Meditation as an Altered State of Consciousness

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 altered 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.

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 (as discussed in Section 1.3) between the Western
model of physicalistic science and the internal, experiential nature of the altered state phenomena. As Tart has noted (1975), "The philosophy of physicalism is a belief system stating that physical reality exists independent of our perception of it, and is the ultimate 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, p. 24-25).

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 (ASC) 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 noted (1975), "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.

7.1 Altered State:
Toward a Working Definition;
Problems in Studying; Approaches Available

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

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." There 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 changes 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 ASC 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 (Chapter One, 1.7) the phrase "meditation as an altered state of consciousness" is intended primarily to help researchers differentiate what aspect of meditation they are studying—i.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 its 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 ASC are described as ineffable and therefore beyond conceptualization. Second, there is a problem, seldom mentioned in the literature, of the generalizability of an ASC. 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.

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.* In fact, as Tart noted, the 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.

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

*It should be noted that this phenomenon is not at all unique to altered-state-of-consciousness research.
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?

### 7.2 Subjective Experiences During Meditation

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 (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." (1965, 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.
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 and 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.

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.

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 Deikman'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'
Subjective Experiences During Meditation

experiences involved having subjects push buttons during the meditation session whenever certain thoughts or feelings occurred (Van Nuys, 1973; Banquet, 1973; Kubose, 1976).

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).

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.

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 Kohr (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 premeditation 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 premeditation
states were related. Subjects came from a variety of dif-
ferent religious traditions, including Unitarian, Zen, Raja Yoga,
Hassidic Judaism, Catholicism. There was an attempt to deter-
mine 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 in-
clusive of) the personal self. The issue of self-selection was men-
tioned 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 Kohr studies that there was
almost no correlation between initial mood and meditation ex-
perience, suggesting that meditation did produce a state of con-
sciousness 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); intensifica-
tion 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. Thir-
ten core items, half of the items in the post-session question-
naire, are contained in this factor. They include: intensification of
consciousness, ways of experiencing change, love and joy, percep-
tual 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).

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. 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.)

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 indepen-
dent 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—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, in both 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," a finding already discussed in Chapters One and Two.

As noted, the above studies involve only a slight variation on the traditional scientific experiment in which an experimenter
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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 Adhidhamma (Goleman, 1972, 1977) and the classical texts of the 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.

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, 1977, 1978; Shapiro, Chapter Three). 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 (Chapter 3) 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.

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

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).

*Whether or not if may be helpful to the meditation practice itself is a different story!—see Chapter Three and the Epilogue.
Subjective Reports of Changes After Meditation

7.3 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, 1977); 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 (Table 7.1).

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 and 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 change.

In an attempt to learn more about daily changes in behavior, Shapiro (1978a), in addition to pre-tests and post-tests, had 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
### Table 7.1 Subjective Changes Following Meditation

