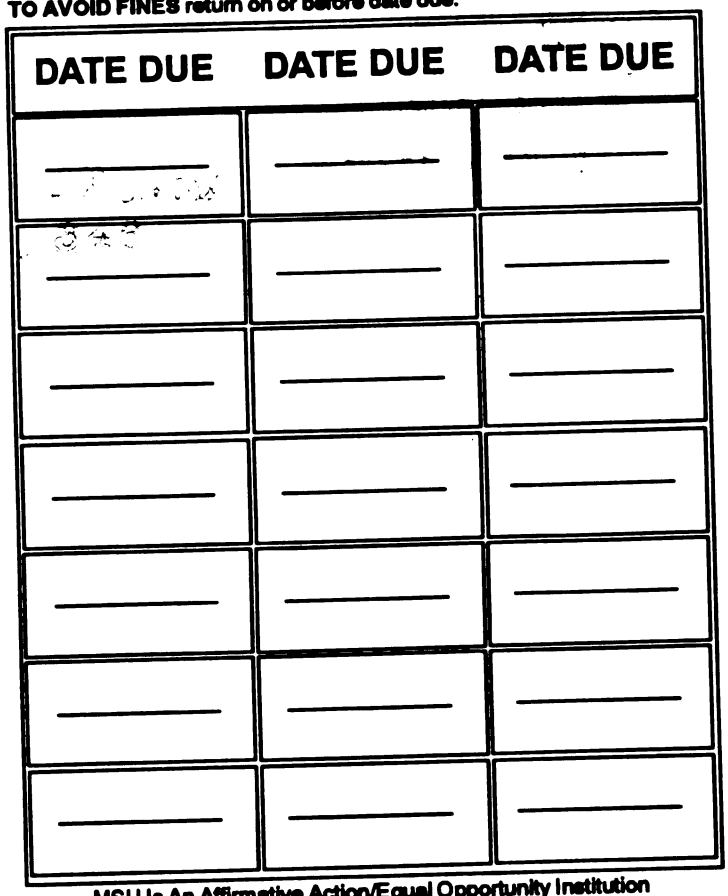

ABSTRACT

MEDITATION AS PSYCHOTHERAPY

By

Jonathan C. Smith

Over the last half-century at least 100 scholarly books and articles have argued that sitting quietly and limiting thought and attention in meditation should be psychotherapeutic. In recent years, one form of meditation, Transcendental Meditation (TM) has been widely promoted as a "natural and effective cure for mental illness," and has attracted considerable research attention. This research consistently shows that persons who learn TM generally do manifest reductions in psychopathology, particularly anxiety.

The present study focuses on isolating what aspects of TM are responsible for its anxiety-reducing properties. One possibility, of course, is the daily practice of the TM meditation exercise. However, since meditation is generally practiced while sitting with eyes closed, perhaps this, and not the meditation exercise, is the critical therapeutic agent. And TM instruction is preceded by extensive claims as to its effectiveness, suggesting that another potent aspect of TM may be expectation of relief--the same ingredient bottled and sold at old-time medicine shows.

Two experiments investigated the effects of the TM meditation exercise on conscious trait anxiety and psychosomatic symptoms of

anxiety. In Experiment I, 49 subjects were taught TM by the Students International Meditation Society; 51 were taught a control treatment, Periodic Somatic Inactivity, or PSI; and 39 received no treatment. The PSI control treatment was carefully devised to match the content and form of all aspects of TM indoctrination, including introductory lectures detailing research and theory, formal instruction, and follow-up meetings. Particular care was taken to match those aspects of TM that might foster expectation of relief. In addition, the PSI control treatment incorporated a daily exercise similar to the TM meditation exercise, except that it involved simply sitting with eyes closed rather than sitting with eyes closed and meditating.

It is not easy to construct a treatment matching all the expectation-fostering aspects of TM, particularly professional-quality promotional literature and numerous accounts of TM in the popular press. For this reason, a different research strategy was utilized in Experiment II. Two treatments were compared, one incorporating a TM-like meditation exercise, the other incorporating an exercise designed to be the near antithesis of meditation. This anti-meditation involved sitting with eyes closed and actively generating as many positive thoughts as possible. In every other respect these two treatments were identical. Each was described as an effective anxiety-reducing treatment called "Cortically Mediated Stabilization," or "CMS." Neither treatment was described as involving meditation so that subjects who might read TM promotional literature would be less likely to generalize the claims made to the treatments they were receiving. In addition,

for both treatments indoctrination was minimal and consisted of an introductory lecture followed by three sessions of follow-up discussion and monthly "checking" sessions.

In both experiments anxiety was measured by the STAI A-Trait inventory and the Epstein-Fenz Manifest Anxiety Scale. In addition, numerous supplementary tests were given, the most noteworthy being the 16PF, the Tennessee Self Concept Scale, the Marlowe-Crowne Social Desirability Scale, and a test measuring skin conductance reactivity while viewing an interpersonal stress film.

Results to Experiments I and II show six months of TM to be no more effective in reducing anxiety than six months of PSI, and 2½ months of CMS Meditation no more effective than 2½ months of CMS Anti-Meditation. However, all treatments are significantly more effective in reducing anxiety than no treatment. These findings support the conclusion that the critical therapeutic agent in TM is something other than the TM meditation exercise.

If the TM meditation exercise is not responsible for TM's therapeutic effects, what is? It is argued that one possibility is that sitting with eyes closed, regardless of whether or not one meditates, is therapeutic for some people. All four treatments studied in this project involved sitting with eyes closed on a regular basis, and all were found to be effective. In addition, a strong argument can be made that TM's therapeutic potential is largely due to expectation of relief. Both TM and PSI control treatments in Experiment I contained expectation-arousing factors previous studies have found to be highly potent in

increasing or decreasing the effectiveness of a treatment. These factors are: (1) belief on the part of a treatment agent in his treatment's effectiveness, (2) credibility derived from the complexity and sophistication of treatment methods and materials, (3) accompanying claims and theoretical rationale, and (4) credible signs of improvement which the person receiving the treatment can observe for himself. The CMS treatments in Experiment II contained these factors to a much lesser extent. And the TM and PSI control treatments were found to be significantly more effective than the CMS treatments.

Finally, the type of person most likely to benefit from TM, PSI, and CMS is described. Evidence drawing into question the validity of skin conductance measures of anxiety is described.

MEDITATION AS PSYCHOTHERAPY

By

Jonathan C. Smith

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To the whole bunch of you, thanks again.

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CHAPTER I

A REVIEW OF THE LITERATURE

The term meditation refers to a family of mental exercises that generally involve calmly limiting thought and attention. Such exercises vary widely and can involve sitting still and counting breaths, attending to a repeated thought, or focusing on virtually any simple external or internal stimulus.

To the casual observer it may seem implausible that a simple mental exercise could have any effect on widespread problems of neurosis and anxiety. However, since 1936 at least 100 scholarly books and journal articles have argued that meditation does have psychotherapeutic potential (most of these references appear in the bibliographies of Haimes, 1972; Kanellakos & Ferguson, 1973; Lesh, 1970a; Timmons & Kamiya, 1970; and Timmons & Kanellakos, 1974). Numerous versions of this claim have appeared, including that mystical experiences associated with meditation are therapeutic, and that meditation can supplement or even take the place of psychotherapy. Virtually every school of psychological thought has been invoked to support these claims, including psychoanalytic, neo-Freudian, Jungian, client-centered, gestalt Maslovian, existential, logotherapy, bioenergetic, and learning theory. Perhaps the essence of what has been written is conveyed by Goleman (1971): "I conceptualize meditation as a meta-therapy: a procedure

that accomplishes the major goals of conventional therapy and yet has as its end-state a change far beyond the scope of therapies, therapists, and most personality theorists--an altered state of consciousness."

In light of this exhilarating display of speculation, it is surprising that serious research on the therapeutic effects of meditation began only recently. This research has yielded three sets of findings: (1) Experienced meditators who are willing to participate without pay in meditation research typically praise meditation and indeed appear happier and healthier than the beginning meditator, the average college student, or the everyday man in the street; (2) beginning meditators who practice meditation for 4 to 10 weeks show more improvement on a variety of measurements than do non-meditators tested at the same times; and (3) persons who are randomly assigned to learn and practice meditation show more improvement over 4 to 10 weeks than do control subjects assigned to some form of alternate treatment. We shall examine each of these findings in detail and evaluate what they show about the therapeutic potential of meditation.

Studies using mail-in questionnaires consistently yield results that appear to speak favorably for meditation. Wallace and Benson (Gattozzi & Luce, 1971) found that of 400 Transcendental Meditators who completed a questionnaire regarding changes in mental and physical health, 84 percent judged that their mental health had improved significantly since learning meditation. Similarly, Otis (1973) sent questionnaires to 1,900 randomly selected Transcendental Meditators and 800 TM practitioners attending TM teacher training course. The

questionnaire in part asked what problems the respondent had before learning TM, and which of these problems had changed since learning TM. The 1,095 who responded generally claimed some improvement after learning TM (the actual number claiming improvement was not reported).

In addition, Transcendental Meditators willing to be tested in the laboratory appear healthier than non-meditators on the Freiburger Personality Inventory (Fehr, Nerstheimer, & Torber, 1973), on the Personal Orientation Inventory (Hjelle, 1973), and on two presumed physiological indices of "good mental health": rate of GSR habituation to a series of loud tones, and number of spontaneous GSR fluctuations during a period of quiet inactivity (Orme-Johnson, 1973).

The major weakness of these studies is that they rely on data resembling solicited testimonials. A meditator asked to participate in a study investigating the beneficial effects of meditation may view this as a calling or opportunity to "step forth for meditation" somewhat analogous to the evangelist's call to "step forth for Jesus." In both cases we are left wondering about those who remain seated. Put technically, the sample of those who volunteer to participate in meditation research is perhaps not representative of the population of those who learn to meditate. We can not conclude from such studies that the practice of meditation is therapeutic.

One way around the ambiguities present in testimonial data is to test a sample of meditators before learning meditation and then after practicing meditation for a period of weeks or months. Using such a design Benson and Wallace (1972) found that 22 hypertension patients

showed a significant reduction in blood pressure after 4 to 63 weeks of meditation. Of course, one might ask if such a decrease could be the result of a simple passage of time rather than meditation. In order to answer this question one needs a control group of non-meditators tested during the same time period. Six studies, all using TM, have incorporated such a control, and have found that over 4 to 10 weeks meditators show a significantly greater decrease in spontaneous GSRs (Orme-Johnson, Kiehlbauch, Moore, & Bristol, 1973) as well as significantly greater improvement on the State-Trait Anxiety Inventory (Ballou, 1973; and Ferguson & Gowan, 1973), the Personal Orientation Inventory (Nidich, Seeman, & Dreskin, 1973; and Seeman, Nidich, & Banta, 1972) the IPAT Anxiety Scale Questionnaire and Northridge Depression, Neuroticism, and Self-Actualization Scales (Ferguson & Gowan, 1973), and the hypochondria, psychasthenia, social introversion, schizophrenia, and Tayler Anxiety Scales of the MMPI (Orme-Johnson et al., 1973; and Orme-Johnson, Authur, Franklin, O'Connell, & Zold, 1973).

Unfortunately, studies that compare changes experienced by meditators and non-meditators are faulted in that the two populations may not be comparable. At the very least, meditators, by their decision to learn meditation, demonstrate some motivation for self-improvement not demonstrated by non-meditator controls. Such motivated subjects might be ripe for growth, and might display reductions in pathology regardless of what they chose to do.

One study clearly illustrates this problem. Lesh (1970) selected 16 counseling graduate students interested in learning

meditation and 23 other graduate students, half of whom were interested in and half "definitely against" learning meditation. The first group was taught a form of zazen meditation while the second served as a non-meditation control. All subjects were given the Affective Sensitivity Scale (a measure of empathy) and the Fitzgerald Experience Inquiry (a measure of tolerance to and openness to regressive, irrational, and non-ordinary experiences). After four weeks the meditators improved significantly more than the controls on the Affective Sensitivity Scale but not on the Experience Inquiry.

Lesh himself points to the problem of initial group differences:

> The criticism might be raised that the experimental group was indeed an exceptional group of people in that they volunteered for such an unusual experiment in the first place. This is a cogent argument since the pretest scores for the experimental groups on tests measuring openness to experience and self-actualization are significantly higher than for either of the control groups. The same is true for the scales on the ASS_{us} [the empathy measure] at pre-test. That is, the experimental group was significantly higher in empathy before the experiment had begun.

The most rigorous studies on the therapeutic effects of meditation have controlled for the problem of initial group differences by randomly assigning subjects to meditation and alternative treatment conditions, and testing before and after several weeks of treatment.

Otis (1973, 1974) randomly assigned 62 employees of the Stanford Research Institute to a TM group (in which the initiation fee was paid for by the Institute), or one of three control treatment conditions: a no treatment condition in which subjects simply took pretests and posttests; a non-meditation treatment condition that involved sitting quietly for 15 to 20 minutes twice daily; and a meditative treatment

(not TM) condition that involved sitting quietly and restfully while repeating the phrase "I am a witness only" 15 to 20 minutes twice daily. All subjects were given a self-image pretreatment questionnaire. After a three-month treatment period subjects were again given the self-image questionnaire, plus a problem checklist which requested estimates of degree of improvement on a variety of physical and behavioral problems over the treatment period. In addition, subjects were interviewed and control subjects were offered TM or financial remuneration equivalent to the TM initiation fee.

Numerous lapses in methodological rigor seriously weaken what is otherwise an ambitious and creative design. First, Otis himself admits that the treatment conditions were not matched for expectation of relief. The TM treatment, more than the control treatments, promoted the belief on the part of subjects that they would benefit. This was clearly evidenced in the posttreatment interview, and by the fact that after the three-month treatment period all but five of the control subjects chose to learn TM. Considerable research, as we shall show later, indicates that expectation of relief can render potent even the lowliest of sugar pills, and its absence can render impotent treatments that are ordinarily respected and accepted (Borkovec, 1972; Goldstein, 1962; Lazarus, 1968; Leitenberg, Agras, Barlow, & Oliveau, 1969; Marcia, Rubin, & Efran, 1969; and Shapiro, 1971). Second, the questionnaires Otis used were new homemade tests of questionable validity and reliability. Otis reports that the variability of the data from the questionnaires was high, a problem one would expect of weak measures of low

reliability. Finally, and most seriously, Otis chose to pool the three control groups--the no treatment group, the group that sat and rested twice daily, and the group that meditated upon the pharse "I am a witness only" twice daily. The reasons he gave were the high variability of his questionnaire data and the small size of his samples. All major reported comparisons were between the TM group and the pooled control group. Obviously, this unusual pooling procedure defeats the purpose for having control groups in the first place.

One would expect from these deficiencies a confused set of results. And this is exactly what Otis obtained. After three months the TM and pooled control group did not differ significantly in degree of improvement in self image. Yet, the TM group displayed a greater degree of estimated improvement on several items of the problem checklist, specifically "enjoyment of life, restfulness of sleep, energy level, sexual adjustment, and creativity." And in posttreatment interviews the TM group claimed more benefits than the pooled control group, although when no treatment subjects were not included in the pooled group the pooled and TM groups did not differ significantly.

Other studies have fared considerably better. Brautigam (1973) in a Swedish study, sent letters to 19 drug abusers inviting them and their friends to attend an information lecture on TM. Twenty people signed up for TM and agreed to participate in the project. Subjects were given a questionnaire and interview on drug habits, and a questionnaire testing self-confidence, stability, adjustment, anxiety, and extroversion. In addition, each subject was observed and rated by a

psychologist and psychiatrist on a checklist of pathological behaviors. Subjects were then divided into two groups of 10 each, equated for frequency of drug use. For three months one group practiced TM twice daily while the other was offered group counseling four hours every two weeks. At the end of the project all subjects were tested again.

Brautigam found that the meditators displayed a significant reduction in drug abuse, pathological behaviors, and anxiety as well as a significant increase in adjustment. The group counseling subjects improved on none of these measures.

For several reasons these results are not clear evidence for the therapeutic effects of meditation. First, all 20 subjects signed up for the experiment wanting and expecting to get TM. Some got group counseling every other week instead. The disappointment among these subjects must have been considerable. Indeed, 30 percent did not attend any of the counseling sessions, and most, according to Brautigam, exerted "strong pressure" on the experimenter to teach them TM. The impact of attitude on the effectiveness of therapy is well documented (Luborsky, Chandler, Auerbach, Cohen, & Bachrach, 1971). The attitude of these control subjects toward their treatment probably interfered, if anything, with its effectiveness. Also, the TM subjects received much more than meditation. In addition to four two-hour training sessions they received weekly individual checking to evaluate how well they were practicing, and participated in an eight-day trip to Denmark for group meditation.

Appropriately, in interpreting her findings, Brautigam does not claim that the TM meditation exercise was the only, or even the most important therapeutic agent; she suggests "meditation opened up new opportunities for social contact without drugs" and "meditation offered an opportunity to break with previous role expectations and find a new role--that of a meditator."

In the first study involving teaching meditation to children, Linden (1973) randomly selected 90 students from the upper half of the third grade in a disadvantaged school. These children were randomly assigned to three groups of 30 each. One met with a guidance counselor 45 minutes a day for 18 weeks. Counseling focused on study skills. A second group was taught two forms of meditation, one involving attending to the process of breathing, the other involving attending to a vase. These students practiced 25 minutes a day, twice weekly for 18 weeks. A third group received no treatment. As compared with the guidance and no treatment controls, the meditators became more field independent, as measured by the Children's Embedded Figures Test, and less test anxious, as measured by the Test Anxiety Scale for Children. Unfortunately, the results of this well-designed study are limited to test anxiety and field dependence among children and should not be generalized to adult psychopathology.

One study stands out for its methodological elegance. Vahia, Doongaji, Jeste, Kapoor, Ardhapurkar, & Ravindranath (1973) wished to isolate the essential components of psychophysiological therapy, a yoga-meditation therapy used at King Edward VI Memorial Hospital in

Bombay, India. This therapy is based on ancient Hindu yoga teachings and incorporates physical yoga stretching exercises as well as meditation.

Ninety-five psychoneurotic patients who displayed no improvement in response to previous therapy were randomly divided into two groups matched for age, sex, diagnosis, and duration of illness. One group was given "total Psychophysiological Therapy," that is, yoga exercises plus meditation, while the other was given "partial Psychophysiological Therapy," a control treatment consisting of exercises resembling yoga exercises and no meditation. Both groups practiced an hour each weekday for four to six weeks and were given support, reassurance, and placebo tablets.

Measurements included: (1) blind clinical assessment before, after, and every week of the project based on target symptom relief and work efficiency on the job as reported by the patients themselves, their relatives, friends, and colleagues; (2) daily notebooks written by all subjects on thoughts that came to mind while practicing; (3) MMPI and Rorschach tests given before and after the project; and (4) the Tayler Anxiety Scale given before, after, and every week of the project.

These results were obtained: (1) 73 percent of the subjects in the total therapy treatment showed significant improvement (an improvement of "50%" or more) on the basis of clinical assessment, while 42 percent in the partial therapy treatment showed significant improvement; (2) the total therapy group showed significantly greater reduction in anxiety measured by the Tayler Scale than the group

receiving partial therapy ($p < .05$); (3) those receiving total therapy showed a consistent reduction in anxiety, as measured by the Tayler Scale, in each of the six weeks of the project, while those receiving partial therapy showed no consistent reduction; (4) MMPI results show a greater overall improvement for subjects receiving total therapy than for those receiving partial therapy; and (5) those who displayed greatest ability to meditate in the total therapy group displayed more clinically assessed improvement than those who did not.

One simple flaw mars this otherwise impressive study. Both the control and experimental treatments were taught by the same person, a physiotherapist with 11 years experience in yoga. Probably this therapist knew, or at least suspected, that the partial treatment was in fact a control treatment. And since the partial treatment did not involve true yoga exercises, but "exercises resembling yoga exercises" one wonders about the therapist's belief in their effectiveness, and about what theoretical rationale, if any, he gave for practicing them. Recent research on classical desensitization points to the importance of credibility and perceived authenticity of control treatments and of therapists who administer them. For example, McReynolds, Barnes, Brooks, & Rehagen (1973) found that a placebo treatment taught by a therapist blind to its placebo-nature and accompanied by a highly credible, yet contrived, theoretical rationale, is just as effective in reducing minor phobias as systematic desensitization. Moreover, such a placebo is significantly more effective than an attention-placebo treatment not accompanied by a theoretical rationale and taught by a therapist aware of its placebo-nature.

Conclusions

Without exception the studies reviewed show the regular practice of meditation to be associated with decrements in psychopathology, particularly anxiety, over a period of time usually ranging from 4 to 10 weeks. The effects of meditation persist when controls are included for initial group differences, passage of time, therapist support and reassurance, individual contact with therapist, and interpersonal contact with practicing peers.

However, this general finding is not clear evidence that meditation is in and of itself therapeutic. The critical therapeutic variables underlying meditation could be something other than the meditation exercise. Two main possibilities not controlled for in the studies reviewed are (1) expectation of relief, and (2) the regular practice of sitting.

As mentioned earlier, McReynolds et al. (1973) found that the therapeutic effectiveness of a placebo treatment can be increased when it is presented in such a way as to nurture expectation of relief. Two crucial variables contributing to expectation of relief appear to be the therapist's belief (or lack of disbelief) in the treatment, and the theoretical rationale presented for the treatment. In all the studies reviewed here, either the meditation instructors, or the subjects, demonstrated some initial belief (or absence of disbelief) in meditation's therapeutic potential. And the most frequently cited form of meditation, TM, is not only taught by believing, practicing meditators, but is introduced by two mandatory lectures that present a plausible

psychophysiological theory of the technique's effectiveness as well as summaries of numerous "verifying" scientific studies.

Second, all forms of meditation reviewed here are practiced while sitting quietly. Perhaps the practice of regular sitting, and not the meditation exercise, is the crucial therapeutic variable. This possibility was hinted at (and rejected) in 1936 by Bagchi in one of the earliest published psychologically-based arguments for meditation's therapeutic potential:

> If some critic . . . contends that it is not so much the intention to relax [as is present in meditation] as the physical quietness and lying still that have the recuperative effect, at present we can only point to clinical cases as a practical counter-argument, waiting for further neurological evidence to support our belief.

Thirty-seven years later this criticism is still valid, and meditation's therapeutic potential remains to be demonstrated.

CHAPTER II

PURPOSE AND OVERVIEW OF PRESENT STUDY

I chose to investigate Transcendental Meditation for three reasons. First, as we have seen, considerable research has already been devoted to TM's therapeutic potential. Second, TM is practiced widely in the United States, with at least 300,000 initiates to date. Third, the person most responsible for TM's current form and popularity, Maharishi Mahesh Yogi, clearly claims that the technique is therapeutic: "We find that this practice of transcendental deep meditation is a boon to mental health. It is a means of preservation of mental health; it serves as a mental tonic and, at the same time, is a natural and effective cure for mental illness" (Maharishi Mahesh Yogi, 1963).

A researcher interested in TM must reckon with this problem: reductions in psychopathology exhibited by persons who learn TM may be due to factors other than practice of the TM meditation exercise. As mentioned in Chapter I, perhaps persons who chose to learn TM are "ripe for growth," and would experience reductions in pathology regardless of what they chose to do. In addition, the critical therapeutic agent in TM may be expectation of relief. TM initiates are exposed to a formidable armada of literature and lectures claiming that scientific research verifies TM's potential for alleviating many forms of human distress. These claims are so persuasive that even the Illinois House of

Representatives has issued a resolution (House Resolution No. 677) encouraging that "all educational institutions, especially those under State of Illinois jurisdiction" consider offering courses in TM. Finally, perhaps TM works, not through the practice of a specific meditation exercise, but through the concomitant daily regime of sitting comfortably with eyes closed.

The present study consists of two experiments intended to isolate the therapeutic effects of TM meditation from the factors described above. In Experiment I our strategy was to compare the effects of TM[1] (taught by the Students International Meditation Society, but with the $45 initiation fee waived) with no treatment and with a control treatment. Subjects consisted of highly anxious volunteers who responded to an advertising campaign soliciting participants interested in receiving safe but unspecified treatments for reducing anxiety. Our subjects, in other words, did not know they might be taught meditation.

The control treatment, called "Periodic Somatic Inactivity" or "PSI,"[2] incorporated a daily exercise patterned after the TM meditation

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[1]I wish to thank Maharishi International University and the Student's International Meditation Society for generously providing TM instruction without charge. In exchange they requested that every time TM as taught in this study is mentioned, some sign or reminder be given that it differs from traditional TM in that no initiation fee was requested. Henceforth, "TM" underlined shall indicate that in this project Transcendental Meditation was taught with no initiation fee. In addition, Maharishi International University requested that I test changes manifested by ordinary, paying TM initiates in East Lansing, Michigan. This study has been completed by Lance Renshaw.

[2]PSI, of course, was taught with no initiation fee. To reduce the possibility of confusion, the title "PSI" shall be underlined, as shall the titles of CMS treatments described later.

exercise with one critical exception: in place of sitting with eyes closed and meditating, the control treatment exercise involved simply sitting with eyes closed. In every other respect the control treatment was designed to match the form and complexity of TM instruction, particularly those aspects that might foster expectation of relief. Like TM, PSI was taught by a person who believed the technique was effective and did not believe it to be a control treatment. Both TM and PSI indoctrination incorporated two introductory lectures separated by a 15 day drug fast. Both TM and PSI lectures detailed theory and research supporting extensive claims for the treatments' effectiveness. (Theory and research described during the PSI lectures was contrived, yet highly credible.) The techniques for TM and PSI were taught individually to each participant using highly formalized and standardized instructions. Initiation for both treatments was followed by three group follow-up discussion sessions, and monthly individual follow-up sessions for "technique checking."

The rationale for this design is simple. If the effects of TM are not due to the growth-proneness of persons selecting the to learn TM, then TM should be more effective than no treatment, since both treatment groups consist of subjects selected from the same pool of volunteers. If the effects of TM are due to the regular practice of the TM meditation exercise, and not to expectation of relief or sitting daily with eyes closed, then TM should be more effective than the PSI control treatment.

It is difficult to construct a treatment matching all the expectation-fostering aspects of TM, particularly the ubiquitous promotional literature and numerous accounts of TM in the popular press. Recognizing this problem we chose a different strategy in Experiment II. Here, two treatments were compared, one incorporating a TM-like meditation exercise, the other incorporating an exercise designed to be the near antithesis of meditation. This anti-meditation involved sitting with eyes closed and actively generating as many positive thoughts as possible. In every other respect these two treatments were identical. Each was described as an effective anxiety reducing treatment called "Cortically Mediated Stabilization" or "CMS." Neither treatment was described as involving meditation in an attempt to reduce the possibility that subjects acquainted with TM promotional literature might generalize the claims made to the treatments considered in this experiment. In addition, for both treatments, indoctrination was minimal and consisted of an introductory lecture followed by three sessions of follow-up discussion, and monthly "checking" sessions.

It was reasoned that if the effects of TM are due to the specific TM meditation exercise, and not due to expectation of relief or simply sitting with eyes closed, then the CMS treatment incorporating meditation instructions highly similar to TM instructions should be more effective than a parallel CMS treatment involving sitting with eyes closed and engaging in a presumably innocuous exercise nearly antithetical to meditation.

In both experiments the primary dependent variable was anxiety. Anxiety was chosen because it has received the largest amount of attention in TM research, and because, as Cattell & Scheier (1963) summarize: "It is what comes closest to being the common element in all forms of mental disorder, and the lack of anxiety thus becomes an excellent operational definition of mental health."

We chose to investigate two aspects of anxiety: (1) conscious trait anxiety, that is, complaints of psychological distress, tension, and nervousness; and (2) psychosomatic symptoms of anxiety, specifically symptoms of striated muscle tension such as backache and neckache, and symptoms of autonomic arousal such as sweatiness and digestive problems. These two aspects were chosen because they cover most of the domain of manifest anxiety symptomatology. In addition, they can be viewed as reflecting different levels of repression or impulse-inhibition, with conscious trait anxiety reflecting relatively little repression, and psychosomatic symptoms reflecting a greater degree of repression (Fenichel, 1945). These two aspects were tapped respectively by the STAI A-Trait Scale (Spielberger, Gorsusch, & Lushene, 1970) and the Epstein Fenz Manifest Anxiety Scale (Fenz & Epstein, 1965).

In addition to the primary measures described above, we gave a considerable number of exploratory or "secondary" tests. Although these tests are not directly referred to in the hypotheses of this study, we included them in order to look into numerous other questions such as the characteristics of those who benefit most from meditation and factors that distract from or add to meditation's effectiveness.

In selecting these tests, we first wanted an omnibus questionnaire that covers the broad spectrum of personality. For this reason we selected the 16PF Forms A and B (Cattell, Eber, & Tatsouka, 1970) and the IPAT Neuroticism Scale Questionnaire (Scheier & Cattell, 1961). Six dimensions taped by these tests load heavily on anxiety, and three on "bound anxiety" or "neuroticism." These dimensions are of particular interest because of their relation to the primary dependent variables.

In addition we wanted to tap relatively severe forms of psychopathology such as psychosis and personality disorder. For this we selected the Tennessee Self Concept Scale (Fitts, 1963).

We wanted a measure that could shed light on whether any differential rates of improvement might be due to differences in social desirability response set, the tendency to distort questionnaire responses in a socially desirable way. We chose the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1965).

We were interested in subjects' own evaluations of their TM, PSI, and CMS treatments. For this purpose we devised a questionnaire requesting that the treatments' effects be described and evaluated.

We obtained supplementary information such as sex, age, whether or not a subject considered learning meditation before participating in this project, whether or not a subject considered receiving psychotherapy before this project, the frequency TM, PSI, and CMS were practiced, and the degree of participation in outside therapeutic activities such as psychotherapy.

Finally we had available a polygraph and a set of interpersonal stress films which tap a wide variety of common conflicts relating to sex, hostility, dependency, etc. As mentioned in Chapter I, several studies have related the practice of TM to a leveling off of skin conductance reactivity in a testing situation involving sitting with eyes open. We were interested in seeing if we would find a similar leveling off of skin conductance reactivity in a somewhat more life-like testing situation involving watching an interpersonal stress film.

All variables incorporated in this study will be described in full later on.

CHAPTER III

METHOD

Experiment I

It was hypothesized that TM is more effective in reducing anxiety than a parallel control treatment involving sitting without meditation; and that both TM and a sitting control treatment are more effective in reducing anxiety than no treatment.

Subjects

Subjects consisted of 139 (70 male and 69 female) Michigan State University students who attended an orientation lecture and four days of pretesting, were not receiving psychotherapy, and had at no time practiced meditation or yoga. Mean age was 22.

Procedure

Pretreatment orientation. Four hundred five persons responded to a campus-wide advertising campaign (Appendix A) soliciting volunteers interested in receiving free treatments for reducing anxiety. Specific treatments involved were not named. These potential subjects attended a 30-minute orientation lecture and were told that the treatments were being offered as part of an extensive research effort directed toward isolating how and why the treatments work (Appendix B). In addition, it was explained that the treatments would be taught individually by a

trained instructor, were safe and effective, and did not involve medication, hospitalization, psychotherapy, external equipment, or hypnosis. No indication was given that the treatments might involve meditation, or that several treatments would be compared.

An effort was made to discourage participation by those who were not highly motivated. Potential participants were warned not to consider taking part unless they were sure they were willing and able to practice the technique they were to learn about 30 minutes a day for about three months. In addition, they were told that only persons who completed four one-hour sessions of pretesting (with no make-up sessions offered) would be considered, and that of these only 70 to 80 percent could eventually be accepted into the project because of resource limitations.

Pretreatment assessment and screening. Of those who attended the orientation lecture, 221 wished to be considered for the project. Over the next four days, November 6-9, 1973, subjects were given the STAI A-Trait Inventory, the Epstein-Fenz Manifest Anxiety Scale, and the following secondary measures: the 16PF Forms A and B, the IPAT Neuroticism Scale Questionnaire, the Tennessee Self Concept Scale, the Marlowe-Crowne Social Desirability Scale, and a therapeutic activities questionnaire inquiring into interest in and degree of participation in numerous therapeutic treatments and activities including meditation and yoga (Appendix C).

One hundred sixty-two persons (half males, half females) who completed all four days of pretreatment assessment, were not currently

receiving psychotherapy, had at no time practiced meditation, and wished to take part were accepted into the project. Male and female subjects were separately ranked on the basis of STAI A-Trait scores. Then, proceeding from the highest scoring subject to the lowest, each subject was randomly assigned using a random numbers table to three treatment conditions: Transcendental Meditation (TM), Periodic Somatic Inactivity (PSI), and No Treatment.

Nineteen (12 male, 7 female) TM subjects, 21 (12 male, 9 female) PSI subjects, and 18 (10 male, 8 female) No Treatment subjects were randomly selected to participate in a test measuring skin conductance reactivity while viewing a series of interpersonal stress film shorts (Appendix D).

Treatments. Forty-nine subjects (27 males, 22 females) were assigned to TM; 51 (24 males, 27 females) to PSI; and 39 (19 males and 20 females) to No Treatment.[1] Subjects were informed by phone when and where their unspecified treatments would begin. No Treatment subjects were told that they had been assigned to a "wait group" which would receive treatment in about three months. They were given no information as to the nature of the treatment they would receive. At no time during the experiment were subjects informed that several treatments were being compared. Treatments were given concurrently at the same days and times. Half of the TM and PSI subjects received training during the first two

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[1]Initially 54 subjects, half males and half females, were chosen for each treatment group. However, some subjects, when informed by phone that they had been accepted into the project, decided not to continue. Hence the unequal number of subjects in each treatment group.

weeks of the project, while the other half received training the second and third weeks.

TM was taught by two official TM instructors from the Students International Meditation Society, and was identical to ordinary TM in every respect except that it was offered free. The TM technique involves sitting twice daily 15 to 20 minutes and meditating on a special thought called a mantra. Complete TM instruction includes two introductory lectures, a 15 day drug fast, individual initiation, three days of follow-up discussion, and monthly follow-up checking.

Periodic Somatic Inactivity was a control treatment specially contrived to match TM in every respect with one exception: instead of sitting and meditating, the PSI technique involved merely sitting with eyes closed. This technique was taught by two carefully selected and trained Michigan State University seniors. Both were chosen from a pool of 30 volunteers on the basis of how well they resembled the TM instructors. Both are unusually warm, articulate, mature, and credible-appearing people. One was chosen to be the senior instructor responsible for most of the training and was deliberately misinformed that the treatment he would teach was highly effective and well-researched, and that the main purpose of this project was to determine if PSI is effective for different people for different reasons. He enthusiastically accepted this rationale and only months later began to suspect that other treatments were being compared. He never suspected that PSI was actually a control treatment. The second volunteer was selected

to be the assistant instructor. He knew the nature of the project, but carefully kept it secret from his partner.[2]

Both instructors were informed that one critical variable in this project was the perceived enthusiasm and credibility of the instructors and the perceived authenticity of treatment they were to teach. They agreed to appear as enthusiastic and credible as possible, even if at some future date they decided that the treatment was worthless. In addition, they agreed to misinform subjects that they had practiced the technique for about five years and had taught it for about two years.

The instructors were given their official PSI Training Manual (Appendix E), which outlines in detail the theory behind PSI as well as every aspect of PSI instruction. The senior instructor was put through a rigorous two-week training program in which he mastered PSI theory, two 60-minute lectures, and individual instruction and follow-up procedure. In addition, he practiced the lectures to proficiency in front of preselected hostile audiences.

Like TM instruction, PSI instruction consisted of two introductory lectures separated by a fifteen day fast from illegal drugs,

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[2]Ideally, the assistant too would have been naive as to the nature of the project. Unfortunately this was not possible. Two weeks before the start of PSI training the experimenter realized that two instructors would be needed to individually initiate the large number of subjects who chose to participate. He also discovered that TM was going to be taught by two instructors and decided that it would be desirable to match PSI with TM for number of instructors. He selected to be the PSI assistant the person who appeared to be best qualified for the job. Unfortunately this person had previously been told the nature of the project.

one day of personal initiation followed by three consecutive days of follow-up discussion, and monthly individual follow-up "checking" sessions.

The two introductory lectures outlined a highly credible, yet contrived, theory explaining PSI's effectiveness and supporting empirical research. Care was taken to base the theory on actual psychological concepts and research in case subjects decided to do some homework and check out the theory's credibility (since two subjects were completing their doctorates, this was not an unreasonable possibility). Key points of the theory were illustrated by professional looking transparencies displayed by means of an overhead projector. The essential points covered in these lectures can be summarized:

> Built into life are factors that disrupt inner calm and generate and maintain anxiety. Research has shown that one of these factors is the desynchronization of circadian rhythms, daily rhythmic changes in physiological functioning. PSI works to bring circadian rhythms into synchrony.
>
> The way PSI works is complex. All physical activity, no matter how small, generates a fatigue-like and stress-like physiological by-product called reactive inhibition. Simple physical inactivity tends to trigger the automatic dissipation of reactive inhibition. Such dissipation appears physiologically as a decrease in physiological activity, and as a small dip or signature in the constellation of circadian rhythms. PSI involves remaining physically inactive for 15 to 20 minutes at the same time each day. The result is that regular inactivity-induced signatures appear at and become classically conditioned to the same point in one's circadian rhythms each day. As one continues practicing PSI, conditioning continues, overlearning occurs, "dips become conditioned onto dips" and gradually, and automatically, the associated physiological changes become deeper and deeper.
>
> The regular appearance of inactivity-induced signatures in circadian rhythms serve as zeitgeber, stimuli that pull and keep circadian rhythms in synchrony. PSI thereby functions to pull and keep circadian rhythms in synchrony, and as a result reduces anxiety and increases psychological well-being.

> Periodic inactivity is the single commonality among a variety of highly effective growth and therapy techniques, including Jacobsonian relaxation, biofeedback training, autogenic therapy, self-hypnosis, meditation, and yoga. However, since PSI incorporates only the essentials of these techniques, and does away with all the unnecessary and cumbersome extras associated with them, it is in fact more effective and more efficient.

After attending the two introductory lectures and participating in fifteen day fast from illegal drugs, each subject was scheduled for private initiation, and his name entered in a professional-looking schedule book filled with signatures of what appeared to be hundreds of previous PSI initiates. The scheduling book, as well as all other PSI literature, was liberally sprinkled with the official PSI logo.

Half the subjects were initiated by the senior instructor and half by his assistant. Each subject was ushered into a small quiet room and his name crossed off the scheduling book. Both the subject and his instructor sat facing each other. The instructor then proceeded to give initiation as is summarized below:

> Today I'll teach you PSI. The technique itself is deceptively simple. Most mistakes are made without the practitioner even knowing he is making them. For this reason we are putting you through a very carefully planned training session.
>
> Training will take place in four segments. First, I will teach you the technique. Then in one of the adjoining rooms you will practice the technique alone for 15 minutes. This is essential. Most errors in technique come to light only during the first few sessions of practice. Then I will knock on your door and give you a questionnaire which asks certain questions about the experiences you had during the PSI session. Finally, we will go over your questionnaire and answer any questions you may have. You will then know the technique, and should practice twice daily, once before breakfast, once before dinner, for 15 to 20 minutes a session.
>
> First, the technique. The best way to learn PSI is to do it. First, I'll read the instructions so you may become

familiar with them. Then I'll read them again, and as I read them I would like you to follow them here and now.

Here are the instructions: Sit up straight in your chair. Place your feet flat on the floor. Place your arms in a position that is comfortable for you. If you are carrying a handbag or package, put it aside.

Now, simply close your eyes and sit for the next 15 to 20 minutes. Remain physically inactive for this period of time: that is, sit still and avoid unnecessary movements. Let your mind do whatever it wants. Whatever you do mentally will have little or no impact on the effectiveness of the technique. The important thing is to remain physically inactive. Do not talk, walk around, or change chairs. You may engage in an occasional action such as shifting your position, or making yourself more comfortable. And you may scratch.

At the end of the session, open your eyes, breathe deeply a few times, and continue with your everyday activities.

OK, do you have any questions? Now I will read the instructions step by step, and I would like to follow them here and now as I read. I may correct certain aspects of your technique if it appears necessary.

First, sit up straight, place your feet flat on the floor, and place your arms in a comfortable position. Close your eyes.

Second, remain physically inactive. Sit still and avoid unnecessary movements. Let your mind do whatever it wants. I'll let you practice this for the next two minutes (two-minute pause).

Third, take several deep breaths and you are finished.

