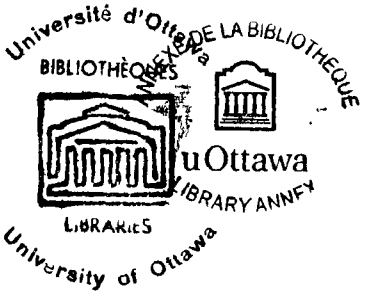
The Effects of Transcendental Meditation on Dream Content

Keith A. Busby

Thesis presented to the School of Graduate Studies
of the University of Ottawa as partial fulfillment
of the requirements for the degree of Master of Arts.



Ottawa, Canada, 1977

Canada, 1977

ACKNOWLEDGEMENTS

This thesis was prepared under the supervision of Joseph M. De Koninck, Ph.D.. Gratitude is expressed to him for his assistance and encouragement during the long course of the study.

The author is also thankful to Professors Charles McInnis, Ph.D. and Lawrence Dayhaw, Ph.D. for their valuable statistical advice. Thanks are extended to Mr. Edwin Achorn for his aid in the setting up of the computer programme. Additional assistance was rendered by Mr. Tom Healey and Mr. Jagdish Maru in preparing the laboratory facilities. Gratitude is also due to Mrs. Yolande Cyr and Mrs. Danielle Laperle-Ackerman for the arduous scoring of many dreams. Finally, the author is indebted to his wife, Janet, for her patience, encouragement, and chauffeuring to the lab each night.

The author benefitted from, and the research was supported by, a grant from the Rector's Research Fund (University of Ottawa).

CURRICULUM STUDIORUM

Keith A. Busby was born October 4, 1951, in Calgary, Alberta. He received the Bachelor of Arts (Honours) degree from Brock University, St. Catharines, Ontario, in 1974. The title of his honours thesis was, Content Analysis versus Psychodynamic Approaches to Dreams.

ABSTRACT

The Effects of Transcendental Meditation on Dream Content

Keith A. Busby

University of Ottawa

Previous research has indicated that within a relatively short period of time (4 weeks), meditation (TM) can influence a number of psychological variables by augmenting positive factors and reducing those that are negatively-toned. In the present study, it was hypothesized that TM would lead to psychological change and be more efficient in this respect, than a common relaxation technique. Following the continuity notion, whereby dreams reflect current waking behavior, it was further postulated that the meditation-induced psychological change would, by extension, induce corresponding alterations in dream content.

A number of dream content (Hall & Van de Castle scales), mood, and psychological (STAI, 16 PF) measures evaluated this notion using a pretest-posttest experimental design. Seven subjects were exposed to TM while six subjects learned progressive relaxation. The relaxation group served to control for the relaxation component of meditation.

The design consisted of initial pre-treatment laboratory dream collection (two nights), followed by a five week exposure period to their respective techniques during which home dreams were collected. Following the five week practice interval, subjects returned for two more nights of laboratory dream collection, after which, subjects terminated their respective techniques and collected home dreams for another five week period.

Contrary to the proposed hypothesis, results did not support previous findings that TM induces significant psychological change nor did relaxation produce an effect. Following these lines, negative findings were also obtained with respect to the predicted dream content measures. Possible explanations are given for these negative results.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Since recorded history began, man has been fascinated by the subjective experience of dreaming. This has been reflected in the many varied explanations and importance ascribed to this peculiar phenomenon. The oldest dream book dates back to the twelfth Egyptian dynasty, about 2000-1790 B.C. (cited in Boss, 1958). Numerous mentions of dreams are recorded in the Bible, the most notable being the dreams and dream interpretations of Joseph, who provided explanations to the Pharaohs. During this time, dreams were thought to be divinely controlled, such that they had the capacity to determine the fortunes of individuals, armies, and even whole countries. Many more examples are evident in the works of Homer, the Iliad and the Odyssey.

It was during the time of Plutarch and Aristotle that the divine nature of dreams first came to be questioned. By the fifth century B.C., dream booklets and tablets were prevalent. These references served a prophetic function; the future being specified by looking up elements that had occurred in the dream. Prior to this era, dreams were seen as coming from natural sources. It was Aristotle, who first stated that dreams were the result of man's own nature and were merely a form of thinking. He suggested that dreams originated from the wants, feelings, experiences, and internal biological processes of the individual. This was the first mention made of a possible relationship existing between dreams and waking life. In addition, this provided an explanation which first hinted at the psychological relevance of dreaming, by postulating the potential internal and external

influences on dream content. Interest in dreams waxed and waned during the next long interval of history. By the latter portion of the nineteenth century, the varying stimuli thought to be associated with dream content sources were more fully expounded upon. These were thought to be: 1) manifestations of somatic stimuli or external sense impressions; 2) due to internal sensory impressions; 3) a result of internal (organic) somatic sources; and 4) of purely psychic origin (Freud, 1965).

The specific function of dreams has been a long and continuing controversy, stretching from antiquity to the present day. Freud (1953) categorized approaches to this controversy, into three groups of theoretical importance. Many of the nineteenth century theorists thought that dreams were merely the extension of waking life and for that reason, they essentially held little or no psychological meaning. Others held the opposite view, that an individual's dream life was completely separate and cut off from normal waking consciousness. In this way, dreams provided a recovery or compensatory function in the processing of daily activity. Lastly, the most prominent and widely held view of dreaming just prior to Freud, regarded dreams as the result of progressive degrees of waking. Thus, the variations in dream content could be accounted for, by these levels of consciousness. This theory attributed no psychological causation for dreams, since they were characterized as epiphenomenal to somatic processes.

