TOWARD A COGNITIVE RECONCEPTUALIZATION OF MEDITATION

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Although pioneers like Brosse (1946), Das & Gastaut (1955), Anand, Chhina & Singh (1961a), Wenger & Bagchi (1961), and Kasamatsu & Hirai (1969) began to examine the physiology of meditation in yogis and Zen masters almost as soon as practical measuring devices came into existence, the field of scientific research into meditation really began with Wallace's (1970a) investigation, which concluded that "transcendental meditation produces a fourth major state of consciousness which is physiologically and biochemically unique" (p. 30). Whereas previous investigators had had to use small numbers of highly experienced subjects and thus conduct their research under relatively uncontrolled field conditions, Wallace had available a large number of subjects who had learned the standardized TM technique and was able to bring them into the laboratory and study them under rigorously controlled conditions. His findings led many other researchers to begin research in this area; thus, hundreds of studies have been conducted within the past five years alone.

In light of this proliferation of studies, it is opportune to re-examine the basic assumptions upon which this research has been conducted. The thesis of the present review is that the conceptualization of meditation as a relaxation technique has...
outlived its usefulness. A reconceptualization of meditation from a cognitive perspective is proposed, and its implications for psychotherapy and future research are explored.

MEDITATION AS RELAXATION

It was probably inevitable that meditation would initially be viewed as a relaxation technique. In the first place, Wallace's (1970a, 1970b) physiological study found significant decreases (from the resting state) in oxygen consumption (16%), carbon dioxide elimination (15%), respiration rate (24%), cardiac output (24%), heart rate (6%) and arterial lactate concentration (30%), together with consistent (though small and not statistically significant) decreases in respiratory quotient, minute ventilation, blood pressure, arterial gases, and rectal temperature. In addition, he found a large increase (160%) in skin resistance and an increase in the intensity of 8-9 cps (slow alpha) brain waves, occasional theta trains of 5-7 cps, with a decrease in the intensity of 2-4 cps (delta) and 12-14 cps (beta) waves. This entire physical pattern is one of relaxed wakefulness.

These results have been confirmed by other studies (Allison, 1970; Banquet, 1972, 1973; Glueck & Stroebel, 1975; Herbert & Lehman, 1977; Levander, Benson, Wheeler & Wallace, 1972; Michaels, Huber & McCann, 1976; Wallace & Benson, 1972; Wallace, Benson & Wilson, 1971; Wallace, Benson, Wilson & Garret, 1971; Westcott, 1976), though Schwartz (1974) reports that some of the changes (especially skin resistance) found by other investigators have not been quite so large as those found by Wallace.

Wallace's research paradigm (which has been followed by most other researchers) was to take these physiological measures continuously (or every ten minutes) during an hour which included rest (pre), meditation, and rest (post) periods; in addition, his subjects' rest periods contained both eyes-open and eyes-closed conditions to control for this variable. While this procedure of using each subject as his own control is usually an ideal method for eliminating the intersubject differences in arousal levels which make physiological comparisons across subjects difficult, it could be hypothesized that Wallace's subjects (who were believers in the benefits of meditation) increased their arousal levels during both rest periods (without being aware of doing so) in order to exaggerate the magnitude of the differential relaxation produced during meditation. Fortunately, other studies (particularly the well-con-
trolled one by Elson, Hauri, & Cunis, 1977) have used groups of meditators and non-meditating controls and still found significant physiological differences between meditation and resting.

Longitudinal studies have also shown that the relaxation produced during meditation generalizes to non-meditation periods when subjects practice meditation over periods of time as short as three months. Thus Benson and Wallace (1972b) and Benson, Rosner, Marzetta & Klemchuk (1974a, 1974b) found decreases in blood pressure over time; Honsberger and Wilson (1973) found improved pulmonary function in asthmatics, and Orme-Johnson (1973) and Orme-Johnson, Kiehlbauch, Moore & Bristol (1976) found similar effects on spontaneous GSR's and reactions to stress.

Thus, the physiological pattern produced by meditation in the short and long run is generally one of lowered arousal, entirely consistent with the perspective that sees meditation as a relaxation technique. In addition, viewing meditation as relaxation has allowed researchers to incorporate various phenomena produced by meditation into already-existing theoretical frameworks. Thus Fischer (1971) and Gellhorn & Kiely (1972) refer to Hess' (1957) model of ergotropic (increased sympathetic nervous system activity, skeletal muscle tonus, and a high level of diffuse, nonsynchronous cortical excitation) and trophotropic (increased parasympathetic nervous system activity, relaxation of skeletal muscles, and high levels of synchronous cortical excitation) systems. Benson and his colleagues (Beary & Benson, 1974; Benson, 1974a, 1975; Benson, Beary, & Carol, 1974; Wallace & Benson, 1972) instead postulate a relaxation response which is similar to Cannon's (1914) fight-or-flight (emergency) reaction except with direction of physiological change reversed (i.e., lowered oxygen consumption in place of increased oxygen consumption, and so forth). Both approaches create functionally equivalent models, i.e., meditation is an integrated relaxation response (trophotropic system reaction). As Kuhn (1972) makes clear, one should not underestimate the tendency to fit new data into preexisting paradigms, nor, indeed, the utility of doing so as long as this can be done without excessive distortion.

Still another reason why the relaxation paradigm has been a natural one to use for meditation is the increasing focus on the role of relaxation in psychotherapy. From Wolpe's (1958) use of relaxation as an incompatible reaction to anxiety in the treatment of phobias by desensitization, to the modern search for improved methods for treating hypertension, colitis, head-
aches, insomnia and other stress-related disorders, a large
and growing literature in psychology and medicine testifies to
the beneficial effects of relaxation. There has consequently
been a proliferation of relaxation procedures: progressive re-
laxation, autogenic training, biofeedback training, hatha yoga
exercises, guided imagery, hypnosis, and so forth. It could well
be asked, Why not add meditation to the list, especially when
its physiological effects are so large and well-documented?

A Critical Appraisal of Meditation as Relaxation

Viewing meditation as a relaxation technique has had a
number of consequences. One result has been to make medi-
tation seem more familiar and acceptable to the Western
public so that subjects are willing to learn and practice it and
researchers and psychotherapists are interested in exper-
imenting with it. Another outcome is that therapists have been
able to find a variety of ways of using it as a therapeutic
technique. If meditation is relaxation, it should serve as an
antidote to anxiety. Thus Berwick & Oziel (1973), and Bou-
dreau (1972) have used meditation in place of the more usual
muscle relaxation procedures to decondition phobic patients.
These therapists used in-vivo desensitization procedures. The
more usual imaginal desensitization procedure could be used
if the client took their phobic stimulus as a meditation object or
switched back and forth between the object of meditation and
the phobic object. Otis (1974) and Goleman (1971) have pro-
posed that meditation can decondition anxiety even when it is
done at fixed times of the day (the usual practice) rather than
in anxiety-provoking situations and when formal hierarchies
are not used. They suggest that the occurrence of random
thoughts during meditation while the person is relaxed pro-
vides for an unsystematic desensitization of the contents of the
mind. Some evidence for the efficacy of such a mechanism was
provided by Wilson & Smith (1968), who obtained symptom
relief in two patients using free association while relaxed
(self-paced, non-hierarchical desensitization) and by Girodo
(1974). Meditation, then, would not seem to be the appropriate
relaxation technique to use in treating specific focal fears, but it
does seem promising in cases of general or diffuse anxiety.

