


Components of Meditation

8.1 Components, Effects, Mediating Mechanisms: A Distinction

 ALTHOUGH THE research discussed in Chapters Five and Seven is relatively conclusive that meditation, broadly conceived, results in powerful subjective experiences and physiological changes, it is not yet clear what variance of the effect is attributable to different components of the technique of meditation. At the simplest level, this chapter tries to answer the question: *What* are the components of meditation which cause the effects? The following chapter, *Mediating Mechanisms*, tries to answer the questions *why* and *how* do the components cause the effects. Although posing the questions is clear and simple, the answers, unfortunately, are not. Unless we are extremely precise and careful, we can find ourselves in a semantic swamp while discussing effects, components, and mediating mechanisms. This is because certain variables, depending upon the perspective of the observer, may at any given time be either a component, a mediating mechanism, or an effect.

The relaxation literature concretely illustrates some potential difficulties. For example, the relaxation response which Benson

(1975) described and the physiological changes during that response may be the mechanisms mediating the effects of meditation on stress, addictions, and hypertension. Therefore, the relaxation response may be viewed as a mediating mechanism accounting for meditation's effects (Shapiro & Giber, 1978). On the other hand, the relaxation response might be considered a dependent variable, an effect of the components of meditation: attentional training, posture, adherence, etc.

Further, one might argue that decreasing oxygen consumption is the main mediating mechanism and that this decreased oxygen consumption causes a variety of other physiological and subsequent cognitive changes to occur (Watanabe et al., 1972). However, other investigators have looked at oxygen consumption as a dependent variable, an effect of meditation (Pagano, 1978; Fenwick et al., 1977). Thus a given variable may be a component, a mediating mechanism, or an effect, depending on how it is viewed.

Therefore, it is critical that a context be formulated and made explicit before proceeding to answer questions about components and mediating mechanisms.

8.2 An Omni-Deterministic Model

THE CONTEXT I will be using in the next two chapters is an omnideterministic model of causality. This model is borrowed from several sources; first, it is indebted to general systems theory, as utilized in structural family therapy (Minuchin, 1974; Minuchin et al., 1978). Each part of the family is thought to influence and interact with the whole, and to focus on any one family member, without acknowledging and dealing with the family context, is seen as anathema to therapeutic success. Second, this model borrows from Skinner (1953, 1966) who outlined a three-form contingency model—functional analysis: antecedents, behavior, consequences. This temporal division previously utilized by Davidson and Goleman (1977) provides an additional helpful structure to our context. Third, Bandura (1978), suggested that our behavior is not solely a function of the environment—a unidirectional view of environment determining behavior; nor is it solely a function of the

individual—a unidirectional view of the individual determining environment. Rather there is an interaction effect, a bi-directional model in which each part reciprocally determines the others. By adding an additional variable (cf. Black and Thoresen, Note Thirteen) of the behavior itself (in this case meditation), we have the following interactive model: (Figure 8.1).

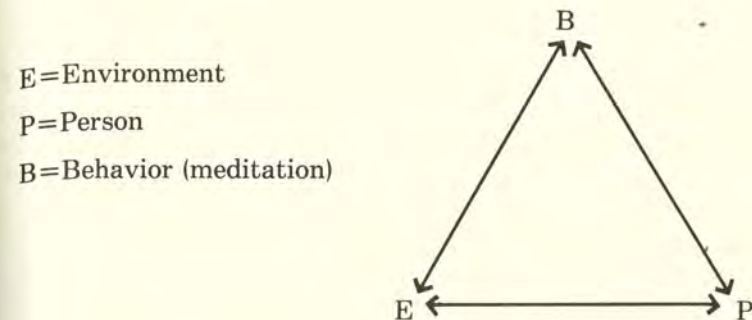


FIGURE 8.1 An Omni-Deterministic Model of Mediating Mechanisms of Meditation

As an illustration of this model, let us consider the following. High demand characteristics from the external environment influence a person to a stronger belief about the possibilities of meditation, $E \rightarrow P$. This belief influences the person's attentional behavior, $P \rightarrow B$. The influence of the attentional behavior could in turn cause reduced physical movement, thereby reducing physiological tension. In this way, the behavior should help strengthen the person's attitude and commitment, $B \rightarrow P$. Further, if an individual becomes more relaxed, he or she may get more social reinforcement, $P \rightarrow E$, so that the individual is affecting the environment. This increased social reinforcement should help the individual continue adherence to the program and the behavior, $E \rightarrow P$. And so the cycle continues. Further, the physical environment can have an effect (environmental planning) on the performance of the behavior, $E \rightarrow B$, and as we