These preceding theories set the stage for what is usually regarded as the most influential work on dreams. This was Freud's book (1965, originally published in 1900) on The Interpretation of Dreams. This monumental work

presented a theory of the psychological function of dreaming, which in essence, labelled dreams as disguised expressions of unconscious, infantile wishfulfillments. Residues from events occurring during the previous day serve as vehicles to which latent wishes become attached. Through the "dream-work", using such processes as condensation, displacement, symbolism, and secondary revision, the latent content could be expressed, thus leading to drive discharge. Therefore, in order to reveal the underlying latent content, a dream interpretation process consisting of the method of "free association" had to be initiated. This conceptualization of the function of dreaming influenced many subsequent dream and personality theorists and with some modifications, was assimilated by a number of them (eg. Adler, 1936; Hall, 1966; Jung, 1960; Erickson, 1954).

It is important to mention the historic development of the correlation between dreaming and rapid eye movements (REMs). Aserinsky and Kleitman (1953) first made the discovery that cyclically recurring periods of conjugate rapid eye movements occurred during sleep. To this was added another major finding, that of an association between the presence of REMs and intense, vivid, hallucinatory-like mentation (Dement & Kleitman, 1957). Through the objective identification of concrete physiological indices, a systematic investigation of the nature and function of dreams has been made possible. Dreams could therefore be tapped and the contents examined, by awakening subjects during REM periods. Through the use of this method, researchers have attempted to experimentally modify dream content by manipulating various

stimuli (eg. hypnotic suggestion, drugs, external and internal stimulation during sleep, and presleep conditions). To date, this has only been moderately successful.

The functional role of dreams however, has still remained largely at the speculative level. Recently, the function of dreams has been extended to include a group of theories subsumed under the role of providing "environmental mastery" (Dallett, 1973). This has been viewed from three distinctive perspectives: 1) problem solving; 2) information processing; and 3) ego consolidation. Assimilation of new input is matched to relevant aspects of past experience. This contemporary approach suggests that dreams aid the individual by providing an adaptive mechanism.

During the past decade, a new interest in self-induced, non drug-oriented altered states of consciousness has arisen. This has been brought about by, partially as a result of, an increasing concern with the effects of a highly industrialized, technological society with its high-paced, stressful life style. Allegedly, these altered states of consciousness have been reported to be of benefit in being able to deal effectively with tension and stress, thus, improving physical and mental health. These various states have been experienced via techniques which produce the relaxation response (Benson, Beary & Carol, 1974). In order to elicit the response, the following four criteria are necessary: 1) a mental device eg. a sound, word, or phrase; 2) a passive attitude; 3) decreased muscle tonus; and 4) a quiet environment. Thus, a number of Eastern or related, meditation techniques such as

Zen, Yoga, and Transcendental Meditation (TM), as well as the various types of relaxation training, eg. Progressive Relaxation and Autogenic Training qualify and are subsumed under the "relaxation response".

Since recently published research has shown that the above mentioned techniques appear to produce psychological as well as physiological changes in the individual (eg. Wallace, 1970; Wallace, Benson & Wilson, 1971; Goleman, 1971; Seeman, Nidich & Banta, 1972), the primary aim of the present study was to explore the possibility that these changes would be reflected in dream content. For this reason, dream content was compared before and after training in two subject groups. The experimental group was exposed to TM (Maharishi Mahesh Yogi, 1968), while the control group learned relaxation training (Jacobson, 1938). In this context, the relationship between dreams, waking behavior and personality was examined. Since a certain degree of correspondence seems to exist between what a person dreams about, and his thoughts and behavior during wakefulness, it was hypothesized on the basis of the continuity notion that changes in the waking state would be reflected in the dreams. Within the framework of dream function, this would be most consistent with ego consolidation as part of the environmental-mastery theory.

In chapter I, the physiological and psychological bases of the meditation and relaxation techniques as well as the theories concerning the function of dreams are reviewed. The procedure and method used in the experiment are presented in chapter II, the results in chapter III and the discussion in chapter IV. Chapter V contains the conclusion.

CHAPTER I

Review of the Literature

Up until quite recently, only anecdotal and subjective reports existed concerning the physiological and psychological effects of meditation (eg. Blair, 1970; Tart, 1971; Robbins & Fisher, 1972). However, a new meditative technique known as Transcendental Meditation (TM) has been introduced and adapted to the Western world by Maharishi Mahesh Yogi (1968), which enables the newly-initiated to practice it without drastic changes in life style. This has led to a rapidly growing membership. A short "induction period" is all that is required in order to become a highly proficient meditator, thus making large groups of meditators readily available for research purposes. Logically, one of the first scientific approaches to this new technique, was to test some of the assertions related to its physiological effects.