A considerable research literature has shown that meditation
does indeed reduce anxiety over time. There are many dif-
ferent methods for measuring anxiety and they do not correlate
very well with each other. Two principal types of measures are
self-report inventories and physiological measures such as skin
resistance and muscle tension. Ferguson & Gowan (1976) using the Cattell (iPAT) and Spielberger inventories with university students and controls matched for age and sex, Hjelle (1974) using the Bendig modification of Taylor's Manifest Anxiety Scale with beginning and experienced meditators, and Linden (1973) using the Test Anxiety Scale for Children—all found that meditators became significantly less anxious over time relative to controls. As indicated above, Orme-Johnson (1973) and Orme-Johnson et al. (1976) found that meditators produced fewer spontaneous galvanic skin responses (GSR's) than controls during baseline periods and when a noxious sound was presented; these results are interpreted by the author as showing the meditators to have lower levels of stress and to respond better to stress situations. A similar study by Goleman (1976b; Goleman & Schwartz, 1976) used the Spielberger inventory as well as GSR and heart rate (HR) and found a complex pattern of results: meditators rated themselves as much less anxious than controls on the self-report measures, while their GSR and HR levels showed the same, or even greater, reactivity to a stress film about industrial accidents. The physiological responses of meditators, however, began and ended more rapidly, which caused Goleman to conclude that the response pattern of meditators was more adaptive, i.e., they attended to environmental stimuli every bit as strongly as non-meditators but could also let go of stresses as they passed, rather than remaining chronically stressed or anxious.

Thus, meditation seems to decrease anxiety (as measured by both self-report and physiological measures) when practiced over a period of time, just as might be expected of any relaxation technique. Other experimenters have explored its effectiveness in situations in which anxiety may be hypothesized as an intervening variable. Thus Pirot (1976) found that meditation seemed to improve auditory discrimination; Orme-Johnson, Kolb, & Herbert (1976) determined that it reduced reaction time; and Blasdell (1976) and Rimol (1976) concluded that meditation improved performance on complex perceptual-motor tasks. Preliminary studies by Abrams (1972), Miskiman (1976a, 1976b), Tjoa (1976), and Vanlydegraf (1973) suggest that meditation may also improve verbal learning, another task that has been shown to be affected by anxiety. But not all studies have supported these conclusions. Most of these studies overlook the fact that the relationship between anxiety and performance is a complex one. Insufficient levels of arousal and motivation may detract from optimal performance quite as much as excessive anxiety does. Indeed, Pirot (1976) argues that resting controls have often become so sleepy that...
meditation, anxiety and drug use

the superior performance of meditators may be explained by the fact that meditation keeps subjects more alert.

Appelle & Oswald (1974) found that meditators did indeed have faster reaction times, but they did not improve any more over time than controls. Williams & Herbert (1976) and Williams & Vickerman (1976) found meditators performing no better on the pursuit-rotor task (a complex perceptual-motor task) than resting controls; nor did they learn faster or display less reactive inhibition. In these latter studies the controls have also used some relaxation procedure, and thus meditation may have a beneficial effect on anxiety but not a greater one than other methods of relaxing.

A retrospective study of meditators (Benson & Wallace, 1972a; Benson, 1974b) revealed a widespread decrease in the use of "hard" drugs, "soft" drugs, "hard" liquor, and cigarettes from reported pre-meditation levels. Similar results were reported by Shafti et al. (1974, 1975) and Winquist (1976). These have resulted in some preliminary efforts to use meditation as a substitute for these other substances as anxiety reducers (Brautigam, 1976; Shapiro & Zifferblatt, 1976a). I will argue later that anxiety reduction may not be the best explanation for drug and alcohol usage.

Other areas in which meditation has been used to treat anxiety-related conditions include asthma (Honsberger & Wilson, 1973), hypertension (Benson, Rosner, Marzetta & Klemchuk, 1974a, 1974b), insomnia (Woolfolk, Carr-Kaffashan, McNulty & Lehrer, 1976), and stuttering (McIntyre, Silverman & Trotter, 1974). Thus, conceptualizing meditation as relaxation has led to its use in a variety of experimental and treatment situations to counteract anxiety and stress with beneficial results. Although there are methodological shortcomings in most of these studies (Shapiro & Giber, 1978), the results are sufficiently promising to warrant the continued use of meditation in these situations while more carefully controlled studies are performed.

But the conceptualization of meditation as relaxation has also had other consequences. In the first place, it does not help us much in understanding the negative consequences which are sometimes reported to follow extensive meditation (Carrington, 1977; French, Schmid & Ingalls, 1975; Lazarus, 1976). Of course all teachers of relaxation report that some clients are threatened by the idea of relaxing and thus paradoxically become more anxious (Bernstein & Borkovec, 1973; Lazarus, 1976; Martin, 1951). Schultz & Luthe (1959) see these distur-
bances as manifestations of unstressing, i.e., the attempt of the organism to normalize itself by erasing old stresses. And Mills (1975) argues that people often mask depression by keeping active with the result that resting brings out the underlying depression. None of these explanations, however, would account for the severity of some reactions to meditation ("psychotic-like" reactions).

Secondly, it has led Benson and his colleagues to the conclusion that meditation is no different from any other relaxation technique; all are just different stimuli for eliciting the relaxation response (Beary & Benson, 1974; Benson, 1974a, 1975; Benson, Beary & Carol, 1974). Any method will work, provided it includes (1) a quiet environment, (2) a mental device for focusing attention, (3) a passive attitude, and (4) a comfortable position. Thus, Zen, yoga, autogenic training, progressive relaxation, hypnosis with suggestions for relaxation, sentic cycles (Clynes, 1972), cotention (Burrow, 1938; Burrow & Galt, 1945), and even prayer will produce the same effects as TM. Benson has even invented his own relaxation procedure (a variant of Zen) in which the subject sits comfortably with eyes closed, attending to his breath, and saying "one" silently to himself with each exhalation (Benson, Greenwood & Klemchuk, 1975).