Now I would like you to practice this technique for the next 15 minutes. I'll knock on the door when it is time for you to take your questionnaire.

Fifteen minutes later the instructor entered the room and gave each subject his questionnaire. He read each item aloud, asked the subject if it corresponded to his experience, and then checked the item off. The instructor consistently responded with support and approval, indicating that the subject was practicing correctly.

Subjects were urged to attend during the next three days three *one*-hour follow-up discussions devoted to answering questions and giving

further instruction. Most questions were anticipated in the PSI Instructional Manual. Answers emphasized the following key points:

> PSI works automatically and gradually. One should not look for dramatic effects. In fact, the effects of PSI can be so gradual that the practitioner may not notice them. However, these effects are soon apparent to others and can be detected by physiological equipment. Also, PSI practitioners may experience periods of anxiety and doubt and may from time to time be completely convinced that PSI does not work. At these times it is important to remember that PSI works in cycles, sometimes slowly, sometimes rapidly.

In addition to answering questions, the first follow-up discussion was devoted to summarizing PSI theory and elaborating on the long term physiological benefits associated with the state of "conditioned stabilized hypoarousal" experienced during PSI.

During the second follow-up discussion each subject was given an official PSI Programmed Self-Instruction Booklet to fill out during the session. This booklet was essentially a multiple-choice exam on crucial aspects of PSI theory and technique. Subjects were told that the reasons for filling out the manual were: (1) to give the instructors an idea of how well the technique was being practiced, (2) to anticipate and answer questions that might come up in the future, and (3) to minimize the possibility that the technique of sitting with eyes closed might be practiced incorrectly in the future.

The third follow-up discussion outlined the long-term psychological benefits in self-concept, anxiety reduction, and range of experiencing that one would obtain by practicing PSI. Nonexistent but plausible research "verifying" these benefits was cited and illustrated by professional looking transparencies. Bogus testimonials

were read illustrating how PSI worked in different ways for different people. Finally, each subject was given a questionnaire and asked to describe his experiences and offer suggestions for improving PSI instruction.

Each month throughout the project each subject was phoned and scheduled for a follow-up "checking" session. If a subject missed a session he was phoned again and the session rescheduled. If he missed the rescheduled session he was not contacted again until the next month.

During each checking session each subject met alone with an instructor in a small quiet room with a door conspicuously labeled "PSI FOLLOWUP," in letters incorporating the official PSI logo. The following format was used during the follow-up sessions:

> The instructor ushers the practitioner into the follow-up room. Both sit. They may engage in a few minutes of informal chit-chat providing the instructor does not ask questions concerning the practitioner's well being.
>
> The instructor then casually asks the following questions in order to get some idea of where the practitioner is at in terms of PSI experience. (He does not ask these questions in an attempt to persuade or pressure the practitioner to practice more regularly): "Let's see, you learned PSI in (instructor fills in proper month). Have you been practicing regularly? (Pause for answer.) Do you do it about 15 to 20 minutes a session, sitting still, letting your mind do whatever it wants? (Pause for answer.)"
>
> The instructor responds with a warm and accepting "fine" or "OK" to most of the subject's responses. The instructor then says "OK, let's sit with our feet flat on the floor with our arms put in a comfortable position, letting the mind do whatever it wants, while remaining physically inactive. (Both the instructor and subject practice for 10 seconds.)" "Do any thoughts or feelings come to mind?" (Pause for answer.) "Fine, let the mind do whatever it wants. For the next three minutes let's close our eyes and practice PSI." Both the practitioner and instructor practice PSI for three minutes, after which the instructor says, "Did you begin to feel a bit rested?" (Pause) "Fine, the effects of PSI are gradual and automatic.

Your body will gradually reach deeper and deeper states of relaxation, although you may not be aware of this."

"OK, I'd like you to continue practicing PSI for the next 10 minutes. I'll go into another room and will let you know when the time is up."

At the end of the practice session the instructor enters the room and asks, "Are there any questions? Any problems concerning the technique? Did you feel relaxed or rested?" (Pause) "Fine, PSI is working even when mentally you may not feel relaxed."

After several checking sessions this procedure was streamlined to include only a preliminary question and answer session, a 15 minute practice period during which the subject practiced alone, and a final question and answer session. This was done because the instructors observed that the original follow-up procedure was beginning to be monotonous for the subjects.[3]

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[3]Through an oversight on the part of the experimenter, PSI was not as closely matched with TM as might be desired. Four differences should be noted: (1) all TM subjects were required to obtain and donate two or three sweet fresh fruits to the Student's International Meditation Society as part of the initiation ceremony. PSI subjects were required to make no comparable contribution. (2) Each of the three TM post-initiation follow-up discussion sessions started with a 15 minute meditation; the PSI post-initiation follow-up discussion sessions started with a question and answer period. (3) The first TM checking session was scheduled for two weeks after initiation; the first PSI checking session was scheduled for four weeks after initiation. And (4) TM subjects were instructed to practice once in the morning and once in the late afternoon or evening, preferably before breakfast or dinner, and that it was not absolutely essential to practice the same time each day. PSI subjects were urged to practice before breakfast and before dinner and were told that it was important that they practice the same time each day, give or take two hours. The importance of this last difference became apparent after about six weeks. Several PSI subjects complained that they were not practicing regularly because they had difficulty scheduling their PSI sessions the same time each day. When this difficulty was discovered, all PSI subjects were informed when contacted for their next checking session that it was unnecessary to practice exactly the same time each day, and that recent research has found PSI to be fully effective when simply practiced twice daily, once in the morning and once in the late afternoon or evening, not within one hour after eating.

Interim assessment. March 1, after 3½ months, subjects were contacted for testing. Subjects in the No Treatment condition were given all tests given during the pretest assessment plus a therapeutic activities questionnaire. No Treatment subjects who were given the skin conductance test during pretreatment assessment were given the same test with a different film. The film used was closely parallel to the one used in pretesting. These subjects were then assigned to the treatment conditions described in Experiment II.

Nineteen TM and 22 PSI subjects agreed to be tested. They were given the STAI A-Trait questionnaire and the Epstein Fenz Manifest Anxiety Scale, and were informed that the experiment was not over and that they should continue practicing.[4]

Posttreatment assessment. May 20, six months after the onset of this project, TM and PSI subjects were contacted for their final assessment. An heroic effort was made to test all subjects, even those who had discontinued with the project. All subjects were informed that it was extremely important that they participate in the assessment, especially if they were not practicing regularly or had dropped out of the experiment.

Subjects were given all of the tests given during the pretreatment assessment period. In addition, the following tests were given: a frequency of practice questionnaire inquiring into how many

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[4]We initially planned to terminate Experiment I if the TM group displayed greater reductions in anxiety than the PSI group, and teach TM to both the PSI and No Treatment subjects. Differences between TM and PSI were not significant, so both treatments were continued.

times PSI or TM was practiced each month throughout the project (Appendix F); a questionnaire inquiring into what therapeutic activities subjects participated in each month throughout the project (Appendix G); and an extensive essay test asking subjects to evaluate the enjoyability, value, and overall impact of TM and PSI, and to describe in detail the types of experiences they had while practicing (Appendix H).

Subjects who were given the skin conductance tests during pretreatment assessment were given the second version of the test, the version given to the No Treatment subjects in March.

At the end of posttreatment assessment each subject was invited to attend a "debriefing" session in which all aspects of the project, including the hypotheses, methodology, and treatment conditions would be revealed and all questions answered. The experimenter offered to send the final results of the project to any subject interested, and to teach meditation, PSI, or any other related technique he knew to any subject wanting such instruction. If a subject was unable to attend the scheduled debriefing session, he was debriefed at a time convenient for him. Five TM and four PSI subjects chose to be debriefed.

Experiment II

It was hypothesized that a treatment based on TM-like meditation instructions is more effective in reducing anxiety than a parallel control treatment based on instructions nearly antithetical to meditation.

Subjects

Subjects consisted of 54 (27 male, 27 female) Michigan State University students with a mean age of 21.5 years. Of these 9 males and 15 females had completed the No Treatment condition of Experiment I. The remaining were newly recruited volunteers who were not receiving psychotherapy and had at no time practiced meditation or yoga. The new recruits were given the same pretreatment orientation given to No Treatment subjects at the onset of Experiment I.[5]

Procedure

Pretreatment assessment. Over three days all subjects were given the following tests: the STAI A-Trait Inventory, the Epstein-Fenz Manifest Anxiety Scale, the 16PF Forms A and B, the IPAT Neuroticism Scale Questionnaire, the Tennessee Self Concept Scale, the Marlowe-Crowne Social Desirability Scale, and a checklist of numerous therapeutic procedures and treatments including meditation and yoga. Subjects who completed all three days of assessment and had not previously practiced meditation or yoga were accepted into the project. For subjects obtained from the No Treatment group in Experiment I, posttreatment assessment in Experiment I served as pretreatment assessment in Experiment II.

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[5]Initially in Experiment II we planned to teach No Treatment subjects in Experiment I meditation and then, using each subject as his own control, compare improvement under No Treatment with improvement under meditation. As mentioned above, only 24 No Treatments wished to participate in Experiment II, a number we considered to be insufficient. The alternative design described above was then utilized.

Treatments. Subjects signed up for one of two treatment conditions, CMS Meditation and CMS Anti-Meditation. Treatments were described as being absolutely identical, except that one was being taught at 7, 9, 7, and 9 PM four consecutive evenings (March 4-7), and the other at 9, 7, 9, and 7 PM the same evenings. Subjects chose the treatment that best fit their schedules. Subjects who had no preference were assigned to groups in such a way that the groups would be matched as closely as possible for sex and for ratio of No Treatment subjects and new recruits.

Twenty-seven subjects (14 males, 13 females) signed up for what was in fact the meditation treatment, and 27 subjects (13 males, 14 females) signed up for what was in fact the anti-meditation control treatment. Both treatments were called "Cortically Mediated Stabilization," or "CMS" and were identical except that one incorporated a TM-like meditation exercise devised by the experimenter,[6] and the other

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[6]In preparation, the experimenter gave the CMS meditation instructions individually to 19 persons who had been practicing TM regularly for at least six months and to one TM instructor. Each person was asked to answer two multiple-choice questions concerning the instructions:

1. In comparison with TM, I would predict that the meditation described here should be
   A. more easy and effective
   B. equally easy and effective
   C. less easy and effective
2. From what I know about TM, the meditation described here appears to be
   A. identical
   B. essentially the same, that is, different in ways that are superficial
   C. different in at least one crucial aspect, that is, the two techniques are not essentially the same.

The TM instructor and 18 of the 19 practitioners stated that the techniques should be "equally easy and effective," were "essentially the

an anti-meditation exercise carefully devised to be the near antithesis of meditation. Subjects were not informed as to the relationship between the various techniques and meditation.

Both treatments were taught in four sessions by the experimenter. He carefully mastered and practiced each aspect of instruction procedure, and made an attempt to appear credible and enthusiastic. In addition, he misinformed subjects that he himself had practiced CMS five years and had taught it for two.

The first training session of both CMS Meditation and CMS Anti-Meditation incorporated the same introductory lecture. This lecture covered the following points (full lecture in Appendix I):

> The technique you will learn is called "CMS" which stands for "Cortically Mediated Stabilization." CMS should be practiced 15 to 20 minutes a session, once in the morning, and once in the late afternoon or evening. CMS should not be practiced before 60 minutes after eating.
>
> An impressive body of scientific research and theory shows that CMS is effective for reducing anxiety, tension, nervousness, and worry, and for increasing mental health. This research will not be described here. To do so could set up expectations which might distort the workings of the technique. However, it can be said that two processes involved in CMS are the accumulation and dissipation of reactive inhibition, and the cortically mediated amplification of these effects (these processes are then briefly defined).

At the end of the first session CMS was taught to each group, practiced for 15 minutes by both the instructor and the subjects, and

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same," and differed in "ways that are superficial." One TM practitioner claimed that the CMS meditation should be less easy and effective and that it was not essentially the same as TM and differed in at least one crucial aspect. Most important differences cited as distinguishing the techniques were that TM, unlike CMS, is taught individually during a special initiation ceremony, and involves secret mantras individually selected for each meditator.

then discussed. The CMS Meditation group received the following instructions:

> CMS involves mental activity centered around a meaningless word, called a "focus." The focus we will use is the word "shanti."[7] I will first read the instructions to acquaint you with them, and then I will reread them slowly and would like you to begin practicing as I read. We will then practice as a group for 15 minutes. Here are the instructions: Sit up straight in a comfortable position. Close your eyes. Give yourself a few minutes, about two, to settle down. Let the focal word repeat itself in your mind as effortlessly as possible; let it come to you and start on its own. If it won't repeat itself on its own, you may gently being it, providing you do so with a minimum of effort. Whenever you notice you have been distracted or that your mind has wandered, let your mind return to the focal word as gently and effortlessly as possible. Let this happen easily, without making a big thing of it. Distractions, especially inner distractions, are an important part of the processes involved in CMS. They are normal and healthy. You are practicing CMS when they occur.

The Anti-Meditation group received the following instructions:

> Here are the instructions for CMS. I will first read them to acquaint you with them, and then I will reread them slowly and would like you to begin practicing as I read. We will then practice as a group for 15 minutes. Here are the instructions: Sit up straight in a comfortable position. Close your eyes. Remain physically inactive. Shift your eyes back and forth, at a slow regular pace, about 15 times.[8] Then deliberately pursue a sequency of cognitive activity that has a positive direction and is comprehensive. That is, simply engage in thought activity that you intend to be positive, that is, good, desirable, interesting, or anything the word "positive" means to you. There are three types of cognitive activity you may pursue: fantasy-daydream,

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[7]The word "focus" was used in place of the more appropriate word "mantra" in order to avoid arousing suspicions that meditation was being taught. "Shanti" was selected because it is a well-tested and widely used Indian mantra.

[8]The esoteric eye-shifting exercise was incorporated to match the esoteric qualities of the focal word "shanti" used in the CMS Meditation exercise.

> story-telling, and listing. If you engage in fantasy-daydream, make it good. Make it have a good outcome. Put components in it that for you are positive--people you like, activities you like, your favorite possessions, places you like, colors you like, etc. If you engage in story telling, tell yourself a story that has a positive ending. Put in details that are good and desirable for you. If you engage in listing, simply list the positive attributes of something. List all the good, desirable, and beneficial qualities of something.
>
> Whatever thoughts and feelings you have in addition to your deliverate sequence of cognitive activity are normal and healthy. They are part of the processes involved in CMS.
>
> As you may have gathered, the specific content of your positive cognitive activity is irrelevant. What is really important is that you engage in deliberate cognitive effort that is directed in a positive direction.

Days two through four of instruction for both meditation and anti-meditation groups started out with a question and answer session. CMS instructions were briefly summarized and the technique practiced by everyone for 15 minutes. This was followed by another question and answer session.

In addition, during the second day of instruction CMS Meditation subjects were given the following talk:

> Today I would like to spend some time on elaborating upon the instructions given earlier. First, don't try to prevent distractions from coming to mind, whether they be internal or external. Don't try to do anything with them. Don't try to figure them out, analyze them, make them go away, or cure them. Simply let them arise when they want to, and then easily favor the focus. Second, don't strain to attend to your focus. Do not exert an effort to attend. When you notice that your mind has been distracted, let it return to the focus. If you have to do this often, again and again, this is fine. This is a part of CMS. Third, if you go on for several minutes without noticing that your mind has wandered, this too is fine. Simply let your mind return to the focus. And fourth, do not strive to achieve a particular state of mind. Accept the session wherever it leads.

During the second day of instruction, anti-meditation subjects were given this talk:

> Today I would like to spend some time on some important elaboration. First, when you practice CMS engage in deliberate thought. Don't get lazy or loaf around. If you feel yourself getting into a lazy trance state or daze, snap out of it. Blink your eyes a few times and continue your thought. Second, the product of your thought activity is irrelevant. It is irrelevant how positive your thinking becomes. It is irrelevant even if you can't think of much of anything positive. The effects of CMS come from deliberate cognitive effort directed in a positive direction. Positive intent is essential. Third, make your cognitive activity cover as much ground as possible. Make it comprehensive. That is, try to think of as many things as possible, with as much variety as possible, and with as much detail and elaboration as possible.

During the third day of instruction, both meditation and anti-meditation subjects were told:

> Here are four important characteristices of the effects of CMS: the effects are gradual, accumulative, cyclical, and automatic. First, the effects are gradual. So gradual that you probably won't detect them. The effects are like the effects of growth--one never experiences the day by day process of growth. Second, the effects are accumulative. Each day you add a little to your body's capacity to generate the physiological changes involved. Third, the effects are cyclical. Because of the specific processes involved, you will experience ups and downs and plateaus. You may experience these within a single session, or over a period of days or weeks. The important thing to remember is: CMS is working during the down phases as well as the up. In fact, both phases are essential for CMS to work fully. Fourth, the effects are automatic. As long as you follow the simple instructions and practice regularly, the physiological processes will be automatically set into motion.

During the fourth day of instruction both meditation and anti-meditation subjects were told that CMS is essentially very simple and easy, and that if it seems difficult, it is probably not being practiced correctly. The instructions were then reviewed.

Once a month for the duration of the experiment each subject was phoned and scheduled for a group follow-up checking session. During these sessions the instructor first asked if there were any questions and then briefly reviewed the instructions. Both the instructor and the subjects practiced for 15 minutes. Then the instructor answered further questions. For both groups the instructor used the following formula (closely patterned after TM) for answering questions: If the question revealed that some aspect of CMS instruction was not being followed correctly, the relevant piece of instruction was reviewed. If it was clear that CMS was being practiced correctly, but the subject was asking about some experience he had while practicing, the instructor responded by saying that such experiences were not only normal and healthy, but at times can be signs of the working of certain CMS processes.

Posttreatment assessment. Eleven weeks after the onset of the project all subjects were called in for posttesting. Once again an heroic effort was made to test all subjects, even those who had discontinued with the project. Subjects were informed that it was extremely important that they participate in the assessment, especially if they were not practicing regularly or had dropped out of the experiment. Subjects were given all measures given during the posttreatment assessment for Experiment I.

At the end of the project each subject was invited to attend a "debriefing session" in which all aspects of the project, including the hypotheses, methodology, and treatment conditions would be revealed and

all questions answered. The experimenter offered to teach meditation, PSI, or the anti-meditation technique to any subject wanting such instruction. One meditation subject was interested in learning the anti-meditation technique. If a subject was unable to attend the scheduled session, he was debriefed at a time convenient for him. Six subjects chose to be debriefed.

Table 1 outlines the designs used in Experiments I and II.

Description of Dependent Variables

Before reading the results of Experiments I and II, the reader may profit from a full description of the dependent variables investigated. Readers who feel no need for such a discussion are hereby given permission to skip to the next chapter. Primary dependent variables, those relating directly to the hypotheses of Experiments I and II are described first. Secondary or supplementary dependent variables then follow.

Primary Dependent Variables

STAI A-Trait. The STAI A-Trait Scale (alpha reliability = .86) taps conscious or manifest trait anxiety. Conscious trait anxiety refers to a relatively stable propensity to experience anxiety states, states characterized by such descriptors as "tense, regretful, upset, anxious, nervous, jittery, high-strung, worried, over-excited, and rattled" (Spielberger, Gorsuch & Lushene, 1970).

Table 1. Designs of Experiments I and II in Diagram Form

	November Assessment	Treatment	March Assessment	Treatment	May Assessment
Experiment I					
TM Group (N = 49)[a]	Full assessment[b]	TM	Partial assessment[c] (N = 19)[d]	TM	Full assessment (N = 20)
PSI Group (N = 51)	Full assessment	PSI	Partial assessment (N = 22)	PSI	Full assessment (N = 24)
No Treatment (N = 39)	Full assessment	No Treatment	Full assessment (N = 34)		
			March Assessment	Treatment	May Assessment
Experiment II					
CMS Meditation Group (N = 27, 12 from the No Treatment condition in Experiment I)			Full assessment	Meditation	Full assessment (N = 14)
CMS Anti-Meditation Group (N = 27, 12 from the No Treatment condition in Experiment I)			Full assessment	Anti-Meditation	Full assessment (N = 19)

[a] N = Number of subjects in each treatment at the onset of the project.

[b] Full assessment incorporated the following tests: STAI A-Trait, Epstein-Fenz Manifest Anxiety Scale, 16PF Forms A and B, IPAT Neuroticism Scale Questionnaire, the Tennessee Self Concept Scale, the Marlowe-Crowne Social Desirability Scale, and for about half of the subjects, a skin conductance test.

[c] Partial assessment incorporated the STAI A-Trait Scale and the Epstein-Fenz Manifest Anxiety Scale.

[d] N = Number of subjects who reported for posttesting.

Symptoms of Striated Muscle Tension (SSMT). The Epstein Fenz Manifest Anxiety Scale (Fenz & Epstein, 1965) consists largely of items selected from the Tayler Manifest Anxiety Scale. It yields three anxiety scores: Symptoms of Striated Muscle Tension (odd-even reliability = .83), Symptoms of Autonomic Arousal (odd-even reliability = .84), and Feelings of Insecurity. Conceptually, Feelings of Insecurity is synonymous with conscious trait anxiety and was not scored in this study.

Fenz and Epstein (1965) describe the Symptoms of Striated Muscle Tension Scale as including "Items . . . descriptive of the effects of sustained contraction of striated or voluntary muscle . . . items referring to tremor, motor incoordination, backache, neckache, rapid breathing, pressure headaches, and skin sensitivity (Appendix L). Generally these authors relate symptoms of striated muscle tension to relatively shallow inhibition of outwardly-directed hostile impulses.

Symptoms of Autonomic Arousal (SAA). This scale consists of items referring to "visceral symptoms associated with activation of autonomic nervous system." Items refer to "tachycardia, vasomotor reactions, emotionally-induced sweating, failure of body temperature control, and digestive disorders." Fenz and Epstein conceptualize such symptoms as representing a deeper level of inhibition of impulse expression than represented by symptoms of striated muscle tension or feelings of insecurity.

The primary dependent variables taken together represent frequently experienced symptoms of anxiety reflecting differing levels of

impulse inhibition or repression. Psychodynamic theories of personality (Fenichel, 1945) frequently argue that the extent to which threatening impulses are not repressed or denied access to consciousness, determines the extent to which anxiety is manifest or conscious. From this viewpoint high scores on the STAI A-Trait Scale can be thought of as representing relatively little repression, and high scores on the Symptoms of Autonomic Arousal Scale a greater degree of repression.

IPAT Anxiety Factors

The Institute of Personality and Ability Testing (IPAT) offers a series of questionnaires designed to tap dimensions of personality as obtained from factor analysis. The 16PF taps the majority of dimensions that characterize normals and neurotics, and the Neuroticism Scale Questionnaire the majority of dimensions that distinguish clinically diagnosed neurotics from normals. Taken together these tests yield 16 primary factor scores. In this project the 16PF Forms A and B and the Neuroticism Scale Questionnaire (the NSQ) were given both at pretesting and at posttesting. Their separate raw factor scores were pooled to increase factor reliability.

Clinically diagnosed neurotics differ from normals on two general dimensions: anxiety, and "neuroticism," a dimension Cattel and Scheier suggest is related to "bound anxiety" (Cattel & Scheier, 1961). Anxiety is indicated primarily by high scores on Factors O and Q_4 and low scores on Factor C, and to a lesser extent by high scores on Factor L and low scores on Factors H and Q_3. These factors are obtained from the 16PF Forms A and B and are described below. A plus sign by the

factor label indicates that high scores represent a high degree of the trait described; a minus sign indicates that low scores represent a high degree of the trait described.

Factor O (+), Guilt Proneness. Low scorers tend to be self-assured, placid, secure, and complacent; high scorers, apprehensive, self-reproaching, insecure, worrying, and troubled. Test-retest reliability is .89.[9]

Factor Q_4 (+), Frustration Tension or Id Pressure. Low scorers tend to be relaxed, tranquil, torpid, unfrustrated and composed; high scorers, tense, frustrated, driven, overwrought, and fretful. Test-retest reliability is .91.

Factor C (-), Emotional Instability or Ego Weakness. Low scorers tend to be affected by feelings, emotionally less stable, easily upset, and changeable; high scorers, emotionally stable, mature, reality-facing, and calm. Test-retest reliability is .87.

Factor L (+), Suspiciousness or Paranoid-Type Insecurity. Low scorers tend to be trusting and accepting of conditions; high scorers, suspecting, jealous, and hard to fool. Test-retest reliability is .87.

Factor H (-), Shy, Timid, Threat-Sensitivity. Low scorers tend to be emotionally cautious, retiring in the face of the opposite sex, shy, timid, restrained, careful, and rule-bound; high scorers, adventurous, thick-skinned, and socially bold. Test-retest reliability is .93.

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[9]All factor descriptions are taken from or adapted from the 16PF Handbook (Cattell, Eber, & Tatsouka, 1970) and the Handbook for the IPAT Anxiety Scale Questionnaire (Cattell & Scheier, 1963).

Factor Q_3 (-), Low Self-Sentiment Integration. Low scorers tend to be uncontrolled and lax and tend not to be motivated to integrate their behavior around a clear self-ideal; high scorers tend to be controlled, precise, compulsive, and tend to have "exacting will-power." Test-retest reliability is .78.

IPAT Neuroticism Factors

In addition to the anxiety factors just described, clinically diagnosed neurotics score higher than normals on Factor I, and lower on Factors F and E, factors Cattell claims are related to "bound anxiety" or "neuroticism." These factors are obtained from the 16PF Forms A and B and the Neuroticism Scale Questionnaire.

Factor I (+), Over-Protected Tender-Minded Sensitivity. Low scorers, tend to be tough minded and tend to reject illusions; high scorers tend to be weak minded, sensitive, dependent, and over-protected. Test-retest reliability is .89.

Factor F (-), Depressive Overseriousness. Low scorers tend to be sober, taciturn and serious; high scorers, enthusiastic, heedless, happy-go-lucky, and extroverted. Test-retest reliability is .90.

Factor E (-), Submissiveness and Dependence. Low Scorers tend to be obedient, mild, easily led, docile, and accommodating; high scorers, assertive, aggressive, competitive, and stubborn. Test-retest reliability is .88.

IPAT Non-Pathology Factors

The 16PF yields seven factor scores that reflect neither anxiety nor neuroticism. These factors are listed below accompanied by both high score and low score descriptors.

Factor A, Schizothymia vs. Affectothymia. Low scorers tend to be reserved, detached, critical, aloof, and stiff; high scorers warm-hearted, outgoing, easygoing, and participating. Test-retest reliability is .89.

Factor B, Low Intelligence vs. High Intelligence. This is a miniature intelligence test. Test-retest reliability is .65.

Factor G, Low Superego Strength vs. Superego Strength. Low scorers tend to lack acceptance of group moral standards, disregard rules, and be expedient; high scorers, conscientious, persistent, moralistic, and staid. Test-retest reliability is .88.

Factor M, Practical vs. Imaginative. Low scorers tend to be practical and have down to earth concerns; high scorers tend to be imaginative, Bohemian, and absent-minded. Test-retest reliability is .82.

Factor N, Naivete vs. Shrewdness and Discipline. Low scorers tend to be sentimental, forthright and unpretentious; high scorers, shrewd, astute, disciplined, and worldly. Test-retest reliability is .76.

Factor Q_1, Conservatism of Temperament vs. Radicalism. Low scorers tend to be conservative, respecting of established ideals and tolerant of "traditional difficulties"; high scorers, experimenting, liberal, analytical, and free-thinking. Test-retest reliability is .83.

Factor Q_2, Group Dependency vs. Self-Sufficiency. Low scorers tend to be joiners and sound followers; high scorers, self-sufficient, resourceful and preferring to make their own decisions. Test-retest reliability is .85.

Tennessee Self Concept Scale Variables

The Tennessee Self Concept Scale (TSCS), unlike the 16PF, consists of items that focus exclusively on one narrow band of personality: self-concept. Its items were selected not through factor analysis, but on the basis of the judgments of clinical psychologists. Finally, unlike the 16PF, the TSCS has scales for more extreme forms of personality disturbance such as psychosis.

I chose to use the following TSCS Scales: Total Positive, Psychosis, Personality Disorder, Personality Integration, Defensive Positive, and Self Criticism. I chose these scales because they tap dimensions of psychopathology and normal personality not tapped in the 16PF or NSQ.

Total Positive, or Self Esteem (TSCS-TP -). The authors claim this scale to be the most important one in the TSCS. "It reflects the overall level of self esteem. Persons with high scores tend to like themselves, feel that they are persons of value and worth, have confidence in themselves, and act accordingly. People with low scores are doubtful about their own worth; see themselves as undesirable; often feel anxious, depressed, and unhappy; and have little faith or confidence in themselves" (Fitts, 1965). Test-retest reliability is .92.

Psychosis (TSCS-PSY +). This scale consists of those items that best distinguish psychotic patients from non-psychotic patients and normals. Psychotics tend to score high on this scale. Test-retest reliability is .92.

Personality Disorder (TSCS-PD -). This scale consists of items that best distinguish personality disorder from other forms of pathology and normality. A low score indicates a high degree of personality disorder. Test-retest reliability is .89.

Personality Integration (TSCS-PI). This scale consists of items that best distinguish persons who are above average in level of adjustement and personality integration from normals and patients. One can view this scale as measuring "self-actualization." Test-retest reliability is .90.

Defensive Distortion Variables

Self-Criticism (TSCS-SC). Low scores on this scale, taken from the TSCS, are claimed to represent "defensive distortion" (Fitts, 1963). This scale is based on the MMPI L Scale and consists of mildly derogatory statements that most people admit as being true for them. The authors claim that "individuals who deny most of these statements most often are being defensive and making a deliberate effort to present a favorable picture of themselves." Test-retest reliability is .75.

Defensive Positive (TSCS-DP). High Defensive Positive scores are claimed to represent a high degree of defensive distortion. The scale stems from the assumption that individuals with established psychiatric difficulties have negative self-concepts, regardless of how positively they describe themselves. The scale consists of those items which best discriminate psychiatric patients with uncharacteristically positive self concepts, that is, TSCS-TP scores, from normals and other patients. Test-retest reliability is .90.

Marlowe-Crowne Social Desirability Scale (MCSD). This is yet another test of defensive distortion. It consists of items reflecting socially desirable attitudes and behaviors which in fact characterize few people, and items reflecting socially undesirable attitudes and behaviors which, alas, characterize most of us. High scores indicate defensiveness. Unlike the TSCS-SC and TSCS-DP Scales, items for the MCSD were chosen because they do not have pathological content.

Why did we include three measures of defensive distortion? First, since the Self Criticism and Defensive Positive Scales are obtained from the TSCS, they were available gratus. However, both scales incorporate items having pathological content, and as a result both scales correlate highly with anxiety which, as Cattell, Eber, and Tatsouka (1970) argue, is partly manifested by a tendency for self-denigration or the tendency to claim that pathological statements apply to oneself. However the MCSD was specifically designed to be less subject to this criticism. For this reason I have selected the MCSD as the primary measure of defensive distortion, and the TSCS Scales as supplementary measures.

Technique Evaluation Variables

The following variables are obtained from a test requesting short, written answers and essays evaluating the effects of TM, PSI, and CMS.

Ranked Value. This score comes from a question asking the respondent to rank the ten activities he values most in life and are most important to him. If practicing TM, PSI, or CMS does not appear

on the list he makes, he is asked to estimate where it would rank among the 100 activities he values most.

Best Session Rank. Another question asks the respondent to rank the 10 most enjoyable and worthwhile experiences he has had during the last six months. If practicing the technique he learned in this project appears nowhere on the list, he is asked to estimate where his most enjoyable and worthwhile session would fit on a list of the 100 most enjoyable and worthwhile experiences he had over the last six months.

Average Session Rank. The respondent is also asked to rank his average or typical session on a list of his 100 most enjoyable and worthwhile experiences over the last six months.

Impact. Finally, the respondent is asked to describe how, if at all, TM, CMS, or PSI has changed his life. That is, he is asked to describe what impact these treatments have had on him.

Impact essays were scored in the following manner: First, for each essay all references to TM, PSI, and CMS were blackened out. Then three Michigan State University seniors were asked to separately score each essay. They were given these instructions:

> Please score these statements on the basis of how the person perceives the impact the technique he practiced actually had on him. Make your rating on the basis of how the person rates the technique for while he was practicing. That is, if someone writes, "The technique worked well while I was practicing, but I stopped one month ago and all my problems have returned," simply score the perceived effect of the technique for the time he was still practicing.
>
> Ignore subject's estimations or predictions of how well the technique would have worked had he practiced more diligently. We are interested only in what he actually experienced.

> Score perceived correlations as if they imply actual impact. That is, if a subject says, "while I practiced my problems seemed to get better, but I have no idea if it was the effect of the technique or something else," assume the technique was the causal agent.
>
> Give each subject a number from 0 to 6 on the basis of the following key: 0 = no impact, not at all effective; 1 = in between; 2 = in between; 3 = moderately effective; 4 = in between; 5 = in between; 6 = highly impactful, very much effective.

When the essays were finally rated, the correlations among the three judges' ratings were .78, .80, and .82.

Skin Conductance Variable

As mentioned in Chapter I, Orme-Johnson et al. (1973, 1973a) found the practice of TM to be associated with decrements in skin conductance lability tested while a subject sits in a laboratory with his eyes open. This, he suggested, indicated a decrease in anxiety or stress-proneness. Although sitting in a laboratory with electrodes attached to various parts of the body may be stressful to many people, it is not representative of the sorts of stresses one meets in everyday life. I was interested in determining if the practice of TM is related to decreases in skin conductance lability in a testing situation in which an attempt is made to introduce stress stimuli akin to those that occur in everyday life.

Specifically I chose to investigate fluctuations in skin conductance before, during, and after observing one of two interpersonal stressor films. Each film was constructed by Dr. Norman Kagan of Michigan State University and consists of 12 and 10 randomly spaced color and sound film shorts. In each short an actor faces the film

viewer and addresses him. Six different actors realistically express seduction (both heterosexual and homosexual), affection, rejection, anger, fear, and maternal control. In other words, the film shorts represent real-life situations many people find stressful.

A skin conductance reaction was defined as any sustained increase in skin conductance occurring within 10 seconds followed by a visible decrease in conductance occurring within five seconds. The following reactivity scores were obtained:

Prefilm, 0-1 Micromho (mm). This refers to the number of reactions of one micromho or less occurring in the three-minute base rate period occurring before the onset of the films.

Film, 0-1 Micromho. This refers to the number of reactions of one micromho or less occurring while the film is being presented.

Postfilm, 0-1 Micromho. This refers to the number of reactions of one micromho or less occurring in the three-minute base rate period occurring after the films.

Prefilm, 1-2 Micromho. This refers to the number of one-two micromho reactions before the film presentation. The following scores are parallel to the above.

Film, 1-2 Micromho.

Postfilm, 1-2 Micromho.

Prefilm, film, and postfilm measures were also obtained for deflections of 2-3 micromhos and 3-4 micromhos. Since only four subjects displayed reactions of this magnitude, deflections from 2-4 micromhos were not separately studied.

Total Reactivity. This refers to the total number of reactions of any magnitude exhibited during all base rate and film periods.

Initial SC. This refers to the level of skin conductance in micromhos at the start of the testing session.

Final SC. This refers to the level of skin conductance in micromhos at the end of the testing session.

What does skin conductance reactivity mean? I propose that reactivity among persons suffering from psychopathology may be related to anxiety and repression. Specifically, I propose that persons who are severely disturbed and exhibit considerable conscious anxiety and few symptoms of repression display more reactive or labile skin conductance than do either normals or phobics, obsessive compulsives, hysterics or psychotics--that is, patients who are severely disturbed and display symptoms of considerable repression. Research tends to support this limited hypothesis. Malmo, Shagass, Davis, Cleghorn, Graham, and Goodman (1948) found that patients carefully selected for exhibiting conscious anxiety, and not phobic, obsessive-compulsive, hysterical, or psychotic symptoms, display more skin conductance fluctuations than do normals in a stress situation involving anticipating a painful stimulus. In addition, Howe (1958) found that during extinction trials following conditioning trials in which GSR-inducing shocks are paired with a tone, skin conductance responses take longer to extinguish for acutely anxious patients than for normals or schizophrenics. And Lader (1967) found that neurotics displaying manifest anxiety show more spontaneous skin conductance fluctuations and a slower rate of GSR habituation than do phobics or normals.

It should be noted that some research has generally found little relationship between anxiety and skin conductance reactivity (Katkin & McCubbin, 1969; Kelly, Brown, & Shaffer, 1970; Johnson, 1963; and Koepke & Pribram, 1966). Each of these studies have utilized the Tayler Manifest Anxiety Scale, a test Fenz and Epstein (1965) claim measures both manifest anxiety and symptoms of repression and inhibition. It is easy to see why scores on this scale would not correlate with skin conductance reactivity. If manifest anxiety is correlated with skin conductance reactivity, and symptoms of repression correlated with less reactivity, a test that confounds both anxiety and repression would tend to be uncorrelated with reactivity.

Other Variables

Outside therapeutic contact. This scale is simply the total number of hours the participant has been in contact with a helping person or agency throughout the time of the project. One-to-one interpersonal help was emphasized, such as seeing a counselor, clergyman, advisor, physician, psychologist, or crisis center.

Outside anxiety reduction activities. This scale consists of the total number of hours the participant participated in some form of impersonal or group anxiety reducing activity during the time of the project. Such activities include: yoga, Jacobsonian relaxation, empathy training, and encounter groups.

Last month's frequency. This score is the total number of times the participant estimated he practiced TM, PSI, or CMS during the last full month of the project.

Total frequency. This score is the total number of times the participant estimated he practiced during the entire project.

Discontinue. This score indicates whether or not the participant practiced at least once during the last full month of the project. A score of "2" indicates he did; "1" indicates he did not.

Considered meditation. A score of "2" indicates that the participant, before the start of this project, indicated that he had considered trying meditation. A score of "1" indicates that he did not.

Considered therapy. A score of "2" indicates that the participant considered seeking psychotherapy before taking part in this study. A score of "1" indicates that he did not.

Sex. "1" = male; "2" = female.

Age.

CHAPTER IV

RESULTS

Twenty out of 49 TM, 24 out of 51 PSI, and 34 out of 39 No Treatment subjects reported for posttesting. This represents an attrition rate of 59 percent for TM, 53 percent for PSI, and 13 percent for No Treatment.

Posttest scores were compared using analysis of covariance. Posttest scores were adjusted for their corresponding pretest scores, if any, as well as for any variable that met all of the following criteria: (1) correlated significantly ($p < .01$) with pretest-posttest difference scores, or with posttest scores where no pretests were given (Table 19), (2) differed significantly among groups (Table 20), (3) contributed significantly to the total variance for posttest scores when used with other covariates, and (4) made rational sense as a confounding variable.

Analyses of covariance comparing TM, PSI, and No Treatment for each dependent variable are summarized in Table 2. Groups differed significantly ($p < .033$) on all primary dependent variables: conscious trait anxiety (STAI A-Trait), symptoms of striated muscle tension (SSMT), and symptoms of autonomic arousal (SAA). Inspection of pretest and posttest means for these variables (Table 3) reveals a pattern: both TM and PSI subjects displayed a considerable reduction in anxiety, while No Treatment subjects displayed little change. Apparently both TM and

PSI treatments are more effective than No Treatment, but equally effective when compared with each other.

Three additional analyses of covariance were conducted comparing TM with PSI, TM with No Treatment, and PSI with No Treatment.[1] Of course, the reader should recognize that conducting three pairwise analyses of covariance can result in inflated significance levels. However, we did so to illustrate what appears to be a pattern. Table 4 shows that on none of the primary dependent variables is TM more effective in reducing anxiety than PSI. The differences obtained do not even approach significance ($p > .715$).[2] And, as expected, Tables 5 and 6 show that TM and PSI subjects exhibited a significantly greater reduction in anxiety than did No Treatment subjects.

Finally, primary anxiety variable posttest means and standard deviations for TM and PSI subjects tested both March and May are shown in Table 7. On none of the variables observed do May posttest means differ significantly ($p > .2$) from March Posttest means. That is, reductions in anxiety manifested by TM and PSI subjects occurred within the first three months of the project.

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[1]In order to reduce possible difficulties in meeting assumptions for the analysis of covariance, only data from each of the two groups being compared were used in these tests.

[2]That this finding might be attributed to a loss of power resulting from the precaution of disregarding data from the third group for each pairwise comparison does not appear to be the case. A second test based on the error mean square from the overall analysis was also not significant for any of the primary dependent variables. F's for STAI A-Trait, SSMT, and SAA were .135, .117, and .068 ($df = 1/71$), respectively, none significant beyond the .7 level.