<table>
<thead>
<tr>
<th>Investigator/Year/Description</th>
<th>Focus of Investigation</th>
<th>Sex of Participants</th>
<th>Independent Variable</th>
<th>Frequency of Treatment</th>
<th>Dependent Variable</th>
<th>Follow-up</th>
<th>Type of Design/Quality of Controls/Methodological Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segal, Walsh, and Racine 1972</td>
<td>“Self Actualization”</td>
<td>Group 1: 20 male, 10 female, Group 2: 10 male, 10 female</td>
<td>Standard Transcendental Meditation training, 30-60 min initial instruction, 3 daily meditations, further instruction given twice weekly to 1-month vs 1-month controls</td>
<td>Same as above</td>
<td>Not stated</td>
<td>Same as above</td>
<td>Group selection and matching procedures not stated. Intent to meditate measures of both groups as pretraining capacity for cognitive control assessed, recall bias to report positive self-perceptions in self-selected controls.</td>
</tr>
<tr>
<td>Walach and Shamir 1974</td>
<td>“Self Actualization”</td>
<td>Group 1: 18 non-meditating controls, Group 2: 18 meditation</td>
<td>Same as above</td>
<td>Not stated</td>
<td>Same as above</td>
<td>Same as above</td>
<td>Study might indicate that initial group differences between meditators and non-meditators are significant. However, group differences may not be maintained in long-term change.</td>
</tr>
<tr>
<td>Stark and Ross 1973</td>
<td>Same sex differences between those abstinent and not interested in meditation and those interested in control and personal adjustment</td>
<td>Group 1: 12 abstinent, Group 2: 12 interested</td>
<td>12-week program, 60 min twice weekly, Performed 60 min twice weekly, 60 min twice weekly, 60 min twice weekly</td>
<td>Same as above</td>
<td>Not stated</td>
<td>Same as above</td>
<td>Study might indicate that initial group differences between meditators and non-meditators are significant. However, group differences may not be maintained in long-term change.</td>
</tr>
<tr>
<td>Kellett 1970</td>
<td>“Awareness: Stressors of Control and Self Actualization”</td>
<td>Group 1: 12 male, 8 female, Group 2: 12 male, 8 female</td>
<td>Standard TM training</td>
<td>Same as above</td>
<td>Not stated</td>
<td>Same as above</td>
<td>Study might indicate that initial group differences between meditators and non-meditators are significant. However, group differences may not be maintained in long-term change.</td>
</tr>
<tr>
<td>Obas 1973</td>
<td>Self concept change/emergence of physical and psychological problems</td>
<td>Group 1: 20 meditation, Group 2: 20 non-meditation.</td>
<td>Group 1: Standard TM training for 6 months, Group 2: No training</td>
<td>Same as above</td>
<td>Not stated</td>
<td>Same as above</td>
<td>Study might indicate that initial group differences between meditators and non-meditators are significant. However, group differences may not be maintained in long-term change.</td>
</tr>
<tr>
<td>Gilpin et al. 1972</td>
<td>Performance Intelligence and Memory Quotients, Neuroticism, Mental Largy and Psychological Health status, Physical Autonomic and Sensory Changes measured</td>
<td>Male: 12 age 18-25, Female: 18 age 18-25, “With a university acquaintance as a mentor”</td>
<td>6-month baseline measurement, 3 daily meditations, 6-month follow-up</td>
<td>Same as above</td>
<td>Not stated</td>
<td>Same as above</td>
<td>Study might indicate that initial group differences between meditators and non-meditators are significant. However, group differences may not be maintained in long-term change.</td>
</tr>
</tbody>
</table>

**Note:** The table includes various studies on meditation and its effects, focusing on subjective changes following meditation. The studies vary in their methodologies, including different types of meditation programs and varying durations. The dependent variables vary from subjective and psychological changes to changes in biological measures. The follow-up periods and types of design also differ, with some studies focusing on the long-term effects of meditation. The quality of controls and methodological problems are noted to ensure the reliability of the findings.
### TABLE 7.1 Subjective Changes Following Meditation (cont'd.)