have noted, the actual behavior can determine how the environment is perceived, B → E (cf. Anand, Chinna & Singh, 1961a; Kasamatsu & Hirai, 1966).

In simple terms, we create the environment that creates us. Therefore, I am proposing that we look at the components and mediating mechanisms of meditation as a multi-level process with several different physiological, cognitive, and attentional mechanisms occurring, often simultaneously. In this model it becomes difficult if not impossible to isolate any one most salient component or "one" mediating mechanism in order to determine a "first" cause. Thus, we have what in physics has been referred to as an organismic, omnideterminism, bootstrap theory (cf. Capra, 1976) in which each part effects all others.

I have restricted my discussion of the components of meditation to antecedent, preparatory variables and posture, attention, and breathing. This is a narrowly based definition of the "Components of Meditation." It excludes issues of expectation effects, demand characteristics, non-specific variables, etc. Some researchers rightly label these issues "confounding variables" that therefore should be appropriately discussed with methodological concerns. Some, again rightly, may label them "indirect" components associated with meditation, and therefore appropriately discussed in this chapter. I have chosen to discuss these "confounding variables and indirect components" as mechanisms mediating meditation's effects, and therefore discussed in Chapter Nine. However, as seen in Table 8.1, the "components" of meditation need to be placed within a context.

By breaking meditation into various components, we may be able to a) devise research which can designate the percentage of variance attributable to each component, thereby separating out active from inert variables; b) pinpoint unique aspects of meditation training as opposed to non-specific effects inherent in any self-regulation strategy (e.g., McFall et al., 1971).

8.3 Antecedent or Preparatory Variables


 MOST RELIGIOUS traditions have a series of preparations which must be performed before an individual is thought to be ready to begin the spiritual practice of meditation (e.g., Goleman, 1971; Brown, 1977; Deikman, 1980 in press).

TABLE 8.1 *Meditation: An Omni-Determinism Analysis*

A. Antecedents: Variables Preceding Beginning to Meditate

Psychological Variables

1. Subject (Client) Variables

- 1.1 Expectation Effects
- 1.2 Initial Motivation
- 1.3 Psychological Profile

2. Therapist/Training Variables

- 2.1 Demand Characteristics
- *2.2 Required preparatory rituals (e.g., change of eating habits, lectures)
- 2.3 Relationship

3. Miscellaneous, non-specific variables: Additional placebo effects: e.g., structured training format, being part of a group, socio-cultural values of society, etc.

*Physical Variables — Environmental planning — arrangement of the environment to facilitate the desired behavior.

B. Behaviors of Meditation

*Physical Posture

1. Movement
2. Stabilized
 - 2.1 Lotus
 - 2.2 Half-Lotus
 - 2.3 Sitting

*Attentional Focus

1. Specific object (e.g., mantra)
 - 1.1 Meaningful
 - 1.2 Meaningless
2. Choiceless awareness

*Attentional Style

1. Active
2. Receptive

*Regulation of Breathing

1. Ignored: "Automatic"
 2. Attentive: controlled
 3. Attentive: "automatic"
- Adherence

C. Consequences

- Cognitions:
Social reinforcement: peer pressure, etc.
Physiological/behavioral/attitudinal changes

Note: the Asterisked (*) items refers to issues discussed in this chapter as components.

These preparations range from the highly structured and complex—changing dietary habits, cultivating feelings of love and compassion, decreasing thoughts of selfishness and greed—to much less complex—preparatory lectures and instructional training. One study (Smith, Note One) has already looked at the relationship between preparation and adherence. The results, discussed more fully in the section on adherence, suggest that the greater the preparation, the greater the adherence.