Benson's view has become popular perhaps because it demystifies meditation (divorcing it from its roots in Oriental philosophies) and proposes a democracy of methods for achieving the end result (thereby countering the apparent secrecy and cultishness that have risen around most meditation procedures). The Benson position can be regarded in two ways: (1) empirically, it represents the null hypothesis (assume all relaxation procedures are equivalent until positive evidence is provided that statistically significant differences exist); (2) as a theory, it goes further and makes assertions about why no difference among methods is likely to be found (because the human organism contains a physiologically-integrated relaxation response so that the properties of the stimuli which trigger it are irrelevant). Benson and his followers appear to confuse these two aspects and assume, incorrectly, that the former implies the latter, which it does not. Let us consider these two propositions in reverse order.

Benson's theoretical assertion about the existence of a unitary relaxation response is difficult to evaluate because enormous problems arise in attempting to define relaxation. Many people experience sleep as relaxing; yet it is clear that sleep and meditation are two very different forms of relaxation re-
sponses. Younger, *et al.* (1975) and Pagano, *et al.* (1976) found that meditators often fall asleep while meditating. Nonetheless, they, with their EEG monitors, and their subjects, introspectively, were able to differentiate the two states without difficulty. Indeed, a provocative new study by Elson, Hauri, & Cunis (1977) provides evidence for their view that meditation is a process of moving into the twilight stage between waking and sleep and maintaining it indefinitely, in contrast to the normal tendency to slide off into sleep within a few minutes of reaching this state. A study of EEG responses to photic stimulation by Williams & West (1975) supports this view. If this is correct, it is perfectly understandable why beginners should occasionally fail to hold the correct meditative state and lapse into sleep.

Closing one's eyes and resting is also relaxing, yet much evidence exists to support the view that these are physiologically quite different states (e.g., Wallace, 1970a, 1970b; Elson, Hauri & Cunis, 1977), even if it is still unclear whether their long-run effects are different. Indeed, Davidson & Schwartz (1976) have noted that many people find chopping wood, running, reading, playing chess, and other activities which produce physiological arousal, relaxing. They have proposed that a complex theory of different types of tensions and matching activities which relax them in a variety of ways is more accurate than the unitary view which Benson has proposed. A recent study by Schwartz, Davidson, and Goleman (1978) has lent some empirical support to this view.

Benson's view is more tenable as a null hypothesis than as a physiological explanation of what happens during meditation. What would be needed to establish positive differences among relaxation methods would be carefully controlled comparative studies utilizing a full spectrum of physiological measures across matched subject populations who are practicing different techniques. Even then, it would be difficult to rule out the effects of belief and expectation (J. Smith, 1975).

No one has yet attempted such a research project. We are instead confronted with a bewildering mass of studies, each focusing on one or at most two techniques, which monitor some relevant physiological variables but not others, and which vary greatly in their methodological and technical sophistication (from the studies made by Brosse [1946] and Gundu Rao, Krishnaswamy, Narasimhaiya, Hoenig & Govindaswamy [1958], with primitive equipment under field conditions, to studies made under laboratory conditions with modern equipment), and in the experience and age of subjects.
Even subtle differences in procedure can render results non-comparable. For example, Wallace's original work (Wallace, 1970a) used invasive procedures (catheters, awkward gas masks) which would be bound to leave his subjects more aroused than would the more sophisticated and less invasive procedures that Benson and others now employ (Benson, Steinert, Greenwood, Klemchuk & Peterson, 1975). Also, Wallace (1970a) used an eyes-closed resting control before subjects began meditating. Use of other controls (e.g., eyes-open, reading, as Benson has used to test his meditation technique, or watching TV as used by Allison, 1970) would also leave subjects more aroused and thus produce greater contrasts between "meditation" and control periods than with Wallace's paradigm.

And as if these research problems were not sufficient, there is a growing body of evidence that suggests that the same technique often produces different effects in different subjects or even in the same subject on different days (Maupin, 1965; Pagano, Rose, Stivers & Warrenburg, 1976; Ritterstaadt & Schenkluhn 1973; Younger, Adrianne & Berger, 1975). These results corroborate the subjective experience that every meditator has had, regardless of technique, that meditations differ from day to day, more thoughts or less, drowsier or more alert, and so forth. It is commonly reported that teachers of TM distinguish three different states associated with the practice of TM: (1) "ordinary" consciousness while meditating, characterized by awareness of thoughts or the mantra; (2) "transcending," a brief experience of pure consciousness without any object; (3) "cosmic consciousness," a stable, prolonged state of such expanded awareness that it can combine ordinary consciousness and "transcending." It is not surprising that Woolfolk (1975), in reviewing some of the better-controlled physiological studies of yoga, TM, and Zen, concludes that "studies have thus far failed to verify an easily replicable, special state' of meditation with physiological concomitants that are consistent across the various esoteric traditions" (p. 1331).

Nonetheless, there are some indications that the different types of relaxation techniques mentioned by Benson (e.g. Benson, Beary & Carol, 1974) are not physiologically equivalent.

1. Yoga. Many practices are included under this general label. Some yogis apparently practice very intense concentration which reduces alpha and raises metabolism, while others use meditative practices that seem more like TM (Anand, Chhina & Singh, 1961a, 1961b; Bagchi & Wenger, 1975; Das & Gaustaut, 1955; Daley, Deshmukh, Dalvi & Vinekar, 1969; Karem-
relaxation in yoga
zen
autogenic training
hypnosis

belkar, Vinekar & Bhole, 1968; Kasamatsu, Okuma, Takenaka, Koga, Ikada & Sugiyama, 1957; Wenger & Bagchi, 1961). Yogic asanas (postures) and pranayama (breathing) have generally been found to increase, rather than reduce, oxygen consumption (Miles, 1964; Rao, 1962, 1963, 1968).

2. Zen. There are also a number of different forms of Zen: sitting and walking, focusing on breath, koans (logical paradoxes), mantras, and whatever happens to cross one's awareness. In addition, zazen (Zen meditation) is done with eyes open and taut muscles in the lower abdomen, which differentiates it from other relaxation methods (Onda, 1965). There is a growing literature on the psychophysiology of seated zazen which generally contains findings paralleling those in TM (Hirai, 1975; Kasamatsu & Hirai, 1969).

3. Autogenic training. This is a form of self-hypnosis which involves passive concentration on a sequence of formulas which produce a relaxed state (Schultz & Luthe, 1959) that has been used to treat a variety of psychological and physiological problems (Luthe & Schultz, 1969, 1970; Orme & Snider, 1964; Shibata & Motoda, 1967; Snider & Oetting, 1966). The physiological research is extensive (Luthe, 1970) but the studies are largely uncontrolled and with few subjects; while it would seem well-documented that some deep relaxation may take place, it has yet to be established that it is of a degree comparable to TM or zazen. Indeed, Schultz & Luthe (1959) do not characterize autogenics as relaxation, and instead pay primary attention to the unstressing (normalization) phenomena which occur during the practice, many of which are very energetic (arousing).

Autogenic training, yoga, and Zen are the procedures closest to TM. The others listed by Benson (1974a, 1975) are far less likely to be shown to share the same physiology as TM.