Studies concerning the physiology of TM were first reported by Wallace (1970) and Wallace, Benson and Wilson (1971). Their results showed decreases in oxygen consumption, carbon dioxide elimination and heart rate; decreases in mean blood lactate concentration; marked increase in skin resistance; and electroencephalographic (EEG) changes (increase in slow alpha wave intensity with periodic theta activity). These changes were apparently greater than those commonly seen during sleep or hypnosis and were, therefore, postulated to underly a qualitatively as well as a quantitatively different state of

consciousness. Wallace (1970) labelled this as a "wakeful, hypometabolic state", in which TM induced a deep state of relaxation accompanied by mental alertness. Maharishi Mahesh Yogi (1968) claims that practicing this technique serves to release "pockets" of accumulated stress and thereby leads to a stabilizing or balancing of sympathetic and parasympathetic activity. Since these initial investigations, several additional studies have been reported to substantiate the original observations (eg. Allison, 1970; Banquet, 1972; Orme-Johnson, 1973).

It has long been known that the sympathetic and parasympathetic nervous systems induce different changes in somatic processes, often accompanied by varying mental content (eg. Cannon, 1941; James, 1896). Sympathetic arousal is most commonly associated with the "fight-or-flight" response, when autonomic indices (eg. respiration, heart-rate, blood pressure etc.) show elevated activity. Opposite to this response of heightened arousal is that induced by the parasympathetic system, whereby autonomic correlates are decreased. In essence then, these results regarding the physiology of meditation, have indicated that meditation probably represents decreased activity from the sympathetic nervous system and possibly increased parasympathetic activity (Benson, Beary & Carol, 1974).

Meditation has also been reported to have beneficial influences on psychological or cognitive processes (eg. Goleman, 1971; Seeman, Nidich & Banta, 1972). The effects of TM, as evidenced by many subjective reports provide a basis for positive psychological change. These include better performance in both work and academic settings, feelings of inner stability and ability to cope, changes in the quality of sleep, reduction in anxiety,

and decreased drug use (Bloomfield, Cain & Jaffe, 1975; Albert & McNeece, 1974; Kanellakos & Lucas, 1974; Robbins & Fisher, 1972, Tart, 1971). These self-reports seem to cover a wide range of effects which manifest themselves in a generalized fashion.

A number of investigations have examined this "meditation effect" through the use of varied psychological tests. For example, Seeman, Nidich and Banta (1972) administered the Personal Orientation Inventory (POI - Shostrom, 1966) to a group of beginning meditators and to a control group of non-meditators. Following a test-retest experimental design in which the POI was given before meditation and again two months later, they found that meditators differed significantly from the control group on a number of subscales. Meditators appeared to be more inner directed, had increased positive self-regard, were more accepting of aggression within one's self, had increased spontaneity, and had more of a capacity for intimate contact (self-disclosure). Since the POI is said to reflect the degree of "self-actualization", meditators appeared to manifest trends toward this. In a replication of this study using the same psychological test employed within a test-retest design, Nidich, Seeman, and Dreskin (1973) showed that significant differences existed between experimental and control groups in the direction of increased self-actualization.

Fehr, Nerstheimer, and Torber (1973), in administering the Freiburger Personality Inventory to a group of over 1000 TM teachers, found them to be less nervous, less aggressive, less depressed and less irritable, while being more sociable, more self-assured, and more outgoing. In a study

conducted by Ferguson and Gowan (1976), an attempt was made to assess whether TM reduces negative personality traits and increases positive personality characteristics. Utilizing the Northridge Developmental Scale developed by Gowan, this test was composed of a major scale which measured "self-actualizing value" as in the POI, and in addition, consisted of three subscales measuring aggression, depression, and neuroticism. Subjects were assigned to one of three groups: 1) a control group which met once weekly in an encounter group setting, 2) experimental group I containing beginning meditators, (6½ weeks experience) and 3) experimental group II composed of long-term meditators (average 43 months). Results indicated that significant changes had taken place towards increased mental health as evidenced by differences between short- versus long-term meditators, differences between pretest and post-test scores in short-term meditators, and no changes from pre- to post-test in the control group. Meditators became more self-actualized, were less aggressive, less depressed, and less neurotic compared to control subjects.

In dealing with normal daily events, a certain amount of stress is imposed upon the individual. This is manifested primarily in the form of anxiety. Since TM purports to alleviate stress and more specifically, anxiety, several studies have focused upon anxiety measures as dependent variables. In the study mentioned directly above (Ferguson & Gowan, 1976), the Cattell Anxiety Scale and the Spielberger State-Trait Anxiety Inventory were also administered. Significant decreases in anxiety on both tests were exhibited by meditators versus control Ss. In addition, long-term meditators were less anxious than short-term meditators.

Following these same lines, Davidson, Goleman and Schwartz (1976) investigated trait anxiety in meditators (mixture of TM, Zen, & Buddhist techniques) of varying practicing intervals (1 month, 1-24 months, and greater than 24 months) versus a control group of non-meditators. Results revealed a highly significant linear decrement in trait anxiety from controls to long-term practitioners.

Orme-Johnson, Authur, Franklin, O'Connell, and Zold (1974) examined the responses to the MMPI (before and after 10 weeks) of an experimental group exposed to TM and a control group who did not learn the technique. Meditators showed significant decreases in manifest anxiety, hypochondria, and personality disorder. Kjelle (1974) administered a modified version of the Taylor Manifest Anxiety Scale to a group of regular meditators and to beginning meditators, with the result that long-term practitionners displayed less anxiety. In this same study, the Rotter internal-external locus of control scale as well as the POI were also given. Regular meditators scored lower on locus of control (ie. were more internally-controlled) and scored significantly higher on seven of the twelve Shostrom scales. These results further replicated findings reported earlier. Similar results were gained, with respect to decreased anxiety, by Ballou (1973) using the Spielberger State-Trait Anxiety Inventory over a ten-week period with a prison sample, and by Boese and Berger (1974), using verbalized hostility and anxiety responses to the TAT, over a six week interval of meditation practice.