<table>
<thead>
<tr>
<th>Investigator(s)</th>
<th>Focus of Investigation</th>
<th>S's (M, age, sex, prior experience)</th>
<th>INDEPENDENT VARIABLE</th>
<th>Frequency of Treatment (Duration)</th>
<th>DEPENDENT VARIABLE</th>
<th>Subsequent Effects (unless otherwise noted)</th>
<th>Follow-up</th>
<th>Type of Design, Quality of Controls, Methodological Problems</th>
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<td></td>
<td>Daily report between and &quot;Global&quot; self-perception</td>
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<tr>
<td>Shapiro (1975)</td>
<td>Dutch college students in class on &quot;Zen Buddhism and Self-Management&quot;, no prior meditation experience</td>
<td></td>
<td></td>
<td>Experiential Group (N=40); 1) 3 weeks between observation on 9 minutes 2) weekend 30 min experience workshop; 3) control 30 min meditation practice for 3 day 4) 2 weeks between observation</td>
<td>Living information: group trained 30 min experience with entire group</td>
<td>Data from pre and post testing on Semantic Differential, Role-k confidence of control showed on significant group difference but minor in hypnosis-induced suggestibility, Standard puffiness; Social from C. Group showed increase in suggestibility for experimental group and decrease in controls</td>
<td>None reported</td>
<td>Modified multiple time series design (e.g. Campbell &amp; Stanley, 1963; p. 25-37; Positive correlation found at daily change as well as group levels. Related trend for medical variables with daily assessment change in ratings.</td>
</tr>
<tr>
<td></td>
<td>Gift of life poems</td>
<td>National college students in class on &quot;Zen Buddhism and Self-Management&quot;, no prior meditation experience</td>
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<tr>
<td>Leach (1977)</td>
<td>All S's were college students taking consumerism course</td>
<td>Group One: N=16, taught 30 min breathing reconditioning; Group Two: N=12, controls; Group Three: N=12, group &quot;locally against&quot; meditation experience</td>
<td></td>
<td>Mortification training (pre to post)</td>
<td>Mortification training (pre to post)</td>
<td>Post and Post Treatment Measures: 1) Increase anxiety among meditators to All-factor Anxiety (FAO) responses to increased class dialog. Both control groups did not show improvement in respiratory ability. 2) No correlation found between ASI and trend ratings of subjective experience to meditation (Weaver, 1963). 3) Positive correlation found between experience (Emotional Inquire, Fitzgerald, 1960) and response to meditation. 4) Positive correlation found between emotional experience to meditation and ASI. 5) Correlation found between high scores on ASI and &quot;self-actualization&quot; measure (Shahum, 1967).</td>
<td>None reported</td>
<td>Between subjects design, possible selection bias.</td>
</tr>
<tr>
<td></td>
<td>Chest breathing exercise</td>
<td>N=52, avg. age 22.35 yrs, 22 male, 45 female, prior experience not stated. Group 1: Deep breathing inducing flow and minimal concentration training. Group 2: Control concentration training (pre to post)</td>
<td></td>
<td>Training for groups 1-2: 7 hrs breathing in meditative deep breathing. 7 hrs training in mental concentration on a specific verbal demand pre and post training. Social evaluation post-peer group for correct performance of exercises.</td>
<td>Not stated</td>
<td>Control Measures: Group E1: Measured S's predictive statistical anxiety in response to mental concentration of active visual sensations of active visual sensations (50 m. s.) total. Analytic sensitivity measurement taken after 60 minute periods of imagery. Group E2: Equated to E1 number of &quot;relaxation&quot; statements made to active &quot;relaxation&quot; statements in relaxation.</td>
<td>None reported</td>
<td>Post-test only revised group design.</td>
</tr>
</tbody>
</table>
(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.

7.4 Non-Subjective Indices of Attitude and Perceptual Change After Meditation

Several studies have looked at behavioral indices of attitude and perceptual change.* Some studies† have noted that meditators seemed to have better auditory receptivity and perceptual discrimination than controls, as well as improved reaction times and increased capacity to attend. Meditators, however, were not more adept at learning a novel perceptual-motor skill (Williams, 1978). Linden (1973) and Pelletier (1974), using the Witkin Embedded Figures Test, found differences between meditators and non-meditators in field dependence. The above studies provide useful information about the relationship between meditation and perceptual changes. Two studies that attempt to clinically measure the effects of perceptual changes were done by Lesh (1970) and Leung (1973).

Lesh (1970) found that counselors who had practiced Zen meditation for one-half hour per day for one month had substantially increased accurate empathy, while those in two control