4. Hypnosis. There have been many attempts to show physiological differences between the hypnotic trance and ordinary waking state, and all have proved unsuccessful (Gorton, 1949; Crasilneck & Hall, 1959; Barber, 1961). All the available evidence thus suggests that the only way to produce meditation-like effects in hypnotized subjects is to give them instructions to meditate, clearly a round-about approach. Thus Walrath & Hamilton (1975) found no difference in heart rate, respiration or GSR between meditators and hypnotized subjects who had been given instructions to minimize metabolic functioning. Morse, Martin, Furst & Dubin (1977) found differences between meditation and hypnosis on some indices.
(e.g. muscle activity) but not others, and even between two different meditation procedures (TM and Benson's technique differed in their effects on blood pressure). It is hard to imagine why Benson includes hypnosis on his list, especially since none of the four elements he sees as essential are present in hypnosis.

5. Progressive relaxation. This is a system of muscle relaxation developed by Jacobson (1938, 1964). It lacks a mental device for focusing attention and is supposed to operate peripherally (i.e., changing the state of tension of skeletal muscles), whereas TM and other meditative procedures operate centrally. As a consequence, it is boring to do; thus, subjects often fall asleep during it and stop practicing it when assigned to do it regularly in control groups in experiments (e.g., Bagchi, 1936; Glueck & Stroebel, 1975). Grim (1975), however, shows how relaxation can be used as a meditation procedure if attention is properly focused. The only study comparing progressive relaxation and meditation is Curtis & Wessberg (1975-1976) who used too few subjects to find any different physiological effects, even though subjects reported that progressive relaxation and resting seemed to them different from meditation.

6. Cotention, sentic cycles, and prayer. Cotention and sentic cycles are obscure techniques which have never become popular enough to generate much research. What little research has been done (Burrow, 1938; Burrow & Galt, 1945; Clynes, 1972; Goyeche, et al., 1972) suggests that relaxation does take place, but further data are needed to determine whether it is of a form and degree comparable to TM. There is, surprisingly, no research on the physiological effects of prayer. There are probably so many heterogeneous activities which take place under that label as to preclude there being any single identifiable physiological state.

7. Biofeedback. Although Benson (1974a, 1975) has not included biofeedback on his list of relaxation techniques, it is often used for this purpose. In this procedure, subjects have some physiological activity monitored by machine and fed back to them. Any physiological measure can be used—brain waves, heart rate, blood pressure, muscle tension, and so forth. The feedback may be visual or auditory, though the latter is preferred in relaxation training because the subject's eyes can then be closed. Information about performance allows subjects to alter the target physiological response in whatever direction is desired. In some studies, subjects have been able to respond very precisely so that tension in the target measure will change without affecting other measures, While the change in some

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target measure, e.g., the frontalis-muscle, may be in the direction of relaxation, it is clearly of a different sort than the integrated response pattern that occurs in meditation. And it is experienced differently by subjects who report it as boring and often will not keep practicing over extended periods of time (Glueck & Stroebel, 1975; Kiefer, 1971).

In summary, then, although there is a paucity of controlled comparative studies of different relaxation techniques, there is ample evidence to suggest that there are differences among them both qualitatively and quantitatively. Experience suggests that if such differences are documented, attempting to explain them will prove to be the most fruitful way of expanding our knowledge about all these techniques and coming to understand more deeply what relaxation is, how it is produced, and the relationship between physical relaxation of specific kinds and various subjective states of mind. Considering meditation as relaxation has not furthered this line of inquiry.

Even if controlled studies do not find meditation to differ significantly from other forms of relaxation techniques in the physiological or psychological responses it produces (as has been the case with some studies — e.g., Shackman, 1974; J. Smith, 1976), and the null-hypothesis version of Benson's position is adopted, this does not affect the major thesis of this paper because the relaxation view of meditation does not tell us anything about the process of meditation. This may be its most serious limitation. Benson (1974a, 1975), for example, includes a mental device as one necessary component of any procedure that will elicit the relaxation response. Why should this be so? What is the role of a mental device? Why do some relaxation procedures (e.g., progressive relaxation, hypnosis, biofeedback) seem to work without using any mental device?

Most meditation systems, by contrast, not only use a mental device, but, in some cases, it is the most important part of the whole process. When a beginner is being taught to meditate, the instructor does not say anything about trying to relax, but rather imparts a mantra (sacred sound), or tells the individual to focus on the breath, a candle flame, a mandala (symbolic picture) or some other object of meditation. The mental device thus consists of an object or thought on which to focus and a way of relating to that object.

Systems of meditation that rely heavily on an object of meditation can differ in their style of relating to the object just as they differ in the object itself. TM teachers, for example, sug-
gest "taking it as it comes," not repeating the mantra, focusing on it, or attempting to exclude other thoughts; and when one becomes aware that one has been attending to other thoughts rather than the mantra, one should gently "favor the mantra." Thus TM is taught as a passive, effortless process. Carrington's (1977) procedure is even more passive. Other systems advise a more active approach, concentrating and trying to exclude competing thoughts, e.g., "with teeth clenched and tongue pressed against the gums, he should by means of sheer mental effort hold back, crush and burn out the (offending) thought" (Conze, 1956, p. 83).

MEDITATION AS A COGNITIVE PROCESS

The process of meditation is one of deliberately altering attention. Teachers of meditation have always stressed this fact. Brown's (1977) extensive description of Tibetan Buddhist writings on meditation makes clear that they consider attentional processes so central that their entire conceptual schema is organized around them. In describing the essence of the TM technique, Maharishi Mahesh Yogi (1969) has called it a systematic procedure of turning the attention inwards towards the subtler levels of a thought until the mind transcends the experience of the subtlest state of the thought and arrives at the source of the thought. This expands the conscious mind and at the same time brings it in contact with the creative intelligence that gives rise to every thought (p. 470).

Kapleau (1965) tells of the man who approached a Zen master asking for the highest wisdom.

Ikkyu immediately took his brush and wrote the word "Attention."
"Is that all?" asked the man. "Will you not add something more?"
Ikkyu then wrote twice running: "Attention. Attention."
"Well," remarked the man rather irritably, "I really don't see much depth or subtlety in what you have just written."
Then Ikkyu wrote the same word three times running: "Attention. Attention. Attention."
Half-angered, the man demanded: "What does that word 'attention' mean anyway?"
And Ikkyu answered gently: "Attention means attention" (p. 10-11).