Changes on the secondary variables also reflect the patterns just described. Overall analyses of covariance (Table 2) show significant differences ($p < .017$) among TM, PSI, and No Treatment groups in Self Esteem (TSCS-TP), Personality Disorder (TSCS-PD), and on five of the six anxiety factors obtained from the 16PF: Emotional Instability or Ego Weakness (Factor C-), Suspiciousness or Paranoid-Type Insecurity (Factor L+), Guilt Proneness (Factor C+), Frustration Tension or Id Pressure (Factor Q_4-), and Shy Timid Threat-Sensitivity (Factor H-).

Once again inspection of pretest and posttest means (Table 3) and pairwise analyses of covariance (Tables 4, 5, and 6) for TM, PSI, and No Treatment reveals that on all these variables TM and PSI are more effective than No Treatment in reducing psychopathology. And on none of these variables is TM more effective than PSI. Indeed, if anything, PSI appears to be more effective ($p < .017$) than TM in reducing Personality Disorder (TSCS-PD).

Turning to subjects' own evaluations of TM and PSI, we find the above pattern once again. Table 4 reveals that TM and PSI subjects found their techniques equally valuable (Ranked Value), equally enjoyable and worthwhile on the average (Average Session Rank) and equally effective and impactful (Impact). The best practice session experienced was ranked significantly more enjoyable and worthwhile ($p < .037$) by PSI subjects than TM subjects.

TM, PSI, and No Treatment groups differed significantly ($p < .001$) on the tendency to exhibit defensive distortion as measured by the TSCS-DP. TM subjects and No Treatment subjects became slightly

less defensive, while PSI subjects became significantly more defensive. If PSI subjects in fact displayed significant increments in defensive distortion tendencies on the TSCS-DP scale, we would expect a similar pattern for the two other measures of defensive distortion, Self Criticism (TSCS-SC), and the Marlowe-Crowne Social Desirability Scale (MCSD). This is clearly not the case. Differences between the three groups on these variables are not significant, either for the TSCS-SC Scale ($p < .106$). This leads to the interpretation that differences among the groups on the TSCS-DP Scale are spurious, and are probably due to vagaries of chance. This is a danger one openly courts by applying three analyses of covariance to a list of 35 dependent variables.

Finally, TM, PSI, and No Treatment subjects differed on none ($p > .133$) of the skin conductance measures.

Experiment II

Fourteen out of 27 CMS Meditation subjects and 19 out of 27 CMS Anti-Meditation subjects reported for posttesting. This represents an attrition rate of 48 percent for CMS Meditation and 30 percent for CMS Anti-Meditation.

Table 8 presents the unadjusted pretest and posttest means and standard deviations on all dependent variables for CMS Meditation and CMS Anti-Meditation.

Table 2. Analyses of Covariance Comparing TM, PSI, and No Treatment Groups on All Questionnaire and Skin Conductance Variables

Variables	MSt	df	MSe	df	F	p <	Covariates
Primary Anxiety Variables							
STAI A-Trait[a]	878.38	2	84.68	71	10.37	.0002	PS[b]
SSMT	172.59	2	32.91	71	5.24	.007	PS
SAA	174.37	2	48.47	71	3.60	.033	PS
IPAT Anxiety Factors							
Factor O	205.97	2	42.26	71	4.87	.010	PS
Factor Q_4	240.16	2	50.37	71	4.77	.011	PS
Factor C	404.03	2	43.13	71	9.37	.0003	PS
Factor L	134.65	2	24.15	71	5.58	.0057	PS
Factor H	561.58	2	61.74	71	9.10	.0004	PS
Factor Q_3	44.76	2	17.39	71	2.57	.083	PS
IPAT Neuroticism Factors							
Factor I	1.23	2	31.33	71	0.039	.962	PS
Factor F	1.71	2	37.82	71	0.045	.956	PS
Factor E	18.07	2	35.15	71	0.51	.600	PS
Other IPAT Factors							
Factor A	43.30	2	46.72	71	0.93	.400	PS
Factor B	3.18	2	3.18	71	0.82	.441	PS
Factor G	0.28	2	15.00	71	0.019	.981	PS
Factor M	37.09	2	16.01	71	2.32	.106	PS
Factor N	16.27	2	13.03	71	1.25	.293	PS
Factor Q_1	11.21	2	14.45	71	0.78	.464	PS
Factor Q_2	2.73	2	21.04	71	0.13	.880	PS
TSCS Variables							
TSCS-TP	25,926.28	2	5,953.06	71	4.36	.017	PS
TSCS-PSY	51.85	2	167.62	71	0.31	.735	PS
TSCS-PD	1,555.61	2	288.88	71	5.39	.006	PS
TSCS-PI	33.11	2	17.65	71	1.88	.161	PS
Defensive Distortion Variables							
TSCS-SC	3.98	2	89.37	71	0.045	.957	PS
TSCS-DP	1,511.61	2	195.21	71	7.74	.001	PS
MCSD	45.01	2	19.40	70	2.32	.106	PS, IPAT Factor L
Skin Conductance Reactivity[c]							
Prefilm 0-1 mm	153.17	2	108.80	23	1.41	.265	PS
Film 0-1 mm	971.11	2	694.72	23	1.40	.267	PS
Postfilm 0-1 mm	47.77	2	95.16	23	0.50	.610	PS
Prefilm 1-2 mm	0.31	2	0.21	23	1.47	.249	PS
Film 1-2 mm	1.50	2	5.54	23	0.27	.765	PS
Postfilm 1-2 mm	0.025	2	0.35	23	0.07	.930	PS
Initial SC	9.50	2	4.33	23	2.20	.134	PS
Final SC	0.18	2	9.54	23	0.019	.981	PS
Total Reactivity	962.26	2	1,865.76	23	0.516	.603	PS

[a]On this and all immediately following variables complete data was available for 19 TM subjects, 22 PSI subjects, and 34 No Treatment subjects.

[b]PS = Pretest Scores are covaried.

[c]On this and all immediately following variables complete data was available for 7 TM, 8 PSI, and 12 No Treatment subjects.

Table 3. Pretest and Posttest Means and Standard Deviations for TM, PSI, and No Treatment Groups on All Questionnaire, Technique Evaluation, and Skin Conductance Variables

	TM				PSI				No Treatment			
	Pretest		Posttest		Pretest		Posttest		Pretest		Posttest	
Variables	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Primary Anxiety Variables												
STAI A-Trait	47.00	14.88	36.05	14.28	47.86	9.26	38.05	12.46	50.00	11.13	48.88	12.76
SSMT	28.84	9.11	24.05	9.41	32.23	8.25	27.18	9.16	32.65	7.90	31.74	8.65
SAA	37.16	15.58	31.89	11.98	35.41	6.43	31.77	6.79	39.29	10.26	38.12	10.33
IPAT Anxiety Factors												
Factor O	26.16	9.71	20.94	11.22	26.14	9.04	22.73	9.53	28.62	9.15	28.53	9.79
Factor Q_4	28.95	12.09	25.16	12.46	30.64	8.20	25.41	10.57	34.47	7.79	34.15	8.33
Factor C	24.63	10.30	31.63	10.32	27.36	7.14	31.86	9.59	24.59	7.84	24.14	7.96
Factor L	15.21	5.32	14.63	4.82	16.36	5.32	13.36	5.53	19.62	4.95	20.09	6.62
Factor H	15.58	11.16	24.89	14.51	17.91	12.08	21.36	10.86	20.00	11.35	18.85	11.80
Factor Q_3	18.63	7.70	20.37	7.50	18.72	6.66	20.91	7.07	17.94	5.13	17.88	5.71
IPAT Neuroticism Factors												
Factor I	37.68	11.62	37.53	11.46	37.41	9.22	36.91	9.55	37.79	7.88	37.65	8.87
Factor F	33.84	17.34	36.74	15.58	42.09	12.43	43.55	11.14	41.15	12.18	42.32	12.11
Factor E	32.95	12.10	35.32	12.82	34.77	9.82	35.14	8.10	36.79	8.77	38.06	11.44
Other IPAT Factors												
Factor A	13.95	5.53	18.89	9.83	15.09	6.53	16.41	6.59	18.32	7.67	18.65	7.07
Factor B	17.58	5.16	19.00	2.60	19.41	2.13	19.05	2.36	17.53	2.96	18.88	2.37
Factor G	20.11	8.48	20.89	7.59	21.68	5.23	22.09	5.59	20.94	5.97	21.71	5.32
Factor M	30.42	8.71	31.42	8.80	30.36	5.04	32.32	4.08	30.18	5.60	29.85	6.58
Factor N	18.37	5.97	18.89	6.57	17.68	4.06	16.68	3.73	17.09	3.41	17.41	4.13
Factor Q_1	21.21	6.65	20.95	6.75	20.09	4.16	21.32	5.46	23.47	5.45	23.09	5.94
Factor Q_2	22.11	8.52	21.47	7.98	21.68	6.73	21.50	6.67	22.00	7.07	22.06	6.53
TSCS Variables												
TSCS-TP	305.95	81.85	315.26	94.11	316.27	79.36	351.41	43.15	302.09	65.93	282.38	97.87
TSCS-PSY	48.42	14.13	46.11	14.17	48.14	16,84	48.50	5.18	49.18	11.40	46.12	16.13
TSCS-PD	66.16	18.80	69.16	21.60	67.23	18.66	75.95	11.75	66.12	16.36	60.38	21.80
TSCS-PI	9.68	4.53	10.58	4.96	9.50	4.81	10.64	3.29	9.18	4.62	8.53	5.32
Defensive Distortion Variables												
TSCS-SC	32.84	9.16	33.11	9.18	34.73	9.32	34.45	5.50	35.44	8.29	34.50	11.83
TSCS-DP	49.47	16.52	47.95	18.68	48.27	15.22	59.82	14.85	44.68	13.60	43.00	16.62
MCSD	13.11	6.42	14.74	6.73	13.45	5.44	16.00	7.33	11.06	4.79	10.44	6.11
Technique Evaluation Variables												
Ranked Value			20.44	30.64			19.95	9.28				
Best Session Rank			22.72	33.02			11.90	8.94				
Ave. Session Rank			29.17	32.59			33.45	18.34				
Judged Impact			31.44	18.14			30.40	12.16				
Skin Conductance Reactivity												
Prefilm 0-1 mm	7.29	10.84	5.43	6.21	8.88	11.26	9.25	11.97	14.50	11.97	12.92	11.01
Film 0-1 mm	57.86	44.11	44.29	28.25	35.88	44.91	19.75	22.58	78.33	57.96	37.58	26.97
Postfilm 0-1 mm	9.71	8.48	11.29	11.69	5.63	7.30	5.88	6.01	13.75	12.56	12.08	10.73
Prefilm 1-2 mm	0.14	0.38	0.00	0.00	0.75	1.75	0.38	0.77	0.91	2.02	0.08	0.29
Film 1-2 mm	6.86	10.51	0.86	1.86	4.00	7.48	1.25	2.38	4.92	7.45	1.25	3.14
Postfilm 1-2 mm	0.43	0.79	0.14	0.38	0.63	1.19	0.25	0.71	1.00	1.86	0.17	0.58
Initial SC	1.43	2.44	3.57	1.99	2.25	2.49	3.00	1.93	6.00	5.52	5.00	2.13
Final SC	3.57	4.76	3.86	2.91	2.00	3.51	3.88	3.00	9.08	7.53	4.17	3.10
Total Reactivity	74.25	70.43	54.75	43.49	70.89	80.03	41.22	40.16	108.92	80.22	64.00	45.22

Table 4. Analyses of Covariance Comparing IM and PSI Groups on Technique Evaluation Variables and on

Table 4. Analyses of Covariance Comparing TM and PSI Groups on Technique Evaluation Variables and on Variables for which TM, PSI, and No Treatment Groups Differed Significantly on an Overall Analysis of Covariance

Variables	MSt	df	MSe	df	F	p <	Covariates
Primary Anxiety Variables							
STAI A-Trait[a]	11.42	1	82.14	36	0.13	.715	PS[b] TF DIS[c]
SSMT	3.85	1	30.76	37	0.12	.726	PS DIS
SAA	3.32	1	56.29	37	0.05	.809	PS DIS
IPAT Anxiety Factors							
Factor O	32.91	1	55.72	38	0.59	.447	PS
Factor Q_4	12.32	1	66.86	38	0.18	.670	PS
Factor C	7.33	1	47.81	37	0.15	.720	PS TF
Factor L	28.43	1	24.22	38	1.17	.286	PS
Factor H	294.52	1	89.95	38	3.27	.079	PS
TSCS Variables							
TSCS-TP	9,413.27	1	2,732.47	38	3.45	.071	PS
TSCS-PD	740.60	1	117.70	37	6.29	.017	PS TF
Defensive Distortion Variable							
TSCS-DP	1,664.66	1	137.29	38	12.13	.005	PS
Technique Evaluation Variables							
Ranked Value[d]	2.32	1	488.98	36	0.005	.950	
Best Session Rank	2,302.57	1	489.52	35	4.70	.037	Last month's frequency
Average Session Rank	173.81	1	679.32	36	0.25	.616	
Judged Impact	10.33	1	233.38	36	0.04	.835	

[a]Complete data available on this and immediately following variables for 19 TM and 22 PSI Ss.

[b]Pretest Scores.

[c]TF = Total Frequency and DIS = Discontinue.

[d]Complete data available on this and immediately following variables for 18 TM and 20 PSI Ss.

Table 5. Analyses of Covariance Comparing TM and No Treatment Groups on Variables for which TM, PSI, and No Treatment Groups Differed Significantly on an Overall Analysis of Covariance

Variable	MSt	df	MSe	df	F	p <	Covariates
Primary Anxiety Variables							
STAI A-Trait[a]	1,247.56	1	66.06	50	18.88	.0001	PS[b]
SSMT	229.00	1	29.15	50	7.86	.008	PS
SAA	249.66	1	53.78	50	4.64	.036	PS
IPAT Anxiety Factors							
Factor O	365.22	1	40.69	50	8.98	.004	PS
Factor Q_4	217.79	1	46.98	50	4.64	.036	PS
Factor C	525.83	1	32.06	50	16.40	.0002	PS
Factor L	41.45	1	17.91	50	2.32	.135	PS
Factor H	722.92	1	46.09	50	15.69	.0003	PS
TSCS Variables							
TSCS-TP	23,029.84	1	7,148.96	50	3.22	.079	PS
TSCS-PD	1,576.98	1	353.34	50	4.46	.040	PS
Defensive Distortion Variable							
TSCS-DP	201.33	1	221.36	50	0.91	.345	PS

[a]Complete data available on all variables for 19 TM and 34 No Treatment subjects.

[b]Pretest Scores.

Table 6. Analyses of Covariance Comparing PSI and No Treatment Groups on Variables for which TM, PSI, and No Treatment Groups Differed Significantly on an Overall Analysis of Covariance

Variables	MSt	df	MSe	df	F	p <	Covariates
Primary Anxiety Variables							
STAI A-Trait[a]	1,082.12	1	84.90	53	12.75	.0008	PS[b]
SSMT	236.23	1	34.98	53	6.75	.012	PS
SAA	140.66	1	35.01	53	4.02	.050	PS
IPAT Anxiety Factors							
Factor O	178.63	1	34.47	53	5.18	.027	PS
Factor Q_4	389.26	1	43.05	53	9.05	.004	PS
Factor C^4	384.11	1	36.89	53	10.41	.002	PS
Factor L	206.99	1	22.66	53	9.14	.004	PS
Factor H	249.42	1	27.96	53	8.92	.004	PS
TSCS Variables							
TSCS-TP	55,883.15	1	6,281.54	53	8.90	.004	PS
TSCS-PD	3,054.29	1	302.13	53	10.10	.003	PS
Defensive Distortion Variable							
TSCS-DP	2,927.93	1	201.74	53	14.51	.0004	PS

[a]Complete data available on all variables for 22 PSI and 34 No Treatment subjects.

[b]Pretest Scores.

Table 7. March and May Posttest STAI A-Trait, Symptoms of Striated Muscle Tension, and Symptoms of Autonomic Arousal Means Compared for TM and PSI Groups

TM

Variables	March		May		df	t	p >
	M	SD	M	SD			
Primary Anxiety Variables							
STAI A-Trait	37.31	8.70	37.19	10.78	15	0.08	.8
SSMT	25.59	6.60	24.47	7.10	16	1.17	.2
SAA	30.82	7.35	31.18	8.02	16	0.39	.5

PSI

Variables	March		May		df	t	p >
	M	SD	M	SD			
Primary Anxiety Variables							
STAI A-Trait	41.65	9.28	39.80	12.45	19	1.36	.2
SSMT	28.55	8.24	27.45	9.49	19	1.21	.2
SAA	32.15	7.21	31.50	7.13	19	0.45	.5

Posttest scores were compared using analysis of covariance. As before, posttest scores were adjusted for their corresponding pretest scores, if any, as well as for any variable that met all of the following criteria: (1) correlated significantly ($p < .01$) with pretest-posttest difference scores, or with posttest scores where no pretests were given (Table 21), (2) differed significantly between groups (Table 22), (3) contributed significantly to the total variance for posttest scores when used with other covariates, and (4) made rational sense as a confounding variable.

These analyses of covariance are summarized in Table 9. CMS Meditation and CMS Anti-Meditation groups did not differ significantly on any of the primary anxiety variables ($p > .6$). Nor did they differ on any of the secondary variables for anxiety or neuroticism, or on any of the technique-evaluation variables.

Inspection of pretest and posttest means (Table 8) suggests that both CMS Meditation and CMS Anti-Meditation groups displayed improvements on several indices of anxiety. A comparison of pretest and posttest means (Table 10) shows that both groups displayed significant improvement ($p < .03$) on conscious trait anxiety (STAI A-Trait), symptoms of autonomic arousal (SAA), and Frustration Tension or Id Pressure (Factor Q_4). The fact that No Treatment subjects in Experiment I did not display significant change ($p > .27$) on any of these variables from November to March supports the interpretation that changes manifested by the CMS subjects were due to the CMS treatments and not to the passage of time or the repeated test administration.

It should be noted that Table 9 reveals four significant differences between CMS Meditation and CMS Anti-Meditation: (1) CMS Meditators became more Group Dependent and CMS Anti-Meditators more Self-Sufficient as measured on Factor Q_2 ($p < .019$); (2) CMS Meditators exhibited significantly greater ($p < .004$) reductions in Personality Disorder (TSCS-PD) than CMS Anti-Meditators; (3) CMS Meditators displayed a greater increase ($p < .01$) in defensive distortion (TSCS-DP); and (4) CMS Meditators scored higher ($p < .006$) in Personality Integration (TSCS-PI). These four differences did not appear in Experiment I. This lack of consistency suggests that they may be artifacts of the large number of analyses made.

Additional Results

Treatments in Experiment I were compared collectively with the treatments in Experiment II. Pretest and posttest means and standard deviations for the TM and PSI groups pooled and the CMS groups pooled are shown in Table 11. These groups were compared using analysis of covariance, using those covariates in Experiments I and II that contributed significantly to the total variance of posttest scores when used with other covariates. Table 12 summarizes these analyses. TM and PSI subjects scored significantly lower than CMS Meditation and CMS Anti-Meditation subjects on one primary variable: conscious trait anxiety (STAT A-Trait) ($p < .012$). In addition, subjects in Experiment I became significantly less ($p < .04$) Shy, Timid, and Threat-Sensitive (Factor H-). Finally, subjects in Experiment I increased in Superego

Strength (Factor G+), where subjects in Experiment II decreased ($p < .01$). Otherwise, no significant differences in changes over treatments were found between the subjects in Experiment I and Experiment II. There was a non-significant trend for the pooled TM and PSI subjects in Experiment I to improve more than the CMS subjects in Experiment II on most pathology-related variables.

Table 8. Pretest and Posttest Means and Standard Deviations for CMS Meditation and CMS Anti-Meditation Groups on All Questionnaire and Technique Evaluation Variables

	CMS Meditation				CMS Anti-Meditation			
	Pretest		Posttest		Pretest		Posttest	
Variables	M	SD	M	SD	M	SD	M	SD
Primary Anxiety Variables								
STAI A-Trait	46.21	12.51	41.14	12.57	52.78	6.84	46.72	8.37
SSMT	28.50	9.09	26.42	7.86	36.44	8.39	30.17	8.89
SAA	38.14	10.13	34.07	9.07	41.00	8.06	36.06	7.26
IPAT Anxiety Factors								
Factor O	27.21	10.24	24.36	8.77	31.39	7.16	27.89	8.12
Factor Q_4	33.71	7.77	28.21	9.55	37.50	7.14	33.33	8.13
Factor C	21.14	8.04	30.14	8.28	22.83	6.50	25.67	6.34
Factor L	19.64	6.69	18.14	4.62	20.56	5.83	18.28	5.68
Factor H	22.14	13.46	23.07	10.44	13.56	10.47	16.33	9.82
Factor Q_3	18.57	7.08	19.14	6.26	19.00	5.35	19.89	5.38
IPAT Neuroticism Factors								
Factor I	41.36	8.72	39.86	8.53	33.72	9.77	31.89	8.82
Factor F	45.64	12.85	45.64	13.47	35.28	9.47	35.44	10.01
Factor E	36.57	11.29	39.14	9.34	35.06	9.40	35.94	8.99
Other IPAT Factors								
Factor A	16.79	7.01	16.43	5.29	13.78	7.38	13.50	7.37
Factor B	19.21	2.89	18.07	3.10	19.61	1.97	19.78	2.56
Factor G	22.07	6.57	19.79	4.89	22.17	5.71	19.83	4.78
Factor M	31.14	4.80	31.00	5.32	29.94	5.63	30.50	5.66
Factor N	16.14	3.99	16.14	4.11	18.72	3.21	19.50	4.82
Factor Q_1	23.00	6.31	22.29	6.43	23.67	3.03	23.17	3.91
Factor Q_2	22.36	6.01	20.93	5.50	25.22	5.59	26.50	5.04
TSCS Variables								
TSCS-TP	281.00	125.08	345.86	42.47	299.28	27.19	314.78	32.43
TSCS-PSY	41.86	19.22	46.79	6.30	50.39	6.72	51.06	6.55
TSCS-PD	61.07	27.75	75.07	9.81	65.06	6.77	66.44	7.59
TSCS-PI	7.86	4.88	11.50	4.99	8.39	4.34	8.83	3.68
Defensive Distortion Variables								
TSCS-SC	33.36	15.07	37.93	6.39	38.61	4.07	38.72	4.57
TSCS-DP	42.93	19.82	56.50	10.72	42.39	8.47	46.50	10.41
MCSD	11.71	6.84	13.43	5.47	12.17	3.40	12.06	4.72
Technique Evaluation Variables								
Ranked Value			18.17	20.73			29.15	33.71
Best Session Rank			12.50	12.69			29.31	33.63
Average Session Rank			43.25	30.84			38.38	35.37
Judged Impact			30.50	11.17			26.15	11.40

Table 9. Analyses of Covariance Comparing CMS Meditation and CMS Anti-Meditation Groups on All Questionnaire and Technique Evaluation Variables

Variables	MSt	df	MSe	df	F	P <	Covariates
Primary Anxiety Variables							
STAI A-Trait[a]	1.39	1	52.13	29	0.02	.871	PS[b]
SSMT	10.85	1	42.54	29	0.25	.617	PS
SAA	0.118	1	21.95	29	0.005	.942	PS
IPAT Anxiety Factors							
Factor O	3.21	1	36.53	29	0.08	.769	PS
Factor Q_4	34.90	1	45.18	29	0.77	.387	PS
Factor C	14.88	1	27.62	29	0.54	.469	PS
Factor L	1.37	1	13.81	29	0.09	.756	PS
Factor H	8.62	1	43.00	29	0.201	.658	PS
Factor Q_3	0.019	1	12.22	28	0.002	.969	PS, Total Frequency
IPAT Neuroticism Factors							
Factor I	30.16	1	25.40	29	1.19	.285	PS
Factor F	9.25	1	44.64	29	0.21	.652	PS
Factor E	55.11	1	37.03	28	1.49	.233	PS, TSCS-TP
Other IPAT Factors							
Factor A	1.96	1	9.55	29	0.21	.654	PS
Factor B	15.41	1	4.63	29	3.32	.079	PS
Factor G	0.0003	1	11.88	29	0.0	1.0	PS
Factor M	2.01	1	11.00	29	0.18	.673	PS
Factor N	5.86	1	9.38	29	0.62	.436	PS
Factor Q_1	0.905	1	12.19	29	0.07	.787	PS
Factor Q_2	58.25	1	9.32	29	6.25	.019	PS
TSCS Variables							
TSCS-TP	4,336.20	1	1,175.48	28	3.69	.065	PS, IPAT-H
TSCS-PSY	4.78	1	29.40	27	0.16	.69	PS, IPAT-F,H
TSCS-PD	678.73	1	65.05	29	10.43	.004	PS
TSCS-PI	88.35	1	9.72	27	9.09	.006	PS, IPAT-H, TSCS-DP
Defensive Distortion Variables							
TSCS-SC	5.78	1	18.13	27	0.31	.577	PS, IPAT-F, TSCS-DP
TSCS-DP	766.68	1	102.05	29	7.51	.010	PS
MCSD	21.33	1	17.97	29	1.19	.285	PS
Technique Evaluation Variables							
Ranked Value[c]	753.28	1	798.06	23	0.94	.341	
Best Session Rank	1,762.79	1	666.95	23	2.64	.118	
Average Session Rank	147.71	1	1,107.54	23	0.13	.718	
Judged Impact	117.87	1	127.51	23	0.92	.346	

[a]On this and all immediate following variables complete data was available for 14 CMS Meditation and 18 CMS Anti-Meditation subjects.

[b]Pretest Scores.

[c]On this and all immediately following variables complete data was available for 12 CMS Meditation and 13 CMS Anti-Meditation subjects.

Table 10. Mean Difference Scores and Significance of Difference Scores for No Treatment (November-March), CMS Meditation (March-May), and CMS Anti-Meditation (March-May) Groups

Variables	No Treatment				CMS Meditation				CMS Anti-Meditation			
	Mean Difference	t	df	p <	Mean Difference	t	df	p <	Mean Difference	t	df	p<
Primary Anxiety Variables												
STAI A-Trait	1.22	0.90	33	.372	5.07	2.43	13	.030	6.06	3.88	17	.001
SSMT	0.91	0.96	33	.346	2.08	1.89	13	.081	6.27	3.02	17	.008
SAA	1.17	1.12	33	.270	4.07	3.19	13	.007	4.94	3.84	17	.001
IPAT Anxiety Factors												
Factor O	0.09	0.10	33	.921	2.85	1.60	13	.133	3.50	1.75	17	.098
Factor Q_4	0.32	0.32	33	.748	5.50	3.96	13	.002	4.17	2.29	17	.035
Factor C	0.45	0.53	33	.597	-9.00	-1.74	13	.105	-2.84	-1.77	17	.093
Factor L	-0.47	-0.66	33	.517	1.50	1.36	13	.195	2.28	2.42	17	.026
Factor H	1.15	1.22	33	.230	-0.93	-0.36	13	.725	-2.77	-1.02	17	.325
Factor Q_3	0.06	0.08	33	.936	-0.57	-0.63	13	.540	-0.89	-1.13	17	.274
IPAT Neuroticism Factors												
Factor I	0.14	0.14	33	.885	1.50	1.16	13	.268	1.83	1.24	17	.230
Factor F	-1.17	-1.08	33	.285	0.00	0.00	13	1.00	-0.16	-0.54	17	.597
Factor E	-1.27	-1.20	33	.237	-2.57	-1.25	13	.223	-0.88	-0.43	17	.667
Other IPAT Factors												
Factor A	-0.33	-0.39	33	.690	0.36	0.33	13	.750	0.28	0.62	17	.542
Factor B	-1.35	-3.31	33	.002	1.14	1.69	13	.116	-0.17	-0.61	17	.550
Factor G	-0.77	-1.03	33	.309	2.28	2.03	13	.063	2.34	2.42	17	.026
Factor M	0.33	0.39	33	.697	0.14	0.18	13	.861	-0.56	-0.83	17	.415
Factor N	-0.32	-0.49	33	.622	0.00	0.00	13	1.00	-0.78	-1.11	17	.281
Factor Q_1	0.38	0.67	33	.507	0.71	9.90	13	.341	0.50	0.083	17	.419
Factor Q_2	-0.06	-0.06	33	.950	1.43	1.48	13	.163	-1.28	-1.96	17	.066
TSCS Variables												
TSCS-TP	19.71	0.89	33	.380	-64.86	-3.52	13	.005	-15.50	-2.79	17	.012
TSCS-PSY	3.06	0.00	33	1.00	-4.93	-1.66	13	.126	-0.67	-0.25	17	.805
TSCS-PD	5.74	1.59	33	.122	-14.00	-3.02	13	.012	-1.38	-0.86	17	.402
TSCS-PI	0.65	0.69	33	.492	-3.64	-3.20	13	.008	-0.44	-0.46	17	.652
Defensive Distortion Variables												
TSCS-SC	-0.94	-2.11	33	.044	-4.57	-2.05	13	.066	-0.11	-0.53	17	.602
TSCS-DP	-1.68	-0.11	33	.912	-13.57	-3.51	13	.005	-4.11	-1.96	17	.065
MCSD	-0.62	-0.84	33	.406	-1.72	-0.78	13	.446	-0.11	-0.17	17	.864

Table 11. Pretest and Posttest Means and Standard Deviations for TM and PSI Groups Pooled, and CMS Meditation and CMS Anti-Meditation Groups Pooled on All Questionnaire and Technique-Evaluation Variables

	TM + PSI				CMS Meditation + CMS Anti-Meditation			
	Pretest		Posttest		Pretest		Posttest	
Variables	M	SD	M	SD	M	SD	M	SD
Primary Anxiety Variables								
STAI A-Trait	47.46	12.03	37.12	13.20	49.91	10.11	44.28	10.61
SSMT	30.66	8.71	25.73	9.30	32.97	9.45	28.53	8.53
SAA	36.22	11.48	31.83	9.42	39.75	8.98	35.19	8.02
IPAT Anxiety Factors								
Factor O	26.15	9.24	21.90	10.25	29.56	8.75	26.34	8.46
Factor Q_4	29.85	10.09	25.29	11.34	35.84	7.54	31.09	9.01
Factor C	26.10	8.74	31.76	9.81	24.72	7.42	27.63	7.48
Factor L	15.83	5.29	13.95	5.19	20.16	6.13	18.22	5.16
Factor H	16.83	11.58	23.00	12.65	17.32	12.44	19.28	10.49
Factor Q_3	18.68	7.07	20.66	7.19	18.81	6.06	19.56	5.70
IPAT Neuroticism Factors								
Factor I	37.54	10.27	37.19	10.35	37.06	9.95	35.38	9.45
Factor F	38.27	15.29	40.39	13.65	39.81	12.07	39.91	12.55
Factor E	33.93	10.83	35.22	10.41	35.72	10.13	37.34	9.14
Other IPAT Factors								
Factor A	14.56	6.04	17.56	8.24	15.09	7.26	14.78	6.61
Factor B	18.56	3.90	19.02	2.44	19.44	2.38	19.03	2.89
Factor G	20.95	6.88	21.54	6.53	22.13	5.99	19.81	4.75
Factor M	30.29	6.89	31.90	6.61	30.47	5.24	30.72	5.43
Factor N	18.00	4.98	17.71	5.29	17.59	3.75	18.03	4.76
Factor Q_1	20.61	5.42	21.15	6.02	23.38	4.67	22.78	5.09
Factor Q_2	21.88	7.52	21.49	7.21	23.97	5.86	24.06	5.87
TSCS Variables								
TSCS-TP	311.95	79.64	344.66	72.77	291.28	83.97	328.38	39.73
TSCS-PSY	48.27	15.45	47.39	10.29	46.66	14.08	49.19	6.69
TSCS-PD	66.73	18.50	72.80	17.15	63.31	18.76	70.22	9.53
TSCS-PI	9.59	4.63	10.61	4.09	8.16	4.52	10.00	4.44
Defensive Distortion Variables								
TSCS-SC	33.85	9.18	33.83	7.37	36.31	10.55	38.38	5.36
TSCS-DP	48.83	15.65	54.32	17.57	42.63	14.29	50.88	11.53
MCSD	13.29	5.84	15.41	6.99	11.97	4.66	12.66	5.03
Technique Evaluation Variables								
Ranked Value			20.18	21.81			23.88	28.22
Best Session Rank			17.03	23.92			21.24	26.69
Average Session Rank			31.42	25.67			40.72	32.67
Judged Impact			30.89	15.08			28.24	11.27

Table 12. Analyses of Covariance Comparing TM and PSI Groups Pooled with CMS Meditation and CMS Anti-Meditation Groups Pooled on All Questionnaire and Technique-Evaluation Variables

Variables	MSt	df	MSe	df	F	p <	Covariates
Primary Anxiety Variables							
STAI A-Trait[a]	462.04	1	69.38	68	6.66	.012	PS[b] Total Frequency Discontinue
SSMT	53.94	1	37.15	69	1.45	.232	PS Discontinue
SAA	48.52	1	40.28	69	1.21	.276	PS Discontinue
IPAT Anxiety Factors							
Factor O	62.62	1	46.02	70	1.36	.248	PS
Factor Q_4	16.00	1	55.69	70	0.28	.594	PS
Factor C	61.23	1	41.87	69	1.46	.231	PS Total Frequency
Factor L	76.97	1	19.86	70	3.88	.053	PS
Factor H	295.42	1	69.78	70	4.23	.043	PS
Factor Q_3	9.30	1	14.67	69	0.63	.429	PS Total Frequency
IPAT Neuroticism Factors							
Factor I	36.31	1	27.26	70	1.33	.252	PS
Factor F	55.83	1	39.73	70	1.41	.240	PS
Factor E	22.78	1	34.29	69	0.66	.418	PS TSCS-TP
Other IPAT Factors							
Factor A	157.17	1	43.15	69	3.64	.061	PS IPAT Factor F
Factor B	2.69	1	4.82	70	0.55	.458	PS
Factor G	90.41	1	13.64	69	6.62	.012	PS IPAT Factor Q_1
Factor M	28.06	1	10.51	70	2.67	.107	PS
Factor N	7.89	1	11.78	70	0.67	.416	PS
Factor Q_1	6.14	1	14.82	70	0.41	.522	PS
Factor Q_2	15.38	1	15.84	70	0.97	.328	PS
TSCS Variables							
TSCS-TP	1.91	1	2,551.70	69	0.0007	.978	PS IPAT Factor H
TSCS-PSY	88.99	1	64.33	70	1.38	.244	PS
TSCS-PD	11.78	1	125.79	69	0.09	.761	PS TSCS-TP
TSCS-PI	0.17	1	15.58	70	0.01	.916	PS
Defensive Distortion Variables							
TSCS-SC	92.77	1	28.43	68	3.26	.075	PS IPAT Factor F TSCS-DP
TSCS-DP	0.005	1	165.14	70	0.0	1.00	PS
MCSD	44.15	1	14.46	68	2.95	.090	PS IPAT Factor L Discontinue
Technique Evaluation Variables							
Ranked Value[c]	555.44	1	505.72	60	1.10	.300	Last Month's Frequency
Best Session Rank	267.74	1	627.37	61	0.42	.520	
Average Session Rank	2,094.52	1	717.48	60	2.92	.092	Last Month's Frequency
Judged Impact	106.27	1	187.90	61	0.56	.455	

[a]On this and all immediately following variables complete data was available for 41 TM and PSI subjects, and 32 CMS subjects.

[b]Pretest Scores.

[c]On this and all immediately following variables complete data was available for 38 TM and PSI subjects and 25 CMS subjects.

CHAPTER V

DISCUSSION

Summary of Results

The results of these experiments are clear: (1) TM is no more effective in reducing anxiety than a parallel control treatment involving sitting without meditation; (2) a treatment utilizing a TM-like meditation exercise is no more effective than a parallel control treatment utilizing an exercise designed to be the near antithesis of meditation; and (3) all meditation and control treatments investigated here are effective in reducing anxiety when compared with no treatment. I believe these results imply that the critical therapeutic agent in the treatments studied is something other than the exercise of meditation.

First, it may be appropriate to elaborate upon these results. Both TM subjects and PSI sitting control treatment subjects, when compared with No Treatment subjects, displayed significant reductions in the following forms of psychopathology: conscious trait anxiety (STAI A-Trait), symptoms of striated muscle tension (SSMT), symptoms of autonomic arousal (SAA), Guilt Proneness[1] (Factor O+), Frustration

[1]All elaborations of IPAT factors are taken from manuals for the IPAT Anxiety Scale Questionnaire (Cattel & Scheier, 1963) and the 16PF (Cattell, Eber, & Tatsouka, 1970).

Tension or Id Pressure (Factor Q_4+), Ego Weakness (Factor C-), Threat-Sensitive Shyness (Factor H-), and Personality Disorder (TSCS-PD).

Both CMS Meditation and CMS Anti-Meditation control subjects displayed significant reductions in conscious trait anxiety, symptoms of autonomic arousal, and Frustration Tension or Id Pressure.

Of particular interest is that of the four treatment groups considered in this study, each displayed significant improvements in conscious trait anxiety, symptoms of autonomic arousal, and Frustration Tension or Id Pressure. The consistency of improvement for these variables implies that they are particularly amenable to change from the types of treatments considered here. And taken together, these variables suggest an intriguing pattern of improvement. Table 13 shows that for our subjects these three variables correlate highly with each other, suggesting that they are related. Of these three variables, conscious trait anxiety and symptoms of autonomic arousal refer to symptoms of discomfort. In contrast, Frustration Tension or Id Pressure refers to what Cattell calls an underlying "source trait." Cattell and Scheier (1963) summarize research on this factor:

> Actual correlations and factor analysis show this to be one of the largest and most central components in anxiety. It appears to represent the degree to which anxiety is generated by id pressure--by excited drives and unsatisfied (frustrated) needs of all kinds. Sex drive excitation, need for recognition, and situational fear are among the drives found positively related to this component. It shows itself descriptively in proneness to emotionality, tension, irritability, and "jitteriness."

Cattell, Eber, and Tatsouka (1970) further observe that undischarged drive can be a function of "level of situational, environmental frustration and difficulty," as well as "incapacity of the ego to handle discharge well even in an environment of ordinary difficulty." Such interpretations invite the speculation that TM, PSI, and CMS treatments reduce symptoms of anxiety by allaying or rendering more manageable underlying frustrations and tension.

Table 13. Correlations Among Pretest Scores for Conscious Trait Anxiety (STAI A-Trait), Symptoms of Autonomic Arousal, and Frustration Tension or Id Pressure (IPAT Factor Q_4) for TM, PSI, and CMS Subjects

	STAI A-Trait	SAA	IPAT Factor Q_4
STAI A-Trait[a]	1.0		
SAA	.38***	1.0	
IPAT Factor Q_4	.64****	.49****	1.0

[a] N = 75 in all cases.

***p < .005.

****p < .001.

Skin Conductance Reactivity

Our findings concerning skin conductance reactivity merit special attention. To review, we found that neither TM nor PSI subjects displayed significantly greater decrements in number of skin conductance reactions to an interpersonal stress film than did subjects receiving no treatment. Yet, as mentioned in Chapter I, Orme Johnson et al (1973a) found that meditators manifested a significantly greater decrease in spontaneous reactivity over eight weeks than did non-meditators. In Chapter III we proposed that our reactivity measure taps anxiety. However, TM, PSI, and No Treatment groups displayed different rates of anxiety reduction, but not different rates of leveling off of skin conductance reactivity. We must reconsider what our skin conductance measures mean.

Table 14 shows correlations among all pretest reactivity scores and pretest scores on personality measures. First, it is clear that high reactivity is not correlated with conscious trait anxiety (STAI A-Trait), symptoms of striated muscle tension, or symptoms of autonomic arousal. In fact there is a slight and insignificant negative correlation between these measures: low reactivity tends to be slightly associated with high anxiety.

Looking at the remaining correlations we find that a number are significant. Reactivity generally correlates with Assertiveness (Factor E+), Self-Sentiment Integration (Factor Q_3+) and Personality Integration (TSCS-PI); and negatively with Guilt Proneness (Factor O+), Frustration Tension or Id Pressure (Factor Q_4+), and Personality Disorder (TSCS-PD).