<table>
<thead>
<tr>
<th>Investigator</th>
<th>Clinical Problem</th>
<th>n &amp; % age sex race experienced</th>
<th>INDEPENDENT VARIABLE</th>
<th>Frequency of Treatment/Testing</th>
<th>Subjective effects</th>
<th>DEPENDENT VARIABLE</th>
<th>Type of Design</th>
<th>Quality of Controls/Methodological Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goleman &amp; Shaller 1914</td>
<td>Meditation training and hypnotic susceptibility</td>
<td>Not recorded</td>
<td>Task: Concentration on a) a 15min task involving attention to one of two lights</td>
<td>Not reported</td>
<td>Behavioral</td>
<td>Self-report of increases in throughput following meditation</td>
<td>None recorded</td>
<td>None subject. 6 groups served as own controls</td>
</tr>
<tr>
<td>Pellegrini 1916</td>
<td>Auditory perception (deafness?)</td>
<td>Hearing age 24-7 yrs, 20 male, 20</td>
<td>Group One: Monaural earphones for two; Group Two: Stereophonic earphones for two</td>
<td>Not reported</td>
<td>Pre and post test of auditory effects (left towards right ear). No control. No feedback. No feedback.</td>
<td>None recorded</td>
<td>None recorded</td>
<td>-7 of 8. in each group not permitted to control for possible interaction effects of auditory and speech measures.</td>
</tr>
<tr>
<td>Shaw and Reih 1917</td>
<td>Simple reaction time</td>
<td>Group One: Block, medium, one or more monkeys Group Two: Both, non-experimental</td>
<td>Task: Reaction to a stimulus</td>
<td>Not reported</td>
<td>Reaction time: Monkeys brighter in mood and more receptive to conversation after meditating</td>
<td>None recorded</td>
<td>-10111.1</td>
<td>Best of statistical significance not reported. Matching of groups not reported</td>
</tr>
<tr>
<td>Ronen, Slat A &amp; Slat 1919</td>
<td>2 point threshold determination of sound pressure level to tones</td>
<td>Group One: Threshold-Mediation (20dB) Group Two: Tone-Mediation (15dB)</td>
<td>Test: 5 dB increase in tone perception</td>
<td>Not reported</td>
<td>Behavioral</td>
<td>Tests given in “half” of the participants by the experimental procedures.</td>
<td>None recorded</td>
<td>None recorded</td>
</tr>
<tr>
<td>Graham 1920</td>
<td>Frequency and amplitude discrimination of pure tones</td>
<td>Group One: 20 monaural medianm</td>
<td>Task: 20 monaural median</td>
<td>Not reported</td>
<td>Behavioral</td>
<td>Pre and post test showed greater percentage improvement after meditation. The effect was 85% after testing (left ear) and 100% after testing (right ear).</td>
<td>None recorded</td>
<td>None recorded</td>
</tr>
<tr>
<td>Post 1923</td>
<td>Perceptual auditory discrimination of tones</td>
<td>Group One: 3 groups</td>
<td>Task: 40 per cent of tone and 4000 microvolts and one 5-225 milliseconds in length</td>
<td>Not reported</td>
<td>Behavioral</td>
<td>Meditation performed better on better than relaxation, or in which order they had meditated.</td>
<td>None recorded</td>
<td>None recorded</td>
</tr>
<tr>
<td>Quinlan, Quinlan, and Quinlan 1976</td>
<td>Differences in attentional abilitation and tiredness</td>
<td>Not recorded</td>
<td>Task: Group 1: Block, medium, one or more monkeys Group Two: Both, non-experimental</td>
<td>Not reported</td>
<td>Behavioral</td>
<td>Tests given in “half” of the participants by the experimental procedures.</td>
<td>None recorded</td>
<td>None recorded</td>
</tr>
</tbody>
</table>

**TABLE 7.2** Studies on Attention and Perception
groups did not change. Accurate empathy was measured by an "affective sensitivity" videotape showing a client telling about his/her problem. Subjects were to formulate what they thought the client's problem was. Lesh hypothesized that meditation helped the counselors by giving them an openness to their own inner experiences. The counselor, by knowing what s/he was feeling, was less likely to project those feelings and judgments onto what the client was saying.

In one of the few studies to control for order of teaching different meditation techniques, Leung (1973) taught counselors a deep breathing (internal focus) technique and an external concentration technique. He randomly assigned subjects to treatment groups that reversed the order of teaching the techniques. The criteria for measuring outcome were accurate empathy on a task similar to the one used by Lesh, and also having the subjects count the number of "notice authority" statements made by actor clients on a simulated client situation videotape. Regardless of the order in which the techniques were taught, both groups showed more accurate empathy and heard more notice-authority statements than controls.

7.5 Summary

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
Summary

Kohr 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 and Ingalls (1975) on altered reality testing resulting from too much meditation. Further, a recent article by Otis (in press, 1980) describes the adverse effects of meditation, presumably some of which resulted from experiences during meditation.

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.
Chapter 7: Further Reading

OVERVIEW


First Approach: Subject and Experimenter Different


Second Approach: Subject and Experimenter the Same.

Shapiro, D.H., A content analysis of the meditation experience, See Chapter Three.


CLASSICAL TEXTS

Chapter 7: Further Reading