Sitting down in a quiet location, closing the eyes, and attending to a Sanskrit sound repeated over and over, as in TM, certainly represents a shift in attention from our normal waking con-
sciouness. There is a change in focus from the external to the internal environment, from stimulus variety to stimulus uniformity, and from an action mode (manipulate the environment) to a receptive mode (taking in or disregarding the environment) (Deikman, 1971). These alterations in attention produce a shift in the dominance of brain hemispheres from left to right (Ornstein, 1971, 1972). Each hemisphere has been associated with different modes of information-processing: the left hemisphere uses primarily verbal, logical, sequential thinking, whereas the right hemisphere uses chiefly imaginal, intuitive, and holistic “thinking” (Galin, 1971). Western society tends to reinforce left-hemisphere thinking almost to the exclusion of right-hemisphere thinking. Meditation would then provide an activity for developing dormant right-hemisphere capacities (Davidson, 1976). Recent coherence analysis of the EEG’s of meditators suggests that meditation may also promote greater integration of the left and right hemispheres (Banquet, 1972, 1973).

Naranjo (1971) surveyed a large number of different types of meditation and found them to cluster into three overlapping attentional sets: (1) concentrative or absorptive meditation (of which TM is an example) which fosters one-pointedness by practice and/or willpower; (2) the negative way, whose focus is on eliminating distractions via purification or inhibition so as to reach a state of “no-mind”; and (3) the way of surrender and self-expression which produces unity by the powerful emotional attraction of the meditator to the object of meditation (possession states are one form this may take).

Goleman (1977) notes that the classic Buddhist text on meditation, the *Visuddhimagga* (a subsection of the Abhidharma, an ancient Buddhist treatise on the psychology of states of consciousness) divides the meditation paths into two: (1) the path of concentration and (2) the path of insight. All the varieties of meditation practices or schools use one or the other, or perhaps a mixture, of these two. The Tibetan Buddhist writings on meditation assert that there is a common core of preliminary requirements, technical practices, and experiences which is shared by all meditative systems and another set of techniques and experiences which varies according to the type of practice and the degree of proficiency of the meditator (Brown, 1977).

This makes an extremely important point, one usually glossed over by meditation-as-relaxation theorists: namely, that meditation is not a single, unitary activity. Different types of meditation produce different outcomes. This was beautifully...
illustrated by the classic EEG studies of Anand, Chhina, & Singh (1961a) and Kasamatsu & Hirai (1969). Anand and his colleagues studied experienced yogis during samadhi (concentration) meditation and found no alpha blocking to a variety of stimuli (strong light, loud sound, hot glass tube, and tuning fork) while meditating, although there was a normal blocking response if the same subjects were only resting. Thus, for the yogis, it was as though the external world did not exist (i.e., no stimuli from it reached their awareness). By contrast, Kasamatsu & Hirai not only found alpha blocking to clicks among experienced Zen (insight) meditators during their meditations, but their subjects showed no decrease in the duration of alpha blocking over time, i.e., it was as though the Zen masters were keenly attuned to the external world and yet formed no concepts about what was happening around them. Thus, the patterns of brain activity in each of the two types of meditation differ in exactly the way their theories would predict, and neither result is one which the ordinary person is capable of producing. These are very specialized states of attention indeed! Davidson and Goleman (1977) also found differences between the EEG patterns of TM teachers and those of practitioners of a Gurdjieff technique which focuses on various body parts.

How could these shifts in attention produce relaxation as well as other psychological benefits which are sometimes claimed for them, such as creativity, emotional growth and self-actualization, and the development of a host of supra-normal powers and extra-sensory perceptions called siddhist This is clearly the central problem facing any attempt to explain meditation from a cognitive perspective.

One possible answer has been proposed by Carrington & Ephron (1975b). They argue that meditation is basically rhythmic (attending to breath or mantras), and that rhythms are basically soothing, e.g., the mother's heartbeat for the infant (Salk, 1973). But this is an oversimplification. As anyone who has ever heard energetic drumming can attest, rhythmic sounds can also be enormously arousing. And the regularity (or repetitiveness) of the sound does not affect this phenomenon. Indeed, the human heartbeat is often experienced by the insomniac as a pounding that prevents relaxation. Furthermore, attending to a mantra need not be rhythmic as long as passive concentration is employed. TM teachers advise that the mantra may alternately slow down or speed up and that best practice requires letting happen whatever happens without attempting to hold it to the breath or any other rhythm. If the meditation object is something fixed like a candle flame or a vase, it is hard to see altogether how rhythm would enter.
Another mechanism whereby meditation may work is through the alteration in sensory input. Haer (1970), Ludwig (1966, 1971) and Silverman (Silverman, Cohen, Shmavonian, & Greenberg, 1961; Silverman, 1968) propose that people vary along a dimension of cognitive style called stimulus-seeking or stimulus-avoiding. They hypothesize that each person regulates his level of sensory input either through attentional processes or by altering the environment so as to produce a level of sensory input that maintains normal consciousness for them. If the level of stimulation is lowered (sensory deprivation) or raised (sensory overload), altered states of consciousness are produced. Whether these are experienced as pleasurable or painful depends upon one's value system. Our culture generally evaluates silence and aloneness negatively; hence, sensory reduction conditions are frequently experienced as unpleasant, as a "deprivation" (Heron, 1957; A. Smith, 1976), though this is not always the case (A. Smith, 1976; Suedfeld, 1975).

Sensory reduction can be produced, not only by decreasing the overall level of stimulation, but also by reducing the variety of stimuli. An extensive literature in psychology has shown that stabilized images on the retina or ganzfeld conditions lead to a loss of vision and a turning off of the external world (Ornstein, 1971, 1972). The same thing happens in mantra meditation; as the mind recycles the same thought endlessly, the thinking function itself habituates, leaving a state of "no-mind." Other forms of concentrative or negative meditation also use a single, unvarying stimulus (breath, visual object, sound). Expressive forms of meditation, by contrast, use sensory overload (e.g., dervish dancing).

The brain seems to have a limit to its capacity to process information at any given time. The amount available for processing sensory data depends on how much is being used to process information from the muscles and the memory (Gaarder, 1971; Singer, 1975). Thus the brain and nervous system need to shut out much of what is taking place at any given moment, selecting only that portion that is likely to be useful. Habituation is one example of this process. Another is automatization, the process whereby behaviors, perceptions, and concepts, as they become well-learned, pass out of awareness (Hartmann, 1958). A familiar example is driving a car; at first it is awkward and self-conscious, but when thoroughly learned it requires no conscious awareness, leaving awareness to be occupied by other thoughts, perceptions, and behaviors.

If people are placed in a situation of sensory reduction, there is some tendency to keep up sensory and cognitive input in order
to maintain reticular activation; otherwise one passes off into sleep. Input can be maintained in a number of ways: thoughts, memories, autonomic and kinesthetic feedback, and hallucinations (sometimes reported in sensory deprivation experiments). All these are familiar to meditators. Another process which seems to occur is deautomatization (Deikman, 1963, 1966a, 1966b; Ornstein, 1971, 1972). In this process, automatization is undone, causing objects to be seen as if for the first time. Zen masters speak of seeing the world as it really is, free of our usual conceptualizations about it; one is reminded here that the EEG’s of advanced Zen meditators did not habituate to stimuli. General semantics also stresses the difference between direct experience and filtering reality through language (Bois, 1961; Klein, 1956-57; Morris, 1951; Sakamaki, 1959).