Table 14. Correlations Among Pretest Skin Conductance Variables and Pretest Questionnaire Variables for TM, PSI, and No Treatment

Table 14. Correlations Among Pretest Skin Conductance Variables and Pretest Questionnaire Variables for TM, PSI, and No Treatment Subjects

Variables	Variables								
	Prefilm 0-1	Film 0-1	Postfilm 0-1	Prefilm 1-2	Film 1-2	Postfilm 1-2	Initial SC	Final SC	Total Reactivity
Sex[a]	-.012	-.151	-.176	-.046	-.061	-.021	.144	-.074	-.112
Age	-.182	-.181	.047	-.072	-.076	-.117	-.128	-.200	-.050
Primary Anxiety Variables									
STAI A-Trait	-.131	-.076	.059	-.099	.085	-.002	.027	-.147	-.033
SSMT	-.131	-.110	-.111	-.075	-.126	-.047	.189	.007	-.109
SAA	-.243	-.217	-.152	-.104	-.144	-.038	.127	-.017	-.186
IPAT Anxiety Factors									
Factor O	-.342*	-.237	.001	-.352*	-.225	-.156	-.239	-.271	-.240
Factor Q_4	-.355*	-.349*	-.088	-.373**	-.271	-.117	-.199	-.237	-.325*
Factor C	.250	.170	.030	.135	.254	.327*	-.172	.253	.214
Factor L	-.163	-.254	.042	-.165	-.222	-.159	.162	-.149	-.244
Factor H	.077	-.056	-.084	-.001	.025	-.073	.086	.045	-.065
Factor Q_3	-.123	.397**	.388**	.215	.557****	.425***	.220	.473****	.432***
IPAT Neuroticism Factors									
Factor I	.050	-.070	-.144	-.076	.015	-.275	.172	-.039	-.029
Factor F	-.071	-.142	-.208	-.045	-.051	-.189	.053	.068	-.180
Factor E	.096	.094	.117	.150	.140	.154	.299*	.389**	.101
Other IPAT Factors									
Factor A	.015	-.102	-.117	.048	-.108	-.216	.201	.036	-.119
Factor B	-.027	-.032	-.047	-.081	-.222	-.240	-.018	-.111	-.049
Factor G	.070	.189	.221	.305*	.107	.186	-.065	.123	.169
Factor M	.131	.003	-.015	.191	.272	-.107	.030	-.021	.071
Factor N	-.107	.012	.135	.102	.100	.077	-.000	.124	.077
Factor Q_1	-.097	-.159	-.123	-.028	-.046	-.127	.028	.127	-.145
Factor Q_2	-.009	.082	.095	.074	-.077	.011	-.030	-.001	.085
TSCS Variables									
TSCS-TP	.141	.106	.088	.176	.271	.138	.096	.176	.161
TSCS-PSY	-.018	.025	.000	.138	.089	-.087	.106	.069	.008
TSCS-PD	.252	.246	.245	.262	.404***	.249	.189	.289*	.342*
TSCS-PI	.231	.182	-.001	.325*	.245	.078	.264	.309*	.214
Defensive Distortion Variables									
TSCS-SC	-.206	-.345**	-.188	-.358*	-.515****	-.260	-.121	-.398**	-.377**
TSCS-DP	.158	.156	.021	.255	.357*	.052	.035	.237	.189
MCSD	.454***	.414***	.288*	.524****	.534****	.331*	.279	.421***	.470****

[a]N = 45 for all correlations. *p < .05 (two tailed). **p < .01. ***p < .005. ****p < .001.

In other words, the presence of reactivity correlates with an absence of psychopathology and anxiety.

However, one set of correlations stand out. Reactivity is most consistently and most highly correlated with all three of our measures of defensive distortion (TSCS-DP, TSCS-SC, and MCSD). Those who are most defensive, most prone to distort their behavior in such a way as to appear socially desirable, display the greatest reactivity. These correlations are moderately high, and range from .342 ($p < .01$) to .524 ($p < .001$), with the average correlation being .431 ($p < .005$).

The implications of these results are hard to avoid: in our study high skin conductance reactivity is not, contrary to what we proposed, an indicator of anxiety and psychopathology. Instead, it appears to be an indicator of the absence of some forms of psychopathology, and completely unrelated to other forms. The fact that reactivity correlates highly with defensive distortion implies that it is a poor measure of health. Persons who are highly reactive may be undisturbed, or highly defensive, or some combination of the two. That TM, PSI, and No Treatment subjects all displayed reductions of reactivity from the first testing session to the second is probably due to simple adaptation to the testing situation. And that these groups displayed comparable reductions in reactivity is a finding most likely unrelated to changes in anxiety or psychopathology.

Furthermore, Orme-Johnson's finding that meditators display reductions in spontaneous reactivity when compared with no treatment subjects may not, contrary to what he proposes, indicate improved mental

health. To date no researcher has carefully studied the relationship between defensive distortion and spontaneous reactivity. It is tempting to speculate Orme-Johnson's meditators displayed reductions in reactivity because of their desire to appear healthy, and demonstrate that meditation was working for them. In fact, in our study, initial level of defensive distortion propensity (TSCS-SC, TSCS-DP, and MCSD) correlates frequently and highly (correlation range from .187 to .822, mean correlation being .479) with the degree of reduction in reactivity from pretest to posttest. Subjects who, at the onset of this project, were most defensive, who wished to appear healthy, displayed the greatest reductions in skin conductance reactivity. Perhaps Orme-Johnson was testing little more than the desire among meditators to appear healthy after several weeks of meditation.

Magnitude of Treatment Effects

Are the improvements found in this study clinically significant? Are they comparable to improvements displayed by those who have chosen on their own to learn, and pay for, TM? Are they comparable to improvements obtained from psychotherapy? And can subjects who finished this project be characterized as "normal"? The evidence suggests that each of these questions can be answered in the affirmative.

Persons who chose to learn TM on their own display improvements comparable to improvements displayed by our TM and PSI subjects. Ferguson and Gowan (1973) gave the STAI A-Trait and IPAT Anxiety Scale Questionnaire (a questionnaire which yields a single score reflecting a composite of IPAT Factors Q_3, C, L, O, and Q_4) to 31 TM initiates before

and six weeks after learning TM. Mean pretest and posttest scores on the STAI A-Trait Scale were 42.90 and 32.87, yielding an improvement of 10.03 points. In our study TM subjects displayed a mean improvement of 10.95 points; PSI subjects, 9.81 points; CMS Meditation subjects, 5.07 points; and CMS Anti-Meditation subjects, 6.06 points. Ferguson further reports that the mean pretest and posttest scores on the IPAT Anxiety Scale Questionnaire were 36.24 and 30.30. This improvement corresponds to a change from a sten score of seven to six (Cattell & Scheier, 1963), an improvement of one sten score point. Table 15 shows pretest and posttest IPAT anxiety factor means converted to sten scores (Cattell, Eber, & Tatsouka, 1970) for TM, PSI, CMS Meditation, and CMS Anti-Meditation subjects. TM and PSI subjects generally improved more than one sten while CMS subjects generally improved about one sten.

Second, persons who receive psychotherapy generally improve on self-report questionnaires as much as subjects in this study. Three studies were found that utilized some of the measures utilized in this study. Cattell, Rickels, Weise, Gray, and Yee (1966) gave 46 patients the IPAT Anxiety Scale Questionnaire before and after six weeks of individual psychotherapy. Pre test and post test means were 46.09 and 43.02, which translates to nine and eight stens, an improvement of one sten score point. As mentioned earlier, our TM and PSI subjects generally improved more than one sten, while CMS subjects generally improved about one sten.

Table 15. Pretest and Posttest Mean IPAT Anxiety Factor Scores (in Stens) for TM, PSI, and CMS Meditation, and CMS Anti-Meditation Groups

IPAT Factors	TM		PSI		CMS Meditation		CMS Anti-Meditation	
	Pretest Mean	Posttest Mean	Pretest Mean	Posttest Mean	Pretest Mean	Posttest Mean	Pretest Mean	Posttest Mean
O	7	5	7	5	7	6	8	7
Q_4	6	5	6	5	7	6	8	7
C	3	6	4	6	3	5	3	4
L	5	5	5	4	6	6	7	6
H	4	5	4	5	5	5	3	4
Q_3	4	5	4	5	4	4	4	5

Hunt, Ewing, Laforge, and Gilbert (1959) at the University of Illinois investigated improvements displayed by students seeking psychotherapy at the University Counseling Center. The six participating therapists generally had five to ten years experience, and characterized themselves as Adlerian, Neo-Freudian, Rogerian, and eclectic. One-hundred-ninety-seven students were given a battery of tests including the 16PF before beginning therapy. Forty-seven percent dropped out before the fifth weekly interview, which compares with the 50 percent dropout rate obtained in our study. Sometime after the fifth interview (time specified) subjects were tested again. Twenty-five were given the 16PF. Subjects improved significantly on five IPAT pathology factors: H, O, Q_3, Q_4, and I (pretest and posttest means were not reported). Similarly, in our study, TM subjects improved significantly on five IPAT variables: H, O, Q_3, Q_4, and C. PSI subjects improved on six: H, O, Q_3, Q_4, C, and I. CMS meditation subjects improved on Q_4; and CMS Anti-Meditation subjects improved on Q_4 and L. TM and PSI subjects displayed improvements comparable to psychotherapy clients studied by Hunt et al.

Fortunately we have available data on Michigan State University students who received psychotherapy at the University Counseling Center. Our study, remember, was also conducted on Michigan State University students. During 1967-1969 a sample of undergraduates who sought counseling for personal-emotional problems and the Counseling Center were given a four hour battery of personality tests before and after receiving about 12 weeks of psychotherapy. Therapy was conducted by

experienced interns and staff therapists with a generally interpersonal and eclectic orientation. One of the tests given was the Tennessee Self Concept Scale. Fahrner (1970) reports pretest and posttest Total Positive scores for 20 students who had received an average of 12 interviews. Before therapy the mean TP score was 301.99, while after therapy the mean was 329.35, showing an improvement of 27.36 points. Our TM subjects improved 9.31 points, PSI subjects 35.14 points, CMS Meditation subjects 64.86 points, and CMS Anti-Meditation subjects 15.50 points.

Third, although subjects in our study started out abnormally anxious, their level of anxiety at the end of the project can be characterized as "normal," at least for TM and PSI subjects. Table 15 demonstrates this clearly. It may be helpful at this point to explain that a "sten score" is a standard score expressed on a scale of 10, and that "average" or "normal" sten scores range from five to six. Sten scores of four or lower, or seven or higher "definitely depart from the average" (Cattell, Eber, & Tatsouka, 1970). Using these figures as a guide, at the onset of our project TM and PSI subjects can be considered abnormally anxious on IPAT Factors O, C, H, and Q_3; CMS Meditation subjects on O, Q_4, C, and Q_3; and CMS Anti-Meditation subjects on O, Q_4, C, L, H, and Q_3. At the end of the project TM subjects can be characterized as abnormally anxious on none of the IPAT anxiety variables; PSI subjects on only Factor L and CMS Meditation subjects on Q_3. Although CMS Anti-Meditation subjects improved on all IPAT variables, at the end of the experiment, they reached the normal range only on Factors L and Q_3. This may be due to the fact that they were more anxious than the other subjects to start with.

Similar comparisons can be made for the STAI A-Trait and TSCS-TP Scales. Undergraduates seeking therapy (Spielberger, Gorsuch, & Lushene, 1970) show a mean STAI A-Trait score of 44.39. TM subjects had a mean pretest score of 47.00; PSI subjects, 47.86; CMS Meditation subjects, 46.21; and CMS Anti-Meditation subjects, 52.78. The mean STAI A-Trait score for normal college undergraduates is 37.95. TM subjects had a mean posttest score of 36.05; PSI subjects, 38.05; CMS Meditation subjects, 41.14; and CMS Anti-Meditation subjects, 46.72.

On the TSCS-TP Scale a score below 318 can be considered to be outside "normal limits" (Fitts, 1965). All four treatment groups displayed pretest means below normal limits: TM subjects, 305.95; PSI subjects, 316.27; CMS Meditation subjects, 281.00; and CMS Anti-Meditation subjects, 299.28. Posttest means for these groups were 315.26, 351.41, 345.86, and 314.78, respectively.

Processes Underlying Treatment Effects

One pattern appears consistently in the results just described. Although TM and PSI treatments are generally equally effective, as are the CMS Meditation and CMS Anti-Meditation treatments, TM and PSI considered together appear to be more effective than the CMS treatments considered together. Indeed, Table 12 makes this point clear; TM and PSI groups pooled displayed significantly greater improvements than the CMS groups on conscious trait anxiety (STAI A-Trait) and on Threat-Sensitive Shyness (IPAT Factor H-). I believe this finding provides us one clue as to the processes underlying these treatments.

First, it is necessary to identify the ways in which the TM and PSI treatments differed from the CMS treatments. The differences are numerous: TM and PSI were taught by more than one person, the CMS treatments were taught by one person; TM and PSI subjects were urged to engage in a preliminary drug fast, CMS subjects were not so urged; and TM and PSI subjects were taught individually, while CMS subjects were taught in groups.

Although these and other differences may be important, one difference stands out conspicuously: the amount and content of indoctrination. TM indoctrination consists of two 90-minute talks, plus a mass of advertisements and articles from the popular press. The largest segment of this indoctrination consists of claims of TM's pervasive effectiveness. To elaborate, of the materials available at the time of this project from Maharhishi International University Press (the publishing organ for TM), a full 67 percent dealt exclusively with theory and research "verifying" the effectiveness of TM in alleviating virtually every form of human misery and discontent (this research is critically reviewed in Chapter I). Theory and research is further summarized in the introductory lectures and illustrated by professional color slides. The claims made on the basis of this research are credible-sounding, if vastly overstated. As one pamphlet, "Scientific Research on Transcendental Meditation," concludes:

> THE EFFECTS OF TRANSCENDENTAL MEDITATION MAY BE SUMMARIZED AS FOLLOWS:
>
> PHYSIOLOGICAL: TM produces a deep state of restful alertness which rejuvenates and normalizes the functioning of the nervous system.

PSYCHOLOGICAL: TM eliminates mental stress, promotes clearer thinking and greater comprehension; it enriches perception, improves outlook and promotes efficiency and effectiveness in life.

SOCIOLOGICAL: TM eliminates tension and discord and promotes more harmonious and fulfilling interpersonal relationships, thus making every individual more useful to himself and others and bringing fulfillment to the purpose of society.

The combined physiological, psychological and sociological changes produce an overall effect of fullness of life. The elimination of mental, physical and behavioral abnormalities through the release of deep stress produces a sense of fulfillment and internal harmony.

PSI indoctrination was comparable, although somewhat less extensive. PSI subjects were exposed to two introductory lectures summarizing the effects of the technique. Credible theory and research were presented and illustrated by professional-looking slides.

In contrast, indoctrination for the CMS groups was minimal. Subjects were not told that the techniques might involve meditation. Instruction was preceded by a brief talk which simply asserted that research and theory support the effectiveness of CMS in reducing anxiety and improving psychological well-being.

It should be clear what I consider to be one factor responsible for the effects of the techniques studied here: expectation of relief.

Expectation of relief refers to a person's belief that a treatment will work for him. I propose that four crucial contributors to expectation of relief are: (1) belief on the part of the person administering a treatment that the treatment is effective, (2) the treatment's credibility derived from its complexity and sophistication,

(3) accompanying claims and theoretical rationale, and (4) credible signs of improvement which the participant can observe for himself. Research suggests the importance of each of these factors.

Goldstein (1962) reviews considerable evidence pointing to the importance of therapist prognostic expectancies on treatment outcome. Patients of therapists who expect much improvement show more improvement than patients of therapists who expect little improvement.

No study was found that tested the isolated effects of treatment complexity and sophistication, accompanying claims and rationale, and credible signs of improvement. However, several studies have varied two or more of these factors together.

Three studies have investigated the combined effects of claims and rationale, and credible signs of improvement. Marcia, Rubin, and Efran (1969) compared standard classical desensitization to two versions of a bogus "T-scope treatment" on treating snake and spider phobias. The T-scope treatment involved flashing blank cards on a tachistoscope and presenting mild electric shocks. Ten subjects receiving the T-scope treatment given bogus instructions that pictures of spiders and snakes would be presented so quickly that they would register unconsciously, and that the pairing of unconscious phobic responses with mild electric shocks would produce a reduction in fear through suppression. Fake polygraph records were provided during the experiment indicating improvement. In addition, seven subjects were given the T-scope treatment without the fake polygraph records, and were told that phobic stimuli would not be presented, and that no improvement should

be expected. Twenty-nine subjects received classical desensitization. The T-scope treatment presented with claims, rationale and credible signs of improvement was as effective as classical desensitization, and more effective than the T-scope treatment presented without claims, rationale, and credible signs of improvement.

Leitenberg, Agras, Barlow, and Oliveau (1969) compared the effects of two versions of classical desensitization and no treatment on snake phobias. Ten subjects were given classical desensitization accompanied by claims that the treatment was effective, a theoretical rationale based on the concept of reciprocal inhibition, plus verbal signs of improvement in the form of one experimenter's praise or observations of improvement. Ten subjects were given the same treatment without the claims, rationale, or signs of improvement. They were simply told that they were taking part in an experiment on visualization. Ten subjects received no treatment. Classical desensitization accompanied by claims, rationale, and signs of improvement was considerably more effective than classical desensitization presented alone, which in turn was slightly more effective than no treatment.

Finally, Borkovec (1972) compared the effects of classical desensitization, implosion therapy, an avoidance response placebo treatment, and no treatment on 50 snake phobic subjects. All treatments were presented in two forms: a positive expectancy form which included claims of effectiveness, theoretical rationale, and signs of improvement in the form of false physiological records; and a neutral expectancy form in which subjects were all instructed they were part of an

experiment investigating feelings of fear under various conditions. Neutral expectancy subjects were shown the same false physiological records shown to the positive expectancy subjects, but no mention was made of any changes which might indicate reductions in fear. Borkovec's main finding was that the positive expectancy treatments were significantly more effective than the neutral expectancy treatments.

A second finding was that the avoidance response placebo treatment was more effective than no treatment, and nearly as effective as classical desensitization and implosion. This treatment contained most of the methodological components of desensitization and implosion, presented in a way that should be ineffective in terms of both desensitization and implosion theory. This brings to light another important factor contributing to expectation: treatment credibility derived from its sophistication and complexity.

Lazarus (1968) describes a study which further supports this point. Thirty subjects with "chronic behavior problems" were divided equally into three treatment groups. One received 12 sessions of behavior therapy, one 12 sessions of psychotherapy, and one 12 sessions of "graded structure therapy." The graded structure therapy was in fact a bogus treatment incorporating complex and sophisticated methods and false signs of improvement. The treatment involved four phases of three sessions each. Passage from one phase to another was automatic, although subjects were instructed that it was contingent on improvement demonstrated by passage of certain tests. Phase one was devoted to explaining and interrelating patient's life experiences. Phase two

consisted of questioning and discussing responses to a previously administered incomplete sentences test. Phase three consisted of reading and discussing inspirational passages from Maslow. And during Phase four subjects learned and practiced at home various mental exercises involving visualizing a blackboard and mentally picturing and erasing the numbers 1-10, imagining sounds, concentrating intensely and "in ardent detail" on everyday objects, and attending deliberately to and becoming increasingly aware of everyday events.

Results, based on the Willoughby Test given before and after treatment, and posttreatment interviews, indicated equal rates of improvement for the behavior therapy and graded structure treatments, and a somewhat lower rate of improvement for the psychotherapy treatment.

One study elegantly shows the combined effects of therapist's belief in treatment, treatment claims and rationale, and complexity and sophistication of method. McReynolds, Barnes, Brooks, and Rehagen (1973) compared the effects of classical desensitization, Paul's "stress-tolerance" control treatment, a "dissonance enhancement" control treatment, and no treatment on snake phobias. The stress tolerance control treatment has been used as a placebo treatment in several previous studies. In it subjects were given a placebo tablet described as a "newly developed and thoroughly tested tranquilizer" and were then presented with a tape of monotonous sounds described as highly stressful and anxiety-arousing stimuli. Listening to this tape under the influence of the tranquilizer was claimed to be highly effective in reducing stress and anxiety.

The dissonance enhancement control treatment involved practicing various exercises such as vividly and repeatedly imagining commonplace situations, and attending to bodily sensations. It was claimed that separately and simultaneously practicing such exercises reduces common fears by bringing out or enhancing the irrationality of the fears. Specifically, the exercises were said to enhance contradictory or dissonant cognitions and feelings, and permit their automatic resolution.

The dissonance enhancement treatment, unlike the stress-tolerance treatment, was designed to closely parallel the sophistication and complexity of classical desensitization. Also, unlike the stress-tolerance treatment it was preceded by an extensive and credible rationale based on plausible concepts. And it was presented by a graduate student who was deceived into thinking the treatment was legitimate. The stress-tolerance treatment was administered by therapists aware of its bogus nature.

The ten subjects receiving classical desensitization and the nine subjects receiving the dissonance enhancement treatment displayed equal improvement, and significantly more improvement than the ten subjects receiving the stress-tolerance or the ten subjects receiving no treatment. In other words, the main therapuetic components of the treatments considered appear to be the belief on the part of the therapist in treatment effectiveness, accompanying theoretical rationale and sophistication and complexity of the treatment methods.

Armed with the fruits of this discussion, we can now return to the treatments investigated in our study. TM and PSI contained all of

the expectation-generating factors we have proposed. The CMS treatments contained these factors to a lesser extent. To elaborate, TM and PSI were enthusiastically taught by persons fully convinced of the treatments' effectiveness. The CMS treatments were taught by the experimenter, who at the time of the study did not consider himself a true believer in any of the treatments. Instead, his sober prediction was that meditation would be more effective than anti-meditation, and that neither treatment would be effective in reducing serious forms of psychopathology.

TM and PSI involved equally complicated and sophisticated instruction rituals, including highly formalized personal initiation and follow-up checking sessions. CMS instruction was generally informal. Subjects were taught in groups. The experimenter simply read the instructions and everyone practiced.

TM and PSI treatments incorporated formidable claims and theoretical rationales. Two full lectures were devoted to explaining scientific research showing that the techniques work, and detailing the subtleties of why they work. CMS subjects received only a 30 minute talk in which the experimenter asserted that the treatments were effective and that theory and research and theory supports this claim.

Finally, TM and PSI subjects were shown signs of treatment effects. Several questionnaires were distributed inquiring into treatment effects. Instructors read responses to these questionnaires and generally claimed that they indicated the subject was practicing

correctly and effectively. CMS subjects were given no such questionnaires.

The rate of improvement displayed by TM and PSI subjects further suggests the role of expectation of relief in these treatments. In our study subjects who practiced for six months experienced no benefits in addition to what they had experienced after three and one-half months (Table 7). And in a pilot project, Ballou (1973) found that anxiety in meditators "does not show a gradual decline, but is reduced quickly and remains at a low level." Interestingly, it is precisely this pattern of quick improvement and leveling off that characterizes the effects of placebos, innocuous treatments effective soley because of expectation of relief. For example, in one study Frank (1973) gave 49 psychiatric outpatients diagnosed as psychoneurotic a symptom checklist (primarily a measure of anxiety) before, during, and after a two-week treatment period during which placebo tables were administered. Subjects experienced their greatest reduction in symptomatology, about a 50 percent reduction, within the first hour of treatment. Scores increased slightly and then leveled off for the following two weeks. Three years later 28 subjects returned for follow-up testing. Symptom checklist scores were about the same as they had been at the end of the two week placebo treatment period. Subjects held their gains.

At this point the reader might legitimately suspect that I believe TM, PSI, and CMS to be effective solely because of expectation of relief. I in fact do not believe this. One commonality among TM,

PSI, CMS Meditation, CMS Anti-Meditation, classical desensitization, and most of the control treatments in classical desensitization experiments reviewed earlier is that they all involve sitting or reclining comfortably with eyes closed. And these treatments all appear to be effective in reducing anxiety and tension. It is difficult not to experience some degree of rest when sitting comfortably with eyes closed. Perhaps one therapeutic agent in these treatments is simple rest, experienced on a regular basis.

Why should expectation of relief and regular sessions of simple restful introversion have any impact on anxiety and underlying frustrations? Let me propose this explanation: Through a daily regimen of simple rest one asserts his potency, his power of choice, and thereby alleviates anxious illusions of helplessness. In addition, sessions of rest promote contact with one's self, one's unconscious, and permit the fantasy expression of id impulses as well as archetypal promptings. Rest gently lifts the lid of repression so that anxious thoughts may arise in a context of inner calm and desensitize. Obsessive anxious thoughts appear again and again, and are imploded. And in simple rest one is forced to take pause, sit with, and perhaps bring together incongruities between organism and self.

I hope I have made it clear that any school of psychological thought can be invoked to explain the effects of the treatments studied. I believe such speculative excursions are best left to those who, because of some unfortunate illness or accident, are forced to remain in armchairs for long periods of time. For the serious researcher

important questions remain to be answered, such as the relative importance of expectation of relief and simple rest in TM, PSI, and CMS when practiced for extensive periods of time, say, over a year.

Characteristics of Those Who Improved

Not everyone in this study manifested the same degree of improvement. Exactly half of those who started in the project in November never showed for posttesting in May. Of the 77 who showed for posttesting, 21 percent displayed no improvement on STAI A-Trait Scale and 18 percent had ceased their technique the last full month of the project. Of course, one could argue that subjects who discontinued practicing or failed to show for posttesting did so for reasons unrelated to the effectiveness of their technique. However, subjects contacted by phone who failed to show for posttesting generally claimed they had stopped practicing because their technique was not working. More direct evidence suggests that this is in fact what happened. In Experiment I, the 41 TM and PSI practitioners who were tested in March were at that time still practicing their technique. By May, 25 of these were still practicing, while the remaining 16 had either failed to show for posttesting or had practiced fewer than ten times from March through May. Table 16 shows the November and March mean STAI A-Trait scores for these groups. Clearly, those who discontinued in one form or another after March were displaying significantly less improvement (Table 17) in March than those who continued ($F = 7.41$, $df = 1/37$, $p < .01$), even when frequency of practice from November through March is used as a covariate.

Table 16. Means and Standard Deviations for November and March STAI A-Trait Scores for Those Who Did and Did Not Continue with This Project through May

	Stops[a] (N = 16)				Stays[b] (N = 25)			
	November		March		November		March	
Variables	M	SD	M	SD	M	SD	M	SD
STAI A-Trait	48.50	10.53	44.63	9.69	47.80	9.21	37.72	7.92
Frequency[c]			90.25	42.23			117.76	45.02

[a]Stops = Subjects who either practiced fewer than 10 times after being tested in March, or failed to show for May testing.

[b]Stays = Subjects who practiced more than 10 times after being tested in March and showed for May testing.

[c]Frequency of practice from November through March testing.

Table 17. Analysis of Covariance Comparing March Posttest STAI A-Trait Scores of Those Who Did and Did Not Continue with This Project through May

Variables	MSt	df	MSe	df	F	p <	Covariates
STAI A-Trait	382.65	1	51.63	37	7.41	.010	Pretest Scores Frequency of Practice[a]

[a]Frequency of practice from November through March.

What variables correlate with degree of improvement? When all pathology variables are considered, rate of improvement correlates most often and most highly with (Table 19): (1) frequency of practice and whether or not one continued practicing through the last month of the project, (2) whether or not one considered trying meditation (but not psychotherapy) at the onset of the project, (3) degree of initial psychopathology, particularly anxiety, TSCS-PSY (Psychosis), and pretest scores on IPAT anxiety Factor H- (shy, timid, threat-sensitive, restrained, retiring in the face of the opposite sex, emotionally cautious, rule-bound, and careful), and (4) pretest scores on IPAT Factor N+ (astute, worldly, emotionally detached and disciplined, aesthetically fastidious, insightful, and ambitious).

These findings suggest the following pattern: the person most likely to benefit from meditation and related techniques is anxious and disturbed. He tends to be shy, withdrawn, retiring in the face of the opposite sex, and generally emotionally cautious and detached (Factor H-, Factor N+, TSCS-PSY). He is not interested in psychotherapy, probably because he finds people threatening; but he is interested in doing something about his anxiety and has considered non-interpersonal activities such as meditation. He tends to be rule-bound, disciplined, ambitious, and insightful (Factor H-, Factor N+), and possibly finds meditative techniques attractive because of their required discipline and their promise of insight.

Subjects who failed to show for May posttesting compared with those who did show (Table 18) displayed significantly ($p < .05$) lower

scores on IPAT Factors B, C, and M, and on TSCS-TP, and higher scores on IPAT Factors A and Q_4, and a greater number of skin conductance fluctuations. Among subjects who did show for May posttesting, discontinuation of practice through the last month of the project correlated most highly (but insignificantly, $p < .2$) with IPAT Factors C, M, A, and O (Table 19). Considering both samples together, three variables are consistently related to discontinuation in this project. Subjects who failed to show for May posttesting and subjects who did show but ceased practicing showed greater emotional instability and ego weakness (Factor C-). That is, they were more affected by feelings, emotionally less stable, easily upset, and tending to give up. In addition, they tended to be practical, concerned with immediate interests, and avoiding of anything far-fetched (Factor M-). Finally, they tended to be less detached and reserved and more attracted to and attentive to people (Factor A+).

These results suggest a pattern: anxious and disturbed persons cease practicing meditation and meditation-like techniques after they find that the techniques to be relatively ineffective for reducing anxiety. They tend to lack the ego strength required for perseveration and indeed are sufficiently practical and concerned with immediate interests to put aside something that is not yielding results. They tend to be outgoing, participating, and attracted to people, and perhaps find a technique involving sitting with eyes closed contrary to these inclinations.

Table 18. Subjects Who Reported for May Posttesting Compared on All Pretest Variables with Subjects Who Did Not Report for May Posttesting

Variables	Shows for May Posttests			No Shows for May Posttests			df	t =	p
	M	SD	N	M	SD	N			
Sex	1.48	0.50	77	1.51	0.50	77	152	0.39	n.s.
Age	22.25	4.02	76	21.83	4.19	59	133	0.59	n.s.
Primary Anxiety Variables									
STAI A-Trait	49.30	8.89	77	51.73	9.75	77	152	1.61	n.s.
SSMT	31.71	7.88	76	31.42	8.29	77	151	0.22	n.s.
SAA	37.63	9.67	76	39.26	9.56	77	151	1.04	n.s.
IPAT Anxiety Factors									
Factor O	27.57	8.60	76	30.69	6.74	76	150	1.61	n.s.
Factor Q_4	32.45	8.41	76	35.47	7.21	76	150	2.35	< .02
Factor C	26.42	7.88	76	23.26	8.87	76	150	2.31	< .05
Factor L	17.57	4.92	76	18.96	5.57	76	150	1.62	n.s.
Factor H	17.80	11.19	76	20.17	10.96	76	150	1.31	n.s.
Factor Q_3	19.30	6.09	76	17.94	5.36	76	150	1.49	n.s.
IPAT Neurotocism Factors									
Factor I	37.79	8.36	76	37.12	8.98	76	150	0.48	n.s.
Factor F	39.79	12.73	76	41.59	11.82	76	150	0.90	n.s.
Factor E	35.70	9.24	76	36.09	9.01	76	150	0.26	n.s.
Other IPAT Factors									
Factor A	14.78	6.11	76	17.12	5.88	76	150	2.39	< .02
Factor B	18.63	2.90	76	17.34	3.64	76	150	2.40	< .02
Factor G	21.97	5.77	76	22.62	5.89	76	150	0.68	n.s.
Factor M	30.79	5.03	76	28.79	5.12	76	150	2.41	< .02
Factor N	17.97	4.05	76	17.24	4.71	76	150	1.09	n.s.
Factor Q_1	22.18	4.56	76	21.05	5.49	76	150	1.37	n.s.
Factor Q_2	22.47	6.68	76	21.23	6.72	76	150	1.14	n.s.
TSCS Variables									
TSCS-TP	321.59	37.08	73	308.88	33.06	75	146	2.18	< .05
TSCS-PSY	49.84	9.36	73	50.65	7.65	75	146	0.57	n.s.
TSCS-PD	69.90	10.76	73	67.13	10.84	75	146	1.54	n.s.
TSCS-PI	9.84	4.06	73	8.69	3.80	75	146	1.77	n.s.
Defensive Distortion Variables									
TSCS-SC	36.07	5.23	73	36.89	5.25	75	146	0.94	n.s.
TSCS-DP	48.86	11.21	73	46.36	11.27	75	146	1.34	n.s.
MCSD	12.87	5.02	73	11.58	4.70	75	146	1.63	n.s.
Considered Meditation	1.54	0.50	76	1.51	0.50	76	150	0.32	n.s.
Considered Therapy	1.49	0.50	53	1.43	0.50	57	158	0.67	n.s.
Skin Conductance Reactivity									
Prefilm 0-1 mm	13.03	12.16	61	5.95	8.25	61	120	1.20	n.s.
Film 0-1 mm	64.31	50.62	32	39.63	35.20	19	39	2.10	< .05
Postfilm 0-1 mm	10.72	9.31	32	10.32	10.45	19	39	0.84	n.s.
Prefilm 1-2 mm	0.81	1.64	32	0.11	0.46	19	39	2.23	< .05
Film 1-2 mm	5.69	8.46	32	1.84	3.00	19	39	2.29	< .05
Postfilm 1-2 mm	0.97	1.91	32	0.53	1.12	19	39	0.94	n.s.
Initial SC	4.09	4.39	32	1.84	3.53	19	39	1.96	n.s.
Final SC	6.22	5.60	32	3.21	4.64	19	39	2.02	n.s.

These findings must be considered with considerable caution. They are the result of post hoc analyses, and considering the sheer number of analyses made in this project, may be due to the vagaries of chance. In other words, the observations and findings in this section should be treated as tentative conclusions needing further verification.

APPENDICES

APPENDIX A

MATERIALS USED IN SUBJECT-SOLICITATION CAMPAIGN

APPENDIX A

MATERIALS USED IN SUBJECT-SOLICITATION CAMPAIGN

Subjects were solicited primarily by means of posters and newspaper advertisements. One thousand copies of the poster on the following page were printed by offset press on orange paper and posted in 90 percent of the classroom and dormatory buildings on the Michigan State University campus. Information in the poster was also published as part of an advertisement in the campus newspaper. The solicitation campaign ran for three weeks.

ANXIETY REDUCTION PROJECT

SUBJECTS NEEDED

WE ARE SEEKING VOLUNTEERS FOR AN EXTENSIVE RESEARCH PROJECT DESIGNED TO STUDY PROMISING TREATMENT METHODS FOR REDUCING ANXIETY, TENSION, AND WORRY, AND ENHANCING ONE'S SENSE OF PSYCHOLOGICAL WELL-BEING. IF YOU ARE INTERESTED AND WILL BE AVAILABLE FOR REGULAR PARTICIPATION FOR AT LEAST THREE MONTHS, PLEASE ATTEND ONE OF THE PRELIMINARY MEETINGS BELOW. AT THESE MEETINGS FURTHER INFORMATION WILL BE GIVEN CONCERNING THE NATURE OF THIS PROJECT.

TREATMENTS WILL BE PROVIDED WITHOUT CHARGE. HOWEVER, COSTS OF STAFFING, MATERIALS, AND TRAINING SOMEWHAT LIMIT THE NUMBER OF SUBJECTS WHO CAN BE SELECTED. FOR THIS REASON WE URGE THAT ONLY PERSONS WHO ARE SINCERELY INTERESTED IN RECEIVING HELP FOR REDUCING ANXIETY AND INCREASING PSYCHOLOGICAL WELL-BEING CONSIDER PARTICIPATING.

PRELIMINARY MEETINGS (ATTEND ONE) WILL BE HELD MONDAY THROUGH FRIDAY, SEPTEMBER 24- OCTOBER 12, 7:30 - 8:30 PM IN ROOM 308 OLDS HALL. IF YOU ARE UNABLE TO ATTEND ONE OF THESE MEETINGS, PHONE 355-0776, OR LEAVE A MESSAGE WITH PROFESSOR D. GRUMMON, DEPARTMENT OF PSYCHOLOGY, 109 OLDS HALL, MICHIGAN STATE UNIVESITY.

APPENDIX B

SUMMARY OF INFORMATION PRESENTED AT ORIENTATION LECTURE FOR PERSONS INTERESTED IN PARTICIPATING IN EXPERIMENTS I AND II

APPENDIX B

SUMMARY OF INFORMATION PRESENTED AT ORIENTATION LECTURE FOR PERSONS INTERESTED IN PARTICIPATING IN EXPERIMENTS I AND II

1. TIME COMMITMENT: You should be here until June, 1974. We will be obtaining follow-up data after the experiment is over until this date. Without the follow-up data, much of the data obtained during the experiment will be useless.

The experiment will involve practicing a simple anxiety reduction technique about 30 minutes a day for about three months. (Two months for subjects in Experiment II.)

Please sign up only if you are willing and able to put in the necessary time commitment.

2. TREATMENTS: Treatments cannot be described here; to do so could confound or contaminate certain aspects of this research. It can be said that the treatment methods are completely safe, and do not involve medication, hospitalization, psychotherapy, external equipment, or hypnosis. Treatments will be presented individually by a trained instructor in a manner designed to maximize effectiveness. Ss will also be given four 60-minute sessions of testing.

3. EXTENT OF PROJECT: These treatments have been researched for several years. Our experiment is part of a coordinated series of studies being conducted across the country.

4. WHAT WE ARE TESTING: We cannot describe the specific goals of this project here without possibly confounding certain aspects of the research. However, it can be said that we are interested in those personality variables which mediate the effects of certain treatment methods. That is, although a treatment may be equally effective for different people, it may work in different ways because of personality differences. We are interested in the ways such personality differences modify or influence the effects of the treatments.

5. WHO CAN PARTICIPATE: Not all volunteers can be accepted for participation, because of limitations in materials, instructors, and other resources. We estimate that about 70 to 80 percent of all volunteers will be selected.

Of those who are selected, a few will be assigned on a random basis to a "wait" group which will not receive treatment until about three months later. Inclusion of such a group is necessary for making certain critical experimental comparisons.

NOW, ARE THERE ANY QUESTIONS? THOSE WHO ARE INTERESTED IN PARTICIPATING SHOULD STAY HERE FOR 20 MINUTES. THOSE WHO ARE NOT INTERESTED SHOULD LEAVE.

1. We now need to schedule each of you for four 60-minute sessions of testing. These tests are designed to tap the 20 major aspects of personality, as determined by factor analysis and other means. On the basis of scores on these tests we will select several groups of Ss, representing different personality types. Then a sample of Ss will be selected randomly from each group of personality types, an equal percentage from each group. Five days after you take these tests we will contact you so you will know if you have been selected and which group you have been assigned to. Remember: your performance on these tests will not determine which group you are assigned to, or whether or not you are chosen for this project; this will be done on a random basis.

2. PRELIMINARY TESTS: We now need to give some preliminary tests. It is important that you answer these tests as openly and honestly as possible. Your answers will be entirely confidential. To insure confidentiality we will assign you a subject number. Throughout this project, if you are selected, your tests will be identified by this number. No one associated with this project will ever see tests scores identified by name. Also, the tests you will take are sensitive to attempts to guard answers, a lack of openness, and attempts to make answers appear particularly good or bad. We will have to screen out Ss who score high on these.

3. SCHEDULE TESTING SEQUENCE

SUBJECTS WHO WERE ACCEPTED INTO THE ANXIETY REDUCTION PROJECT WERE GIVEN THE FOLLOWING NOTICE AFTER INSTRUCTION.

ANXIETY REDUCTION PROJECT
IMPORTANT NOTICE

We would like to thank you for proceeding this far in the Anxiety Reduction Project. We trust that in the end you will find that the techniques you learned were well worth the time and effort you put in.

At this time we have two important requests. Perhaps the most important aspect of the Anxiety Reduction Project, from a research point of view, is the data that will be obtained at the end of the project three months from now. At this time you will be given a series of psychological tests similar to those you took earlier. Without data from these tests, crucial experimental comparisons cannot be made. For this reason we need your promise that you will, if at all possible, complete these psychological tests.

Also, if at any time during the next three months you find that you are unable to continue with the project, we need your promise that you will contact us as soon as possible and take a brief early termination questionnaire.

If you have any questions concerning these requests, please contact one of the researchers for the Anxiety Reduction Project at any of the following numbers: 355-9561, 489-1568, or 355-0776.