In a recent investigation conducted by Goleman and Schwartz (1976) using a elaborate experimental design, an attempt was made to show how the practice of meditation (TM) aids one in coping with stress. This study involved the placement of meditation between an initial threat cue and the actual stressor. In this way, an assessment could be made as to the utility of meditation in alleviating stress reactivity. The experimental group consisted of meditators (> 2 years experience), while the control conditions were composed of subjects interested in TM but who did not practice the technique and who relaxed with either eyes open or closed. The threat cue constituted signing a consent form, warning Ss about the nature of a stressor film and the physiological measurements (GSR, HR) to be made. The stressor consisted of a film depicting three shop accidents. Subjects filled out adjective checklists reflecting present affect and the state-form of the STAI before the experiment began. The procedure involved four periods: an initial baseline period for autonomic measurements; a 20-minute meditation period; a 5-minute post-meditation rest; and finally, viewing of the stressor film. Following the film, the Activity Preference Questionnaire (APQ - Lykken & Katzenmeyer, 1960), the STAI (Spielberger, Gorsuch & Lushene, 1970) and the Eysenck Personality Inventory (Eysenck & Eysenck, 1968) were filled out. With respect to the autonomic variables, meditators responded with greater initial arousal to the film, but then recovered more rapidly than the control Ss. Results on the

personality variables also indicated that meditators exhibited less affect as evidenced by less anxiety-proneness (APQ), less state anxiety and lower trait anxiety (STAI), and were significantly less neurotic (EPI). This study then, served to confirm that meditation had a significant contribution to make as a stress intervention. The state effects of meditation appeared to generalize into more stable traits which affected meditators' reactivity to threat. This was manifested primarily by a more rapid recovery phase following exposure to stress.

Thus, based on preliminary studies, support has been gathered for the notion that meditation seems to influence a number of global as well as specific psychological dimensions by decreasing more negatively-toned aspects and facilitating positive domains. These effects appear to manifest themselves within a relatively short period of time (4-10 weeks) (Smith, 1975).

Function of dreams

The controversy surrounding the function of dreams is still of major concern amongst sleep and dream theorists. Although man has had a long history of interest in dreams dating from the Egyptian dynasties, a single specific purpose for dreams within the context of man's psychology has not been universally accepted. Of course, the most prominent theorist to expound upon this consuming interest was Freud. He proposed that dreams served two functions: 1) to reduce instinctual drives via the disguised, symbolic expression of repressed infantile wishfulfillments; and 2) to

serve a biological function involving preservation of sleep. Even though many aspects of this formulation are problematical from an empirical point of view, Freud still provided a sound theoretical foundation from which many contemporary approaches originate.

A number of authors (eg. Ullman, 1959; French & Fromm, 1964; Breger, 1967; Jones, 1970; Greenberg, 1970; Pearlman, 1970; Greenberg & Pearlman, 1975) have extended the notions of Freud that dreams serve to reintroduce events of psychological trauma back into the forefront of consciousness. Therefore, dreams would function within an adaptive role when the individual is confronted with novel experiences and stress. This group of investigators views dreams as extensions of waking behavior and in some way, aid the individual in controlling his relationship to the environment (Dallett, 1973). Dallett proposed that expression of environmental mastery is achieved from three possible perspectives: 1) problem-solving; 2) information processing; and 3) ego consolidation.

The problem solving model is exemplified by such writers as Adler (1936), Ullman (1959), Pearlman (1970), and Breger (1969). Adler (1936) proposed that dreams reflect the waking idiosyncratic features of an individual's life. Within this context, dreams operate by resolving reality problems associated with emotional arousal and direct the dreamer towards their appropriate solution. Ullman (1959) extended this notion by suggesting that dreams facilitated adaptation by linking current concerns to pertinent past experiences. By allowing relevant dream conscious symbolism to play a part in

problem solving, this would lead to more effective solution than that which might be applied by waking thought alone. Breger (1969) applied the problem solving model to children's dreams by arguing that dreams aid in mastering emotional problems. Through fantasy during play and dreaming, "fantasy programs" emanate to produce original solutions. Pearlman (1970) postulated that during sleep as opposed to wakefulness, similar cognitive functions are in operation, but a different process is occurring. A distinction is made between "intellectual and emotional insight" in that, perceiving a problem solution is differentiated from internalizing or making the solution part of oneself. In essence then, dreams fulfill a role of "emotional assimilation" to the problem solving function.

Researchers which include Breger (1967), Greenberg, (1970), Shapiro (1968), and Hawkins (1966) have hypothesized psychologically oriented information processing models. Breger (1967) proposed that dreams reflect "present affectively arousing problem situations". This material is matched to events, which have occurred in the past, that have effectively dealt with previously similar problems. Within this framework, dreams are much more adept for handling affectively-laden conflict since the memory storage of information input is more accessible, associational processes are much more flexible, conventional societal standards are minimally present, and variability of symbol manipulation is increased (Dallett, 1973). Shapiro (1968) postulated that an external reality model is approximated through the process of dreaming. If inconsistencies exist, then this brings about corresponding changes in various personality and behavioral spheres. New input is being continually tested, during both waking and sleep, against present and past experiences with respect to how future actions should be

considered. Finally, Hawkins (1966) suggests that like Greenberg (1970), dreams provide secretarial duties which involve sorting, categorizing, and classifying new input of an affective nature. This allows new information to be assimilated so that adaptation can be as efficient as possible within the context of possible coping strategems presently available to the individual.