Given that automatization serves the adaptive function of shielding us from stimulus overload, would it be desirable for deautomatization to generalize to non-meditation periods? Those who have experienced deautomatization speak of the experience as making the world seem more vivid and themselves more alive than ever before. But even if one wanted to experience the world in this way outside of meditation periods, would this be possible given the information-processing limitations of the brain? Modern cognitive psychology would insist that it is not possible (e.g., Diamond, Balvin & Diamond, 1963). Yet meditation masters imply, if not actually insist, that it is possible — and, indeed, that this is what "enlightenment" or "cosmic consciousness" means (e.g., Maharishi, 1969).

Although the requisite studies have not been performed, we may speculate as to what processes could be involved. In the first place, a relaxed person will use less brain capacity to process feedback from tense muscles. Although tense people are usually not conscious of their muscle tension and require practice before they are aware of it, it may nonetheless be registering in the brain and contributing to affect or mood (the James-Lange theory of emotion). Secondly, focusing only on what is happening at the moment ("living in the present") reduces competition from memory and cognitions about the future. Thirdly, meditation masters often simplify their lives so as to reduce the number of stimuli requiring attention. And finally, the overall capacity of the brain to process information may be increased (an expansion of consciousness), perhaps by better integration between the hemispheres and greater use of holistic rather than sequential thinking.

Even if deautomatization is possible, not all psychologists would find it desirable. Many psychoanalytic writers, for ex-
ample, have labelled meditation a regression to primary process thinking. Alexander (1931) saw meditation as "a sort of artificial schizophrenia with complete withdrawal of libidinal interest from the outside world" (p. 130); the outcome is a masochistic (ascetic) and systematic undoing of the entire development of ego capacities which leaves the adept catatonic. Federn (1952) viewed mystical union as a return to primary narcissism. Becker (1961) sees meditation as "imbibing in magical, omnipotent, self-hypnotic trance experiences" (p. 646) which produce diffuse body experiences, depersonalization, loss of ego-functioning and conversion to a magical belief system that views all this pathology as positive. Prince & Savage (1966) elaborately compare the phenomena of mystical states with similar ones in infancy, psychosis, and psychedelic states. Motives for these states have been stated to be (1) a reaction to intense hatred of the Oedipal parent, a struggle with irrational authority (Freud, 1928; Salzman, 1953); (2) a defense against libidinal or, more rarely, aggressive impulses (Dickes, 1965; Hartocollis, 1976); or (3) a soothing transitional object that relieves stress, much like a child's blanket (Horton, 1974).

While the phenomenological accounts of mystical and meditative experiences resemble accounts of pathological regressions, further research is needed to determine whether all of those states are in fact biochemically and neurologically equivalent (Pelletier & Garfield, 1976). Motivation for such research might come from observing the different roles that mystical and meditative experiences, on the one hand, and pathological regressions, on the other, play in the lives of those experiencing them. For one thing, meditators can enter and leave meditative states voluntarily, whereas schizophrenics are subject to involuntary regression. Moreover, increasing experience with meditation seems to lead to higher levels of normal functioning, whereas schizophrenics tend to deteriorate over time.

Moreover, while it is valuable to consider the motivations which underlie meditation, they need also not always be perverse. Weil (1972) contends that the desire to alter our state of consciousness is a normal and universal one, and Maslow (1970,1971) has written much about the positive effects of such "peak experiences." As is true in the understanding of artistic creation, there is a need here for making subtle distinctions between pathological regressions and "regression in the service of the ego" (Fromm, 1977; Kris, 1952; Maupin, 1962) or "tolerance for unrealistic experiences" (Gardner, et al., 1959).
In summary then, meditation has been viewed as a form of sensory deprivation experience which may lead over time to generalized alterations of usual cognitive and perceptual processes such as deautomatization. Whether this is the only, or even the best, explanation of how the attentional shifts caused by using a mental device produce their effects is still to be determined. But this hypothesis allows us to reexamine many of the traditional arguments about how meditation works as a relaxation therapy and discover alternative explanations.

For example, meditation may not reduce anxiety by substituting relaxation for it (the counter-conditioning explanation), but rather by teaching people to shift their attention away from frightening thoughts or images or the disturbing subjective state, to more positive ones (like the object of meditation). Wilkins (1971) has argued that this is a possible explanation for how desensitization itself may work. Yulis, Brahm, Charnes, Jacard, Picota & Rutman (1975) confirmed this in a study which found that clients who learned to shift attention away from phobic objects improved as much as did those using a relaxation procedure. This would explain how teaching coping strategies would also serve to reduce fears (i.e., as a shift of attention from negative helplessness to positive coping techniques).

Likewise, the way in which meditation may decrease use of alcohol, drugs, and cigarettes (if longitudinal studies confirm that it does) may not be by reducing anxiety as conventional explanations would argue (Marzetta, Benson & Wallace, 1972; Swinyard, Chaube & Sutton, 1974), but rather by substituting an alternative way by which people can alter their state of consciousness. The point at issue here is whether addictive substances are ingested in order to reduce anxiety (an avoidance, or negative reinforcement, model) or whether they are used in order to produce an intoxicated state of consciousness which is positively reinforcing in its own right (Weil, 1972; Galanter, 1976). Of course, these positions are not mutually exclusive either. Furthermore, if drug and alcohol usage are motivated by a desire to alter consciousness, meditators might be expected to have higher initial levels of usage than the general population (these are persons with higher than average needs for altering their state of consciousness), and the larger decreases in usage of these substances may be attributed to the higher initial levels and substitution of another method that meets their needs more effectively.

In addition, at least some of the negative experiences which sometimes follow meditation may be accounted for by using
cognitive explanations. I have already referred to the possibilities that some people may have negative associations to the idea of relaxation or may be unable to cope with the lifting of repression which may follow deep relaxation. Kennedy (1976) has also proposed that the depersonalization experiences which often follow meditation may be due to the extensive self-observation which is part of many procedures.

And finally, a cognitive perspective allows us to reinterpret some of the contradictory or puzzling results obtained in studies of meditation-as-relaxation. For example, following a critical review of meditation research in which J. Smith (1975, 1976) focused on methodological problems, such as small sample sizes, inappropriate control groups, possible self-selection of subjects, and confounding effects of expectations, Smith conducted a study in which he attempted to control for expectations by developing alternative procedures with their own rationales for his controls to engage in. When he found no significant differences between meditators and these controls on his measures of anxiety, he concluded that expectational factors must be responsible for the decreases in anxiety which both groups obtained. A closer look at his control procedures, however, reveals them to be alternative forms of meditation; i.e., generating as many thoughts as possible is not "antimeditation," as Smith calls it, but rather a more active form of focusing attention on a mental device.