The primary physical-environmental variable involving antecedent preparation for meditation concerns the room or the place where meditation occurs. There has been no specific research looking at the effect of the actual environmental setting on the effects of meditation. However, environmental planning (stimulus cue) research is quite convincing (Shapiro & Zifferblatt, 1976b; Mahoney & Thoresen, 1974), and common sense as well as anecdotal experience suggest that the actual site in which meditation occurs should influence outcome. For example, a quiet, soundproof room would give one the opportunity to concentrate more effectively than if one were to attempt meditation initially in a more stimulus-demanding environment.

8.4 Posture

WHAT EFFECT DOES physical posture have on successful meditation practice? The Eastern literature believes that bodily self-regulation plays a strong role in determining the subsequent self-regulation of attention. As Ikegami (1973) noted, Zen practice derives very much from the fundamental teachings of the yoga school which suggests we need to “regulate the body in order to obtain peace of mind.”

The only series of studies on the role of posture has been carried out by Ikegami (1973), so I report his findings here in some detail. Ikegami began by investigating the relative muscle tension of different postures ranging from lying down to standing. He found that the half-lotus position and the full lotus position and relaxed *agura* (which is sitting in a full lotus position but without the buttock on a pillow) all showed EMG activity about midway between a standing posture and a supine posture. Ikegami then devised an ingenious experiment in which subjects

were asked to sit on a wooden disc which measured fluctuations in body movement. In summary, it was found that:

a) Experience and age of the practitioner had an effect in determining the amount of fluctuation: the more experienced the practitioner, the less that fluctuation occurred.

b) For the experienced meditator, the full lotus posture was the posture that maintained the most balance and best center of gravity.

Ikegami then tried to assess which posture was most stable for naive subjects. He held the attentional component constant by having naive subjects focus on a red digital lamp, and he had these subjects take three different postures, each for thirty minutes. The postures, assigned to the subjects in random order, were *seiza*: a sitting posture with the body weighing on the folded legs, and the buttocks resting on the heels;* *agura*: a cross-legged posture with the buttocks directly on the floor; and half lotus. The least fluctuation occurred in the half lotus and *seiza* positions.


Ikegami then raised a question regarding the role of attention on the effectiveness of the posture. Subjects were asked to sit in a half-lotus position under two different conditions: condition one involved concentration on a red digital lamp; condition two permitted free eye movement. Concentration on the lamp reduced fluctuation considerably. This study strongly suggests the importance of attentional focus in maintaining firm non-fluctuating posture. Ikegami suggested, however, that these effects may be reciprocally enhancing in that the posture allows one to concentrate better, and the concentration helps maintain a more non-fluctuating physical posture.

These studies raise two interesting and related points. The first question involves which posture is most “balanced and centered.” It seems clear from Ikegami’s work that the full lotus posture is the “most balanced” for experienced meditators. However, this is not true for naive meditators. Further, anecdotal and personal experiences make it clear that for inexperienced meditators the full lotus posture is more of a hindrance and distraction “to calming the mind” than a help. Further

*In the case of the male, the kneecaps are placed apart so the folded legs form the two sides of a triangle.

research should clarify the process and time sequence through which the lotus posture becomes an aid to meditation. The second question deals with the relationship between posture and attentional focus. As noted above, Ikegami first held attentional focus constant and varied posture. Then he held posture constant and varied attentional focus. This latter study showed the importance of attentional focus in posture. We now turn to the attentional literature to see what additional effects the attentional component may have on meditation outcome.

8.5 Attention

 WE SAW IN THE previous section that attentional focus on an external object improved the stability of the posture (Ikegami, 1973). Several additional questions need to be addressed concerning the attention variable. For example, is there a relationship between improvement in concentration and clinical improvement? Does attentional absorption increase with practice? What is the type of attention primarily used during meditation—discriminating, analytical; or “holistic,” global, intuitive? Are there certain individuals with a better ability to attend? Do they make better meditators? Are there different levels of concentration? Are there differences in the type of concentration involved during “concentrative” versus opening-up (mindfulness) meditation? Does it make any difference whether there is active or passive attention? Does it make any difference whether one stimulus is focused upon or whether a variety of complex stimuli are attended to? Does it make any difference in concentrative meditation whether the stimulus is internal or external?