The last perspective to be discussed as it relates to the environmental mastery function, is that of ego consolidation. Erikson (1954) postulated an "identity-preserving function of the dream". Jones (1970) has extended this view by suggesting that the dream serves an ego synthesis role, by allowing "nuclear crises resolution". In this way, ego continuity is maintained by the interrelationship and integration of new information to past experiences. Within a Piagetian mode, Jones proposed that dreams represent "assimilation" of current experiences. In Piaget's theory, the equilibration function consists of two compensatory processes; one involving assimilation which refers to the level of interaction between an individual and the environment with respect to the individual's current structures and the other, being accommodation which is the alteration and modification of an individual's structures in response to demands from the environment. Jones suggested that dreams reestablish this balance between these two processes by furnishing compensatory assimilation. This would occur in situations where predominant accommodation is present, ie., when an individual is faced with new or novel experiences. In extending this notion, Witkin (1969)

postulated that as a dream progresses, the dreamer's status relative to some problem is enhanced. This presumably corresponds to increased mastery of the situation. Ego development seemed to be reflected in the degree of active participation by the dreamer in the dream.

Rossi (1972) views dreaming as an essential part of the growth process in personality. Evidence is consistent with the "psychosynthetic" property of dreams, which quite often, accurately reflects attempts to cope with stress and personality disturbances (eg. traumatic war neurosis, depression, etc.). In other words, dream function is a constructive process, where novel and more differentiated psychological structures are produced to enable the individual to both adapt and cope. Dreaming (REM state) seems essential for the maintenance of personality and learning, since when individuals are deprived of this phenomenon, drastic breakdowns occur within these spheres (eg. Dement, 1960). Within this framework, dreaming "has a synthetic function in maintaining the growth and stability of the ego" (Rossi, 1972, p. 126).

In developing a hypothesized relationship between meditation and dream content, reference was made earlier to the reported modifications in several personality variables after practice (eg. reduced anxiety, increased self-actualization, etc.). Since these alterations tend to produce almost immediate state effects, meditation should, upon increased exposure, tend to become associated with relatively more permanent trait effects. This would, according to psychological theory, lead to new configurations among already existing personality structures as well as establishment of new ones, in order to deal more effectively with environmental demands.

Since many dream theories postulate a continuity between waking behavior (current concerns) and dream content, it was hypothesized that with exposure to meditation, the resulting modifications in personality and behavior should also be reflected in dream content. That is, dream content would correspond to consonant changes in psychological structures and patterns of behavior. To date, only one study has been reported (Albert & McNeece, 1974) which investigated sleep and dream characteristics after meditation (similar to TM) training in a female sample. However, specific dream content was not studied, but instead, a self-report questionnaire tapped the relevant variables. These researchers found that with respect to dreaming, meditators reported more often that dreams provided a problem-solving function, that they enjoyed their dreams, and dreamed more often per night than non-meditators. The non-meditation group, on the other hand, reported more dreams with negative affect, more dreams of being chased, more sexual dreams, and more repetitious thematic content than meditators.

In attempting to assess the effectiveness of meditation in being able to influence psychological variables and indirectly, dream content, it was not known whether a cognitive component (viz. the mantra in TM) or a somatic component (relaxation) is responsible for these changes. Therefore, in order to control for the possibility that the somatic or physical portion of meditation might influence the changes, a control group of subjects was taught a somatic relaxation technique (Jacobson, 1938). An extension of this notion is that because meditation is more cognitively-oriented, this would have a more direct and rapid effect on psychological elements than would a somatically-oriented technique. In addition, to control for initial group differences (eg. experienced meditators versus non-meditators) subjects served as their own controls, ie. pre-treatment variables were

A number of studies support the notion that relaxation training reduces physiological indices of arousal. It was Jacobson's contention that the majority of stress is manifested through anxiety, and since anxiety and relaxation produce two differing and opposite physiological states, they cannot exist simultaneously. The following physiological variables have been shown to change in response to relaxation training: lower level of EMG activity (Mathews & Gelder, 1969; Reinking & Kohl, 1975; Janda & Cash, 1976), lower frequency of skin conductance activity (Mathews & Gelder, 1969), lower heart and respiratory rates (Jacobson, 1938; Paul, 1969; Burns & Ascough, 1971). Therapeutic relaxation training has been extensively used within the context of systematic desensitization (Wolpe, 1958), autogenic training (Luthe, 1963) and biofeedback (Stoyva & Budzynski, 1973). Corresponding psychological changes have been noted by several researchers, but these have been limited to psychiatric samples and to relatively immediate state effects on anxiety as a dependent variable (eg. Janda & Cash, 1976; Stoudenmire, 1972; Johnson & Spielberger, 1968).