APPENDIX C

QUESTIONNAIRE INQUIRING INTO INTEREST IN AND DEGREE OF PARTICIPATION IN VARIOUS POTENTIALLY THERAPEUTIC TREATMENTS AND ACTIVITIES

APPENDIX C

PERSONAL BACKGROUND SHEET

YOUR CODE NUMBER:_____ YOUR AGE:_____

YEARS OF UNDERGRADUATE EDUCATION (IF ANY):_____

YEARS OF GRADUATE EDUCATION (IF ANY):_____

SAT (OR CEEB) TEST SCORES:

Total: _____

Verbal: _____

Quantitative: _____

ARE YOU CURRENTLY RECEIVING PSYCHOTHERAPY OF ANY TYPE?

OF THE FOLLOWING ACTIVITIES, CHECK THOSE YOU HAVE AT ANY TIME TAKEN PART IN:

____ AIKIDO
____ AUTOGENIC TRAINING
____ BIOENERGETICS
____ BIOFEEDBACK TRAINING
____ BREATHING THERAPY
____ CONDITIONED RELAXATION
____ DANCE OR MOVEMENT THERAPY
____ DRUG THERAPY (FOR PSYCHOLOGICAL REASONS)
____ ENCOUNTER GROUPS
____ FOCUSING
____ GESTALT GROUPS
____ GROUP STRESS TRAINING
____ HYPNOSIS (INCLUDING SELF-HYPNOSIS)
____ JACOBSONIAN RELAXATION
____ JUJITSU
____ MEDITATION (INCLUDING ZEN, TRANSCENDENTAL MEDITATION, AND YOGA)
____ PSYCHOANALYSIS (INCLUDING GROUP AND INDIVIDUAL)
____ PSYCHOSYNTHESIS
____ PSYCHOTHERAPY (ANY TYPE OTHER THAN PSYCHOANALYSIS)
____ SILVA MIND CONTROL

OF THE ACTIVITIES LISTED ABOVE, <u>UNDERLINE</u> THOSE YOU HAVE AT ANY TIME CONSIDERED TAKING PART IN.

APPENDIX D

PROCEDURE FOR TESTING SKIN CONDUCTANCE REACTIVITY AND TRANSCRIPTS OF INTERPERSONAL STRESS FILMS USED

APPENDIX D

PROCEDURE FOR TESTING SKIN CONDUCTANCE REACTIVITY AND TRANSCRIPTS OF INTERPERSONAL STRESS FILMS USED

In this test each subject was tested alone in a quiet room with temperature kept from 68° to 72° F. Subjects were seated in a comfortable chair facing a 12 x 12 inch movie screen. Behind the screen was a one-way mirror leading into a projector room. Two silver-plated electrodes 5 cm in diameter were attached to the left palm and just below the left elbow on the volar side. Hewlett Packard Redux electrode paste was used. Both electrodes were connected to a Hagfors bridge, which in turn was connected to a four-channel Grass Polygraph Recorder (Model 50) in the adjoining projector room.

After the electrodes were attached, each subject was instructed:

> See the screen in front of you? We will be showing you some short films. In these films a person will face you and speak to you, much in the manner a person would speak to you in everyday life. All you have to do is watch these films, and imagine that the person in the film is here in this room with you talking to you.
>
> Everyone who sees these films has some thoughts or feelings in response to them. However, different people react to different films in different ways. We are interested in your reactions. There is no right or wrong, good or bad way of reacting.
>
> Do you have any questions?
>
> OK, now I will go into the other room and adjust the equipment. While I am calibrating the equipment I would like you to sit facing the screen, and avoid making

> unnecessary movements, since these can lead to distorted measurements. Also, please keep your eyes open, except for normal blinking. I will return in about six minutes to let you know when the experiment is starting.

At this time the experimenter went into the projector room, calibrated the polygraph, and obtained three minutes of pre-film skin conductance measurements. He then entered the testing room and instructed the subject:

> We are now ready to start the film. Remember, all you have to do is watch the film and imagine that the person in the film is in this room with you talking to you. Please do not make any unnecessary movements. And please keep facing the screen.

The experimenter then entered the projector room and played the film. At the end of the film he entered the testing room and instructed the subject:

> We are now finished with the film. However, please stay in your chair a few more minutes. I need to take a few more measurements. Please sit facing the screen with your eyes open, and avoid making any unnecessary movements. I will be back in about four minutes.

The experimenter then obtained three minutes of post-film base rate.

Two parallel versions of the interpersonal stress film were used. Below are transcripts of these films.

Film 1

1. White, late-40s, female. "Has anyone ever said anything to you about, well, about your shape? Well, it's different. Oh, well, not as if that's not fine, but it is different."

2. White, early-20s, female. (crying) "I . . . I thought you liked me. I really . . . I guess I know what you're thinking. (sighs) I, uh, I thought that you really liked me, and I, uh, oh wow!"

3. White, mid-20s, female. "You know what? I'd really like to touch you. I want to feel you. I want to touch you."

4. White, mid-40s, female. "I know I can trust you. I know you wouldn't do anything I wouldn't approve of. I know you'll do what's right."

5. White, early-30s, male. "You're very nice. You're really very nice."

6. White, early-30s, male. "I could really turn you on. (chuckles) Yes, I could really turn you on."

7. White, late-40s, female. "I'm going to level with you. Frankly, I don't like having you around."

8. White, mid-20s, female. "Well, uh, I'd like to, but, uh, well, I really, well, I've really got a lot of work to do. I've really been busy lately. I mean it would be nice if, you know, we could get together sometime. (sigh) It's just that right now, it would really be difficult, I . . . it would almost be impossible right now . . . I, I really couldn't. Maybe, um, sometime in the future, though."

9. White, late-20s, male. "And I feel pretty bad that, uh, I can't--I mean, uh, I tried and, uh, I can't do it. I mean I'm sorry--I mean I'm sorry--I, uh, . . . I, just my stomach is getting all, um, . . . I'm all . . . I'm just getting all uptight and I couldn't do it. I'm sorry . . . I'm sorry."

10. White, late-20s, male. "So what are you looking at? I'm not scared of you. You can't do anything to me. You piece of shit."

11. Black, late-20s, male and white, late-20s, male. Black male: "You're always bugging us, you're always around . . . always. We don't want you here, man. Like you add nothing." White male: "He's right. You got it now? You don't add to anything. Let's kick his ass . . . let's just kick the shit out of him." Black male, "Yeah."

12. White, mid-20s, female and white, mid-20s male. (laughing) "Would you look at that? I don't believe it. Oh, shh. . . ."

Film 2

1. White, mid-40s, female. "I don't know what it is, but there's something about you that scares me. There's something there that just frightens me."

2. White, mid-40s, female. "I know you don't want me here anymore. You don't need me. Al right. You don't want me here; I'll leave."

3. White, early 30s, female. "You really turn me on. You really turn me on."

4. White, late 40s, female. "I want you to settle down and do the kind of job that we both know you're capable of."

5. White, mid-20s, male. "I want you. I want to feel you. I want to lie next to you. I want to touch you and I want you to touch me."

6. White, early-30s, female. "What's the matter? In over your head? Things getting too much for you? Oh, well, shit man, grow up!"

7. White, mid-20s, female. "Well, you did pretty well, un, I think you have, uh, a great deal of potential, uh. I think if you keep working at it and keep trying, uh, you'll get much better."

8. White, mid-20s, male. "I thought we had something. I thought that you cared. I thought that you felt the way I did. Why did you let me make a fool of myself?"

9. Black, late-20s, male. "I tell you, man. I can't take it much more. You can get the fuck off my back. You know what, I'm going to have to kick your ass. I'm going to have to kick your fucking ass."

10. Black, mid-20s, female, and black, mid-20s, male. (Laughing) "Shh . . . shh. . ."

APPENDIX E

OFFICIAL PERIODIC SOMATIC INACTIVITY INSTRUCTION MANUAL

PSI

MANUAL

franklin gothic ex. cond. 60PT.

1973

JONATHAN C. SMITH

PSI MANUAL

Jonathan C. Smith

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PART ONE

THEORY AND TECHNIQUE OF PSI

I. PSYCHOPHYSIOLOGICAL TENSION AND ITS SOURCES

Psychophysiological tension refers to a wide range of feelings and physiological states including anxiety, nervousness, worry, uneasiness, restlessness, and so on. Such tension exists at different levels of intensity ranging from severe panic to a mild sense of uneasiness and discontent. And it varies in duration from brief anxiety attacks to pervasive feelings of nervousness.

Perhaps the best indicator of the presence of psychophysiological tension is the absence of feelings of calm, peace of mind, contentment, psychological well-being, etc. Internal tension can be so pervasive that its presence is indicated only by the absence of internal calm.

Internal tension has two sources: those which differ widely among people, and those common to everyone. Individualized sources include life crises, traumatic events in childhood, and the wide array of situations and events that are the concern of psychiatrists, counselors, and clinical psychologists. However, our concern is with universal sources of internal tension, sources which affect everyone. Technically, two major universal sources are the accumulation of reactive inhibition and the desynchronization of circadian rhythms. Both are processes which are present in the lives of all of us, and slowly and continuously generate psychophysiological tension. The effects of such tension accumulate throughout the day, and week, and month, so that all of us, to some degree, feel its persisting effects.

A. Reactive Inhibition

Reactive inhibition is the accumulative byproduct of all effortful activity and change. It is similar to stress and fatigue and has as its main effects the generation of inner tension and the impairment of activity (Hull, 1943). Specific examples of reactive inhibition are easy to find. A student working on a term paper will find, after a period of continuous writing, that the work becomes more difficult. He finds himself becoming more tense and fatigued. Reactive inhibition accumulates and inhibits his writing. Every activity a person does results in a small increment in reactive inhibition. Swimming, eating, reading, watching television, making love, walking--all of these generate reactive inhibition.

In addition to activity, change generates reactive inhibition. This is most clearly demonstrated in an extensive study conducted by Holmes and Rahe (1967). These researchers first constructed a long list of life changes such as marriage, divorce, getting a job, moving, etc. Each event was then rated by thousands of subjects on the amount of impact it would probably have on a person's life. There was considerable agreement among subjects. Fifty items were then selected, weighted for rated impact, and given in questionnaire form to thousands of American and Japanese subjects. Subjects were asked to check each life change they had recently experienced. Each received a life change score, consisting of the weighted sum of changes checked.

Life change scores were then compared with medical records. The pattern was so striking that the authors initially hesitated to publish

the results. Persons with high life change scores were more likely to show serious mental and physical pathology the next year. Those in the top 10 percent suffered twice as many pathology as those in the bottom 10 percent. And severity of pathology was correlated with life change score.

One implication of this study is that change, in and of itself, whether it is pleasant or unpleasant, contributes to what we have generally termed reactive inhibition, and results in both psychophysiological tension and impaired activity.

Physiologically, reactive inhibition can be seen as involving what is called stress and fatigue. The physiological aspects of stress are pervasive and include changes in cardiovascular activity, skin conductance, respiratory activity, gastrointenstinal activity, muscle tension, blood pressure and volume, and brain wave activity.

Research on stress shows that it impairs activity and generates a variety of forms of inner tension. Specifically, stress has been found to increase the tendency toward rigidity of response, inflexibility, inability to profit from experience and use new information, and inability to shift when shift is necessary, or to persevere when required. In addition such effects as increased irritability, hostility and suspiciousness occur with stress (Cofer & Appley, 1967). As Cofer and Appley summarize, the effects of stress involve "an increased interference with the ability to operate in the 'real world' because of the intrusion of feelings (conscious or otherwise) or anxiety. . . ."

The effects of stress are accumulative and self-amplifying. That is, stress reduces the ability of a person to cope with stress-generating activity and change. This results in the accumulation of even more stress, which in turn decreases even further a person's ability to resist stress.

Another aspect of reactive inhibition is fatigue. Physiological aspects of fatigue are at times similar to those of stress, that is, they often include changes in metabolic rate, pulse rate, hormone secretion, skin conductance, body temperature, and brain wave activity. Like stress, fatigue impairs performance. Specifically, research has shown some of the effects of fatigue to be an increase in errors of performance, less self control and a deterioration of performance on a variety of mental and physical tasks (Cofer & Appley, 1967). Fatigue, like stress, can generate psychophysiological tension in the form of anxiety and irritability (Cofer & Appley, 1967) or the lack of feelings of well being. However, associated with fatigue are additional states such as exhaustion, weariness, and lack of energy and enthusiasm (Cofer & Appley, 1967). Finally, fatigue, like stress, is accumulative and self-reinforcing.

Fatigue and stress exist as discrete phenomena only in the abstract. In reality they are similar and interacting. Fatigue can generate stress, and stress can generate fatigue. Both eventually impair performance and result in psychophysiological tension.

B. Desynchronization of Circadian Rhythms

Any event that recurs at a predictable interval can be described as a cycle. Day and night occur at predictable intervals, and form a cycle. Seasons recur with cyclical regularity every year. The hour hand of a clock completes a cycle twice a day. The interval of time it takes to complete a cycle is its period. The period of the cycle of day and night is 24 hours. The period of the cyclical reoccurrence of seasons is 12 months. And the period for the complete 360° turn of an hour hand on a clock is 12 hours.

A circadian rhythm is a cycle with a period of 24 hours, or one day. Numerous clinical and physiological studies show that there is apparently no organ or function of the body that does not regularly change, day by day, in the form of a circadian rhythm (Aschoff, 1965). To illustrate, human body temperature does not stay at a constant 98.6° but drops several degrees during the night, rises in the morning to its peak in the afternoon, and then falls once again during the evening. Body temperature exhibits a daily, circadian, rhythm. Similar circadian rhythms are exhibited by most other physiological processes, such as urine production, hormone secretion, blood composition, metabolic rate, brain activity, skin conductance, and so on.

The peaks of these various rhythms occur at different times during the day in a consistent, or synchronized, pattern. For example, for some people, body temperature peaks consistently 90 minutes before the peak of adrenal hormone production. Here, body temperature exhibits a fixed phase relationship with adrenal hormone production. Most

physiological processes are similarly patterned, as a sort of physiological orchestra.

At times various processes may become desynchronized or move out of harmony, like the various instruments of an orchestra playing at different rhythms. The effects of desynchronization are important, and can be described as a form of psychophysiological tension; conversely, as Luce (1971) describes, synchronization "is a part of the organization we call mental health." This point is supported by real life phenomena, laboratory experiments, and comparative studies. A person who flies a considerable distance East by jet will find himself, and the end of his journey, in a different time zone. His watch will be hours off compared with the time at the place of his destination. The rhythm of his watch will be out of phase with the rhythm of local clocks. Similarly, his circadian rhythm of physiological processes will be out of harmony with local time. Peak body temperature may not occur at noon, but at 6 PM local time. The result will be a massive desynchronization of circadian rhythms as they shift to move in phase with local rhythms of day and night. This massive disruption is the result of different body processes taking different amounts of time to adjust to local time. Body temperature rhythms may take six days, heart rate, eight days, and potassium excretion, eleven days (Luce, 1971). The results of this massive desynchronization are equally massive, and have been termed "jet fatigue." Specifically, these results include anxiety symptoms such as headaches, gastrointestinal problems, shortness of breath, sweating, occasional nightmares, insomnia, and other mental difficulties.

The effects of desynchronization are also shown in studies in which circadian rhythms are experimentally disrupted. In one study (Luce, 1971) subjects were placed in an experimental chamber completely sealed from external stimuli such as light and sound. Different subjects were placed on different sleep-wake cycles, such as 18 hour days, or day-night shifts lasting six hours each. Subjects were filmed continuously and were recorded for body temperature, weight, mental performance, fatigue, physical fitness, heart functions, and hormone secretion. The result, as expected, was a desynchronization of circadian rhythms. And the effects of desynchronization included an increase in stress, as measured physiologically, and an increase in psychological symptoms such as restlessness and tension.

In a similar experiment (Aschoff, 1965) subjects were kept in an underground chamber for three to four weeks, and displayed desynchronization of circadian rhythms. However, one subject displayed a periodic resynchronization every three to four days. That is, although his physiological processes were out of hormony, every three to four days the peaks of various cycles would occur in a pattern "normal" for that subject. This subject kept a diary during the experiment which revealed that every three to four days, at the time his physiological processes tended to resynchronize, he felt "especially well and fit."

Still another line of evidence relating desynchronization to inner tension comes from studies in which the circadian rhythms of disturbed and healthy persons are compared. Numerous studies have found disturbed circadian rhythms among depressed persons (Luce, 1971).

One well-designed study shows the relationship clearly. Cahnet (Luce, 1971) selected 11 normal young males, 6 normal elderly men, and 5 depressed middle-aged men. Physiological functions were chosen for study whose circadian rhythms usually peak close together: body temperature, urine flow, heart rate, and potassium excretion. Subjects were placed in an experimental chamber isolated from external stimuli. Every hour for 33 hours measurements were taken. Among the healthy young men, all but two showed perfect internal synchrony of circadian rhythms. The two exceptions showed only a slight desynchronization of one rhythm. Half of the elderly men showed desynchronization. Four of the five depressed subjects showed desynchronization. That is, the depressed subjects, although younger than the aged subjects, showed considerably more desynchronization. In a similar study (Luce, 1971) two normal and three anxious subjects were placed in isolation, and a blood analysis was conducted around the clock. Unlike the normals, the anxious subjects showed a higher base level of adrenal hormone present in the blood. In addition, the anxious subjects secreted more adrenal hormone in the day and evening, that is, at a period of time out of phase with peak hormone secretion for normal persons.

What causes the desynchronization of circadian rhythms? Earlier, we mentioned research in which circadian rhythm were artificially disrupted by altering day and night patterns. This disruption illustrates an important characteristic of circadian rhythms: the tendency to synchronize, or hook on to, important external stimuli which fluctuate daily in a regular manner. Such stimuli are called

zeitgeber (Aschoff, 1954). Elimination of the zeitgeber of day and night is enough to disrupt circadian rhythms. However, even when day-night patterns are not disrupted, circadian rhythms can desynchronize as the result of stress and the gradual accumulation of tension from normal everyday activity and change (Luce, 1971). Stroebel (1967, 1969), in a number of experiments, offers striking evidence for this point. Because of the ethical problems of inducing prolonged stress in human subjects, monkeys, who physiologically show important similarities to humans, were used. Stroebel's early experiments involved inducing anxiety through noxious stimuli such as loud noises. Such stimuli were sufficient to disrupt circadian rhythms and produce symptoms. In a later experiment, Stroebel (1969) utilized mild behavioral stress, somewhat akin to everyday human stress. Thirteen monkeys were placed in separate restraining chairs. Each restraining chair faced a panel surrounded by four lights, a device that delivered rewards in the form of food pellets, a projector screen, and a retractable lever on the left and right. For 24 hours around the clock a monkey would be shown visual problems which could be solved by using the right hand lever. Whenever a subject correctly solved a problem, he was rewarded by a food pellet. In other words, each monkey was given a job or occupation of solving visually presented problems.

Each monkey was then put through a 10 day period of stress. The temperature in the testing chamber was made uncomfortably warm, but within tolerable limits. At this time the testing booth was arranged so that pressing the left lever would produce a refreshing gust of cool

air. Once a monkey learned to press the lever for fresh air, he was also taught to press the same lever to avoid other annoyances such as noises, flashing lights, mild shocks. During this period of time each monkey was continuously presented with the visual problems as before, in other words he remained "on the job." Each monkey soon learned to keep its left hand on the left lever for security and continue with his problem solving tasks without becoming disturbed.

After 24 hours the left lever was retracted. Although no more annoying stimuli were presented from this point on the monkeys became deeply disturbed. Five displayed two interesting trends: their temperature rhythms tended to become desynchronized in spite of the external zeitgeber of "normal" 12 hour periods of light and darkness, and regular feeding times. The monkeys became increasingly inefficient in their problem-solving, and developed neurotic and psychosomatic symptoms. Eventually two developed asthmatic breathing, two developed duodenal ulcers and eventually died, and three developed high blood pressure. The remaining monkeys displayed even greater desynchronization and breakdown of behavioral functioning. They ceased to groom themselves, displayed considerable lassitude, and seemed unusually weak. They also performed unpredictably on the visually presented problem task.

To summarize Stroebel's research, the application of mild stress, in a form that generated insecurity, resulted in the disruption of circadian rhythms, and the eventual impairment of activity and generation of physiological anxiety-related symptoms.

C. Summary

Built into life are factors that disrupt inner calm and generate what can be generally termed psychophysiological tension. Two main factors are the accumulation of reactive inhibition and the desynchronization of circadian rhythms. Both processes are unavoidable consequences of activity and change. And both contribute to each other. The accumulation of reactive inhibition can disrupt circadian rhythms, and the disruption of circadian rhythms can contribute to the stress and fatigue associated with reactive inhibition.

II. REDUCTION OF PSYCHOPHYSIOLOGICAL TENSION

Although psychophysiological tension is an unavoidable part of life, it can be brought under control. Specifically, reactive inhibition can be controlled through periodic dissipation; and desynchronization can be controlled through the establishment of physiologically-oriented zeitgeber. First we will consider these controls in terms of theory, and then discuss practical ramifications.

A. Dissipation of Reactive Inhibition

Reactive inhibition accumulates through activity and change. It tends to dissipate automatically whenever activity and change cease (Hull, 1943). This point needs to be emphasized: in order for reactive inhibition to start to dissipate, nothing more is needed than simple inactivity. This phenomenon has been demonstrated in the laboratory.

Physiologists are familiar with the phenomenon of dissipation. Whenever a physiological measurement is taken, say heart rate, breath rate, or brain wave activity, it is common practice to wait several

minutes after a subject has been connected to measuring equipment before beginning actual measurement. The reason for this is that the activity and change a subject undergoes while becoming situated in the novel setting of the laboratory, and while the experimenter goes through the ritual of attaching electrodes to his skin, affects physiological processes. Part of this effect can be seen as reactive inhibition, and may become manifest in the form of increased heart rate, respiration rate, or frequency of brain wave activity. Allowing a subject to remain inactive for a few minutes allows physiological processes to return to normal, that is, to return to their previous base rate. This is important for the physiologist if he is to obtain an accurate measurement. A few minutes of simple inactivity permits most of the reactive inhibition that has accumulated in the laboratory to dissipate.

Like physiologists, psychologists concerned with the nature of learning are quite familiar with reactive inhibition and its dissipation. One well-known learning phenomenon is what has been termed "spontaneous recovery" (Hilgard & Atkinson, 1967). When a subject continuously performs a learned response, his performance will deteriorate. However, if he ceases his activity, and remains inactive for a period of time, and begins performing again, his level of performance will be considerably better after the period of inactivity than before. The sudden improvement in performance after a period of inactivity is spontaneous recovery, and is seen as the result of the spontaneous dissipation of reactive inhibition.

An experiment conducted by Bourne and Archer (1956) (Appendix I) dramatically demonstrates this phenomenon. In this experiment subjects

performed what is called a pursuit rotor task. This task simply involves continuously keeping a metal stylus in contact with a metallic spot on a rotating turntable. Whenever the stylus is in contact with the moving spot, an electric circuit is completed through a clock so that the amount of time a subject remains in contact with the spot can be determined. In this experiment each subject received 21 trials of 30 seconds duration. Subjects were divided into three groups: one with 15 seconds of inactivity between trials, one with 30 seconds, and one with 45 seconds. After the 21st trial all subjects were given a five-minute period of inactivity. The results are shown in Appendix I. Subjects with the largest inactivity intervals performed best; and all subjects performed better after an inactivity interval of five minutes. Put differently, subjects who were given the largest periods of inactivity between trials experienced the largest dissipation of reactive inhibition built up during the trials, and performed best, After 21 trials all subjects experienced sufficient dissipation of reactive inhibition during five minutes of inactivity to perform considerably better on later trials.

The theory of reactive inhibition and its dissipation through inactivity has practical implications. The impact of daily sessions of inactivity for certain groups of patients is widely accepted. Elderly patients with heart trouble are often advised, when going on extended vacations or working for long periods of time, to take breaks from time to time. Without such breaks the accumulation of reactive inhibition in the form of stress and fatigue could be fatal.

Unfortunately, the importance of periodic inactivity breaks for relatively healthy persons is rarely recognized. People can remain relatively untroubled and perform adequately in spite of the accumulation of reactive inhibition. The effects of this accumulation are usually nothing more than mild feelings of tension, or simply the absence of feelings of inner calm. One even might not be aware of these symptoms. If he is, he is likely to shrug them off as "minor" and not worthy of concern. In addition, the notion of taking "inactivity breaks" runs counter to many commonly held beliefs in our society. Inactivity is often seen as laziness, or "wasted time." If one is concerned with his level of inner tension, "inactivity breaks" seem too simple a solution. Our society tells us that all gain, even when it is the reduction of tension, comes through work and effort. And yet, paradoxically it is this very work and effort that contribute to the generation of reactive inhibition.

Contrary to popular notions, and contrary to what may be our own inner promptings, one can deal with inner tension with nothing more than simply sitting down and remaining inactive at regular, daily intervals. And, as I shall describe next, such intervals of inactivity should have a profound effect on the synchronization of circadian rhythms.

B. Synchronization of Circadian Rhythms

We have seen that the synchronization of circadian rhythms seems to be associated with feelings of well being, and desynchronization with feelings of anxiety, depression, and psychophysiological tension. In addition, we have seen the powerful effects of externally imposed regularities, zeitgeber, on synchronizing circadian rhythms.

The most effective zeitgeber are those which actually interrupt circadian rhythms. The daily chiming of a church bell can have no effect on one's circadian rhythms if one cannot hear the bell. Similarly, a regularly consumed noon snack can have no synchronizing effect on one's circadian rhythms if it does not even effect the physiological processes which exhibit circadian rhythms. It is for this reason that common zeitgeber such as eating patterns and the passage of day and night are relatively ineffective; their continued presence in no way insures continued synchronization. In research mentioned earlier, people can become severely depressed and anxious, and monkeys can exhibit serious psychological abnormalities even when the zeitgeber of regular meals and day and night remain. Eating a meal simply does not have sufficient impact on physiological processes to make it an effective zeitgeber. Although one may feel rested and relaxed while taking a meal break, the activity of consuming a meal still generates reactive inhibition, although perhaps at a slower rate than activity before eating. This relative lowering of the rate of generation of reactive inhibition may be accompanied by feelings of relief or rest, just as a slow walk following a long period of running may be experienced as restful. However, in order for reactive inhibition to dissipate, and have maximum effect as a zeitgeber, one must cease all physical activity, and remain completely inactive for a period of time.

The relative ineffectiveness of sleep as a synchronizing zeitgeber may have a somewhat similar explanation. Although sleep

results in a reduction in many forms of physiological activity, sleep usually occurs when such activity is already at a low ebb, so that its impact on changing the trend of physiological processes is minimal.

A stimulus may affect physiological processes and still be ineffective as a zeitgeber. Along with being impactful, a zeitgeber must be appropriately timed. It should have a sudden onset and termination, so that its physiological impact is clearly defined. It is easier to dance in rhythm to the sharp, clean beat of a drum than to the vague, poorly defined rhythms of the splashing of ocean waves. Also, a zeitgeber should be sufficiently long to have some impact. Since some physiological processes are slow to react to stimulus changes, a zeitgeber should last at least five minutes. However, a zeitgeber that is excessively long, longer than an hour, could theoretically lose some of its impact. Such a long stimulus would less likely be felt as having a discrete beginning and end, and consequently would have less impact on physiological processes. To give an analogy, a light that is turned on and off within an interval of 20 seconds is more likely to be seen as a single event with a beginning and end than a light that is turned on and off in an hour.

Periodic intervals of inactivity should function as extremely potent zeitgeber. The reasons for this are complex. First, as mentioned earlier, reactive inhibition can influence virtually every physiological process. The physiological effects of the dissipation of reactive inhibition can be equally pervasive. Inactivity then has an impact on physiological processes, and qualifies as a potentially effective zeitgeber.

The regular spacing of periods of inactivity, at times of day during which some reactive inhibition has accumulated, should produce the most effective zeitgeber effects. First, spacing of periods of inactivity at times at which some reactive inhibition has accumulated insures some physiological effect, the dissipation of some reactive inhibition. Second, the regular spacing of inactivity periods should enhance and fix their effects through the processes of classical and operant conditioning.

Before pursuing this last point, it is necessary to explain the learning processes involved. According to learning theory, most responses become learned through the processes of classical and operant conditioning. Responses that are learned again and again are continuously strengthened, and become deeply fixed; in terms of learning theory such responses become "over-learned." Classical conditioning involves the modification of a given stimulus-response contingency. To explain, classical conditioning always starts with this given: a stimulus that consistently produces a specific and identifiable response. For example, the stimulus of an electric shock will consistently and reliably produce the response of a startled jump. Then, a second stimulus, one chosen by the experimenter and called the "conditioned stimulus," is paired with the original stimulus. For example, a soft tone might be paired with the electric shock. The result is that the original response is firmly conditioned to the conditioned stimulus so that presentation of the conditioned stimulus alone is sufficient to produce the response. In terms of our example, presentation of a mild tone will produce a startle response.

The effects of classical conditioning can fix and amplify the effects of periodic inactivity on reactive inhibition, providing the periods occur regularly, and at the same point in time each day so that they coincide with the same portion of the pattern of circadian rhythms each day. When these conditions are present, classical conditioning will most likely occur. Here the original stimulus is a session of inactivity, and the response is the dissipation of a portion of reactive inhibition. The conditioned stimulus is a particular point in time, and that particular pattern of physiological functioning that occurs at that time. The result is a tendency for the dissipation of reactive inhibition to be conditioned to a particular point in one's circadian pattern of physiological rhythms. This conditioned pattern reinforces the effects of future periods of inactivity that occur at the same time, and these future periods tend to strengthen the conditioned relationship through overlearning.

Operant conditioning always starts with this given: a specific event that is rewarding. When this reward, or reinforcement, is made the consistent consequence of a particular response, that response tends to be learned and fixed. The dissipation of reactive inhibition is considered to have excellent reinforcing characteristics (Hull, 1943). When sessions of inactivity occur consistently at the same point in time, that is, at the same point in one's circadian pattern of physiological rhythms, this pairing will be consistently followed by the dissipation of a portion of reactive inhibition, and will tend to be reinforced and learned or fixed through operant conditioning.

To summarize the last several paragraphs, daily sessions of inactivity, occurring at the same time each day, should serve as strong zeitgeber. Although the subjective effects of each session will most likely be mild and undetectable, the effects are real and measurable. Continued practice of daily inactivity should gradually increase the technique's effectiveness, although the increase will be so gradual that it may not even be noticed. The dual operation of classical and operant conditioning should serve to fix the zeitgeber of periodic dissipation of reactive inhibition. This zeitgeber should gradually increase in strength, as the pairing of inactivity sessions and specific points in the circadian pattern of physiological processes become ever increasingly overlearned. In addition, the amount of dissipation of reactive inhibition during each session should gradually increase, also because of the accumulative effects of overlearning. All of this will occur automatically, providing periodic inactivity is practiced regularly at the same time each day. And usually all of these effects will occur unconsciously. Physiological research shows again and again that most people are completely unaware of dramatic physiological changes when they occur (Cofer & Appley, 1964). It is unlikely that one would be aware of the moderate and gradual physiological changes that will occur as a result of periodic inactivity.

One question we have not considered is the frequency and timing of periods of inactivity. Two periods of inactivity a day should have the largest and most efficient impact. One session should be considerably less effective, and more than two should be only slightly more

effective, not meriting the extra expense in time. The reasoning behind this is based on the fact that a circadian rhythm slopes upward during the morning, and downward in the afternoon. Thus, during the day the average circadian rhythm passes through the same point of functioning two times. For example, body temperature may reach 98° at 9:00 in the morning, increase to 99° in the afternoon, and then decrease to 98° in the early evening. By placing periods of inactivity close to these two points of similar level of functioning, one increases the tendency of such periods to be conditioned and fixed to that level of functioning. Such scheduling increases the effects of overlearning, since the pairing is conditioned twice, rather than once, a day.

A second question is that of timing. The impact of interrupting a circadian rhythm is greatest when its cycle has neither reached its high point nor its low point, but is just beginning to increase. Here the interruption is likely to have a somewhat longer effect, since at this point a circadian rhythm is more susceptible to brief alteration. To use an analogy, it is easier to change the course of a river by interrupting its flow upstream rather than downstream. A final, more pragmatic consideration is that a period of inactivity is more likely to have physiological impact before, rather than after eating a meal since the processes of eating and digesting food tend to counter or mask the effects of inactivity.

Taking the above considerations into account, the ideal placement of two periods of inactivity appear to be just before breakfast

(or after arising from bed) and just before dinner (or around 5:00 to 7:00 PM).

III. PRACTICAL RAMIFICATIONS

The complex array of theory and research we have considered points to one conclusion: sessions of inactivity, carefully scheduled on a daily basis, should function to gradually and automatically reduce feelings of tension and anxiety, and increase inner calm. This conclusion is supported by a more practical vein of evidence: Periodic sessions of inactivity form the single common denominator among a wide variety of differing growth and therapy techniques, techniques that have similar tension-reducing effects.

Jacobsonian relaxation, bio-feedback training, autogenic training, electrosleep, self-hypnosis, meditation, and yoga are all techniques effective in reducing inner tension and increasing inner calm. In spite of this similarity these techniques differ widely. Some involve inducing relaxation by stressing certain muscle groups, while others involve sitting still or lying down. Some involve generating vivid visual images, while others involve keeping the mind relatively blank. Some involve thinking about and exploring unconscious conflicts, others treat such unconscious factors as trivial, and even consider the exploration of them to be harmful. Some of these techniques involve the repetition of self-hypnosis formulae, others reject any form of self-hypnosis. Some involve the mechanical or electrical induction of inactivity, while others consider all forms of external

manipulation to be completely unnecessary and even harmful. Some involve interacting with another person, others are performed alone.

In spite of these variations, all of these techniques have effects, implying that the effects are due not so much to the variations we have mentioned, but to some underlying common factor. The one similarity underlying these techniques is that the practitioner interrupts his busy schedule of daily activity, once or twice a day, on a regular basis, and submits to a period of inactivity.

The effects of such techniques have been demonstrated in the laboratory. First, the effects of a single, isolated session of inactivity are small, but measurable (Orme-Johnson, 1971). However, after several months of daily practice, the effects that occur during a session become pronounced, even though they may be unnoticed by the practitioner. These effects include a dramatic decrease in the amount of beta brain wave activity, spontaneous fluctuations in skin resistance, heart rate, skin conductance, blood lactate level, breath rate, carbon dioxide elimination, oxygen consumption, and so on (Anand, Chhina, & Singh, 1961; Banshckikov, 1970; Das & Gastaut, 1957; Goyeche, Chihara, & Shimizu, 1972; Kasamatsu & Hirai, 1963; Koike & Yamaoka, 1963; Luce, 1971; Luthe, 1970; Pratap, 1972; Schultz & Luthe, 1969; Sugi & Akutsu, 1964; Wallace, Benson, & Wilson, 1971; Wenger, Bagchi, & Anand, 1961; and Wolpe & Flood, 1970).

Continued practice of techniques involving periodic inactivity have a number of desirable long term effects. These include a decrease in anxiety and feelings of tension and insecurity as well as a decrease

in psychosomatic symptoms, and an increase in feelings of self worth. Secondary effects, probably a partial result of anxiety reduction and increase of self-worth, include improved work and study effectiveness, improved social relationships, and increased self-actualization (Brautigam, 1971; Kanfer & Phillips, 1970; Kondo, 1953; Luce, 1971; Luthe & Schultz, 1969; and Schultz & Luthe, 1969).

IV. THE TECHNIQUE

On the basis of the theory and research reviewed, the critical aspects of sessions of inactivity can be isolated and presented formally as a technique. We shall call this technique Periodic Somatic Inactivity (PSI) since its crucial characteristics involve sessions of physical inactivity, which is mediated by the somatic nervous system, practiced at periodic intervals. Below are the instructions for PSI.

> The technique itself is simple. Sit in a comfortable chair. Make yourself at ease. Place your arms in a position that is comfortable for you. Place your feet on the floor. If you are carrying a handbag or package, put these aside.
>
> Now simply close your eyes and sit for the next 15 to 20 minutes. Remain physically inactive for this period of time. Mentally you may do whatever you wish. Whatever you do mentally will have little or no impact on the effectiveness of the technique; the important thing is to remain physically inactive. Do not talk, walk around, or change chairs. You may engage in an occasional action such as shifting your position, making yourself more comfortable, or scratching.
>
> At the end of the session, open your eyes, breathe deeply a few times, and continue with your everyday activities.
>
> Timing of PSI is crucial for its effectiveness. It is important to practice this technique twice daily, once before breakfast (or after arising from bed) and once before dinner (or around 5:00 to 6:00 PM if you do not eat dinner). Do not practice the technique at any other times, or the effects may be disrupted.

Finally, and most important, is regularity of practice. Practice PSI every day without exception. However, if you happen to skip a session, do not try to make up for lost time by scheduling extra sessions.[1] This can be disruptive. Instead, simply continue practicing with your next scheduled session. An occasionally skipped session will not destroy the effectiveness of the technique, but each session skipped will slightly increase the amount of time necessary before the effects will become manifest.

Try not to look for dramatic effects. The effects of PSI are automatic and gradual. Usually they are so gradual that one will not notice them. However, your friends will probably notice changes in you after a few months, and physiological changes will probably become manifest within a month. Also, it is important to emphasize that there will be periods of time that you may be upset or disturbed, and may be convinced that PSI is completely ineffective. At these times remember: PSI tends to work in cycles, there will be times it is working slowly and times it is working with relative speed.

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[1]Later these instructions were revised for reasons explained in the text. Subjects were instructed to practice once in the morning and once in the late afternoon or evening, not right after eating. They were told that the technique is fully effective even if practiced different times on different days.

PSI THEORY

Addendum

This addendum covers in detail the relationship between the accumulation of mental tension during PSI and the working of PSI through the dissipation of reactive inhibition. In terms of PSI theory one can legitimately ask: during a session of PSI reactive inhibition tends to dissipate; however, since reactive inhibition is the automatic by-product of activity and change, should not mental activity during a PSI session produce an accumulation of reactive inhibition, countering the effects of dissipation?

That reactive inhibition which accumulates from physical activity tends to dissipate automatically during physical inactivity, i.e., during a session of PSI. During this same session, mental activity may be producing small amounts of reactive inhibition, somewhat limiting the initial effects of PSI.

However, as one continues to practice PSI the physiological effects of dissipation of reactive inhibition increase. They are conditioned onto themselves, or overlearned. Eventually the physiological changes that occur during a single session of PSI are profound, so profound that they override the small accumulation of reactive inhibition that results from mental activity and tension. In fact, there comes a point when the physiological changes are so pronounced that they trigger the automatic release of reactive inhibition accruing from mental activity and tension. The mechanism behind this is not

clearly understood, although one can offer this speculation: According to Jacobsonian theory, mental activity, particularly mental tension, is reflected physiologically, particularly by tension in the skeletal muscles. There is some experimental evidence for this; a person asked to imagine a situation in which he was extremely angry may display an increase in muscle tension for those muscles around the jaws, almost as if his mental anger were being reflected physiologically be clenched teeth. A second aspect of Jacobsonian theory is that relaxation of the skeletal muscles will result in relaxation of mental tension reflected in those muscles. This is the key for understanding the effects of PSI. The deep physiological changes resulting from overlearning in PSI include a profound decrease in skeletal muscle tension. As skeletal muscle tension decreases, mental tension tied in with muscle tension also decreases. This all occurs automatically, and often unconsciously.

PART TWO

INSTRUCTIONS FOR TEACHING PSI

Teaching of PSI will be done in four stages: (1) preparatory talks, (2) individual instruction, (3) feedback discussion and further instruction, and (4) monthly follow-up. Subjects will attend two 60-minute preparatory talks, two weeks apart. After these talks each subject will be taught PSI in an individualized 20-minute instruction session. During each of the three days following this instruction subjects will meet in group feedback discussion sessions lasting 60 to 90 minutes each. Finally, once a month for the duration of the experiment, each subject will meet individually with the instructor in follow-up sessions. The details of each of these stages are described below.

I. PREPARATORY TALKS

Two 60-minute talks will be given by the instructor. The purpose of these talks is to give subjects a good theoretical and empirical background for practicing PSI. It is felt that giving this background will facilitate the effects of the PSI treatment. Below are the general outlines of material to be presented in each talk. The instructor should write his own talks, using material described in Part One.