The literature on meditation and attention has not always been sufficiently precise. Therefore, we need to be careful of our assumptions as we review it. Our definition in Chapter One assumed that attention is a component of meditation, and therefore, is at least in part responsible for its effects. However, others have looked at attention as an effect of meditation (Davidson et al., 1976). Others, as we discuss in Chapter Nine, have viewed it as a mediating mechanism. There have been six studies which look at the relationship between meditation and attention. Let us look at each of these in turn to see what information they might provide about the above questions.

8.5A LENGTH OF MEDITATION AND ATTENTIONAL ABSORPTION

Davidson et al., (1976) in a cross sectional design, compared those interested in meditation with those who had practiced meditation for either one month, from one to twenty-four months, or longer than two years. Using the Tellegan Absorption Scale (Tellegan & Atkins, 1974), it was found that more experienced meditators had significantly increased attentional absorption,* and that attentional absorption increased as the length of meditation experience increased. This study about increased ability to attend as one practices meditation is consistent with the physiological literature and the studies by Kasamatsu and Hirai (1966) and Anand et al., (1961a). Longer-term meditators seem to have a better developed ability to voluntarily control attention.

8.5B INCREASED ABILITY TO ATTEND AND CLINICAL IMPROVEMENT

Further, it appears that increased ability to attend is positively correlated with clinical improvement (Vahia et al., 1973). Vahia had each of the patients in his study write in their notebooks all thoughts which occurred and disturbed their concentration during their meditation-like practice. Two psychiatrists, who had no knowledge of the patients' improvement, then studied these notebooks several months after the training was over. They noted whether or not there was an improvement or not in concentration during the course of the four-week treatment. A correlation was then made between concentration and clinical improvement which showed that clinical improvement was closely related to improvement in concentration.

*It should be noted that absorption is a precise technical term used in classical Eastern texts to describe a specific concentrative state of consciousness which occurs with increasing depth as one attains different jhānas (Goleman, 1972).

8.5C CONCENTRATIVE VERSUS
OPENING-UP MEDITATION:
DOES IT MAKE ANY DIFFERENCE
WHAT THE INDIVIDUAL ATTENDS TO?

It is quite clear from the studies of Kasamatsu and Hirai (1966) and Anand, Chinna and Singh (1961a) that there are pronounced physiological differences between concentrative and opening-up meditation. Whether these differences generalize to the post-meditation period awaits further research.* Further, it appears that during non-meditating time, the Rāja Yogins in Anand, Chinna and Singh's study, and also TM meditators in a study by Wallace (1970), are able to dehabituate to stimuli as well as those who practice opening-up meditation.

Are those who practice opening-up meditation equally able to focus intensely to the exclusion of other stimuli in the environment? Or are different attentional styles being employed in each type of meditation (Pribram & McGinnis, 1975)? How much does one type of learning generalize to the other type? As Brown noted (1977), there is some neurophysiological evidence distinguishing different styles of meditation and the two different modes of awareness—receptive versus active focusing. Two major cortical control mechanisms for the sub-cortical mechanisms involved in selecting and processing information have been reported: a frontal system associated with restrictive processing and a posterior temporal system associated with more wide-ranging information-processing (Pribram, 1971). Brown goes on to note, "The brain may be likened to a camera. It can use either a wide angle lens or a zoom. Or, in cognitive terms, attention can be directed to the more dominant details of the stimulus field or to the entire field" (1977, p. 266). Thus different meditation systems may train different attentional styles.

*These post-meditation effects have not yet been documented in Western research literature. However, descriptive information of different post meditation effects on behavior and personality change are available in the classical Eastern texts (see Goleman, 1972, 1977).