To conclude this review, Goleman (1971) postulated that meditation represents a meta-therapy, whose goals are of a much more global nature than that normally encountered with conventional therapies. Meditation is analogous to systematic desensitization in that muscle relaxation training, an anxiety hierarchy, and graduated pairing via mental imagery with the induced relaxation state, are all inherent in this technique. The only real difference existing, is that the whole contents of consciousness

represent the "desensitization hierarchy". Total past experience becomes available, so that self-observation as part of an "inner feedback system" will make behavioral change optimal. Therefore, with respect to dream content, it was hypothesized that meditation would produce more cognitive changes with respect to waking psychological variables and consequently, dream content would reflect this. Along these lines, it was postulated that dream content variables of a negative nature (eg. anxiety, aggression, failure, etc.) would be attenuated, while more positively-toned aspects (eg. friendliness, success, etc.) would be enhanced after a period of exposure to meditation. In addition, it was further predicted that upon cessation of this practice, the relevant variables would revert back toward near pre-treatment levels. The present study made the following predictions concerning personality variables, mood, and dream content:

Personality Variables: following a period of practicing TM, it was hypothesized that decreases in state and trait anxiety (Spielberger et al., 1970) would occur. Using the Sixteen Personality Factors (16 PF) test, it was predicted that decreases would be exhibited with regard to guilt proneness (worrying), ergic tension, and anxiety, while there would be increases in affectothymia (outgoing), ego strength, and spontaneity.

Presleep Mood: decreases in negatively-toned mood such as aggression, anxiety and depression, while an increase in social affection, were predicted to occur.

Laboratory Dreams: from pre-treatment to post-treatment the following dream content dimensions were expected to decrease: aggression, failure, misfortune and anxiety. In contrast, increases in friendliness, success, good fortune, fantasy elements related to personal life, and participation were hypothesized.

Laboratory Dream Mood: similar predictions to those of presleep mood were made, ie., decreases in aggression, anxiety, and depression and an increase in social affection were expected.

Home Dreams: when home dreams from two 5-week periods (treatment versus no-treatment) are compared, the following dream content dimensions should exhibit decreases: friendliness, success, good fortune, fantasy elements related to personal life and participation, while increases should be observed in aggression, failure, misfortune, and anxiety.

CHAPTER II

Methodology

Design of the Study

A split-plot factorial design with repeated measures in which subjects (N=16) were assigned serially to one of two treatment conditions such that each group contained eight subjects, was used. All Ss went through the following regimen. Ss spent three non-consecutive nights in a sleep laboratory (one adaptation night and two dream collection nights) where electroencephalographic, electrooculographic, and electromyographic data were recorded throughout the night. Following the first laboratory session, each S was exposed to one of two treatment conditions, either meditation or relaxation training. Each S then practiced the assigned technique for a period of five weeks, whereupon, he returned to the sleep laboratory for another three non-consecutive nights (one adaptation and two dream collection nights using identical physiological recording methods). Following the second laboratory session, each S was asked to stop practicing his assigned technique for another five week period. During both of these five week intervals, a home dream record was kept by each S. This design enabled comparisons to be made between dreams collected in the laboratory (pre-treatment versus post-treatment) and between dreams collected at home (treatment versus no-treatment). Table 1 gives a summary of the design of the study.

Table 1

Design of the Study

Meditation Group (N=8)	First Laboratory Dream Collection	Treatment Condition for five weeks (Home Dream Collection)	Second Laboratory Dream Collection	No Treatment for five weeks (Home Dream Collection)
Relaxation Group (N=8)	First Laboratory Dream Collection	Treatment Condition for five weeks (Home Dream Collection)	Second Laboratory Dream Collection	No Treatment for five weeks (Home Dream Collection)

Subjects

Subjects were male, undergraduate volunteers solicited from an introductory psychology course at the University of Ottawa. They ranged in age from 17 to 29 (mean 20.6 years). An initial interview took place, which included administration of the MMPI, to determine Ss who were free from physical and psychological disabilities. A questionnaire was also administered to determine those Ss who had a relatively high rate of spontaneously recalled dreams over a previous two week period (Cohen, 1972). This enabled an optimal number of dreams to be collected during the two five week intervals of home dream recall. Sixteen Ss were asked to participate in a "sleep and dream" study. One or two days prior to reporting to the sleep lab for the first session, each S was administered the 16-PF Personality Test (Cattell & Eber, 1967) and the Spielberger State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970). These two tests were again given just prior to the second laboratory session, that is, after five weeks of the treatment condition.

Procedure

The following procedure was applied to all Ss. On night 1, S reported to the sleep lab three-quarters of an hour before bedtime. The general procedure of the experiment was again explained, while electrodes were being attached. There were no experimental awakenings during the first night as this was used for adaptation purposes.

On night II, the dream collection procedure and the Mood Adjective Checklist (MACL) were explained. Just prior to retiring for the night, the MACL was administered. An intercom system was used for communication with Ss during each awakening for dream collection. All reports were recorded for later transcription. In the morning after S had awakened, the MACL was again administered. The procedure was identical for night III.

Two Ss were recorded simultaneously in two separate rooms adjacent to the main equipment room.

Dream Collection Procedure

Subjects were awakened during rapid eye movement (REM) periods, following the method of De Koninck and Koulack (1975), by an 85-db buzzer attached to the wall about five feet above the head of the bed. Awakenings were initiated after five minutes of REM sleep for the first REMP of the night, 10 minutes after the second REMP, and one minute later for each subsequent REMP (that is, 11 minutes after the third REMP onset, 12 minutes after the fourth and so on).