Thus, a cognitive model of meditation allows us to reexamine many of the explanations which relaxation theorists have put forth as to how meditation works, and to generate alternative explanations. More sophisticated research will be needed to discriminate between these viewpoints; but without such complex designs, experimental results will prove more ambiguous than enlightening.

IMPLICATIONS FOR RESEARCH AND PSYCHOTHERAPY

This view, that meditation is a process of deploying attention in a different way than usual so as to produce an altered state of consciousness characterized physiologically by deep relaxation, has a variety of implications for research and psychotherapy.

The major research problem is to elucidate the psychophysiological processes through which the shifts in attention produce their effect. In the previous section we noted two hypotheses which have been advanced to explain this: the effects of
rhythm and of sensory reduction on the nervous system. There are problems with each approach. As noted above, the effects of rhythm are more complex than often recognized and some forms of meditation appear to make little use of rhythm. The sensory reduction hypothesis, while far more solidly grounded in empirical findings, still contains some fascinating puzzles. Why is it that sensory reduction sometimes produces sleep, other times hallucinations, or deautomatization of sensory perception, and on still other occasions a state of relaxed wakefulness? And what are the neurological mechanisms through which shifts in attention operate?

A review of cognitive and psychoanalytic theories about attention does not immediately advance us very far in our search for research paradigms by which meditation can be studied. Attention seems to have been split into several different components, each of which is studied in isolation from the other. A brief review of two cognitive approaches (selective attention and vigilance) and the psychoanalytic models of Rapaport and Gardner will make this clear.

One approach to attention stresses selective (or divided) attention and investigates how people make choices among the stimuli that bombard them. The principal research strategy has been to provide subjects with multiple stimuli (e.g., dichotic listening) and observe which are perceived. This approach has provided information about the salient characteristics of selected stimuli and variables such as arousal which affect the limitations of simultaneous processing. Theoretical explanations include filter models based on semantics or stimulus properties (Broadbent, 1977; Treisman, 1960), theories of response sets (Deutsch & Deutsch, 1963), and theories which combine both elements (Kahneman, 1973). Not only is there a great deal of controversy among theorists as to the mechanisms involved in selective attention, but it is not clear what predictions about meditation would be made from these models, since most research thus far has involved subjects confronted by more stimuli than they can process, and meditation is a process which involves reduced stimulation.

Another approach to attention, the study of vigilance, involves subjects who remain in a relatively unchanging stimulus situation for long periods attempting to detect unusual stimuli when they occur. This research has measured exhaustively the effects of various components of the stimulus situation or the arousal level of the subject on performance and attempted to explain the observed reduction in detected signals using theories of arousal, inhibition, and expectancy, as well as combina-
Psychoanalytic models of attention and meditation

tions of these (such as signal-detection theory) (Mackworth, 1970; Stroh, 1971). While vigilance experiments usually contain low-stimulation conditions like meditation, meditators are not waiting for signals to respond to; also depending on whether they are using a concentration or insight approach, they may completely habituate to external stimuli (yogis) or dis-habituate to them (Zen masters). A study of vigilance during sensory deprivation (Johnson, Smith, & Myers, 1968) found that sensory deprivation subjects were more vigilant than resting controls.

Psychoanalytic models of attention seem closer to the process of meditating. Rapaport, Gill & Schafer (1945-1946) distinguish between concentration and passive attention and suggest measures for each (the arithmetic and digit span subtests, respectively, of the Wechsler intelligence tests). A more comprehensive theory of attention has been elaborated by Rapaport (1967) and Schwartz & Schiller (1967, 1970). These offer some interesting explanations of the reasons different meditators may find concentration or passive attention easier as well as a clinical explanation of the difficulty of directing attention. Gardner and his associates at the Menninger Foundation (Gardner, Holzman, Klein, Linton & Spence, 1959; Gardner, Jackson & Messick, 1960) have taken another approach to attention deployment by looking for stable traits called cognitive control mechanisms which govern the ways people attend and perceive. This would suggest that there may be a certain personality type which chooses to meditate and is able to stay with it, whereas other personality types would be less likely to try meditating or, if they do, would drop out. While some researchers have concluded that there is such a relationship between personality and decision to meditate (Otis, 1974; Sohackman, 1974; Smith, 1975), others have found no such difference (e.g., Steck & Bass, 1973).

Thus, previously-developed theories of attention do not appear to help us much in understanding the particular patterns of attention-deployment in meditation and how they produce their effects. It is to be hoped that current research in the psychophysiology of altered states of consciousness will shed some light on this question. In the meantime, it would be interesting to administer a battery of tests used to measure different aspects of attention, e.g., the digit span and arithmetic subtests of the WAIS, the rod-and-frame and embedded-figures tests of Witkin, Dyk, Faterson, Goodenough & Karp (1962), size estimation tasks which employ Piaget’s centration-hypothesis (Gardner, et al., 1959), the Stroop color-word test, the Tellegen absorption scale (Davidson, Schwartz & Roth-
man, 1976), EEG's and so forth, to a group of experienced meditators, beginning meditators and non-meditating controls, and to readminister these tests later to the latter two groups. This might provide some useful information about the longitudinal effects of meditation on attention.

It is far more difficult to study attentional processes during meditation because most procedures interfere with the meditative process. One example of this problem is Van Nuys' (1971, 1973) proposal that subjects press hand buzzers to signal when a distracting thought arises or when they are entering a particularly deep meditation (e.g., "transcending"); in this way, the subjective experience could be correlated with concurrent physiological investigation. The problem is that the signalling process interferes with the attentional set that meditation is attempting to establish (i.e., "transcending" is a state of no-thought, yet awareness of a buzzer to be pushed constitutes a thought), or is very difficult to do (e.g., subjects who are gripped by a distracting thought are unlikely to remember to press a buzzer). The EEG studies of Anand, et al. (1961a) and Kasamatsu & Hirai (1969) previously cited, demonstrate, however, that the problems involved, while difficult, are tractable.

Thus, a reconceptualization of meditation as a cognitive process involving voluntary redirection or attention rather than as a relaxation technique would shift the focus of meditation research to attentional variables and processes such as those outlined above. There would also be a number of implications for the use of meditation in psychotherapy.

In addition to its use as a relaxation technique for counter-conditioning anxiety, meditation can be seen as a shift towards self-observation which has been shown by itself to bring about changes in behavior (Johnson & White, 1971; Shapiro & Ziglerblatt, 1976b). It is well to be aware, however, that Kennedy (1976) believes excessive self-observation to lead to depersonalization. At minimum, it may prove uncomfortable for some clients.