8.5D DIFFERENT TYPES OF CONCENTRATIVE
MEDITATION: MANTRA VERSUS NON-MANTRA;
ACTIVE VERSUS PASSIVE FOCUSING

Stroebe and Glueck (1977) suggest that the mantra may be the key variable in the effectiveness of meditation. This was tested in a study by Smith (1976) which looked specifically at the mantra's component role in the effectiveness of meditation. In the first experiment, Smith compared a TM group which focused on a mantra with a PSI group (Periodic Somatic Inactivity) which received similar expectation effects and just sat without any specific instructions to focus on a mantra. In the second experiment, Smith taught two groups what he called "cortically mediated stabilization" (CMS). Specifically, group one (CMS-1) was asked to sit with eyes closed and focus on a mantra—shanti. Group two (CMS-2) was asked to sit with eyes closed and to "engage in thought activity that you intend to be positive . . . fantasy-daydream, story telling, and listening" (Smith, 1976, p. 634). In the first experiment, he found no differences between groups on anxiety scores, symptoms of striate muscle tension, or measures of autonomic arousal. Similarly, in the second experiment, he found no differences between groups on trait anxiety, symptoms of striate muscle tension, and measures of autonomic arousal. The first experiment suggests that it may not be the attentional focusing on a mantra that is the effective component in meditation (cf. West, 1979). The second experiment suggests that focusing on a specific stimulus in a passive manner (mantra) may be equally effective to focusing in an active manner on a variety of stimuli—positive fantasies, thoughts, etc. The second experiment raises a question of whether voluntary regulation of attention may be more important than the nature of the stimuli attended to, whether stimuli are attended to passively or actively.*

An unpublished study by Schwartz, Davidson, and Margolin (Note Six) suggests results somewhat different from Smith's. In this study there were three groups of ten subjects. Group one

*There is some question, however, whether Smith's second group was really "anti-meditation" since, as noted in Chapter One, conscious focus of attention is at least part of our definition of meditation. For further discussion of what constitutes a "control" group, see Chapter Ten.

included teachers of Transcendental Meditation who had practiced for at least two years; this group focused in a passive way on an internal mantra. Group two consisted of those trained in a Gurdjieffian form of meditation, involving active voluntary control of attention through a restricted range of somatic and other stimuli. In this study all subjects were required to attend to either a kinesthetic stimulus (sensations in the right hand) or a visual stimulus (photograph of a person). For both groups, during kinesthetic attention, the ratio of occipital to sensory-motor alpha was significantly higher, suggesting activation of the sensory-motor region. During the visual tasks there was relatively greater occipital activation. Further, there was, as predicted, a significantly greater activation of the respective brain regions for the Gurdjieffian meditation group than for the TM group.* The finding of greater cortical specificity in these subjects compared to Transcendental Meditation and control subjects seems consistent with the active versus passive nature of the attentional component in the techniques practiced (Davidson & Goleman, 1977; also Davidson, Schwartz, & Rothman, 1976). Davidson suggested that, "different meditation techniques may lead to the cultivation of different attentional skills which are reflected in a particular patterning of neural processes" (Davidson, Goleman & Schwartz, 1976, p. 238).

How might we account for these seemingly different findings between Smith's study (1976) and Schwartz, Davidson and Margolin's (Note Six)? Or the fact that in Smith's first experiment comparing PSI (just sit) versus focus (TM mantra) there was no difference between groups, whereas in Ikegami's experiment, just-sit versus focus (red light) there were changes?

There are two specific difficulties in comparing the above studies. The first relates to the sensitivity of the dependent variable. As Smith himself noted, when using trait anxiety as a dependent variable, it may be difficult to find changes in periods ranging from eleven weeks to six months, whereas in Schwartz, Davidson and Margolin's study EEG measures were being used. In Ikegami's study, the minute fluctuations, millimeters in physical posture, also provide a more sensitive dependent variable.

*Or, as the authors note, the results of the study may merely reflect a subject-selection bias, an increased ability for attentional absorption on the part of the Gurdjieffian group.