Prior to sleep, Ss were instructed to report, immediately upon hearing the buzzer during the night, anything that had been going through their mind, in as much detail as possible. If they were dreaming, they were asked: 1) to describe the surroundings in the dream; 2) to describe the characters; 3) to indicate the types of social interactions; and 4) to describe any feelings in the dream. Subjects were encouraged to report as

much of the dream as possible, without interventions by the experimenter. If after the buzzer was sounded, S did not initiate the report procedure, the experimenter asked the standard question "Was there anything going through your mind?". When S had completed his report, the experimenter asked questions about areas that he felt had not been covered, such as, "Can you describe any feelings? Could you describe the situation in any more detail?".

When the report was completed, the MACL was administered. Subjects were asked to respond to the MACL in accordance with their feelings during the dream. All dream reports were tape recorded using Sony Cassette-corders (TC-110B) for subsequent transcription and analysis.

Similar instructions for describing dream content were given for the collection of home dreams. Subjects were asked to write down their dreams in as much detail as possible, upon awakening each morning.

Treatment Conditions

Subjects in the meditation group were taught a standardized meditative technique associated with TM. Instruction was provided by trained instructors associated with the area coordinating centre of SIMS/IMS. In order to learn the technique, prospective meditators first attend two introductory lectures, which outline the physiological and psychological effects as well as a description of the mechanics of the technique. The technique involves silently repeating a personalized mantra while assuming a relaxed position in a relatively quiet environment. This routine is practised twice daily in two 20-minute periods (once upon getting up each morning and again in the late afternoon). The initiation fee for this instruction for each S was paid through a grant (Rector's Research Fund) received by the author's thesis supervisor.

Subjects in the control group were taught a technique commonly associated with Progressive Relaxation (Jacobson, 1938). This involves tensing and relaxing various muscle groups of the body, accompanied by imagery training. Instructions were provided on cassette tapes (A. Lazarus, 1970). To provide a similar motivational set as that of TM, the author gave a short lecture on the beneficial effects of relaxation training, to each S in the relaxation group. Subjects practised this technique once daily (mid to late afternoon) for a 35-minute period, in a relaxed position in a quiet environment.

Analysis of Data

Analysis of dream content. Dreams were analysed independently by two judges, blind to the conditions under which the dreams were obtained. Each dream was analysed along several dimensions using the following scales. Scores were marked on individual sheets for each dream. A sample dream and score sheet are provided in Appendix B.

(1) - Social interactions: The Hall and Van de Castle (1966) scales of aggressiveness and friendliness were used.

(2) - Achievement outcomes: The Hall and Van de Castle (1966) scales of success and failure were used.

(3) - Environmental press: The Hall and Van de Castle (1966) scales of good fortune, misfortune, and consequences were used.

(4) - Anxiety: The scale developed by Breger, Hunter, and Lane (1971) was used. Scores range from 0 (absence of anxiety) to 4 (extremely anxiety-provoking).

(5) - Fantasy elements: The scale of fantasy associations related to personal life was used. Scores were in terms of simple frequency.

(6) - Bizarreness: A modified version of a scale developed by Dorus, Dorus, and Rechtschaffen (1971) for scoring the overall dream was used.

(7) - Cognitive distrubance: This scale measured the degree of confusion and fragmentation of recall, as manifested by inconsistencies and contradictions. An adapted version of the scale used by Breger, Hunter, and Lane (1971), with scores ranging from 0 (absence) to 4 (very high) was used.

(8) - Participation: Judges rated the dreamer on the degree of participation in the dream, or whether he was simply observing the dream. Scores ranged from 0 (mere observation) to 3 (marked participation) (Prévost, 1974).

(9) - Recall: Judges rated the dream according to the degree of completeness and clarity, ranging from 0 (no report) to 4 (complete) using the scale of Breger, Hunter, and Lane (1971).

Mood adjective checklist (MACL). Before retiring on each of the laboratory dream collection nights, a modified Nowlis mood checklist (Nowlis, 1965) was administered. This has been used previously in several studies (eg.

Goodenough, Witkin, Lewis, Koulack, & Cohen, 1974; Koulack, 1969; De Koninck & Koulack, 1975) and consists of twenty-four adjectives, to which the subject responds on a four-point scale (0-3). There are three adjectives in each of eight categories: aggression, anxiety, surgency, social affection, depression, distrust, quiet, and detached. The score on each category can vary from 0 to 9. Following each dream collection, S was asked to respond to the MACL in accordance with his feelings during the dream. In addition, after each dream collection, Ss were asked to give subjective assessments of their dreams and sleep, by answering four other items using the same four-point scale. These items consisted of: dream activity, dreamer activity, dream business, and vividness. In all cases, adjectives were read through an intercom to Ss after dream collection and Ss' responses were recorded on a special form (see Appendix C). Finally, the MACL was again administered following awakening each morning after the dream collection nights.

Physiological measures. Electroencephalogram (EEG, C3-A2), oblique electrooculogram (EOG), and submental electromyogram (EMG) measures were monitored continuously throughout the dream collection nights. Subjects were awakened at each REMP following the criteria of Rechtschaffen and Kales (1968). A thirteen channel Nihon Kohden electroencephalograph (Model ME - 135) was used for recording.

Interjudge agreement. Correlations between the ratings of the two judges on the different scales were computed and used as reliability criteria. These are presented in Table 2.