First Talk

1. What is psychophysical tension?
   a. Characteristics
   b. Sources
2. Reactive inhibition and tension
3. Desynchronization of circadian rhythms and tension

4. PSI and reactive inhibition and desynchronization: a brief preview to the second talk.

At the end of the first talks subjects should be instructed to abstain from ingesting illegal drugs until after learning PSI. Specifically, the instructor should say:

> Before the end of this lecture we need to cover one important piece of business. As we have just mentioned, the technique you will learn has its impact by releasing reactive inhibition and pulling desynchronized circadian rhythms into harmony or shychrony. Numerous drugs, such as heroin, LSD, marijuana, amphetamines, sedatives, morphine derivatives, and psychedelics affect physiological processes and can indirectly contribute to the desynchronization of circadian rhythms. To help insure that PSI is as effective as possible for you, we ask that you refrain from taking any of these or similar substances for the next two weeks. This is an extremely important request. If you take any of these drugs I have mentioned, there is a chance that any desynchronization you are experiencing will be chemically reinforced, making it all the more difficult for PSI to have a synchronizing effect.
>
> This drug abstinence applies only for illegal non-prescription drugs. If you are taking a drug for a medical condition, continue. The disruptive effects of abstaining from a drug you need for medical reasons will probably be greater than the disruptive effects of taking the drug. Also, you may still take alcohol. For some reason, as yet not explained by researchers, the disruptive effects of alcohol seem to be minor and temporary.

Second Talk

1. Review of psychophysiological tension, reactive inhibition, and desynchronization of circadian rhythms
2. Dissipation of reactive inhibition through PSI
3. Synchronization of circadian rhythms through PSI
4. Practical ramifications

At the end of the second talk schedule subjects for individual instruction using the official PSI schedule book (Appendix II).

II. INSTRUCTION

Each subject will meet individually with the instructor at a previously scheduled time. The instructor should check the subject's name on the schedule book, and then say:

> Today I'll teach you PSI. The technique itself is deceptively simple. Most mistakes are made without the practitioner even knowing he is making them. For this reason, we are putting you through a very carefully planned training session.
>
> Training will take place in four segments. First, I will teach you the technique. Then, in one of the adjoining rooms, you will practice the technique for 15 minutes. This is essential. Most errors in technique come to light only during the first few sessions of practice. Then I will knock on your door and give you a questionnaire (Appendix VIII) which asks certain questions about the experiences you had during the PSI session. Finally, we will go over your questionnaire, and answer any questions you may have. You will then know the technique and should practice twice daily, once before breakfast, once before dinner, for 15 to 20 minutes a session.
>
> First, the technique. The best way to learn PSI is to do it. First, I'll read the instructions so you may become familiar with them. Then I'll read them again, and as I read them I would like you to follow them here and now.
>
> Here are the instructions:
>
> Sit up straight in your chair. Place your feet flat on the floor. Place your arms in a position that is comfortable for you. If you are carrying a handbag or package, put it aside.
>
> Now, simply close your eyes and sit for the next 15 to 20 minutes. Remain physically inactive for this period of time, that is, sit still and avoid unnecessary movements. Let your mind do whatever it wants. Whatever you do mentally will have little or no impact on the effectiveness of the technique. The important thing is to remain physically inactive. Do not talk, walk around, or change chairs. You may engage in an occasional action such as shifting your position, or making yourself more comfortable. And you may scratch.
>
> At the end of the session, open your eyes, breathe deeply a few times, and continue with your everyday activities.
>
> OK, do you have any questions? Now I will read the instructions step by step, and I would like you to follow them here and now as I read. I may correct certain aspects of your technique if it appears necessary.

First, sit up straight, place your feet flat on the floor, and place your arms in a comfortable position. Close your eyes.

Second, remain physically inactive. Sit still and avoid unnecessary movements. Let your mind do whatever it wants. I'll let you practice this for the next two minutes (two minute pause).

Third, take several deep breaths, and you are finished.

Now I would like you to practice this technique for the next 15 minutes. I'll knock on the door when it is time for you to take your questionnaire.

III. FEEDBACK DISCUSSION

Subjects will participate in three 60-minute feedback discussion sessions the three days following PSI instruction. In general these sessions will be devoted to answering questions, and presenting further theory and research on PSI. In addition, these three sessions should include the following:

Session One

In our first two talks we explained the fundamentals of PSI theory, how PSI works and why. The main purpose of these talks was to emphasize the importance of practicing PSI regularly, and that the effects of PSI are automatic and gradual. Today we will consider the more long term effects of PSI. First, I think it might help if I reviewed the salient features of the first two talks.

Reactive inhibition is the physiological by-product of all psychological activity, no matter how mild the activity may be. The primary characteristics of reactive inhibition are that it impedes performance and psychological well-being. Physiologically, reactive inhibition is accompanied by numerous changes, such as increases in heart rate, blood pressure, brain wave activity, skin conductance, and so on.

Put differently, whenever you act, something called reactive inhibition builds up in your body and eventually you find you are not feeling your best, and you are not performing your best.

Reactive inhibition will automatically tend to dissipate whenever you stop activity. When you walk, reactive inhibition builds up. When you stop walking, it tends to dissipate. When you read, reactive inhibition builds up; when you stop reading it tends to dissipate; when you talk, reactive

inhibition builds up; when you stop talking, it tends to dissipate. When you sit quietly in a chair and remain physically inactive for 15 to 20 minutes during a session of PSI, all the reactive inhibition that has accumulated from your everyday activities--from eating, talking, reading, looking around, walking--all this reactive inhibition automatically starts to dissipate.

Notice that I said starts to dissipate. The amount of reactive inhibition released in a single session of PSI is small, but real and measurable. Precise measuring instruments will show a slight decrease in such physiological activities as heart rate, brain wave activity, skin conductance, and so on.

Engaging in a discipline of remaining inactive for 15 to 20 minutes, twice a day, the same time each day, greatly enhances the effects of inactivity. In one session of PSI the amount of reactive inhibition released is very small. However, as I mentioned earlier, even this small amount of dissipation can be physiologically measured, and will show as a decrease in body temperature, heart rate, breath rate, brain wave activity, and so on. However, when PSI is practiced regularly, these small physiological effects accumulate. Technically, they are conditioned on to each other, they are overleanred.

Eventually the physiological changes during a session of PSI become more and more pronounced. And, as mentioned in the last talk, sessions of PSI begin to serve as zeitgeber. They tend to pull desynchronized circadian body rhythms into harmony, and one begins to feel less anxious and one begins to feel less anxious and nervous, and greater psychological well-being.

There is another aspect of the effects of PSI we have not considered. First, I will present it in summary form, and then elaborate on each step. Eventually during a session of PSI the body experiences a state of profound physiological stillness or stability, called "Conditioned Stabilized Hypoarousal." Experiencing this conditioned stabilized hypoarousal twice daily during PSI tends to stabilize and normalize physiological processes. As a result, one feels less anxious, less nervous, and more psychological well-being.

Let me explain this step by step. First, when we are nervous, anxious, and uptight, when we are experiencing psychophysiological tension, our physiological processes are characterized by high arousal and high lability. High arousal simply means that our bodies are working hard. For example, body temperature may be slightly high, heart rate may be up, blood pressure may be up, breath rate may increase, and brain wave activity may be speeded up. Lability simply means that certain body processes are exhibiting a high degree of change. For example, heart rate may be 80 beats per minute

at one point in time, 85 the next minute, 75 the next minute, and so on. Skin conductance, or sweat activity on the palms of your hands, may be highly active one minute, inactive the next, and again active the next minute.

Arousal and lability can be described graphically like this: This graph shows different levels of arousal, say for skin conductance (see graph in Appendix III). This graph also shows different levels of lability for skin conductance.

An experienced practitioner of PSI will experience during PSI extremely low arousal and low lability as a result of the accumulative effects of conditioning mentioned earlier. He will experience a state of conditioned stabilized hypoarousal. Stabilized, since there is a low degree of lability; hypoarousal, since there is a low degree of arousal. Let me show you what this conditioned state of stabilized hypoarousal looks like (see Appendix IV).

At 5:00 PM, before practicing PSI an advanced practitioner will exhibit physiological activity that looks something like this: (show right half of transparency).

At 5:15 PM, during PSI, his physiological activity will look something like this: (show left half).

You can see very clearly that during a session of PSI physiological processes show considerably lower arousal and lability.

This is extremely significant. The dramatically lowered arousal and lability that occurs during a session of PSI gradually carry over into everyday life, they generalize to use the technical term, so that even while you are not practicing PSI bodily processes show less arousal and lability. We can see this by comparing the graphs of skin conductance for a person before learning PSI and after practicing PSI for three months. Please note that these graphs are somewhat styalized for easier presentation (see Appendix III).

Note that this person shows less lability in skin conductance, and that this carries over from each session of PSI. Also note that his general level of skin conductance is somewhat lower. Circadian rhythms remain in tact.

These changes lead to a number of psychological changes that have been tested in psychological studies. Such changes include increased feelings of well-being, increased self-actualization, decreased symptoms of anxiety and nervousness, increased sensitivity to the outside world, better social relations, and more effective work habits.

Finally, people often ask if there is some danger in reducing lability and arousal, if one can reduce lability and arousal too much. The answer is no. Most of us have a level of arousal and lability that is too high. PSI permits arousal and lability to return to a more normal and healthy level. The body automatically reaches a more normal level of functioning during PSI--PSI does not force anything

on the body. When the level of physiological functioning is reached, the body will remain at this level, providing the practice of PSI is continued. In other words, PSI permits physiological activity to return to a normal level, and helps physiological activity to remain at a normal level.

Another commonly asked question is this: Will decreased arousal and lability decrease the amount of feelings and reactions one has in life? Will one become more bland, unfeeling, and unaware? The answer is again no. You will still experience all the normal feelings that are a part of being human. When it is appropriate to feel angry, you will feel angry; when it is appropriate to be anxious, you will be anxious; when it is appropriate to be excited, you will be excited. However, there will be one difference: your feelings and reactions will be far less disruptive. You will get over upsets much more quickly. And you will less frequently find yourself feeling upset, angry, anxious, or depressed for no reason whatsoever.

You may find yourself feeling emotions more clearly, almost as if there were less internal noise or turbulence blocking your experience. Similarly, you may find yourself experiencing external stimuli more vividly and clearly.

And feelings such as calm, peace of mind, contentment, happiness, and joy, will come to you more often, and they will feel more real.

Session Two

Are there any questions concerning PSI?

Today we are going to give you a brief programmed feedback manual covering PSI theory and technique (Appendix V). There are several reasons for having you complete this manual.

First, completing this manual will give us an idea of how well you are practicing, and if you have the essentials down pat. Comprehension of the basics of PSI theory is important since if you understand the theory, you are more likely to understand the justification for certain aspects of the technique, and as a result, more likely to perform the technique correctly.

As you practice PSI during the following weeks and months, questions will arise concerning the technique. You may find yourself asking yourself if you are practicing correctly. You may also find yourself inadvertently adding to or varying the technique. Some additions and variations are harmless, others could be detrimental.

In order to minimize future questions, and the tendency to alter or add to the technique, we are giving you this feedback manual. This manual should serve as sort of a microscope, and enable you to detect hidden flaws in your

comprehension of PSI technique and theory before they become manifest and damage the technique. It is easier to catch and correct such flaws in the bud, rather than wait until they become full-blown. The instructions for completing this programmed manual are easy. Read each question. Write down the answer you select. Then move your answer shield and read the correct answer. It is important that you write down your answer before reading the correct answer. Considerable research shows that learning is greatest when one actually makes an incorrect response, and then is corrected, rather than when told the correct response before he has a chance to respond.

At the end of this session the instructor should go through the question and answer portion of the PSI Manual, and read questions and answers that have not been covered previously.

Session Three

We have covered the three main processes involved in PSI: dissipation of reactive inhibition, synchronization of circadian rhythms, and normalization of physiological arousal level and lability. Psychologically, four types of changes occur.

1. Self concept. Self concept is an important variable in psychology, perhaps the most important. Basically it refers to how one thinks of oneself, whether one likes or dislikes himself. An important dimension of self concept is termed "discrepancy between real and ideal self." Your real self is how you see yourself now, that is, what traits and attributes you feel you possess. Your ideal self is how you would like yourself to be--what traits and attributes you would like to have. The greater the distance between one's real and ideal self, the less fulfilled and happy one feels. Practice of PSI reduces the discrepancy between ideal and real self.

2. Anxiety. No two people experience anxiety the same way. For some, anxiety is felt as a vague "tension," for some, as "nervousness," for some, as "worry." Some experience anxiety physiologically as rapidly beating heart, stomach tension, sweatiness. PSI reduces anxiety.

3. Range of Experiencing. Considerable research shows that one side effect of anxiety is the narrowing of experience. Anxiety narrows our range of experience. One is aware of fewer stimuli, less aware of the world and the work he is doing. As a result things are less enjoyable. Instead of eating a steak and relishing the varieties of flavors in it, a highly anxious person may consume his food and barely

notice how it tastes. Instead of enjoying his work, he may perform his duties mechanically. Anxiety also constricts our range of inner experience so that feelings such as contentment, happiness, excitement, and joy are experienced less often. As PSI reduces anxiety, it increases one's range of experiencing.

The effects of anxiety on reducing experience have been shown empirically. Perhaps the most dramatic experiments have involved a device called a tachistoscope. A tachistoscope is simply a sort of picture viewer. One looks into a screen and a picture is flashed on the screen. Pictures can be presented for varying intervals of time, varying from 10 seconds to 1/10,000 of a second. If pictures are flashed at a high speed, so that they are barely noticed, highly anxious persons will be less likely to notice them than low anxious persons.

4. Personal Functioning. Finally, anxiety lowers personal functioning. High anxiety is correlated with a greater tendency to make errors in physical tasks, in memory tasks, and in learning tasks, as well as with decreases in flexibility, originality, and the ability to perform cognitive tasks. As anxiety decreases with PSI, performance on such tasks improves.

The benefits of PSI are demonstrated in this graph (Appendix VI). Here we see the effects of one, two, and three months practicing on anxiety, self concept (TSCS), self esteem (SE) and creativity.

Now I would like to read some statements from people who have learned PSI over the last few years. These statements illustrate much of what we have said during PSI training.

Person A.Q.

"The big thing I noticed about PSI is that it doesn't work like you think it will. It works, but in ways you don't expect. For example, when I started PSI I thought I was going to feel more relaxed, and less and less worried. But that's not exactly how it worked for me. After a while I just noticed myself getting more interested and excited about classes and about dating. I didn't really notice anything about getting more calm, and I just sort of forgot about worrying. No big thing. Things seemed more even, and less busied or noisy. It seemed like there were fewer things hassling me even though I was still doing the sorts of things I always do."

Person J.S.

"One fascinating aspect of PSI for me is that its beginning to grow on me, somewhat like an old friend. No matter how busy or hectic a day may be I know in the back of my mind that at 5:00 I will always return to it. The occasional times I skip practice leave me feeling somewhat edgy, almost a little angry, as if something were taken away from me. PSI is beginning to be the island of security in a turbulent ocean of daily activity."

Person M.V.

"I think my PSI instructors made a mistake when they didn't tell me about some of the effects of PSI. The most important thing I wish they would have told me about was that some weeks it seems to work, and some weeks it doesn't. When I first started PSI worked really great for about two weeks. I really felt with it and together. The third week I was really down. The next month or so I felt all right, sort of so so, not on top of the world, not really down in the dumps. Sometimes I have really good days and I'm really excited and happy. This happens maybe a few times a week now. Every once in a while I have a really bad day, and am down. PSI doesn't make things feel even better and better, day in and day out. Everyday there are ups and downs; every week there are ups and downs."

Person S.H.

"My husband does yoga. Every once in a while we talk about our experiences. From what he says, yoga releases some sort of energy in nerve centers in the body, but I never really understood what this was about. He says the same about my 'PSI' theory. We agree that the theory doesn't matter as much as the practice. We both have noticed that we feel more comfortable and relaxed and close with each other."

Person L.M.

"At first I couldn't imagine that anything so boring could have any earthly effect at all. But I stuck with it, sort of bit the bullet. Once I made up my mind to keep with it, no matter what, the boredom tended to disappear. Now I've gotten used to it, and let my mind wander. I usually end up thinking about girls and sex, and that's sort of fun. Sometimes I don't think about anything, and just get really deep and relaxed. This sort of mellows out my day."

Person S.S.

"My roommates were really tough on me. I tried to do PSI in my room in the morning. They thought I was pissed off about something and wasn't talking. I told them what I was doing. Once I was doing it and I must have been smiling or something. John, my roommate, came out and said, 'OK, what's so funny, kid?' Things got better when I started doing it in the lounge. People would just sort of leave me alone, thinking I was sleeping while sitting up or something.

Person P.K.

"I am a graduate student in Botany and have been practicing PSI for five months. Although the theory of PSI appeared to have a few weaknesses, by and large I felt it accurately represented my personal experiences. Two months ago I performed a small experiment to test a small part of PSI theory on myself. The theory states that lowered levels of physiological

arousal become classically conditioned to specific points in one's daily biological rhythms. If this is the case, I reasoned, if one stopped PSI for one day these same points should still be accompanied by decreases in physiological arousal, in spite of the fact that PSI is not being practiced. I did just that. One day I stopped PSI. In the morning things seemed relatively unchanged, but I usually feel relaxed and refreshed in the morning. However, just before dinner I suddenly noticed myself becoming very calm and peaceful. I took my pulse, and sure enough, my heart rate was at a level low for me. Then, 15 minutes later, the sense of calm stillness left, and a sense of calm activity took its place."

Finally, I would like to get some feedback from you on how your PSI sessions are going, as well as on what improvements you think we could add to PSI instructions. Please fill out these questionnaires as openly and honestly as possible (Appendix VII).

IV. FOLLOW-UP

Once a month the instructor will phone each subject to schedule an individual follow-up checking session. If a subject misses a session, he should be rescheduled. If he misses again, wait until the next month to call him.

The purpose of PSI follow-up sessions is to check, reinforce, and if necessary, correct a person's practice of PSI. This is done by having a practitioner practice PSI with the instructor.

The instructor's only concern is the quality of the PSI the practitioner practices with him in the follow-up session. The instructor is not concerned with, and does not ask about, past PSI sessions. Similarly, he is not concerned with future effects of practicing PSI. Most important, he is not interested in, and does not ask about, matters not directly related to the practice of PSI, including personal problems, interests, concerns, activities, and the like.

In administering follow-up the instructor should follow as closely as possible the format described below:

> The instructor ushers the practitioner into the follow-up room. Both sit. They may engage in a few minutes of informal chit-chat providing the instructor does not ask questions concerning the practitioner's well-being.
>
> The instructor then casually asks the following questions in order to get some idea of where the practitioner is at in terms of PSI experience; (he does not ask these questions in an attempt to persuade or pressure the practitioner to practice more regularly): "Let's see, you learned PSI in (instructor fill in proper month). Have you been practicing regularly (pause for answer). Do you do it about 15 to 20 minutes a session, sitting still, letting your mind do whatever it wants?" (Pause for answer.) The instructor responds with a warm and accepting "Fine" or "OK" to most of the subject's responses. The instructor then says "OK, let's sit, with our feet flat on the floor, with our arms put in a comfortable position, letting the mind do whatever it wants, while remaining physically inactive" (10-second pause, while instructor and subject pause). "Do any thoughts or feelings come to mind?" (Pause for answer.) "Fine, let the mind do whatever it wants. For the next three minutes let's close our eyes and practice PSI." Both the practitioner and instructor practice PSI for three minutes, after which the instructor says, "Did you begin to feel a bit rested?" (Pause) "Fine, the effects of PSI are gradual and automatic. Your body will gradually reach deeper and deeper states of relaxation, although you may not be aware of this."
>
> "OK, I'd like you to continue practicing PSI for the next 10 minutes. I'll go into another room and will let you know when the time is up."
>
> At the end of the practice session the instructor enters the room and asks, "Are there any questions? Any problems concerning the technique?" "Did you feel relaxed or rested?" (Pause) "Fine. PSI is working even when mentally you may not feel relaxed.

PART THREE

QUESTIONS AND ANSWERS

Below are some questions and answers concerning PSI. The instructor should pattern his responses to the subject's questions after the answers below. These questions and answers may also be incorporated into the feedback discussion sessions.

Q: Hasn't research shown TM to be more effective than rest or hypnosis?
A: Not really. Research on meditation has compared a single session of rest or hypnosis with a session of meditation which has been preceded by countless sessions of meditation. Any practice involving periodic inactivity will be ineffective unless practiced regularly.

Q: What about studies in which the states of rest and meditation were compared for the same subject, showing meditation, and not rest, to be associated with physiological changes?
A: Meditation involves the repetition of a word called a mantra. Through the processes of classical and operant conditioning the gradual and accumulative effect of periodic inactivity can become conditioned to the mantra, so that the repetition of the mantra becomes a necessary precondition for the effects of periodic inactivity to become manifest. Also, self-suggestion effects can affect the meditative repition of a mantra; if one believes that the repetition of a mantra is a necessary precondition for the effects of meditation to occur, this belief will indeed make it a necessary precondition.

Q: When I practice PSI, sometimes I feel sleepy, and once I went to sleep. Is this wrong?
A: Not at all. There will be times you will feel tired during PSI. At these times it will not hurt the effectiveness of the technique to sleep for 15 to 20 minutes. The most important thing to remember about PSI is that it involves stopping your busy everyday activity, sitting down, and remaining inactive for 15 to 20 minutes. What you do with your mind during these sessions will have no impact on the effectiveness of the technique. Let your mind do whatever it wants.

Q: Sometimes when I practice PSI disturbing feelings come up. What should I do?
A: Having such feelings in no way impairs the effectiveness of PSI--your mind can do whatever it wants and PSI will still be effective. Different people deal with disturbing feelings in different ways. It would interfere with the effectiveness of PSI for us to tell you some way to deal with such feelings. Deal with them in any way you wish. They will, in time, go away on their own.

Q: PSI seems not to be working for me. I have practiced for weeks and feel no change.
A: The effects of PSI are gradual, so gradual that you probably will not notice them. However, if we measured certain physiological processes such as heart rate, skin conductance, and brain wave activity,

changes will probably be apparent. Also, in time your friends may begin noticing changes in you, even though you may be unaware of such changes.

Q: I am practicing PSI regularly, and things are getting worse for me. I am feeling more anxious and upset than ever. Perhaps PSI is not for me.
A: PSI can work in cyclical phases. You may experience from time to time periods of tension lasting from a few days to a few weeks. This is normal, and does not mean that PSI is not working. Also, just as our bodies exhibit daily, or circadian, rhythms, they exhibit longer, weekly rhythms. These can become disrupted from time to time, due to everyday pressures and stresses. The regular practice of PSI will tend to bring these rhythms into harmony.

Q: Sometimes I daydream during PSI. Is this OK?
A: Daydreaming is fine. Let your mind do whatever it wants during PSI. The effects will be automatic.

Q: Is it OK to watch television or listen to music during PSI?
A: No. Watching television or listening to the radio serve as external stimuli and change which generate inner tension. This counters the effects of PSI.

Q: Should I practice PSI while stoned or drunk?
A: Preferably not. Although certain drugs can induce relaxation, this relaxation is artificial and is not the same as the spontaneous dissipation of reactive inhibition that occurs during PSI. Drugs will not damage the effects of PSI, but will only slow down the working of PSI. (A session of PSI practiced under the effects of a drug will have much the same impact as not practicing PSI during that session.) The reason for this is that the effects of PSI are accumulative and self-enhancing due to the operation of the processes of classical conditioning. Research shows that learning that occurs in a drug-induced altered state of consciousness tends not to be remembered when the effects of the drug wear off. Similarly, the effects of a session of PSI conducted under the influence of a drug will tend not to persist after the effects of the drug have worn off.

Q: Is it OK to take drugs, providing I do not take them while practicing PSI?
A: First, taking drugs will slow the effects of PSI. Second, you do not need drugs in order for PSI to be effective. Third, if you must take drugs, be sure to be extra careful to practice PSI on a regular basis, twice a day. Remember, if you take drugs you will not be sure whether any changes you experience are temporary drug-induced changes or are changes due to the practice of PSI.

Q: Will PSI take the place of sleep?
A: No. Some people may find that as inner tension gradually decreases through the continued practice of PSI, that they need less sleep,

perhaps because less energy has been wasted through everyday tension. However, PSI is no substitute for sleep. If you are tired, go to sleep.

Q: Should I expect certain unusual effects from practicing PSI?
A: Very few people do. The effects of PSI are gradual. Try not to set up any expectations concerning the effects of PSI. One cannot know how the effects will feel before they occur. Anticipating certain effects can, through self-suggestion, distort those effects that actually occur.

Q: Should I meditate during PSI?
A: No. Most of the effects of regular meditation are probably due to PSI. Meditation does for a few people produce some temporary side effects, such as visual images or intense feeling states of euphoria. Most theorists believe these side effects are due to sensory deprivation and self-hypnosis. They are temporary, relatively rare, and have little impact on enduring psychophysiological tension. In some cases they are dangerous, especially when they are valued or held up as worthwhile and desirable goals. Then they can serve as desired expectations which could distract from or distort the spontaneous functioning of PSI. Put differently, when a person holds these states as desirable goals, he is setting himself up to be frustrated when these states do not occur, and they usually do not occur. This frustration may interfere with the slow, spontaneous effects of PSI.

Q: I want to read more about PSI and other techniques. Is there anything I can read?
A: There are a few books, articles, and unpublished papers on PSI and related techniques. I strongly urge that you not read these until the end of the project. There are several important reasons for this. Material on PSI considers such topics as how the technique works, how it works differently for different people, its specific effects, and so on. If you read these articles, there is a strong possibility that certain expectations would be set up in your mind, on both a conscious and unconscious level, and that these expectations could distort or influence the effects of PSI, and invalidate certain aspects of this research.

Q: I find it very difficult to practice PSI. When I sit down for my PSI session I get nervous and restless. Things get very uncomfortable for me.
A: Try to stay with PSI. Your feelings of discomfort are normal. You will find it easier to practice as time goes on. The first phase of PSI is the most critical, and for many people is the most difficult. There are several reasons for this. When one starts practicing PSI he sets into motion the process of periodic dissipation of reactive inhibition and the synchronization of circadian rhythms. This initially runs against the ongoing processes of accumulation of reactive inhibition and desynchronization of circadian rhythms, and as a result may be uncomfortable for a few weeks or longer. (The time or amount of discomfort differs for different people and is not related to the

effectiveness of PSI). The body is not used to being brought under control in such a manner. One can liken the initial discomfort some people feel while practicing PSI with the initial discomfort one may feel when altering any firmly entrenched habit, such as eating fattening foods or smoking. These habits have their physiological component. Interruption of these habits leads to physiological changes, resulting in feelings of discomfort. Similarly, the daily accumulation of reactive inhibition and the slow desynchronization of circadian rhythms are physiological phenomena. One may get used to these phenomena, in spite of their accompanying psychophysiological tension. Practicing PSI interrupts these patterns--in a healthy way--but the mere fact that they are being interrupted may cause some initial discomfort.

The important thing to remember is this: Stay with PSI. Don't let feelings of discomfort, restlessness and the like discourage you. A few minutes of discomfort is well worth the long-term effects of psychological well-being.

Q: Practicing PSI makes me edgy. I keep thinking about the time, how long it's taking, and when I will be finished.
A: This may help: If you continuously think about the clock, about how long PSI is taking, asking yourself if your time is up, this will make the time seem to go more slowly. It is important to remember that such thoughts will not impair the effectiveness of PSI--the effects of PSI are automatic providing one closes his eyes, remains physically inactive, and lets his mind do whatever it wants. Concern about time will only make PSI a bit more uncomfortable.

It may help to know that considerable psychological research shows that unfilled time seems longer than filled time. If you let your mind occupy itself with whatever it wants during PSI--thoughts, feelings, fantasy, daydreams, and so on--the time will seem to go more quickly than if you wait and think about nothing or about the time.

Q: You say that during PSI I should let my mind do whatever it wants. Doesn't this represent a form of activity which may interfere with the effects of PSI?
A: Reactive inhibition is the accumulative by-product of predominantly physical activity, or the mental intention to perform physical activity (such mental intentions have subtle physical counterparts--the intention to walk will be accompanied by slight increases in the muscle potentials in the legs).

The reactive inhibition resulting from purely central nervous system activity is minute, unless the mental activity is deliberate and effortful, such as doing mental arithmetic or memorizing a list of words.

Q: Why should I close my eyes during PSI?
A: To reduce the effects of external stimuli which might interrupt your practice of PSI.

Q: Will it help to do some sort of relaxation exercise, such as a breathing exercise, during PSI?

A: No. Practice of these exercises may increase feelings of rest in certain parts of the body, but these feelings of rest are not the same as dissipation of reactive inhibition. In fact, the practice of some such exercises involves physical activity, which increases reactive inhibition.

Relaxation resulting from such exercises is forced, or imposed externally. Any reactive inhibition that may dissipate during such an exercise does so under artificial, forced conditions. In PSI the dissipation of reactive inhibition is spontaneous, and thus more harmonious with, or similar to, circadian rhythms. This similarity, or compatibility, means that the circadian rhythms are more easily modified. The effects of forced rest are similar to those of taking drugs or alcohol--temporary.

Put more technically, the pattern of spontaneously occurring dissipations of reactive inhibition during PSI may be more similar to the already existing pattern of circadian rhythms. For example, one may exhibit a pattern of circadian rhythms in which body temperature, heart rate, and sodium excretion occur at a maximum level at two-hour intervals, their peaks are two hours apart. At 12:00 AM a person may experience a peak in body temperature, but heart rate and sodium excretion may be at a normal, or basal level. A session of PSI will at this time have its greatest impact on body temperature, the other physiological processes occurring at a basal level will be minimally affected. Taking a relaxation drug, or practicing a forced relaxation exercise at this time may artificially lower all of these processes, even those occurring at a basal, or below-basal level. When the effects of the drug or forced relaxation wear off, these processes will rebound, or increase, to an above-basal level, which will tend to disrupt circadian rhythms.

Q: Doesn't PSI in time dramatically lower most physiological processes? Won't this produce a disruptive rebound effect?
A: No. The effects are so gradual and accumulative that the body adapts to them. The physiological effects will gradually become more and more pronounced and pervasive, but they will not be disruptive because they are gradual.

Q: Aren't the effects of PSI due to autosuggestion or self-hypnosis?
A: No. Autosuggestion, or as it is technically known, self-hypnosis, requires a specific procedure in order to have pronounced effects, and even then the effects are temporary, lasting no more than a week or two. This procedure involves sitting for an hour or more, first inducing a state of hypnotic suggestibility by repeating a hypnotic formula, and then repeating the desired suggestion.

In PSI we do not want you to attempt any form of self-hypnosis. If you do so the effects will only be temporary, and could interfere with the spontaneous functioning of PSI. The effects of self-hypnosis are similar to those of any form of artificially imposed rest (see previous question).

Q: Does reactive inhibition always accumulate? Doesn't it ever dissipate on its own? If it does, why doesn't this dissipation function to synchronize circadian rhythms?
A: Reactive inhibition accumulates and dissipates in a slow tide-like manner, some days in phase with circadian rhythms, some days out of phase. The net effect on synchronization of circadian rhythms is neutral, or balanced out.

Reactive inhibition does dissipate during sleep, but different amounts dissipate at different times, in no regular pattern. Any synchronizing effect such dissipation periods may have on circadian rhythms are balanced or countered by the irregularity of the time and duration of the periods of dissipation.

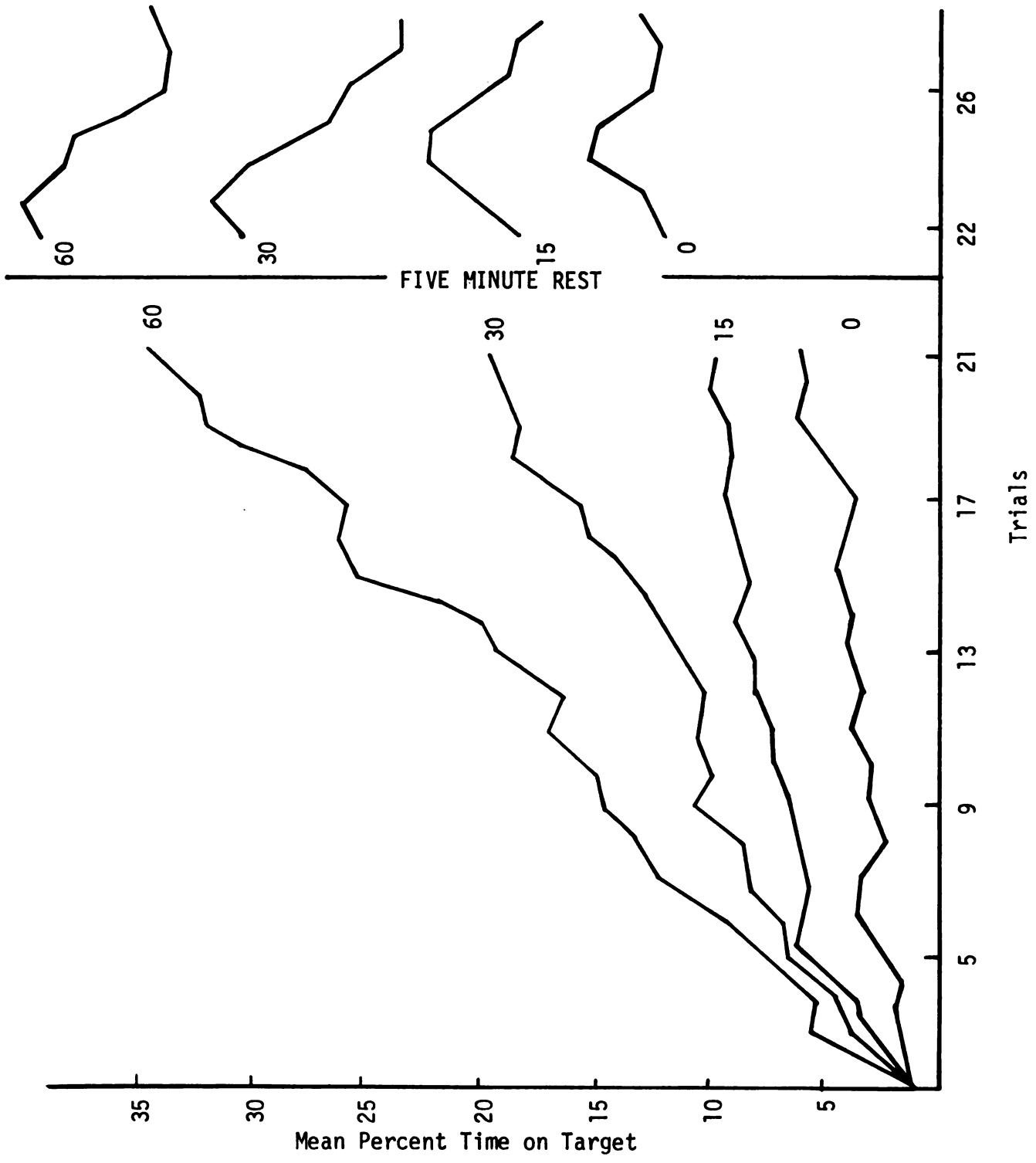
NOTE: If a subject feels there is some weakness in PSI theory, a weakness the instructor cannot answer, the instructor should indicate that this is only a theory, currently the most accepted theory for explaining the researched effects of PSI. Every theory has its shortcomings. This theory has far fewer weaknesses than theories which have been proposed in the past (theories involving the psychoanalytic concept of regression in the service of the ego).

Subjects should be strongly advised that they need not accept--or understand--the theory behind PSI in order for PSI to be effective. We give the theory in order to attempt to explain the overriding importance of practicing PSI regularly, and to explain why the effects are gradual and often undetectable to the subject. Subjects who are uninterested in the theory may accept on faith that PSI should be practiced regularly in order to be effective, and that the effects are gradual.

PART FOUR

APPENDICES

APPENDIX I


60
30
15
0
FIVE MINUTE REST
60
30
15
0
35
30
25
20
15
10
5
Mean Percent Time on Target
5
9
13
17
21
22
26
Trials

APPENDIX II

PSI
INDIVIDUAL INSTRUCTION
SIGN-UP SHEET

INSTRUCTORS: (1) _____ (2) _____

INSTRUCTION DATE: _____

INSTRUCTION PLACE: _____

TIMES	NAMES
12:00	
12:05	
12:10	
12:15	
1:00	
1:05	
1:10	
1:15	
2:00	
2:05	
2:10	
2:15	
3:00	
3:05	
3:10	
3:15	
4:00	
4:05	
4:10	
4:15	
5:00	
5:05	
5:10	
5:15	

(PSI SIGN-UP SHEET, PAGE 2)

TIMES	NAMES
6:00	
6:05	
6:10	
6:15	
7:00	
7:05	
7:10	
7:15	
8:00	
8:05	
8:10	
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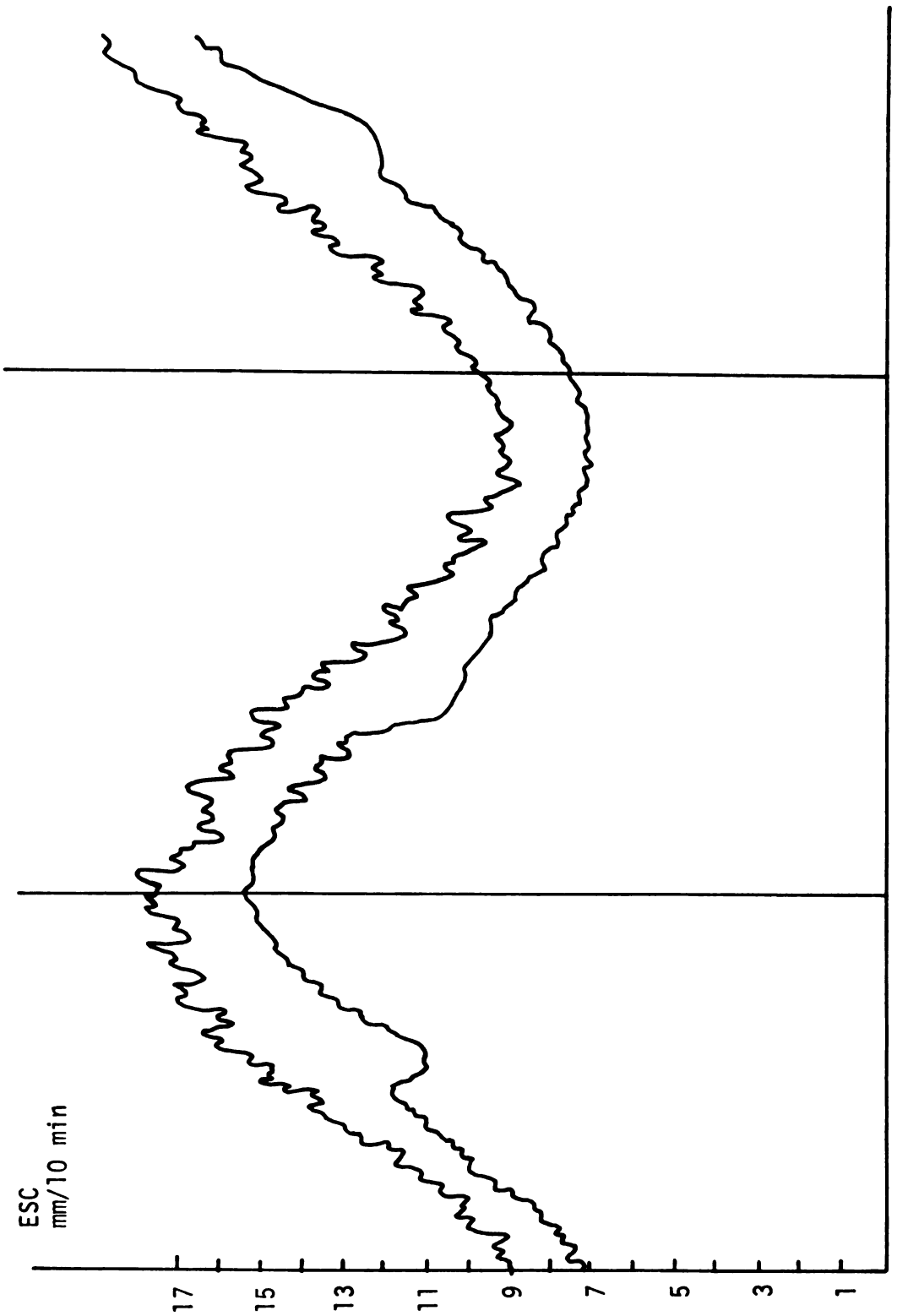
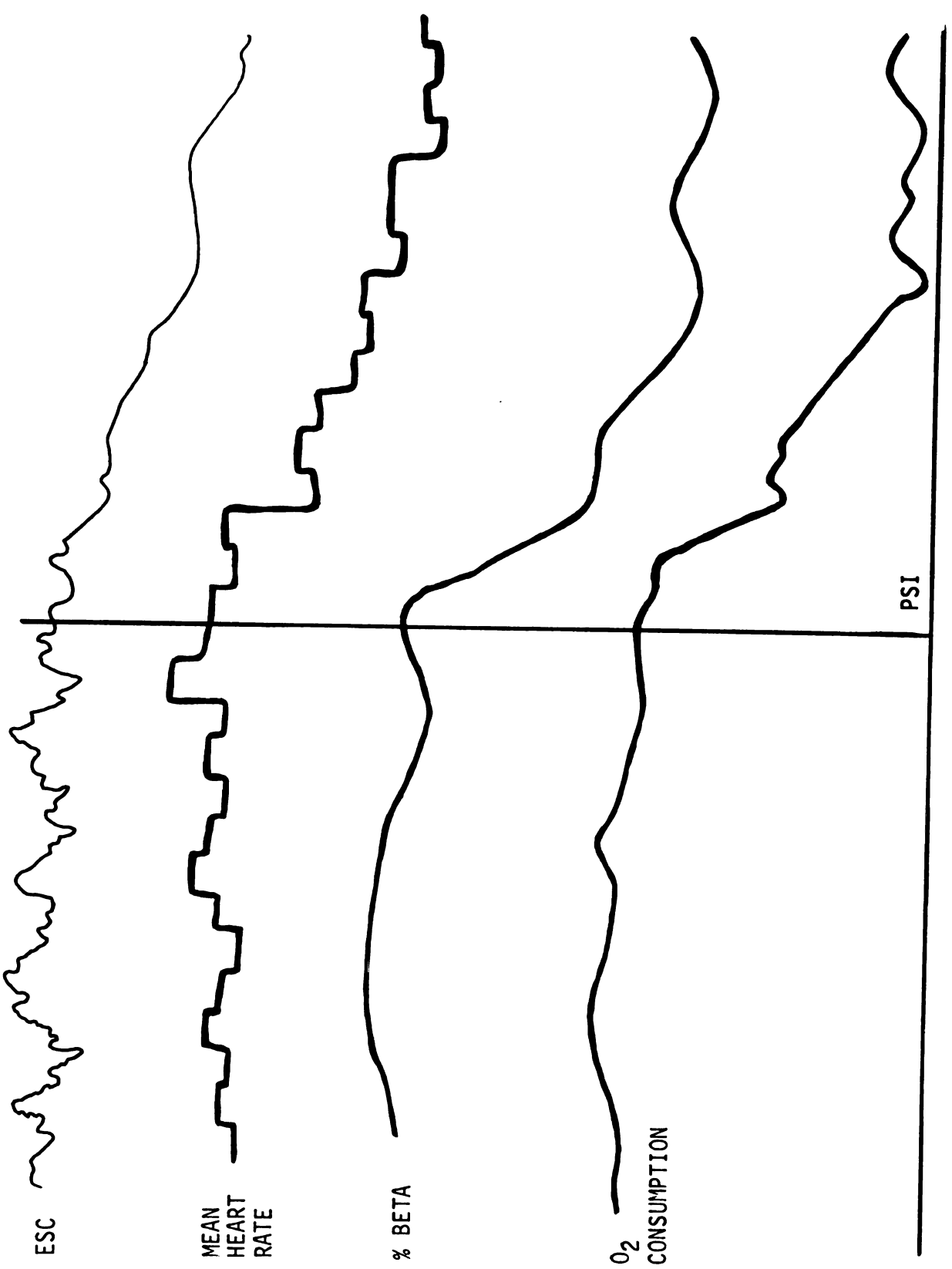
10:15	

APPENDIX III



Differing levels of arousal and lability for skin conductance



PHYSIOLOGICAL FUNCTIONING AND PSI

APPENDIX V

PSI FEEDBACK MANUAL

Form 3

INSTRUCTIONS: Read each question. Select the answer you think is correct. Then write the number for this answer in the answer blank. After you have written in your choice, check the correct answer. Remember: No fair cheating! Do not look at the correct answer until you have written in your choice in the answer blank.