Learning is also a function of the relationship between figure and ground. If the background noise is sufficiently great, learning is impeded; if noise can be reduced, learning is facilitated. DiCara (1970) found this to be true with curarized rats. Meditation may accomplish the same result for humans. This line of argument has been given as an explanation for why yogis have developed such extraordinary control over their autonomic functioning without the benefit of signal amplification that biofeedback instrumentation provides (Ornstein,
Meditation and learning

The deautomatization processes referred to above would also allow the meditator to see the world less as that person has been accustomed to see it and more as it is. Learning is bound to be inhibited if fear of criticism and false perceptions of reality keep one from obtaining the feedback necessary for learning (Gallwey, 1974; Goleman, 1971, 1976a).

Meditation can also be a training in the self-control of attention. As such, it might be expected to prove beneficial for those patients who have difficulty in focusing their attention (e.g., children with the learning disability syndrome, schizophrenics) (Rubinfine, 1973). There is as yet no published report of the use of meditation techniques with these populations. Present research also has left unclear whether concentrative absorption is a trait, a skill which can be increased with practice (Davidson, Goleman & Schwartz, 1976), or a response to particular stimulus conditions (Csikszentmihalyi, 1975; Furlong, 1976).

Meditation also includes practice in beginning and ending the mantra at will. As such, it might be considered as an alternative to conventional "thought-stopping" procedures for patients who are plagued by intrusive thoughts. Hendricks (1975) has found that patients are often helped by learning to discriminate that some events are "merely thoughts."

There is also some preliminary evidence that meditating may improve the performance of psychotherapists by making them more calm and centered (and therefore less likely to become destructively involved in the client's problems), more empathic, better able to attend in a relaxed and easy way to what the client says, and more tolerant of unusual and regressive experiences (Berger, 1962; Carrington & Ephron, 1975a; Lesh, 1970; Leung, 1973).

If meditation is to be used successfully as an adjunct to psychotherapy, greater attention will have to be paid to the difficulties which arise in meditation that make various individuals want to stop the practice (Carrington & Ephron, 1975b; Martin, 1951), and strategies for maintaining it. These may include redefining meditation positively as a chance to be quietly relaxed (rather than as punishing "time-out" from reinforcement), and the development of cues that signal meditation (meditating in the same place at the same times of day, possibly even with some preparatory ritual like lighting candles or incense). In TM, the mantra itself comes to serve as a discriminative stimulus for meditation. Injunctions not to talk about one's meditation practice and not to share the mantra with
others, and to stop thinking the mantra if it comes to mind during other times of the day ensure that it is associated specifically with meditation. Classical conditioning would suggest that the changes which occur during meditation would become conditioned to this word so that over time they would be elicited more rapidly and profoundly. The TM organization also holds several group meetings right after initiation which use social reinforcement to develop the habit of meditating. The organization also provides free checking (booster) sessions whenever the meditator feels the need of them, and advanced lectures which would also make use of social reinforcement. Other reinforcements for the meditator during the early stages would include the monetary commitment that has been made (via the motivating power of cognitive dissonance) and the expectation of benefits.

In the long run, actual benefits and the pleasure of meditating itself may serve to maintain the practice. If not, judicious use of behavioral self-management (e.g., won't have breakfast until I've meditated”) may be necessary. More systematic research on the dropouts from meditation would be helpful in designing better approaches for teaching and maintaining the practice.

Another interesting research question is whether the object of meditation matters, or will any stimulus work provided that it is unvarying? The Buddha divided people into four general categories (hateful, lustful, faithful and intelligent) and recommended different objects of meditation for each (e.g., images of corpses for the lustful, the idea of compassion for the hateful, and so forth) (Goleman, 1977). These are all thoughts, however. Are there differences between words, visual imagery, external sounds or objects, kinesthetic phenomena (breath, pains), and so forth in terms of their efficacy as objects of meditation? There is as yet no research on this question.

And within the more commonly-used mantra meditations like TM, does it matter which mantra one uses? Although many studies have found that words lose their meaning when repeated over and over (e.g., Lambert & Jakobovitz, 1960), cognitive behavior therapists have demonstrated that it matters what we tell ourselves (Meichenbaum & Cameron, 1974). The words "stupid" and "competent," if repeated continually for 40 minutes per day, would probably produce very different effects over several months. Indeed, therapists might consider selecting meditation mantras that would be therapeutic for individual clients. Something like this is done in autogenic training with the use of special formulas.
The TM mantras are Sanskrit words. Although these words may be argued to be without meaning for most Western subjects, it is possible that the common linguistic roots between English and Sanskrit give some meaning to them. Maharishi (1969) states, however, that it is the sound qualities that are of primary importance; some sounds have beneficial effects on the nervous system whereas others do not. The importance of sound is said to become more significant as the subtler levels of consciousness are reached. These hypotheses still await experimental verification.

SUMMARY

Meditation is viewed by most researchers today as a relaxation technique. This conceptualization is supported by a large body of physiological evidence. In addition, this conceptualization allows meditation to be comfortably included within existing paradigms. Moreover, the current interest in effective relaxation techniques in the treatment of both physiological and psychological disorders facilitates this conceptualization. As we have seen, this conceptualization has apparently facilitated research on meditation and on the use of meditation as an adjunct to psychotherapy. These have been significant gains.

Adopting this conceptualization has led researchers like Benson to postulate both that relaxation is an integrated response pattern of the organism, and also that it makes no difference what triggers this response. An extensive review of the literature indicates, however, that relaxation is in fact quite a varied phenomenon (e.g., it may include both running and resting, which obviously have different physiological patterns). Furthermore, even within the category of accepted relaxation techniques (including, for example, progressive relaxation, hypnosis, and biofeedback), there may be significant psychophysiological differences. Thus, focusing only on similarities is a significant weakness. An even more important weakness is that such an approach sheds little or no light on the process of meditation.

One of the advantages of a proposed reconceptualization of meditation in cognitive terms (as a process involving complex patterns of deploying attention) is that it overcomes both of those major weaknesses of the relaxation view. The question then arises, however, as to how those attentional shifts produce the psychophysiological patterns seen in meditation. A survey of existing theories of attention reveals that we are not yet able to provide any complete answer to this question. Thus, further
specific research will be needed on attention in meditation. There are difficulties here, however, particularly in devising measures of attention that will not interfere reactively with the process of meditation they are designed to measure. The most promising theory at the moment is that of sensory reduction. It is discussed at some length, including its implications for deautomatization phenomena.

There are additional advantages to reconceptualizing meditation along the lines here suggested. For one thing, viewing meditation as a cognitively-altered state of consciousness allows us to reinterpret other models of how meditation works and to reconcile some conflicting experimental results. For another, this perspective also provides many new insights for the psychotherapist both as to what the active ingredients are in producing beneficial results and as to new ways in which meditation can be used therapeutically. In addition, this cognitive reconceptualization fits directly into the broader expansion of behavior therapy from its origins in conditioning (and deconditioning) to its recent inclusion of cognitive procedures and models of all sorts.

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