A second problem to be addressed is determining what actually happens with the "just-sitting" group. For example, we know that even when individuals are instructed to concentrate on a specific object, the mind often wanders, other thoughts occur. Might the just-sit group also, during their own process of "sitting relaxation" find something to focus on? Maybe they begin to generate positive daydreams, similar to those in Smith's CMS-2 study. Further, just sitting may not be a viable control group because it is in fact a type of Zen Meditation—Shikan-taza (Kapleau, 1967). Also, when "just sitting" is done, and thoughts occur, it may be no different than any other mantra meditation in which thoughts occur, especially if the individual "by chance" picks one thought or object to focus on for the majority of the session. Therefore, the just-sitting group may not be a control group at all, and a debriefing of the just-sitting group may be necessary to determine the degree to which they are consciously directing attention.

8.5E TYPE OF ATTENTION UTILIZED DURING MEDITATION

In the first study to look specifically at attentional style during meditation,* Maupin (1965) found that attention measures did not predict response to meditation. His measures of attention—digit span, continuous additions, and size estimation—may not have been appropriate measures of type of attention involved. As Van Nuys (1973) suggested, a certain type of attention is necessary for meditation: sustained non-analytic attention, whereas the Strupp and Witkin test involves tasks that necessitate a constant and rapid shifting of attention. Also, such tasks invite discursive, analytical thought. In his study, Van Nuys had subjects focus for fifteen minutes on a candle, and then, after fifteen minutes debriefing, on their breathing. Subjects were asked to push a button noting when they had an intrusion that distracted them from the task at hand. He noted a .91 negative correlation between number of thought intrusions in

*The Deikman study (1966) did look at attention (in terms of how well individuals were able to reduce distracting external sounds). However, the prime focus of his study was the phenomenology of meditation.

meditation and hypnotic susceptibility measures. It appears that there was a large variability among subjects, but good hypnotic subjects on the average tended to experience fewer intrusions during meditation than poor ones.*

The Witkin Embedded Figure Test, requiring subjects to be able to pick out a certain form from the context of a distracting stimulus background, is another measure often used to assess attentional change resulting from meditation. At its most concrete level, the test measures field dependence and independence. Results indicate that meditators become significantly more field independent (Pelletier, 1974; Linden, 1973).

However, the generalizations drawn from this finding and the hypotheses used to justify it may at first appear quite confusing and contradictory. For example, Linden (1973) hypothesized that since the subject's meditation practice trains the individual to focus attention on an object or process (figure) and to resist distracting sources of stimulation (background), meditation might be expected to enhance field independence, which reflects a general disposition to perceive and think in an articulate as opposed to a non-analytic fashion (Witkin et al., 1962). However, Van Nuys' study (1973), in which there was no correlation between the Strupp and Witkin test and the ability to concentrate, accounted for the results by arguing that the Embedded Figures Test is an analytical and discursive test with rapid shifts of attention whereas meditation involves a more pinpointed focus. Therefore different types of attentional training are involved. How can we account for these contradictory findings and theories? Although this issue is dealt with in more detail in the section on mediating mechanisms—discrimination training and hemisphere function—let me suggest here that we might explain these seeming contradictions by noting that although meditation might have a non-analytical focus of attention as a goal, some analysis and discrimination may be necessary to achieve this goal.

*Van Nuys assumed that better attenders have fewer intrusions. Might the opposite be the case: the better the attenders, the more they were able to discriminate their attention wandering, and therefore the higher number of intrusions reported?