1. How many times a day should PSI be practiced?
   A. 1
   B. 2
   C. 3
   D. As many as possible

   YOUR ANSWER: _____

   CORRECT ANSWER: B

2. When should PSI be practiced?
   A. Before eating
   B. After eating
   C. While eating
   D. After performing any physical activity

   YOUR ANSWER: _____

   CORRECT ANSWER: A

3. A person practices PSI 30 minutes after supper. Which of the following should be the most likely effect?
   A. The amount of reactive inhibition dissipated during PSI will be unusually large, because of the large amount of reactive inhibition accumulated while eating.
   B. Digestion will interfere with the dissipation of reactive inhibition.
   C. Since the person practices PSI so late in the day, the effects of PSI will be minimal.
   D. The effects will be the same as those which would occur if he practices before supper.

   YOUR ANSWER: _____

   CORRECT ANSWER: B

4. While practicing a session of PSI it is important to:
   A. Make yourself as calm and relaxed as possible.
   B. Avoid any form of thought.
   C. Let your mind do whatever it wants.
   D. Avoid going asleep.

   YOUR ANSWER: _____

   CORRECT ANSWER: C

5. A session of PSI is beneficial only when:
   A. One feels calm and relaxed afterwards.
   B. One experiences no thoughts during the session.
   C. One experiences no visual images during the session.
   D. None of the above.

   YOUR ANSWER: _____

   CORRECT ANSWER: D

6. One can watch television or listen to the radio while practicing PSI without lessening the effects of the technique.
   A. True
   B. False

   YOUR ANSWER: _____

   CORRECT ANSWER: B

7. One can practice PSI while driving an automobile, providing it is done before eating.
   A. True
   B. False

   YOUR ANSWER: _____

   CORRECT ANSWER: B

8. After five weeks of practicing PSI imagine you notice very little change in your level of psychological well-being. Which of the following is the most likely explanation:
   A. PSI is not working for you.
   B. The effects of PSI are so gradual that they are often not noticed.
   C. PSI has absolutely no effect whatsoever until eight weeks.
   D. None of the above.

   YOUR ANSWER: _____

   CORRECT ANSWER: B

9. The effects of a single session of PSI are small. However, these small effects gradually and automatically increase during later sessions. Why?
   A. At first one has many doubts about the effectiveness of PSI. These doubts impede PSI's effects.
   B. With practice, the practitioner of PSI learns to think thoughts that are more and more peaceful. These increasingly peaceful thoughts in turn cause PSI to be more and more effective.
   C. The effects of each session of PSI are gradually conditioned to a particular point in one's body rhythms. The effects of later sessions are conditioned onto these same points.
   D. One learns to digest more and more quickly.

   YOUR ANSWER: _____

   CORRECT ANSWER: C

10. During PSI it is important to:
   A. Keep your eyes closed.
   B. Keep your eyes in a relaxed, half-closed, half-opened position.
   C. Keep your eyes open.
   D. Keep one eye closed and one eye open.

   YOUR ANSWER: _____

   CORRECT ANSWER: A

11. During PSI it is important to:
   A. Sit up in a comfortable chair.
   B. Stand.
   C. Sit with your arms behind your back.
   D. Lie down with your legs up in the air.

   YOUR ANSWER: _____

   CORRECT ANSWER: A

12. In terms of PSI theory, three processes are responsible for PSI's effects:
   A. Synchronization of circadian rhythms. Dissipation of reactive inhibition. Stabilization and normalization of physiological activity.
   B. Dissipation of reactive inhibition. Release of unconscious conflicts and problems. Relaxation through self-hypnosis.
   C. Synchronization of circadian rhythms. Relaxation through self-hypnosis. Development of self-discipline.
   D. Development of self-discipline. Stabilization and normalization of physiological activity. Relaxation through self-hypnosis.

   YOUR ANSWER: _____

   CORRECT ANSWER: A

13. While practicing PSI, person X finds that he seriously doubts if PSI can have any effects at all. How should these doubts influence the working of PSI?
    A. Circadian rhythms will remain desynchronized, although reactive inhibition will be dissipated.
    B. The dissipation of reactive inhibition will be blocked.
    C. Doubts will have no effect on the working of PSI.
    D. Doubts will facilitate the working of PSI.

    YOUR ANSWER: _____

    CORRECT ANSWER: C

14. During a session of PSI you find that you are extremely tense and nervous. What should you do?
    A. Continue the session. Your feelings will have little impact on the effect of PSI.
    B. Stop the session and take a nap.
    C. Watch some television until you are calmer; then start the session again.
    D. Continue the session. Although your tension will probably negate the effects of the session, the effects of interrupting the session would be even more disruptive.

    YOUR ANSWER: _____

    CORRECT ANSWER: A

15. While practicing PSI you find that you are bored and are thinking about the time. What should you do?
    A. Such thoughts have no effect on the working of PSI. Let the mind do whatever it wants.
    B. Discontinue PSI. Boredom indicates that PSI is not working for you.
    C. Try to push such thoughts out of your mind. The more you feel at ease, the greater the effects of PSI will be.
    D. Turn on the radio or record player.

    YOUR ANSWER: _____

    CORRECT ANSWER: A

16. Numerous explanations have been offered for the effects of yoga, meditation and autogenic training in reducing anxiety. Some of these explanations are given below:
    - "In yoga one assumes special postures that stimulate certain glands to secrete healthful hormones."
    - "In meditation one mentally repeats a special word which possesses certain relaxing powers."
    - "In autogenic training one repeats a hypnotic formula which permits unconscious problems and conflicts to surface and dissipate."

    In terms of PSI theory, yoga, meditation, and autogenic training have a single common characteristic which accounts for their effectiveness in reducing anxiety:
    A. All involve self-hypnosis.
    B. All involve giving up unhealthy habits such as smoking and drinking.
    C. All involve daily sessions of inactivity.
    D. All involve the psychotherapeutic release of hidden feelings.

    YOUR ANSWER: _____

    CORRECT ANSWER: _____

17. If you miss a session of PSI, what should you do?
    A. Continue practicing PSI as usual, starting with the next session.
    B. Practice the next session twice as long.
    C. Schedule three PSI sessions the next day.
    D. Start the missed session as soon as possible.

    YOUR ANSWER: _____

    CORRECT ANSWER: A

18. Advanced practitioners of PSI typically experience during a session of PSI.
    A. An increase in Alpha brain wave activity.
    B. A decrease in oxygen consumption.
    C. A decrease in skin conductance.
    D. All of the above.

    YOUR ANSWER: _____

    CORRECT ANSWER: D

19. Certain drugs, such as marijuana, induce in some people a sense of calm and relaxation. Why is it unwise to take such drugs during PSI?
    A. The sense of calm induced by such drugs is artificial and forced, and can interfere with the spontaneous physiological changes that take place during PSI.
    B. Such drugs will dangerously lower the already low level of arousal and lability resulting from PSI.
    C. The process of assimilating such drugs will increase reactive inhibition, which will counteract the release of reactive inhibition during PSI.
    D. Such drugs are likely to induce sleep, and sleep interferes with the effects of PSI.

    YOUR ANSWER: _____

    CORRECT ANSWER: A

20. Will the effects of a relaxing hot shower, taken before each session of PSI, enhance the effects of PSI?
    A. Yes, but this is usually inconvenient for most people.
    B. No, a shower may make one feel relaxed, but this relaxation is artificial and externally induced. The effects of PSI are spontaneous and "natural" and can be hindered by artificially inducing feelings of relaxation.
    C. No, but it is acceptable to take a shower during a session of PSI providing you are in a seated position and have your eyes closed.

    YOUR ANSWER: _____

    CORRECT ANSWER: B

21. Which of the following are characteristics of reactive inhibition?
    A. Some of its components are stress and fatigue.
    B. It builds up automatically as a result of activity.
    C. It tends to dissipate automatically during physical inactivity.
    D. All of the above.

    YOUR ANSWER: _____

    CORRECT ANSWER: D

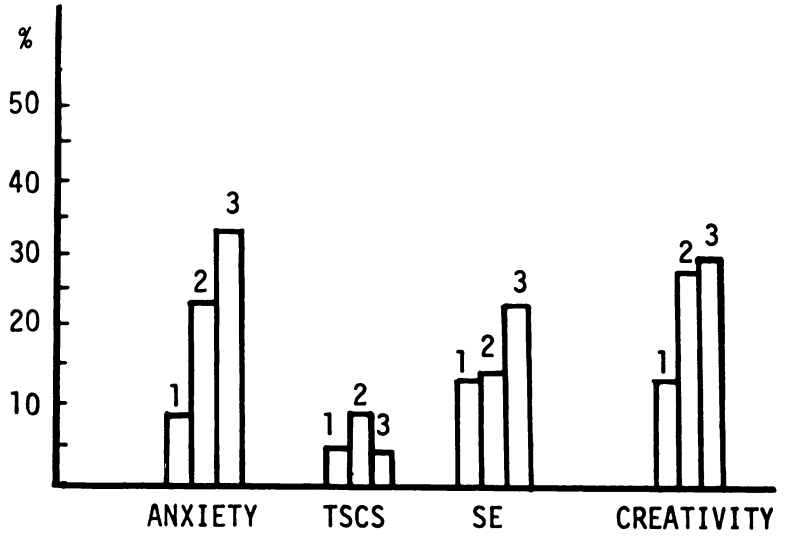
22. One student of PSI gave his instructor the following complaint: "This week I had a hard time practicing PSI. Every time I sat down, I couldn't relax. I kept worrying about finals." Which of the following is the best response to his complaint?
    A. "Try not to worry during PSI, but don't force yourself to relax since this can generate disruptive reactive inhibition."
    B. "It doesn't matter if you worry during PSI. However, try to relax."
    C. "Let your mind do whatever it wants. Even if you find yourself worried and not at all relaxed, PSI is still working. The effects of PSI are automatic."
    D. "Take a hot shower."

    YOUR ANSWER: _____

    CORRECT ANSWER: C

APPENDIX VI

CHANGE IN PSYCHOLOGICAL FUNCTIONING AFTER THREE MONTHS PSI (COMPARING 1, 2, AND 3 MONTHS)



APPENDIX VII

PSI EXPERIENCE QUESTIONNAIRE

Form A: 3 to 6 Days Practice

The technique of PSI has been improved numerous times and has reached what we hope is a high degree of perfection. However, we are continuously seeking ways of improving the technique even further. For this reason we are giving you this questionnaire. Please spend the next 15 to 20 minutes answering the questions below. Make your answers as complete and detailed as possible. The more you say, the more your responses will help us. Also, please do not put any form of identification on this questionnaire--we want your answers to be completely anonymous.

1. What experiences did you have during your last six sessions of PSI? Describe these experiences as fully and specifically as possible, no matter how trivial they may seem. Include all the thoughts, worries, fantasies, feelings, and sensations you remember. Exclude nothing.

2. (Answer on the other side.) What parts of PSI training did you find most helpful? What parts did you find least helpful? Please describe any suggestions you may have for improving PSI training.

APPENDIX VIII

PSI QUESTIONNAIRE

YOUR NAME: _____ PSI INSTRUCTOR: _____

BELOW IS A LIST OF EXPERIENCES WHICH AT TIMES MAY ACCOMPANY THE PRACTICE OF PSI. PLEASE CHECK ANY EXPERIENCES YOU HAVE HAD DURING YOUR MOST RECENT PSI SESSION.

PHYSIOLOGICAL

1. I felt chilly.
2. I had a headache.
3. My mouth felt dry.
4. I felt discomfort in the pit of my stomach.
5. I felt sweaty.
6. I felt hot all over.
7. I felt dizzy.
8. I felt sensations of burning, tingling, or craving in certain parts of my body.
9. I felt muscle tension in the back of my neck.
10. I had a backache.
11. My muscles twitched or jumped.

OTHER: _____

COGNITIVE

1. Words or sentences came to mind.
2. I found myself thinking about the rest of the day's activities.
3. I saw vague fuzzy visual images that seemed to have no specific recognizable form.
4. I saw visual images that had specific, recognizable forms.
5. I found myself thinking about the past.
6. Sounds or music came to mind.
7. I found myself thinking about PSI.

OTHER: _____

AFFECTIVE

1. I felt tense and anxious.
2. I felt calm and relaxed.
3. I felt bored.
4. I felt excited.
5. I felt angry.
6. I felt love.

OTHER: _____

IN THE SPACE BELOW PLEASE DESCRIBE ANY THOUGHTS OR FEELINGS THAT CAME TO MIND CONCERNING ANY ASPECT OF PSI.

PART FIVE

REFERENCES

REFERENCES

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APPENDIX F

FREQUENCY OF PRACTICE QUESTIONNAIRE

APPENDIX F

FREQUENCY OF PRACTICE

NAME OR CODE: _____

Often people find it difficult to practice their technique regularly, and skip several sessions or even large numbers of sessions. Frequency of practice is an important variable in this project. Hence this questionnaire. Please try to answer as honestly and openly as possible, and estimate when you aren't sure of an answer. Remember: don't hesitate to tell us when you skipped practicing. This information will help us.

In this questionnaire we ask you to estimate how frequently you practiced during the months listed below. For each month please do the following:

1. Think back to the month in question. Take some time to think of things that happened to you and things you did. Specifically, think of something for the first part of the month, the middle part of the month, and the last part of the month. This memory exercise is important since it should improve the accuracy of your answer to the following questions.

2. During the month in question, how many days did you NOT PRACTICE AT ALL? How many days did you skip? Write your answer in the appropriate space at the bottom of the page.

3. Next, for those days you DID practice, did you practice twice daily, once daily, or twice half the time and once half the time? Check "twice" if you practiced twice a day when you did practice, "once" if you practiced once a day, and "half & half" if you practiced twice half the time and once half the time.

MONTH	DAYS SKIPPED	TWICE	ONCE	HALF & HALF
December	_____	_____	_____	_____
January	_____	_____	_____	_____
February	_____	_____	_____	_____
March	_____	_____	_____	_____
April	_____	_____	_____	_____
May	_____	_____	_____	_____

One more question: How many follow-up checking sessions have you had?

ANSWER: _____

WHAT IS YOUR AGE? _____ WHAT IS YOUR CURRENT GRADE POINT AVERAGE _____

APPENDIX G

OUTSIDE THERAPEUTIC ACTIVITIES QUESTIONNAIRE

APPENDIX G

CODE: _____ ACTIVITIES QUESTIONNAIRE

Below is a list of some of the types of people and agencies some people see when in need of help. Indicate in the space to the right the total number of hours you have spent with each for the months indicated.

	DEC.	JAN.	FEB.	MAR.	APR.	MAY
Counselor at Counseling Center	___	___	___	___	___	___
Religious counselor or clergyman	___	___	___	___	___	___
Dorm advisor	___	___	___	___	___	___
Physician	___	___	___	___	___	___
Psychologist or psychiatrist (not at counseling center)	___	___	___	___	___	___
Listening Ear, Deck, or other crisis agency	___	___	___	___	___	___
Teachers	___	___	___	___	___	___
Other: _____	___	___	___	___	___	___
Other: _____	___	___	___	___	___	___

Over the past several months have you participated in any anxiety-reduction activities outside of this project (for example, Zen, Yoga, Progressive Relaxation, Encounter Groups)? List these activities below and in the spaces to the right indicate the total number of hours you have spent with each for the months indicated.

ACTIVITY	DEC.	JAN.	FEB.	MAR.	APR.	MAY
_____	___	___	___	___	___	___
_____	___	___	___	___	___	___
_____	___	___	___	___	___	___
_____	___	___	___	___	___	___
_____	___	___	___	___	___	___
_____	___	___	___	___	___	___
_____	___	___	___	___	___	___

APPENDIX H

TECHNIQUE EVALUATION TEST

APPENDIX H

TECHNIQUE EVALUATION TEST

The following test was given to TM subjects. Parallel versions were given to PSI and CMS subjects. In these versions all references to "TM" were changed to "PSI" or "CMS."

MEDITATION SELF-REPORT QUESTIONNAIRE

CODE OR NAME: _____

HOW LONG HAVE YOU BEEN PRACTICING MEDITATION?
(MONTHS AND YEARS)

ANSWER: _____

WHAT TYPE OF MEDITATION DO YOU PRACTICE?

ANSWER: _____

PART I

What activities do you really value in life? That is, of all the things you do, which are the most important to you personally? Think of the ten activities you value most and are most important to you. Then rank these in the ten spaces below, putting the most important and valued first. Please give this question careful consideration and answer as honestly and frankly as possible. Your answers will be completely confidential.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

If meditation is not on this list, where would it fit if you were to rank the 100 activities you value most and are most important to you? About what number would meditation get on this extended list?

ANSWER: _____

PART II

Another question we are interested in is the degree to which meditation sessions are enjoyable and worthwhile. Specifically, we are interested in how the experiences one has while practicing meditation compare with other enjoyable and worthwhile experiences.

First think of the 10 most enjoyable and worthwhile experiences you have had during the last six months. In the spaces below, rank these experiences, putting the most enjoyable and worthwhile experience first.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

If a meditation experience does not appear on this list, please answer the following question: Where would your most enjoyable and worthwhile meditation session fit if you were to rank the 100 most enjoyable and worthwhile experiences you have had over the last six months? About what number would it get?

ANSWER: _____

For about how long had you been practicing meditation before you had this experience? (Years and months.)

ANSWER: _____

In the space below, please describe this experience as completely as possible. We are not interested in your interpretations or explanations, just your description of this experience.

What label or title would you give this experience? ANSWER: _____
What five words best describe this experience? WORD 1: _____,
WORD 2: _____, WORD 3: _____, WORD 4: _____,
WORD 5: _____.

Where would your average or typical meditation session fit on a list of the 100 most enjoyable and worthwhile experiences you have had over the last six months? About what number would it get?

ANSWER: _____.

PART III

This next question is the most important one of this questionnaire. How, if at all, has meditation changed your life? What impact has it had on you?

PART IV

In this section we are interested in obtaining as complete a picture as possible of what goes on during meditation for you. We are interested in what you experience, not in your interpretations or explanations.

On the following pages please describe the different types or categories of experiences and happenings that take place while you practice meditation.

You don't have to fill in all the pages; only as many as are necessary to give a thorough and complete picture of what goes on during meditation for you.

One kind or type of experience I have while practicing meditation can be given the following label or title: _____.

Here is a description of this type of experience: (Please make this description sufficiently detailed and complete so that even someone who doesn't practice meditation can get some idea of what the experience is like).

_____

_____

_____

_____

_____

_____

_____

_____

_____

What five different words best describe this type of experience?

WORD 1: _____

WORD 2: _____

WORD 3: _____

WORD 4: _____

WORD 5: _____

Considering all of the time you have spent practicing meditation during the last month, what percent of this time has been filled with the type of experience described?

ABOUT _____%.

Now consider the total number of times you have meditated. During how many of these sessions have you had the experience you described above? That is, what percent of all the meditation sessions you have had have been sessions in which you had the experience described above? (Count sessions in which you had the experience only briefly.)

ANSWER: _____%.

One kind or type of experience I have while practicing meditation can be given the following label or title: _____.

Here is a description of this type of experience: (Please make this description sufficiently detailed and complete so that even someone who doesn't practice meditation can get some idea of what the experience is like).

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_____

_____

What five different words best describe this type of experience?

WORD 1: _____

WORD 2: _____

WORD 3: _____

WORD 4: _____

WORD 5: _____

Considering all of the time you have spent practicing meditation during the last month, what percent of this time has been filled with the type of experience described?

ABOUT _____%.

Now consider the total number of times you have meditated. During how many of these sessions have you had the experience you described above? That is, what percent of all the meditation sessions you have had have been sessions in which you had the experience described above? (Count sessions in which you had the experience only briefly.)

ANSWER: _____%.

One kind or type of experience I have while practicing meditation can be given the following label or title: _____.

Here is a description of this type of experience: (Please make this description sufficiently detailed and complete so that even someone who doesn't practice meditation can get some idea of what the experience is like).

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_____

What five different words best describe this type of experience?

WORD 1: _____

WORD 2: _____

WORD 3: _____

WORD 4: _____

WORD 5: _____

Considering all of the time you have spent practicing meditation during the last month, what percent of this time has been filled with the type of experience described?

ABOUT _____%.

Now consider the total number of times you have meditated. During how many of these sessions have you had the experience you described above? That is, what percent of all the meditation sessions you have had have been sessions in which you had the experience described above? (Count sessions in which you had the experience only briefly.)

ANSWER: _____%.

One kind or type of experience I have while practicing meditation can be given the following label or title: _____.

Here is a description of this type of experience: (Please make this description sufficiently detailed and complete so that even someone who doesn't practice meditation can get some idea of what the experience is like).

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What five different words best describe this type of experience?

WORD 1: _____

WORD 2: _____

WORD 3: _____

WORD 4: _____

WPRD 5: _____

Considering all of the time you have spent practicing meditation during the last month, what percent of this time has been filled with the type of experience described?

ABOUT _____%.

Now consider the total number of times you have meditated. During how many of these sessions have you had the experience you described above? That is, what percent of all the meditation sessions you have had have been sessions in which you had the experience described above? (Count sessions in which you had the experience only briefly.)

ANSWER: _____%.

One kind or type of experience I have while practicing meditation can be given the following label or title: _____.

Here is a description of this type of experience: (Please make this description sufficiently detailed and complete so that even someone who doesn't practice meditation can get some idea of what the experience is like).

_____

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_____

What five different words best describe this type of experience?

WORD 1: _____

WORD 2: _____

WORD 3: _____

WORD 4: _____

WORD 5: _____

Considering all of the time you have spent practicing meditation during the last month, what percent of this time has been filled with the type of experience described?

ABOUT _____%.

Now consider the total number of times you have meditated. During how many of these sessions have you had the experience you described above? That is, what percent of all the meditation sessions you have had have been sessions in which you had the experience described above? (Count sessions in which you had the experience only briefly.)

ANSWER: _____%.

One kind or type of experience I have while practicing meditation can be given the following label or title: _____.

Here is a description of this type of experience: (Please make this description sufficiently detailed and complete so that even someone who doesn't practice meditation can get some idea of what the experience is like).

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What five different words best describe this type of experience?

WORD 1: _____

WORD 2: _____

WORD 3: _____

WORD 4: _____

WORD 5: _____

Considering all of the time you have spent practicing meditation during the last month, what percent of this time has been filled with the type of experience described?

ABOUT _____%.

Now consider the total number of times you have meditated. During how many of these sessions have you had the experience you described above? That is, what percent of all the meditation sessions you have had have been sessions in which you had the experience described above? (Count sessions in which you had the experience only briefly.)

ANSWER: _____%.

One kind or type of experience I have while practicing meditation can be given the following label or title: _____.

Here is a description of this type of experience: (Please make this description sufficiently detailed and complete so that even someone who doesn't practice meditation can get some idea of what the experience is like).

_____

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What five different words best describe this type of experience?

WORD 1: _____

WORD 2: _____

WORD 3: _____

WORD 4: _____

WORD 5: _____

Considering all of the time you have spent practicing meditation during the last month, what percent of this time has been filled with the type of experience described?

ABOUT _____%.

Now consider the total number of times you have meditated. During how many of these sessions have you had the experience you described above? That is, what percent of all the meditation sessions you have had have been sessions in which you had the experience described above? (Count sessions in which you had the experience only briefly.)

ANSWER _____%.

One kind or type of experience I have while practicing meditation can be given the following label or title: _____.

Here is a description of this type of experience: (Please make this description sufficiently detailed and complete so that even someone who doesn't practice meditation can get some idea of what the experience is like).

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What five different words best describe this type of experience?

WORD 1: _____

WORD 2: _____

WORD 3: _____

WORD 4: _____

WORD 5: _____

Considering all of the time you have spent practicing meditation during the last month, what percent of this time has been filled with the type of experience described?

ABOUT _____%.

Now consider the total number of times you have meditated. During how many of these sessions have you had the experience you described above? That is, what percent of all the meditation sessions you have had have been sessions in which you had the experience described above? (Count sessions in which you had the experience only briefly.)

ANSWER _____%.

One kind or type of experience I have while practicing meditation can be given the following label or title: _____.

Here is the description of this type of experience: (Please make this description sufficiently detailed and complete so that even someone who doesn't practice meditation can get some idea of what the experience is like).

_____ _____

_____

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What five different words best describe this type of experience?

WORD 1: _____

WORD 2: _____

WORD 3: _____

WORD 4: _____

WORD 5: _____

Considering all of the time you have spent practicing meditation during the last month, what percent of this time has been filled with the type of experience described?

ABOUT _____%.

Now consider the total number of times you have meditated. During how many of these sessions have you had the experience you described above? That is, what percent of all the meditation sessions you have had have been sessions in which you had the experience described above? (Count sessions in which you had the experience only briefly.)

ANSWER _____%.

One kind or type of experience I have while practicing meditation can be given the following label or title: _____.

Here is a description of this type of experience: (Please make this description sufficiently detailed and complete so that even someone who doesn't practice meditation can get some idea of what the experience is like).

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What five different words best describe this type of experience?

WORD 1: _____

WORD 2: _____

WORD 3: _____

WORD 4: _____

WORD 5: _____

Considering all of the time you have spent practicing meditation during the last month, what percent of this time has been filled with the type of experience described?

ABOUT _____%.

Now consider the total number of times you have meditated. During how many of these sessions have you had the experience you described above? That is, what percent of all the meditation sessions you have had have been sessions in which you had the experience described above? (Count sessions in which you had the experience only briefly.)

ANSWER: _____%.

APPENDIX I

LECTURE 1 GIVEN TO BOTH CMS MEDITATION AND CMS ANTI-MEDITATION GROUPS

APPENDIX I

LECTURE 1 GIVEN TO BOTH CMS MEDITATION AND CMS ANTI-MEDITATION GROUPS

The technique you will be learning the next few days is called CMS, for Cortically Meditated Stabilization. I will go into the meaning of this complicated piece of jargon later on. CMS is something you practice 15 to 20 minutes a session, once in the morning, and once in the late afternoon or evening.

It is a technique which an impressive body of scientific research and theory shows to be effective for: (1) reducing overall anxiety, tension, nervousness, worry, and uneasiness, and (2) increasing one's general sense of psychological well-being. People who practice this technique become less nervous, and less anxious in everyday living. It is a technique that is stabilizing and normalizing. It is a technique that fosters what has been generally termed "mental health," "psychological well being," and "self actualization."

Here is how the CMS Training Program is structured. This week there will be four sessions. The first half of today's session will be devoted to general aspects of CMS theory. I will not go into CMS research because certain aspects of this research are being replicated in this study. It would be undesirable to set up general expectations which might distort the effects of CMS.

However, if you find it difficult to practice CMS without knowing this body of research, see me individually and I'll answer your questions as best I can. I would prefer that you not do this because data obtained from persons who are briefed on CMS research will have to be considered apart from that from other participants.

The second half of today's session we will devote to teaching CMS, practicing it briefly, and answering questions.

The next three sessions this week will be primarily follow-up sessions. We will start each session by practicing CMS. Then further instruction will be given in a question and answer format. Then once a month until the end of the project at the end of Spring quarter we will continue with follow-up sessions.

It is important that you attend all training and follow-up sessions. If you miss a session, it is important that you schedule a make-up session. I will give you my office and home phone numbers. Why so much emphasis on follow-up sessions? The first reason is motivation. If you know that you will be attending follow-up sessions, you will be more likely to stick with CMS and practice regularly. CMS works best when practiced regularly. Second, CMS training is continuous. As you practice CMS, very gradually distortions in technique may develop without you knowing it. Follow-up is important for checking these distortions in the bud. Third, as you gain experience, questions will come up. Follow-up instruction is structured around these questions.

Let's now have a five minute break before we get into CMS theory.

It is not important to know CMS theory. The technique will work equally well if you know nothing about it. In fact, I am going to outline only two of the five or more processes involved in the working of CMS. And these two processes I am going to sketch out very briefly. The research design requires that I be brief. If you have trouble practicing without knowing the specifics of other processes, or these processes in greater detail, see me later and I will try to answer your questions.

The two main processes we will cover are: (1) the accumulative effects of the dissipation of reactive inhibition, and (2) the cortical amplification of these effects.

Reactive inhibition is the accumulative physiological by-product of all physical activity. Its most general effects are increased tension and the impairment of everyday functioning. Every physical activity results in the generation of some reactive inhibition. Physiologically, reactive inhibition is characterized by complicated changes involving most physiological systems. Changes occur in cardiovascular activity, skin conductance, respiratory activity, gastrointestinal activity, muscle tension, blood pressure, blood volume, oxygen consumption, carbon dioxide elimination, and brain wave activity.

Also, reactive inhibition appears to be mediated by a large part of the brain called the cortex.

Reactive inhibition automatically starts to dissipate whenever physical activity stops. This point is crucial for the working of CMS. All that is needed for triggering the physiological changes associated with CMS is physical inactivity. This has been demonstrated in the laboratory. Researchers in physiology typically have their subjects sit and remain still a few minutes before physiological measurements are obtained. This is because the simple activitiy of walking into a testing room and sitting down generates some reactive inhibition, and this excess reactive inhibition can distort physiological measurements. A few minutes of inactivity permits reactive inhibition to dissipate.

An experiment conducted by Bourne and Archer in 1956 dramatically illustrates reactive inhibition and its dissipation. In this experiment subjects performed what is called a pursuit rotor task. This task simply involves continuously keeping a mental stylus in contact with a metallic spot on a rotating turntable. Whenever the stylus is in contact with the moving spot, an electric circuit is completed through a clock so that the amount of time a subject remains in contact with the spot can be determined. In this experiment each subject received 21 trials of 30 seconds duration. Subjects were divided into three groups: one with 15 seconds of inactivity between trials, one with 30 seconds, and one with 45 seconds. After the 21st trial all subjects were given a five-minute period of inactivity. The results of this experiment were that subjects with the largest inactivity intervals performed best; and all subjects performed better after an inactivity interval of five minutes. Put differently, subjects who were given the largest periods of inactivity between trials, experienced the largest dissipation of reactive inhibition built up during the trials, and performed best. After 21 trials all subjects experienced sufficient dissipation of reactive inhibition during five minutes of inactivity to perform considerably better on later trials.

The effects of a single session of inactivity are very small. But the dissipation of reactive inhibition has a second characteristic: because of cortical meditation, it is accumulative. If you practice inactivity regularly every day, the effects are conditioned onto one another so that the overall physiological changes become more and more impactful. This is basically what CMS is all about.

The effects of CMS are accumulative because of cortical mediation. This needs to be elaborated. Most physiological processes are mediated through the cortex. The cortex can be described as the organ of thought or mental activity. CMS utilizes thought or mental activity in such a way that the healthful and beneficial effects of inactivity are maximized. Also, the one part of the body with the largest number of nerve connections with the cortex is the eyes. CMS utilizes ocular activity in such a way as to maximize the benefits.

APPENDIX J

ANALYSES USED TO OBTAIN POTENTIAL COVARIATES FOR ANALYSES OF COVARIANCE

Footnotes for Table 19

[a]Subscript "d" indicates a pretest-posttest difference score variable. TM and PSI pretest scores were taken in November 1973; CMS pretest scores were taken in March 1974.

[b]All the following variables are pretest variables except in cases (frequency, for example) where only posttests were given. TM and PSI pretest scores were taken in November 1973; CMS pretest scores were taken in March 1974.

[c](= N) for all entries across table for that variable.

•Indicates a posttest variable.

*$p < .05$.

**$p < .01$.

***$p < .005$.

****$p < .001$.

Table 19. Correlations Among (1) Pretest-Posttest Difference Scores, and Posttest Scores Where Only Posttests Were Given, and (2) Potential Covariates for TM, PSI, AND CMS Meditation, and CMS Anti-Meditation Subjects♦

Variables	STAI A-Trait$_d$[a]	SSMT$_d$	SAA$_d$	IPAT Factor O$_d$	IPAT Factor Q$_{4_d}$	IPAT Factor C$_d$	IPAT Factor L$_d$
Sex	.042(73)	.276*	.143	-.022	-.018	.043	-.040
Age	-.151(73)	-.093	-.122	-.181	.025	-.005	.000
Primary Anxiety Variables							
STAI A-Trait[b]	.276(73)**[c]	.059	.060	.185	.127	-.226	-.134
SSMT	-.080(73)	.372***	.068	.063	-.031	-.097	.128
SAA	-.071(73)	.117	.567****	.119	-.166	-.049	.169
IPAT Anxiety Factors							
Factor O	-.023(73)	.137	.126	.299**	.027	-.141	.226
Factor Q_4	-.068(73)	.081	.089	.215	.197	-.099	.148
Factor C	.008(73)	-.123	.007	-.161	.009	.213	-.208
Factor L	-.062(73)	-.143	-.145	-.019	-.027	.135	.479****
Factor H	-.124(73)	-.103	-.128	-.307**	-.119	.194	-.229*
Factor Q_3	.018(73)	.070	-.006	-.239	-.036	.089	-.133
IPAT Neuroticism Factors							
Factor I	.166(73)	.021	.156	.014	-.181	-.073	-.025
Factor F	-.144(73)	-.206	-.214	-.184	-.106	.136	-.142
Factor E	.005(73)	-.206	-.146	-.116	.074	.118	.007
Other IPAT Factors							
Factor A	-.024(73)	-.132	-.067	-.091	-.189	-.008	-.182
Factor B	-.097(73)	-.052	-.067	-.113	.009	.136	.016
Factor G	-.170(73)	.053	.032	-.309**	-.185	.172	-.103
Factor M	.087(73)	-.059	.105	-.006	.000	-.035	.014
Factor N	.301(73)**	.130	.131	.199	.027	-.307**	.044
Factor Q_1	-.079(73)	-.007	-.122	-.023	.162	.040	.096
Factor Q_2	.057(73)	-.097	.100	.016	.021	.030	.135
TSCS Variables							
TSCS-TP	-.029(73)	-.196	-.110	-.215	-.126	.195	-.170
TSCS-PSY	.220(73)	.109	-.009	.207	.180	-.256*	.124
TSCS-PD	.028(73)	-.128	-.068	-.192	-.185	.150	-.044
TSCS-PI	-.109(73)	-.092	-.045	-.325***	-.233*	.245*	-.177
Defensive Distortion Variables							
TSCS-SC	-.173(73)	.155	.101	-.051	.026	.088	-.046
TSCS-DP	-.009(73)	-.228	-.161	-.163	-.160	.064	-.096
MCSD	.111(73)	.089	.059	-.145	-.055	.002	-.173
Technique Evaluation Variables							
Ranked Value•	-.184(63)	-.109	-.049	-.123	-.280*	.328**	-.046
Best Session Rank•	-.142(63)	-.203	-.154	-.086	-.222	.330**	-.003
Average Session Rank•	-.157(63)	-.177	-.094	.002	-.178	.238	.020
Judged Impact•	.451(63)****	.198	.084	.257*	.313*	-.462****	.030
Follow-Up Session•	.030(73)	-.033	.044	-.012	.078	-.101	-.142
Hrs. Anxiety Reduction Activities•	.137(73)	.093	.016	-.011	.028	-.029	.078
Hrs. Therapeutic Contact•	.053(73)	-.038	-.086	-.146	-.043	.024	.001
Skin Conductance Reactivity							
Prefilm 0-1 mm	.462(20)*	.385*	.106	.037	.181	-.238	.217
Film 0-1 mm	.432(20)*	.453**	.163	.053	.159	-.120	.122
Postfilm 0-1 mm	.345(20)	.353	.239	.014	.064	-.069	.199
Prefilm 1-2 mm	.223(20)	.043	-.203	-.192	.072	-.076	-.103
Film 1-2 mm	.401(20)	.182	.092	.048	.078	-.172	-.065
Postfilm 1-2 mm	.169(20)	.131	.291	-.122	.040	.107	-.076
Initial SC	-.006(20)	-.336	-.029	-.244	-.253	.182	.125
Final SC	.156(20)	-.006	-.088	-.145	-.035	.024	-.131
Last Month's Frequency•	.328(73)***	-.051	-.049	.111	.245*	-.327***	-.026
Total Frequency•	.367(73)***	.057	-.074	.128	.163	-.384****	-.203
Discontinue•	.305(73)**	.204*	.225	.114	.211	-.311**	-.008
Considered Meditation	.209(53)	.138	.151	.053	.075	-.202	.325*
Considered Therapy	-.043(60)	.036	.085	-.197	-.150	.005	-.151

♦See facing page for footnotes.

