factor, intensification and change of consciousness, seemed to be the most central and complex. Thirteen core items, half of the items in the post-session questionnaire, are contained in this factor. They include: intensification of consciousness, ways of experiencing change, love and joy, perceptual enrichment, refreshment after session, depth of insight, unity with group, and the feeling that it was a good session. There often seemed to be an organismic arousal during this intensification and change of consciousness. Another factor, the meaning dimension, included core items such as relevant visual images, relevant thoughts, deep insights, alertness, and sense of presence. The next factor, what Osis called "forceful exclusion of images," included negative items. As the authors stated, "The predominant note is one of tension: negative loadings on relaxation, serenity, and affirmation of the external" (Osis *et al.*, 1973, p. 122). In the fourth experiment, they introduced a negative experience factor. It expresses "the opposites of affirmation and deep acceptance of self and others. It appears to express the feeling that the meditation was interfered with" (p. 130).

*six
factors*

In the Kohr experiment (1977), which tried to extend and replicate the Osis experiment, again there was strong bias in the subjects selected: a sampling from members of the Association for Research and Enlightenment agreeing to participate in meditation research and answer questionnaires.

*five
variables*

Some of the refinements that occurred in the questionnaire were breaking the subjects into various subgroups of high and low categories on five variables: anxiety level as measured by the IPAT Anxiety Scale Questionnaire; incidents of perceived personal problems as indicated by the total score on the Mooney Problem Check List (Mooney & Gordon, 1951); the length of time previously spent engaged in meditation on a fairly regular basis; the amount of previous meditation experience combined with whether a consistent schedule had been maintained in the month prior to the study, and the degree to which the participants adhered to the procedures: low anxiety, high anxiety, low problems, high problems, low regular schedule, high regular schedule, low prior experience, high prior experience, low adherence, high adherence.

*Kohr's
study with
individual
meditators*

The meditators in Kohr's study meditated alone, based on a manual, whereas the subjects in the Osis experiment meditated and discussed their experiences in a small group context. The major factor was intensification and change of consciousness. Kohr found, "This factor conveys the impression of a heightened sense of fullness, deep positive emotion, and intensification of awareness, perceptual change and enhancement, a presence of religious significance and a sense of satisfaction with the session" (1977, p. 200). The authors noted that this factor seemed a blend of the factors of self-transcendence and openness as well as the intensification factor. The "psychological state prior to session" was also a consistent factor, similar to Osis's mood-brought-to-session factor. Importantly, this factor was independent of the other factors except for the tendency for the freedom-from-anxiety item to load with the "negative experience factor" in a majority of the subgroup analysis. This suggests that anxiety can often impair the meditation experience unless one is successful in reducing its effects prior to the session. Kohr noted, "Overall, the cohesiveness of this factor suggests that one's mood and functioning during the day represented a different state of consciousness than the altered state as measured by the post-session questionnaire" (1977, p. 200). The negative experience factor was based on those items added in Osis's fourth experiment plus some additional items. These included sessions characterized by an inability to relax, compounded by the intrusion of unwanted thoughts, some of them anxious residues from the day's experience or anticipations of future events. The mental clarity factor, reflecting retention of awareness and sense of alertness was not observed in the Osis experiment. The physical effects factor-s-including various physical sensations like an increase in bodily warmth and sensations

around the "seven spiritual centers" of Oriental and occult religions-was also weak.

The independence of the psychological-state-prior-to-session factor seems important, both in the Kohr and Osis experiments. As Osis (1973, p. 130) noted, "The items of everyday mood as measured in the pre-meditation questionnaire did not appreciably load on any other factors of the meditation experience and formed a strong common compact factor by themselves. The subjects' free comments support the view that successful meditation leads to altered states of consciousness" (1973, p. 130). Similarly, in the Kohr experiment, the independence of states arises from the fact that "Good sessions frequently occurred regardless of feeling tired or depressed prior to the session. In these sessions there seemed to be an ability to let go of a negative emotion or to move beyond fatigue" (1977, p. 202). The only area where a prior psychological state demonstrated leakage into a meditation period was anxiety associated with having negative experiences. The author noted, "Negative experience is not uncommon among individuals who resolve to meditate on a daily basis, especially the novice."