8.5G ADDITIONAL QUESTIONS ON ATTENTION: IDEAS FOR FUTURE RESEARCH

Many unanswered questions related to attention remain for future research to address. For example, there have not yet been sufficiently well controlled studies to determine whether there are actual differences in clinical outcome depending on whether the focus of attention is internal or external (cf. Leung, 1973), say on breathing or a candle (cf. Van Nuys, 1973). Another important area for future research in the case of concentrative meditation may be to match a person's dominant sensory representational system, be it auditory, kinesthetic or visual with concentrative focus in a non-dominant system (cf. Branstrom, Note Seven). Further research may also wish to investigate the specific cortical training involved in different types of attentional style (cf. Davidson & Goleman, 1977), and to determine whether there is generalization from skill in one mode (non-analytical, single-pointed) to skill in another mode (analytical, discursive). The hypothesized connection between attentional style and hemispheric functioning (Galín, 1974) also awaits documentation. Further, in studies such as Smith's (1976), it would be useful to have a measure of attentional absorption (Tellegen & Atkinson, 1974) or number of intrusions (Van Nuys, 1973; Kubose, 1976) to determine how well the individual is actually concentrating. Future research also needs to look at whether the pinpointed attentional focus on a specific object, say a mantra, is *as effective* in producing successful clinical outcome as discursive thinking about a complex variety of stimuli, say positive daydreaming, fantasy and listening, (cf. Smith, 1976; Goldman, Domitor & Murray, 1979; Boswell et al., 1979). And both need to be compared with opening-up (mindful) meditations.

Another issue raised about the nature of attention in meditation is whether the attentional level is one of drowsiness and lowered arousal, bordering on but not involving sleep (Fenwick et al., 1977) and at the same time, a state of sustained attention (Williams & West, 1975). Is it possible to maintain a combined state of low arousal and high attention—a restful alertness? The work of Hirai (1974), following up on the previous study of Kasamatsu and Hirai (1966), suggests that meditators are able to maintain attentional awareness, a cortical activity, without emotional arousal, a limbic activity, whether the presenting stimulus

is a click, supposedly neutral or a word of high affect, for example their own name. However, an alternative explanation, and one which may be plausible for concentrative but not opening-up meditation techniques, is that the clinical success is not due to calm attentional focus on an object, but rather on cognitive avoidance. For example, research suggests that a "competing" focus helps individuals to tolerate pain (Kanfer & Goldfoot, 1966) or to reduce fears (Yulis et al., 1975). Further research will need to precisely define the meditation technique and look carefully at the attentional style involved.

Finally, additional studies, such as Schwartz, Davidson and Margolin's (Note Six), comparing different techniques with different attentional styles, need to be undertaken. For example, based on a distinction made by Bagchi (1936) between passive attention versus "strained" attention, what differences in effects would we find between the awareness involved in a passive meditation technique such as TM, compared to a more active, devotional meditation technique like Bhakti meditation? What about the difference between focus on a word without meaning like the TM mantra for Westerners versus focusing on a word with meaning (cf. Elson, Hauri & Cunis, 1977)? Or the difference between focus on a self-selected mantra like om versus the spontaneous attentional focus of choiceless awareness?

8.6 Breathing

ONE ADDITIONAL component, which has been largely ignored in the research literature, *as a component*, is the role of breathing. Some traditions such as Zen, place a great deal of importance on breathing. Breath becomes the object of awareness, and the individual is told to breathe "spontaneously" and easily. Breath regulation is seen as one of the critical components (e.g., Nakamizo, 1974, Mastumoto, 1974). In Benson's technique (Benson, 1975), the individual is instructed to count one on each outbreath. In Transcendental Meditation, breathing is not directly attended to. In many Yoga traditions, great importance is placed upon voluntary control of breathing, for example, Swan Yoga.

In the one study comparing different types of breathing (Timmons et al., 1972), it was found that diaphragmatic breathing, as

opposed to thoracic, was associated more with EEG alpha. However, the exact role of breathing as a component of meditation awaits further research.

8.7 Summary

THIS CHAPTER has suggested the complexity of component variables, their context, and their interactions, all operating in relationship to the effectiveness of meditation. For example, preparatory behaviors may increase adherence (Smith, Note One), adherence may increase both attentional concentration and posture stability, (Davidson, Goleman & Schwartz, 1977; Ikegami, 1973). If I may take the liberty of an over-generalization about opportunities for research in this area, it seems the type of research that will ultimately be most productive is one which looks at the components listed in Table 8.1, alone, and in various combinations, and determines, through multivariate and multifactorial studies, the specific variance of outcome success due to the various components as well as their interaction with each other.

Chapter Eight: Further Readings

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