Table 19--Continued

Variables	IPAT						
	Factor H_d	Factor Q_{3d}	Factor I_d	Factor F_d	Factor E_d	Factor A_d	Factor B_d
Sex	-.092(73)	-.126	.054	-.050	-.100	-.021	-.016
Age	.316(73)**	-.022	-.154	.364**	.328***	.183	.152
Primary Anxiety Variables							
STAI A-Trait[b]	-.128(73)	-.108	-.156	-.123	-.046	-.037	-.135
SSMT	-.104(73)	-.114	-.002	-.013	-.061	.065	.125
SAA	-.092(73)	.041	-.043	-.066	-.039	-.041	.008
IPAT Anxiety Factors							
Factor O	-.147(73)	-.;64	-.107	-.052	-.214	-.001	.042
Factor Q_4	-.007(73)	-.088	-.150	.086	-.123	-.010	.040
Factor C	.087(73)	.042	-.009	.074	.065	-.031	-.078
Factor L	.015(73)	.101	-.064	-.009	.084	-.095	.081
Factor H	.365(73)***	.104	.136	.280*	.255*	.115	.052
Factor Q_3	-.006(73)	.324**	.177	-.145	.164	.001	-.074
IPAT Neuroticism Factors							
Factor I	.025(73)	-.046	.310*	.100	.036	-.149	-.132
Factor F	.193(73)	.194	.174	.395***	.056	.256*	.165
Factor E	.151(73)	.204	.145	.200	.456****	.043	-.002
Other IPAT Factors							
Factor A	.084(73)	.068	.252*	.073	-.004	.317**	.112
Factor B	.132(73)	.140	-.129	.245*	.018	.172	.560****
Factor G	.061(73)	.243*	.185	-.039	.091	.135	.034
Factor M	.006(73)	.050	-.001	-.110	.063	-.101	-.063
Factor N	-.281(73)*	-.277*	-.133	-.401****	-.213	-.113	-.097
Factor Q_1	.098(73)	.066	.003	.127	.173	.068	.146
Factor Q_2	.036(73)	-.053	.074	-.166	.121	-.045	-.101
TSCS Variables							
TSCS-TP	.118(73)	.029	.009	.046	.010	.012	-.043
TSCS-PSY	-.229(73)	-.079	-.150	-.160	-.128	.236*	.014
TSCS-PD	.028(73)	.066	.024	-.074	-.075	-.077	-.085
TSCS-PI	.177(73)	.078	.073	.093	.127	.054	.076
Defensive Distortion Variables							
TSCS-SC	.212(73)	-.080	-.083	.276**	-.021	.151	.215
TSCS-DP	-.011(73)	.029	.110	-.066	.059	-.046	-.037
MCSD	-.056(73)	-.007	.185	-.213	.090	.027	-.177
Technique Evaluation Variables							
Ranked Value*	-.158(63)	.222	-.122	.063	-.282*	-.046	-.006
Best Session Rank*	-.150(63)	.220	-.125	.107	-.206	.006	-.041
Ave. Session Rank*	-.165(63)	.258	-.111	-.026	-.321**	.009	.009
Judged Impact*	-.282(63)	-.154	-.001	-.275	.049	.040	-.036
Follow-Up Session*	.039(73)	-.062	.007	.088	-.109	-.026	.052
Hrs. Anxiety Reduction Activities*	-.243(73)*	.003	.220	-.203	.090	-.162	-.174
Hrs. Therapeutic Contact*	-.032(73)	.003	.082	-.036	.026	-.032	-.040
Skin Conductance Reactivity							
Prefilm 0-1 mm	-.006(20)	-.085	.116	-.370	.261	-.154	.090
Film 0-1 mm	-.137(20)	-.121	-.046	-.336	.098	-.176	-.144
Postfilm 0-1 mm	.030(20)	-.089	-.182	-.241	.288	.051	-.081
Prefilm 1-2 mm	.079(20)	.041	.225	-.310	.139	.240	-.174
Film 1-2 mm	-.172(20)	-.155	-.119	-.269	.102	-.068	-.373
Postfilm 1-2 mm	-.017(20)	-.115	-.250	-.189	.072	.104	-.536**
Initial SC	-.065(20)	.137	.173	-.163	.094	-.086	.057
Final SC	-.084(20)	-.086	.025	-.195	.206	-.017	-.201
Last Month's Frequency*	.019(73)	-.222	.043	-.009	.104	-.130	-.091
Total Frequency*	-.200(73)	-.219	-.037	-.105	-.028	-.143	-.112
Discontinue*	-.025(73)	-.176	.011	-.073	.002	.101	-.020
Considered Meditation	-.227(53)	.109	.269*	-.171	.012	-.221	-.134
Considered Therapy	.125(60)	-.204	-.079	-.006	.084	.123	-.039

Table 19--Continued

Variables	IPAT Factor G_d	Factor M_d	Factor N_d	Factor Q_{1d}	Factor Q_{2d}	TSCS-TP_d	TSCS-PSY_d
Sex	.058(73)	-.028	.004	-.085	.032	-.066	.030
Age	.071(73)	.143	.029	.227	-.038	-.057	.059
Primary Anxiety Variables							
STAI A-Trait	.073(73)	.045	.016	-.053	.072	-.132	.188
SSMT	.055(73)	-.008	-.253*	.176	-.101	-.078	.175
SAA	-.036(73)	.149	-.242*	.026	.168	-.036	.109
IPAT Anxiety Factors							
Factor O	.067(73)	-.038	-.093	.094	.110	-.107	.210*
Factor Q_4	.037(73)	.103	-.088	.026	.032	-.192	.160
Factor C	-.144(73)	-.092	.083	-.132	-.092	.171	-.260*
Factor L	.252(73)*	.070	-.071	.031	.102	-.068	.082
Factor H	.057(73)	.096	-.108	-.049	-.145	.220	-.142
Factor Q_3	.188(73)	.087	.065	.127	-.052	.078	-.261
IPAT Neuroticism Factors							
Factor I	-.041(73)	.144	.075	-.111	.051	-.043	.052
Factor F	-.061(73)	-.054	.119	-.105	-.156	.148	-.014
Factor E	-.013(73)	-.112	-.012	-.102	-.069	.094	-.150
Other IPAT Factors							
Factor A	.095(73)	.058	-.008	-.102	-.067	.201	.156
Factor B	.103(73)	-.058	-.005	.030	.038	.056	-.014
Factor G	.456(73)****	.078	.021	.134	-.071	.094	-.086
Factor M	-.124(73)	.335***	-.025	-.185	.066	-.016	.037
Factor N	-.026(73)	.119	.295*	-.023	.042	-.044	.060
Factor Q_1	.236(73)*	-.112	-.070	.297**	-.020	-.049	-.109
Factor Q_2	.114(73)	.214	-.087	-.002	.413****	-.113	-.134
TSCS Variables							
TSCS-TP	-.162(73)	-.138	.099	-.215	-.122	.308**	-.142
TSCS-PSY	-.033(73)	.051	.027	.315***	.018	-.171	.740****
TSCS-PD	-.062(73)	-.153	.036	-.090	-.008	.205	-.120
TSCS-PI	-.017(73)	.079	-.069	-.030	-.135	.222	-.098
Defensive Distortion Variables							
TSCS-SC	.052(73)	.173	.065	-.054	-.179	-.036	.066
TSCS-DP	-.079(73)	-.104	.010	-.044	.054	.166	-.100
MCSD	-.011(73)	-.050	-.036	-.040	-.038	.017	-.097
Technique Evaluation Variables							
Ranked Value*	.119(63)	.015	.152	.029	.041	.312*	-.060
Best Session Rank*	.145(63)	.042	.027	.107	.052	.320*	-.096
Ave. Session Rank*	.127(63)	-.025	.083	.057	.016	.313**	.022
Judged Impact*	-.073(63)	-.010	.236*	-.155	.089	-.323**	.131
Follow-Up Session*	-.055(63)	.144	.339***	-.094	-.161	-.047	.062
Hrs. Anxiety Reduction Activities*	.006(73)	.191	-.137	-.073	.179	-.050	-.012
Hrs. Therapeutic Contact*	.067(73)	-.001	.120	-.084	-.007	.039	-.010
Skin Conductance Reactivity							
Prefilm 0-1 mm	-.087(20)	-.008	-.057	.130	.196	-.421*	.093
Film 0-1 mm	-.185(20)	-.075	-.001	.110	.238	-.463	.051
Postfilm 0-1 mm	-.070(20)	-.056	-.257	-.142	.100	-.223	-.045
Prefilm 1-2 mm	.073(20)	.148	.187	.109	-.004	-.226	.025
Film 1-2 mm	-.284(20)	-.160	.168	.135	-.067	-.147	.090
Postfilm 1-2 mm	-.412(20)	-.205	.121	.197	-.132	-.085	-.049
Initial SC	.033(20)	.020	.041	.275	-.060	.170	.009
Final SC	-.318(20)	-.039	.193	.265	-.003	-.043	.005
Last Month's Frequency*	.035(73)	.127	.168	.046	.055	.158	-.108
Total Frequency*	-.142(73)	.160	.132	.032	.029	-.172	.126
Discontinue*	.001(73)	.023	.021	.046	-.025	-.083	-.021
Considered Meditation	-.164(53)	.125	.051	-.074	.206	.224	.245
Considered Therapy	.036(60)	.240	.005	-.033	-.300**	.014	.025

Table 19--Continued

Variables	TSCS-PD$_d$	TSCS-PI$_d$	TSCS-SC$_d$	TSCS-DP$_d$	MCSD$_d$	Ranked Value	Best Session Rank
Sex	.033(73)	.101	.042	-.163	-.092	.126	.035
Age	-.200(73)	.010	.145	-.064	-.142	-.257*	-.253*
Primary Anxiety Variables							
STAI A-Trait	-.055(73)	.230*	.056	-.127	.058	-.052	.042
SSMT	-.078(73)	.007	.054	-.109	.048	.037	.035
SAA	-.014(73)	-.083	.020	-.050	-.043	-.038	-.061
IPAT Anxiety Factors							
Factor O	-.058(73)	-.294*	-.003	-.108	.159	-.011	.071
Factor Q_4	-.161(73)	-.273**	.023	-.183	.141	-.237*	-.173
Factor C	.150(73)	.204	-.026	.130	-.149	.208	.111
Factor L	.039(73)	-.087	-.100	-.030	.289*	-.094	.009
Factor H	.079(73)	.388****	-.047	.189	-.049	-.119	-.173
Factor Q_3	.203(73)	.322***	.034	.095	.030	-.036	.015
IPAT Neuroticism Factors							
Factor I	-.095(73)	.026	.159	-.177	-.050	-.228*	-.270*
Factor F	.034(73)	.166	-.203	.055	.058	-.040	-.078
Factor E	.025(73)	.221	-.154	.143	.029	-.271*	-.185
Other IPAT Factors							
Factor A	.157(73)	.256	-.058	.119	.056	-.076	-.109
Factor B	.008(73)	.023	.032	.027	.043	.184	.268*
Factor G	.223(73)	.345***	-.052	.140	.149	-.129	-.085
Factor M	-.118(73)	.069	-.001	.121	.050	-.114	-.125
Factor N	-.019(73)	-.031	.174	-.083	-.223	.169	.158
Factor Q_1	-.048(73)	-.068	.093	.153	.020	-.060	.084
Factor Q_2	-.100(73)	-.123	.185	-.111	.041	.047	.134
TSCS Variables							
TSCS-TP	.146(73)	.360***	-.161	.136	.044	-.028	.032
TSCS-PSY	-.168(73)	-.088	.135	-.103	.034	.099	.164
TSCS-PD	.324(73)***	.323***	-.205	.117	.072	.016	-.072
TSCS-PI	.151(73)	.591****	-.014	.170	.013	-.014	-.084
Defensive Distortion Variables							
TSCS-SC	-.136(73)	-.123	.212	-.152	-.127	-.006	-.148
TSCS-DP	.133(73)	.420****	-.271*	.227	.095	-.178	-.151
MCSD	.094(73)	.286*	.004	.015	.109	.032	-.119
Technique Evaluation Variables							
Ranked Value•	.359(63)***	.110	-.041	.279*	.064		
Best Session Rank•	.355(63)***	.028	-.140	.329**	.185	.895****	
Ave. Session Rank•	.305(63)*	.013	-.019	.224	.198	.772****	.769****
Judged Impact•	-.265(63)*	-.139	.119	-.268*	-.155	-.442****	-.395***
Follow-Up Session•	-.185(73)	-.078	.030	-.067	.001	-.489****	-.420***
Hrs. Anxiety Reduction Activities•	.032(73)	.084	-.029	-.037	.141		
Hrs. Therapeutic Contact•	.024(73)	.181	.032	.026	.086		
Skin Conductance Reactivity							
Prefilm 0-1 mm	-.333(20)	.282	.022	-.309	.138	-.313	-.284
Film 0-1 mm	-.383(20)	.265	-.262	-.263	.037	-.129	.029
Postfilm 0-1 mm	-.290(20)	.261	-.208	-.186	.210	-.250	-.086
Prefilm 1-2 mm	-.159(20)	.480*	.072	-.311	.064	-.125	-.071
Film 1-2 mm	-.059(20)	.301	-.241	-.117	-.019	-.135	.068
Postfilm 1-2 mm	.011(20)	-.015	-.154	-.222	.151	.043	.309
Initial SC	.273(20)	.255	-.004	-.004	.332	.288	.254
Final SC	-.020(20)	.453*	-.227	-.047	.220	-.122	.074
Last Month's Frequency•	-.180(73)	.067	.052	-.129	-.202	-.410****	-.353***
Total Frequency•	-.232(73)*	.115	.170	-.129	-.180	-.314*	-.306*
Discontinue•	-.100(73)	-.006	.066	-.163	-.233*	-.151	-.169
Considered Meditation	-.256(53)*	.031	-.009	-.311*	.044	-.126	-.237
Considered Therapy	-.051(60)	.012	.154	-.108	-.166	-.156	-.141

Table 19--Continued

Variables	Prefilm 0-1 mm_d	Film 0-1 mm_d	Postfilm 0-1 mm_d	Prefilm 1-2 mm_d	Film 1-2 mm_d	Postfilm 1-2 mm_d
Sex	-.281(19)	-.344	-.092	-.185	-.096	-.293
Age	-.235(19)	-.403	-.396	-.074	.055	.038
Primary Anxiety Variables						
STAI A-Trait	-.291(18)	-.260	-.183	-.232	.079	.169
SSMT	-.309(19)	.111	-.205	-.274	-.153	.176
SAA	-.361(19)	-.372	-.413	-.213	-.237	.106
IPAT Anxiety Factors						
Factor O	-.628(19)***	-.516*	-.414	-.595***	-.409	-.339
Factor Q_4	-.522(19)*	-.557**	-.376	-.640***	-.431	-.209
Factor C	.512(19)*	.426	.429	.380	.420	.482*
Factor L	-.462(19)*	-.536*	-.476*	-.477*	-.479*	-.376
Factor H	.561(19)**	.293	.308	.192	.197	.170
Factor Q_3	.405(19)	.351	.209	.554**	.502*	.459*
IPAT Neuroticism Factors						
Factor I	.177(19)	-.093	.019	.141	.149	.006
Factor F	.323(19)	.114	.209	.109	.032	-.229
Factor E	.401(19)	.145	.145	.241	.085	-.052
Other IPAT Factors						
Factor A	.378(19)	.242	.300	.207	-.025	-.104
Factor B	-.088(19)	.039	.119	-.360	-.460*	-.618***
Factor G	-.033(19)	.205	-.011	.286	.200	.237
Factor M	.286(19)	.088	.136	.433*	.293	-.111
Factor N	-.098(19)	-.146	-.151	.167	.219	.104
Factor Q_1	-.115(19)	-.166	-.219	-.044	-.294	-.269
Factor Q_2	-.087(19)	-.002	-.165	.057	-.141	.020
TSCS Variables						
TSCS-TP	.539(19)*	.302	.422	.345	.457*	.178
TSCS-PSY	-.209(19)	-.128	-.271	.224	.052	-.002
TSCS-PD	.470(19)*	.353	.412	.500*	.620***	.340
TSCS-PI	.479(19)*	.394	.292	.502*	.365	.259
Defensive Distortion Variables						
TSCS-SC	-.341(19)	-.395	-.228	-.659**	-.822****	-.498*
TSCS-DP	.524(19)*	.321	.276	.537*	.630***	.187
MCSD	.497(19)*	.338	.238	.661***	.705****	.471*
Technique Evaluation Variables						
Ranked Value•	-.161(15)	.158	.157	-.150	-.177	.023
Best Session Rank•	-.119(15)	.230	.228	-.200	.004	.183
Ave. Session Rank•	-.062(15)	.132	.197	-.345	-.326	.049
Judged Impact•	.512(17)*	.184	.224	.327	.191	-.244
Follow-Up Session•	-.298(19)	-.381	-.419	-.085	.201	.082
Hrs. Anxiety Reduction Activities•	.006(19)	-.101	-.069	-.060	-.121	-.082
Hrs. Therapeutic Contact•	-.119(19)	-.227	-.320	-.133	-.057	-.212
Skin Conductance Reactivity						
Prefilm 0-1 mm	.777(19)****	.776****	.644***	.663***	.640***	.446*
Film 0-1 mm	.543(19)**	.774****	.613***	.480*	.728***	.533*
Postfilm 0-1 mm	.513(19)*	.622***	.618***	.349	.698****	.649**
Prefilm 1-2 mm	.505(19)*	.567**	.368	.916****	.572**	.370
Film 1-2 mm	.400(19)	.400	.343	.464*	.979****	.698****
Postfilm 1-2 mm	.271(19)	.333	.297	.249	.689****	.969****
Initial SC	.599(19)***	.395	.426	.434*	.446*	.439*
Final SC	.518(19)*	.378	.279	.550*	.829****	.626***
Last Month's Frequency•	.279(19)	.017	-.109	.435*	.422	.091
Total Frequency•	.204(19)	.041	-.109	.459*	.469*	.073
Discontinue•	.273(19)	.231	.184	.273	.413	.350
Considered Meditation	-.086(19)	-.191	-.138	.167	-.229	-.356
Considered Therapy	.052(19)	.015	.018	.223	-.089	-.099

Table 19--Continued

Variables	Initial SC_d	Final SC_d	Last Month's Frequency	Total Frequency	Discontinue
Sex	.036(19)	-.062(19)	-.183(73)	-.135(73)	-.099(73)
Age	-.330(19)	-.187(19)	.218(73)*	.151(73)	.109(73)
Primary Anxiety Variables					
STAI A-Trait	-.270(18)	-.249(18)	-.018(73)	-.007(73)	-.126(73)
SSMT	-.215(19)	-.308(19)	-.264(73)*	-.161(73)	.034(73)
SAA	-.411(19)	-.380(19)	-.154(73)	-.138(73)	.008(73)
IPAT Anxiety Factors					
Factor O	-.711(19)	-.715(19)***	-.166(73)	-.187(73)	-.190(73)
Factor Q_4	-.527(19)*	-.572(19)**	-.027(73)	-.142(73)	-.133(73)
Factor C	.694(19)	.763(19)****	.081(73)	.067(73)	.178(73)
Factor L	-.197(19)	-.406(19)	-.102(73)	-.265(73)*	-.147(73)
Factor H	.598(19)***	.599(19)***	.036(73)	.002(73)	-.096(73)
Factor Q_3	.320(19)	.523(19)	.098(73)	.128(73)	.101(73)
IPAT Neuroticism Factors					
Factor I	.055(19)	.157(19)	.117(73)	.162(73)	.037(73)
Factor F	.328(19)	.192(19)	-.013(73)	-.040(73)	-.125(73)
Factor E	.482(19)*	.426(19)	.158(73)	.010(73)	-.038(73)
Other IPAT Factors					
Factor A	.462(19)*	.339(19)	-.189(73)	-.081(73)	-.187(73)
Factor B	-.095(19)	-.409(19)	-.187(73)	-.113(73)	.154(73)
Factor G	-.210(19)	-.006(19)	-.032(73)	.091(73)	-.058(73)
Factor M	.283(19)	.313(19)	.178(73)	.210(73)	.199(73)
Factor N	-.063(19)	.035(19)	.156(73)	.229(73)*	.129(73)
Factor Q_1	-.210(19)	-.149(19)	.187(73)	-.064(73)	.138(73)
Factor Q_2	-.249(19)	-.186(19)	.130(73)	-.009(73)	.138(73)
TSCS Variables					
TSCS-TP	.593(19)***	.590(19)***	.093(73)	.221(73)	.176(73)
TSCS-PSY	-.265(19)	-.155(19)	-.198(73)	.025(73)	-.067(73)
TSCS-PD	.606(19)***	.787(19)****	.139(73)	.200(73)	.138(73)
TSCS-PI	.510(19)*	.638(19)***	.002(73)	.048(73)	.043(73)
Defensive Distortion Variables					
TSCS-SC	-.360(19)	-.650(19)***	-.177(73)	-.288(73)*	-.041(73)
TSCS-DP	.424(19)	.627(19)***	.234(73)*	.319(73)**	.126(73)
MCSD	.426(19)	.607(19)***	.098(73)	.173(73)	.172(73)
Technique Evaluation Variables					
Ranked Value•	.215(15)	.062(15)			
Best Session Rank•	.115(15)	.129(15)			
Ave. Session Rank•	.121(15)	-.075(15)			
Judged Impact•	.029(17)	.003(17)			
Follow-Up Session•	-.539(19)*	-.150(19)			
Hrs. Anxiety Reduction Activities•	.267(19)	.223(19)			
Hrs. Therapeutic Contact•	-.351(19)	-.173(19)			
Skin Conductance Reactivity					
Prefilm 0-1 mm	.459(19)*	.559(19)*	.289(19)	.260(19)	.199(19)
Film 0-1 mm	.106(19)	.497(19)*	.324(19)	.434(19)	.243(19)
Postfilm 0-1 mm	.091(19)	.468(19)*	.283(19)	.215(19)	.259(19)
Prefilm 1-2 mm	.291(19)	.362(19)	.252(19)	.280(19)	.273(19)
Film 1-2 mm	.247(19)	.691(19)****	.351(19)	.445(19)*	.345(19)
Postfilm 1-2 mm	.114(19)	.549(19)**	.045(19)	.116(19)	.233(19)
Initial SC	.901(19)	.774(19)****	-.037(19)	.200(19)	.182(19)
Final SC	.389(19)	.813(19)****	.369(19)	.383(19)	.188(19)
Last Month's Frequency•	-.089(19)	.145(19)			
Total Frequency•	-.175(19)	.139(19)	.697(73)****		
Discontinue•	-.094(19)	.088(19)	.635(73)****	.426(73)****	
Considered Meditation	-.355(19)	-.454(19)*	-.025(53)	.099(53)	-.080(53)
Considered Therapy	-.096(19)	-.057(19)	.077(60)	.162(60)	.067(60)

Table 19--Continued

Variables	Average Session Rank	Judged Impact	Follow-Up Session	Hours Anxiety Reduction Activities	Hours Therapeutic Contact
Sex	-.007(63)	.064(63)	-.172(73)	.236(73)*	-.040(73)
Age	-.359(63)***	-.047(63)	.195(73)	-.114(73)	-.088(73)
Primary Anxiety Variables					
STAI A-Trait	-.011(63)	.095(63)	.048(73)	.130(73)	.199(73)
SSMT	.062(63)	-.113(63)	-.161(73)	.076(73)	.075(73)
SAA	.013(63)	-.061(63)	-.050(73)	.130(73)	.098(73)
IPAT Anxiety Factors					
Factor O	.180(63)	-.003(63)	-.019(73)	.021(73)	.073(73)
Factor Q_4	-.105(63)	.054(63)	.104(73)	.084(73)	.114(73)
Factor C	.078(63)	-.006(63)	-.102(73)	-.098(73)	-.195(73)
Factor L	.088(63)	-.155(63)	-.032(73)	.061(73)	.137(73)
Factor H	-.216(63)	-.021(63)	-.046(73)	.053(73)	.057(73)
Factor Q_3	-.049(63)	.185(63)	.115(73)	.143(73)	.025(73)
IPAT Neuroticism Factors					
Factor I	-.256(63)*	.219(63)	.193(73)	.252(73)*	.071(73)
Factor F	-.039(63)	.148(63)	-.019(73)	-.119(73)	.000(73)
Factor E	-.211(63)	.158(63)	.053(73)	.077(73)	.150(73)
Other IPAT Factors					
Factor A	-.044(63)	.076(63)	-.082(73)	.128(73)	.066(73)
Factor B	.232(63)	-.069(63)	-.089(73)	-.070(73)	.037(73)
Factor G	-.138(63)	.004(63)	.235(73)*	.073(73)	.254(73)*
Factor M	-.086(63)	.051(63)	.252(73)*	.106(73)	.184(73)
Factor N	.053(63)	.088(63)	.097(73)	.003(73)	.065(73)
Factor Q_1	.001(63)	-.123(63)	.011(73)	.038(73)	.122(73)
Factor Q_2	-.009(63)	-.119(63)	.009(73)	-.043(73)	-.065(73)
TSCS Variables					
TSCS-TP	-.041(63)	.089(63)	.012(73)	.163(73)	.066(73)
TSCS-PSY	.191(63)	-.053(63)	-.086(73)	-.080(73)	-.052(73)
TSCS-PD	-.062(63)	.082(63)	-.042(73)	.092(73)	.073(73)
TSCS-PI	-.084(63)	-.050(63)	.008(73)	.112(73)	.034(73)
Defensive Distortion Variables					
TSCS-SC	-.068(63)	-.001(63)	.033(73)	-.018(73)	.041(73)
TSCS-DP	-.213(63)	.067(63)	-.019(73)	.045(73)	.122(73)
MCSD	-.075(63)	.034(63)	-.003(73)	-.008(73)	.043(73)
Technique Evaluation Variables					
Ranked Value•				-.050(63)	-.100(63)
Best Session Rank•				.014(63)	-.098(63)
Ave. Session Rank•				-.153(63)	-.116(63)
Judged Impact•	-.294(63)*			.154(63)	.191(63)
Follow-Up Session•	-.470(63)****	.021(63)		.021(73)	.271(73)*
Hrs. Anxiety Reduction Activities•					.218(63)
Hrs. Therapeutic Contact•					
Skin Conductance Reactivity					
Prefilm 0-1 mm	-.386(19)	.055(19)	-.037(19)	.216(19)	-.226(19)
Film 0-1 mm	-.290(19)	.292(19)	.160(19)	.193(19)	-.028(19)
Postfilm 0-1 mm	-.249(19)	.269(19)	.113(19)	-.007(19)	-.078(19)
Prefilm 1-2 mm	-.152(19)	.234(19)	.008(19)	.011(19)	-.055(19)
Film 1-2 mm	-.122(19)	.172(19)	.322(19)	-.056(19)	.168(19)
Postfilm 1-2 mm	.157(19)	.068(19)	.217(19)	-.062(19)	-.062(19)
Initial SC	.095(19)	-.114(19)	-.304(19)	.414(19)*	-.107(19)
Final SC	-.192(19)	.271(19)	.241(19)	.164(19)	.347(19)
Last Month's Frequency•	-.422(63)****	.423(63)****	.490(73)****	.025(73)	.139(73)
Total Frequency•	-.302(63)*	.410(63)****	.450(73)****	.134(73)	.276(73)*
Discontinue•	-.181(63)	.292(63)*	.360(73)***	-.015(73)	.045(73)
Considered Meditation	-.119(53)	.087(53)	-.003(53)	.092(53)	.094(53)
Considered Therapy	-.318(60)**	.055(60)	.273(60)*	.146(60)	.207(60)

Table 20. Summaries of Analyses of Variance Comparing TM, PSI, and CMS Groups on Potential Covariates

Variables	MSt	df	MSe	df	F	p <
Sex[a]	0.17	5	0.25	148	0.69	.629
Age[b]	9.34	5	16.96	129	0.55	.740
Primary Anxiety Variables						
STAI A-Trait	139.41	5	96.62	148	1.44	.212
SSMT	119.72	5	67.68	147	1.77	.123
SAA	12.56	5	93.94	147	0.13	.984
IPAT Anxiety Factors						
Factor O	76.62	5	65.29	146	1.17	.325
Factor Q_4	62.21	5	67.39	145	0.92	.468
Factor C	66.21	5	73.48	146	0.90	.482
Factor L	79.39	5	30.07	146	2.64	.026
Factor H	314.60	5	121.50	146	2.59	.028
Factor Q_3	10.98	5	34.90	145	0.31	.903
IPAT Neuroticism Factors						
Factor I	115.21	5	77.01	146	1.49	.195
Factor F	458.29	5	143.91	146	3.18	.009
Factor E	145.41	5	91.83	146	1.58	.168
Other IPAT Factors						
Factor A	80.51	5	36.37	146	2.21	.056
Factor B	9.12	5	11.01	146	0.82	.531
Factor G	5.11	5	35.46	146	0.14	.982
Factor M	26.13	5	26.68	146	0.98	.431
Factor N	24.91	5	19.35	146	1.29	.271
Factor Q_1	74.09	5	24.85	145	2.98	.014
Factor Q_2	32.48	5	42.27	145	0.76	.574
TSCS Variables						
TSCS-TP	3,171.14	5	1,228.47	142	2.58	.029
TSCS-PSY	39.96	5	72.43	142	0.55	.737
TSCS-PD	213.01	5	111.43	142	1.91	.096
TSCS-PI	9.46	5	16.01	142	0.59	.707
Defensive Distortion Variables						
TSCS-SC	25.38	5	26.09	142	0.97	.437
TSCS-DP	210.34	5	120.55	142	1.74	.128
MCSD	1.58	5	24.37	145	0.06	.997
Skin Conductance Reactivity						
Prefilm 0-1 mm[c]	50.18	3	83.96	43	0.59	.620
Film 0-1 mm	981.59	3	1,494.55	43	0.65	.583

Table 20--Continued

Variables	MSt	df	MSe	df	F	p <
Postfilm 0-1 mm	14.34	3	86.77	43	0.16	.919
Prefilm 1-2 mm	0.11	3	0.71	43	0.15	.920
Film 1-2 mm	16.36	3	47.97	43	0.34	.796
Postfilm 1-2 mm	1.49	3	2.41	43	0.61	.608
Initial SC	27.93	3	6.08	43	4.59	.007
Final SC	2.96	3	15.58	43	0.19	.902
Last Month's Frequency[d]	1,562.65	1	419.51	39	3.73	.061
Total Frequency	19,911.99	1	7,506.99	39	2.65	.112
Discontinue	0.28	1	0.21	39	0.77	.386
Considered Meditation[c]	0.16	3	0.25	107	0.65	.579
Considered Therapy	0.15	3	0.25	118	0.61	.609

[a]For this variable and the variables immediately following, six groups were compared: TM, PSI, CMS Meditation subjects obtained from the No Treatment group in Experiment I, CMS Meditation subjects newly recruited for Experiment II, CMS Anti-Meditation subjects obtained from the No Treatment group in Experiment I, and CMS Anti-Meditation subjects newly recruited for Experiment II.

[b]Pretest scores.

[c]For this variable and the variables immediately following, four groups were compared: TM, PSI, CMS Meditation subjects obtained from the No Treatment group in Experiment I, and CMS Anti-Meditation subjects obtained from the No Treatment group in Experiment I.

[d]For this posttest variable and the posttest variables immediately following, two groups were compared: TM and PSI.

Table 21. Correlations Among (1) Pretest-Posttest Difference Scores and Posttest Scores Where Only Posttests Were Given, and (2) Potential Pretest Covariates for CMS Subjects Obtained from Analyses of Variance Comparing CMS Groups on All Variables

	Potential Covariates (Pretest Scores)					
Variables	Factor H	Factor F	Factor A	TSCS-TP	TSCS-PD	TSCS-DP
Primary Anxiety Variables						
STAI A-Trait•	-.244(32)	-.133	-.053	-.235	-.165	-.185
SSMT•	-.166(32)	-.089	-.073	-.185	-.145	-.299
SAA•	-.225(32)	-.208	-.004	.022	.215	.014
IPAT Anxiety Factors						
Factor O•	-.246(32)	-.256	.036	-.163	-.187	-.046
Factor Q_4•	.106(32)	.101	-.032	.055	-.139	-.014
Factor C•	.226(32)	.198	-.113	.123	.067	-.036
Factor L•	-.208(32)	-.177	-.242	-.077	.007	-.037
Factor H•	.534(32)***	.243	.043	.164	.014	.013
Factor Q_3•	.006(32)	.083	-.025	.028	-.029	-.031
IPAT Neuroticism Factors						
Factor I•	.022(32)	.180	.234	-.095	-.007	-.004
Factor F•	.323(32)	.253	-.017	-.166	-.272	-.300
Factor E•	.152(32)	-.110	.022	-.213	-.412*	-.219
Other IPAT Factors						
Factor A•	.207(32)	.369*	.396*	.207	.281	.226
Factor B•	.135(32)	.075	-.013	-.029	-.079	.200
Factor G•	-.010(32)	.029	.164	-.334*	-.243	-.243
Factor M•	.234(32)	.078	.153	-.151	-.355*	-.212
Factor N•	-.100(32)	.137	-.117	.157	.211	-.054
Factor Q_1•	-.025(32)	.019	.010	-.112	.051	-.054
Factor Q_2•	-.089(32)	-.192	-.093	-.098	.050	.323
TSCS Variables						
TSCS-TP•	.264(32)	.006	.133	.116	.124	.077
TSCS-PSY•	.245(32)	.271	.218	.023	.154	.168
TSCS-PD•	-.070(32)	-.176	.063	-.062	.219	-.162
TSCS-PI•	.358(32)*	-.034	.110	.031	-.119	.120
Defense Distortion Variables						
TSCS-SC•	-.180(32)	-.271	.023	-.112	-.146	-.110
TSCS-DP•	.245(32)	-.143	.095	.015	.027	.078
MCSD•	.030(32)	.098	.095	-.059	-.045	.019
Technique Evaluation Variables						
Ranked Value	-.375(25)	-.290	-.280	-.167	-.049	-.374*
Best Session Rank	-.432(25)*	-.326	-.295	-.385*	-.304	-.494***
Ave. Session Rank	-.332(25)	-.232	-.180	-.067	.130	-.149
Judged Impact	-.173(25)	.069	-.167	.002	.110	-.103
Follow-Up Session	.307(32)	.251	-.108	.147	.061	.117
Last Month's Frequency	.088(32)	.008	-.294	.105	.091	.319
Discontinue	-.134(32)	-.179	-.237	.120	.213	.059

[a](= N) for all entries across table for that variable.

•Pretest-posttest differences.

*$p < .05$.

***$p < .005$.

Footnotes for Table 22

[a]For this variable and the variables immediately following, four groups were compared: CMS Meditation subjects who were in the No Treatment condition in Experiment I, CMS Meditation subjects who were not in the No Treatment condition in Experiment I, CMS Anti-Meditation subjects who were in the No Treatment condition in Experiment I, and CMS Anti-Meditation subjects who were not in the No Treatment condition in Experiment I.

[b]This and all following comparisons are based on pretest scores obtained in March.

[c]For this and the immediately following variables two groups were compared: all CMS Meditation subjects, and all CMS Anti-Meditation subjects.

[d]For this and the immediately following variable, two groups were compared: CMS Meditation subjects who were in the No Treatment condition in Experiment I, and CMS Anti-Meditation subjects who were in the No Treatment condition in Experiment I. Data from other subjects were not available.

Table 22. Summaries of Analyses of Variance Comparing CMS Groups on Potential Covariates♦

Variables	MSt	df	MSe	df	F	p <
Sex[a]	0.23	3	0.25	50	0.93	.431
Age	15.28	3	21.66	37	0.70	.555
Primary Anxiety Variables						
STAI A-Trait[b]	232.05	3	103.86	50	2.23	.096
SSMT	100.65	3	77.69	49	1.29	.287
SAA	8.95	3	97.31	49	0.09	.964
IPAT Anxiety Factors						
Factor O	107.35	3	72.43	50	1.48	.231
Factor Q_4	61.01	3	56.65	50	1.08	.367
Factor C	96.01	3	95.74	50	1.00	.399
Factor L	27.41	3	31.41	50	0.87	.462
Factor H	395.42	3	134.41	50	2.94	.042
Factor Q_3	15.35	3	35.22	50	0.43	.728
IPAT Neuroticism Factors						
Factor I	127.41	3	83.30	50	1.53	.218
Factor F	414.72	3	131.26	50	3.15	.033
Factor E	90.47	3	111.13	50	0.81	.492
Other IPAT Factors						
Factor A	131.30	3	36.88	50	3.56	.021
Factor B	4.51	3	11.92	50	0.38	.769
Factor G	1.43	3	33.64	50	0.04	.988
Factor M	26.03	3	27.27	50	0.95	.421
Factor N	15.74	3	14.98	50	1.05	.378
Factor Q_1	7.85	3	29.51	50	0.26	.850
Factor Q_2	26.67	3	44.24	50	0.60	.616
TSCS Variables						
TSCS-TP	3,595.25	3	1,202.94	47	2.98	.040
TSCS-PSY	48.89	3	45.99	47	1.06	.374
TSCS-PD	250.50	3	97.43	47	2.57	.065
TSCS-PI	4.79	3	16.91	47	0.28	.837
Defensive Distortion Variables						
TSCS-SC	7.33	3	22.07	47	0.33	.802
TSCS-DP	237.99	3	94.17	47	2.53	.069
MCSD	2.22	3	21.92	48	0.10	.959
Last Month's Frequency[c]	313.50	1	222.97	30	1.41	.245
Total Frequency	2,979.86	1	2,234.75	30	1.33	.257
Discontinue	0.21	1	0.08	30	2.63	.116
Considered Meditation[d]	0.01	1	0.26	21	0.06	.806
Considered Therapy	0.37	1	0.25	22	1.97	.237

♦See facing page for footnotes.

APPENDIX K

MEANS AND STANDARD DEVIATIONS FOR TM, PSI, CMS MEDITATION, AND CMS ANTI-MEDITATION GROUPS ON FREQUENCY OF PRACTICE VARIABLES

APPENDIX K

Table 23. Means and Standard Deviations for TM, PSI, CMS Meditation, and CMS Anti-Meditation Groups on Frequency of Practice Variables

	TM		PSI		CMS Meditation		CMS Anti-Meditation	
	M	SD	M	SD	M	SD	M	SD
Last Month's Frequency	29.89	22.95	17.05	19.01	30.17	10.38	25.23	16.04
Total Frequency	173.50	86.84	123.05	82.97	119.08	37.18	102.00	39.48
Discontinue	1.83	0.38	1.60	0.50	2.00	0.00	1.92	0.28

APPENDIX L

EPSTEIN-FENZ MANIFEST ANXIETY SCALE ITEMS FOR SYMPTOMS OF STRIATED MUSCLE TENSION AND SYMPTOMS OF AUTONOMIC AROUSAL

APPENDIX L

EPSTEIN-FENZ MANIFEST ANXIETY SCALE ITEMS FOR SYMPTOMS OF STRIATED MUSCLE TENSION AND SYMPTOMS OF AUTONOMIC AROUSAL

Symptoms of Striated Muscle Tension

1. I have sensation of burning, tingling, or crawling in certain parts of my body.
2. I have trouble getting my breath, for no special reason.
3. I clench my teeth when anxious.
4. My skin becomes painfully sensitive.
5. I grind my teeth in my sleep.
6. I am troubled by tension interfering with my speech.
7. I have pressure headaches in which my head feels as if it were caught in a vise or as if there were a tight band around it.
8. I have trouble with my hand shaking while I write.
9. I have pains in the back of my neck.
10. I am troubled with backaches.
11. My hand shakes when I try to do something.
12. My head feels tender to the point that it hurts when I comb my hair or put on a hat.
13. The muscles in my neck ache as if they were tied in knots.
14. I have trouble with muscles twitching and jumping.
15. I have a hard time swallowing.

Symptoms of Autonomic Arousal

1. I feel chilly in temperatures that are comfortable for others.
2. I am either too hot or too cold and cannot get comfortable at a constant temperature setting.
3. My mouth feels dry.
4. I have pounding headaches in which I can feel a definite beat.
5. I am troubled by discomfort in the pit of my stomach.
6. I notice my heart pounding.
7. I am bothered with blushing.
8. My finger tips or other extremities become cold.
9. When embarrassed, I break out in a sweat.
10. I break out in a sweat which is not the result of heat or physical exertion.
11. I am troubled with diarrhea.
12. I suddenly feel hot all over, without apparent cause.
13. In the absence of physical action my heart beats wildly.
14. I have stomach trouble.
15. I am bothered by dizziness.

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