*pre-meditation
psychological
states*

As noted, the above studies involve only a slight variation on the traditional scientific experiment in which an experimenter gathers information from subjects. But there is also a different approach to gathering information on the phenomenology of meditation-one in which the subject and experimenter are the same person. The roots of this approach go back to the classical texts, such as the *Abhidhamma* (Goleman, 1972, 1977) and the classical texts of Mahamudra tradition (Brown, 1977). These texts attempt to develop a scientific phenomenology of meditation, a cartography of the "inner voyage." The scientists are the meditators who use themselves as subjects and through a process of introspective psychology try to chart which experiences and thoughts are helpful in moving toward enlightened experiences, and which are harmful. Their texts provide us with one model derived from long-term experienced meditators. They may or may not be a state-specific science in the sense that we do not know how much the practitioners' own belief systems were looked at carefully as part of the "outcome" success.

*subject
and
experimenter
as
same person*

The reports in the classical texts give us information from long-term meditators who were presumably not trained in the behavioral sciences. Three studies have been done by behavioral scientists who are also meditators of intermediate, one to several years, experience (Tart, 1971; Walsh,

*behavioral
scientists
as
meditators*

1977, 1978; Shapiro, 1980). Theoretically, those trained in the behavioral sciences should have more acute and accurate discrimination skills, should be less biased and more willing to admit where the technique of meditation is or is not useful, and should try to communicate those subjective experiences to others in accessible terms. For example, Tart {1971} practiced TM meditation for a year and Walsh (1977, 1978) described his experiences during two years of Vipassana (insight meditation). In a similar vein, Shapiro (1980) recorded thoughts and images during several meditation sessions, and subsequently analyzed data for number and type of thoughts and cognitions, and percentage of time when there did not appear to be thoughts.

self-reporting

This approach, using behavioral scientists as subject, observer, and experimenter, has several potential pitfalls. However, it does have the advantage of direct experience and reporting by the same person, without the intervening hypotheses and interpretations of another experimenter. At the very least, observing one's own meditation experience should be a rich source of gaining experiential understanding of relevant concepts and of generating hypotheses and refining dependent variables for subsequent research.

CONCURRENT VALIDITY FOR SUBJECTIVE EXPERIENCE DURING MEDITATION

*research
on
meditative
attention*

Because of the subjective nature of the meditation experience, it is difficult to obtain concurrent validity on subjects' self-report. Maupin (1965) attempted to correlate attention measures (digit span, continuous additions, size estimation) with response to meditation. However Van Nuys (1973) has suggested that these measures were not relevant to the type of attention involved in meditation (*see also* Galin, 1974). Van Nuys notes that alterations in consciousness occur when attention is relatively fixed and sustained, whereas the tests Maupin used involved tasks that require a constant and rapid shifting of the focus of attention; furthermore, "they invite discursive, analytic thought that is actively restricted in meditation" (Boals, 1978, p. 165).

Van Nuys (1973) developed a simple technique for studying attention during the latter stages of meditation. He had his subjects push a button to report intrusion of "off-task" thoughts that distracted them from the task of meditation. He found that the reports of these intrusions correlated with hypnotizability. Other promising methods of obtaining concurrent validity may be the use of experimenter-controlled

buttons to signal physiological values of the meditator to the meditator, requesting a continuing experimenter-subjective report (Herbert & Lehman, 1977), the signal detection format employed in the daydreaming studies of Singer (1975) to obtain reports of occurrence of "task-irrelevant thoughts," and monitoring hemispheric laterality and synchrony to determine brain wave patterns within and between hemispheres during meditation (Davidson, 1976; Galin, 1974).

*experimenter
controlled
intrusions*

SUBJECTIVE REPORTS OF CHANGES IN ATTITUDES AND PERCEPTIONS AFTER MEDITATION

The studies reported above have tested short-term, mostly in-state effects of meditation. Other researchers have tried to document perceptual and/or behavioral changes that occur at times other than during meditation. These studies, which look at self-concept and perceived behavior change, have gathered data primarily by use of pencil and paper tests, including Shostrom's Personal Orientation Inventory (Hjelle, 1974; Nidich, Seeman & Dreskin, 1973; Seeman, Nidich & Banta, 1972); the Northridge Development Scale (Ferguson & Gowan, 1976); and the Otis Descriptive Personality List and Otis Physical and Behavioral Inventory (Otis, 1974). All of these studies report that meditators change more than control groups in the direction of positive mental health, positive personality change, and "self-actualization." (Studies that used self-report data, but that focused primarily on anxiety, are not included here.) These changes include such items as self-perceived increase in capacity for intimate contact, increased spontaneity, self-regard, acceptance of aggression, and inner directedness.

*studies
of
perceived
behavior
change*

There are, however, several methodological problems with the above studies. First, none of the studies, except Hjelle's (1974), controls for expectations and demand characteristics, and Hjelle's study, as already noted, does not control for commitment (long-term practice). The commitment or motivation of the subjects may be quite important. For example, it appears that five of the original twenty subjects in the experimental condition in Seeman, Nidich & Banta's (1972) study dropped out, a fact that could have biased the experiment in a direction favoring meditation. A second methodological problem of the above studies is that they do not show, aside from paper and pencil test scores, whether the meditating subjects demonstrated behavior changes.

*importance
of
commitment
and
motivation*

In an attempt to learn more about daily changes in behavior, Shapiro (1978a), in addition to pre-tests and post-tests, had

self-
monitoring
daily
variables

subjects self-monitor nine variables daily: Feelings of anger, seeing beauty in nature, positive self-thoughts, negative self-thoughts, feelings of anxiety, feelings of creativity. The experimental group (informal and formal Zen meditation) daily reported data significantly more in a favorable direction: less feelings of anxiety, more feelings of creativity, *etc.* This longitudinal study was useful because it provided self-report of feelings rather than simply before and after pencil and paper test data of global feeling change. However, it is unclear from the study which parts of the treatment intervention were responsible for what percentage of the variance of the successful outcome. Further, no concurrent covarying overt variables were involved in the study, which still leaves us with the problems of self-reported data. And, finally, in an intriguing study, which corrects some of the problems of earlier studies, Brown & Engler (1980) asked meditators, from beginning to advanced, to take Rorschach ink blots, and noted quite interesting perceptual differences depending on length and type of practice.

SUMMARY

scientific
approaches
to
meditation
research

What can we make of these studies? *First*, it clearly seems important to distinguish between short- and long-term meditation experience. Compared to "Eastern" standards, most Western meditators are at a "beginning level" in terms of length of time spent in meditation practice. The classical texts give us a cartography—a context for clarifying different types of long-term meditation experience. *Second*, it seems a useful scientific strategy to have those trained in the behavioral sciences who also meditate be both experimenters, subjects, and observers, although certain conditions must be observed. *Third*, it does seem possible to gain useful and precise information about the phenomenology of the meditation experiences. As Osis *et al.* noted, "in spite of the almost universal claim that the meditation experience is ineffable, clear dimensionalities emerge" (1973, p. 130). *Fourth*, it appears that even in short-term meditators, relatively strong experiences occur (Deikman, 1966; Maupin, 1965). Further, as the work of Osis and Kohl' suggest, meditation experiences, with the exception of anxiety, were different from the mood brought to the session—evidence for the view of meditation as an altered state of consciousness. *Fifth*, both Osis and Deikman argue that although belief systems may be part of the variance accounting for the effect of the altered state, more than simply belief systems are at work in meditation because "different beliefs of different subjects will on the whole cancel each other out . . .

whereas meditation seems to tap more universal dimensions" (Osis *et al.*, 1973, p. 130). Deikman noted that "hypnotic experiences do not appear to have the ineffable, profoundly uplifting, highly valued quality of the mystic state and are not remembered as such" (1963, p. 340). He noted that there may be strong belief systems, suggestion, and demand characteristics operating, but then suggests that the hypothesis of demand characteristics is not consistent with the fact that the highest mystic experiences are similar in their basic content despite wide differences in cultural backgrounds and expectations: a) feeling of incommunicability, b) transcendence of sense modalities, c) absence of specific content, such as images and ideas, and d) feelings of unity with the ultimate. *Sixth*, not all altered states are pleasant and uplifting. For example, in his final experiment, Osis put in questions to tap these negative experiences, and Kohr found a negative experience factor to be a clear dimension. As noted, these negative experiences can also be seen in the earlier reports of Van Nuys, and in an article by French, Schmid & Ingalls (1975) on altered reality testing resulting from too much meditation. Further, a recent article by Otis (in press, 1983) describes the adverse effects of meditation, presumably some of which resulted from experiences during meditation.

*similarity
of
basic
content
in
mystical
experiences*

Therefore, in conclusion, greater clarity and precision seem necessary in describing altered states. Rather than on the one hand shying away from this area as epiphenomena or dismissing it *a priori* as "psychotic and delusional," or on the other hand calling it "enlightened and higher consciousness," we need to gather more precise information to see when these powerful experiences may in fact be psychotic and when they may be truly enlightened and spiritual. Further, with this kind of precise information, in addition to being able to compare meditation with other self-regulation strategies, we also may be able to learn more about meditation as an altered state of consciousness, and thereafter compare it to other altered states such as dreaming (Faber *et al.*, 1978), hypnotic trance, psychosis, sleep, and others.

*more
precise
information
needed*

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