Statistical Analysis. Several recent reports (eg. Boneau, 1960; Cohen, 1965; Lunney, 1970) have called attention to the fact that parametric tests seem to retain their robustness in cases where their assumptions may be violated, such as with scale measurement and nonnormal distributions. For this reason, separate analyses of variance were used to assess the data. The .05 level of confidence was adopted for statistical comparisons in this study.

Table 2

Correlations Between Judges' Ratings
on the Scales of Dream Analysis

Aggression	.882
Friendliness	.825
Achievement	.717
Good Fortune	.873
Misfortune	.727
Anxiety	.762
Participation	.804
Bizarreness	.859
Cognitive Disturbance	.756
Recall	.846
Fantasy Elements (P)	.762

CHAPTER III

Results

The original design was to study a total of 16 subjects, however, during the course of the experiment three subjects dropped out for personal reasons. Therefore, all results are based upon 13 subjects (seven in the meditation group and six in the control relaxation group).

Effects on Psychological Variables

The basic assumption that meditation would induce psychological change with reference to specific personality factors was generally not confirmed. In addition, meditation was no more effective than simple relaxation training. The only predicted variable to reach significance was anxiety (16 PF), where a significant main effect for treatment was noted {F (1,11) = 5.42, $p < .05$}. However, two other variables did approach significance. Trends were observed for both groups after their respective treatments with regard to less trait anxiety (Spielberger) {F (1,11) = 4.07, $p < .07$} and greater ego strength {F (1,11) = 4.50, $p < .06$}. Table 3 contains the summary tables of the analyses of variance for the above variables. No significant results were obtained for the other predicted factors of state anxiety, affectothymia, guilt proneness, ergic tension, or spontaneity. Means for the predicted personality factors (pre vs. post) appear in Table 4. Analyses of variance summary tables for the nonsignificant variables are contained in Appendix D.

Table 3

Summary Tables of Analyses of Variance
for Anxiety (16 PF), Ego Strength, and Trait Anxiety (STAI)

Anxiety (16 PF)

Source	SS	df	MS	F	
A (group)	0.554	1	0.554	0.111	
C/A	54.924	11	4.993		
B (treatment)	4.403	1	4.403	5.421	$p < .04$
AxB	0.246	1	0.246	0.303	
BxC/A	8.935	11	0.812		

Ego Strength (Factor C - 16 PF)

Source	SS	df	MS	F	
A (group)	3.989	1	3.989	0.733	
C/A	59.859	11	5.442		
B (treatment)	9.846	1	9.846	4.495	$p < .06$
AxB	0.059	1	0.059	0.027	
BxC/A	24.095	11	2.190		

Trait Anxiety (Spielberger)

Source	SS	df	MS	F	
A (group)	0.074	1	0.074	0.001	
C/A	995.464	11	90.497		
B (treatment)	88.615	1	88.615	4.074	$p < .07$
AxB	34.111	1	34.111	1.568	
BxC/A	239.274	11	21.752		

Table 4

Means of the Predicted Personality Factors
for Meditation (M) and Relaxation (R) Groups

Scale		Pre-treatment	Post-treatment
Anxiety (STAI)			
State	(M)	35.29	36.29
	(R)	33.17	31.00
Trait	(M)	34.43	32.86
	(R)	36.83	30.67
Affectothymia	(M)	4.86	4.14
	(R)	4.17	5.17
Ego strength	(M)	6.14	7.29
	(R)	6.83	8.17
Guilt proneness	(M)	4.00	4.29
	(R)	4.83	4.17
Ergic tension	(M)	4.86	4.14
	(R)	4.67	4.00
Anxiety	(M)	4.61	3.97
	(R)	4.52	3.48
Spontaneity	(M)	6.57	6.00
	(R)	5.00	5.83

Effects on Presleep Mood.

Significant main effects for treatments were shown for decreased anxiety {F (1,11) = 10.27, $p < .01$} and social affection {F (1,11) = 9.17, $p < .01$}, however, the latter was not in the predicted direction i.e. subjects exhibited less social affection after their respective treatments. Summary tables of the analyses of variance appear in Table 5 for these variables. No main effect for groups was noted for any of the presleep mood variables. On the distrust dimension, a main effect for treatment tended to approach significance {F (1,11) = 3.88, $p < .07$}. Means for the presleep MACL (pre vs. post) appear in Table 6. Appendix E contains the summary tables for the analyses of variance for the nonsignificant variables.

Effects on Laboratory Dreams.

A two factor analysis of variance (Factor A - meditation or relaxation, Factor B - pre- versus post-treatment) with repeated measures on the last factor was used to assess the data. From a total of 170 REM sleep arousals for dream collection, 166 of these yielded scorable dreams. Results were computed on 46 dreams for the pre-treatment meditation condition, 32 dreams for the pre-treatment relaxation condition, 47 dreams from the post-treatment meditation conditions, and 41 dreams from the post-treatment relaxation group. Two of the predicted dream content measures showed significant results. A significant main effect for groups was observed for participation {F (1,11) = 6.76, $p < .05$}, however, this was not in the predicted direction, since the relaxation group evidenced more participation than the meditation group. This, however, was not a true effect, since initial pre-treatment differences were significant. A significant treatment effect was shown for fantasy elements related to personal

Table 5

Summary Tables of Analyses of Variance
for Presleep MACL Anxiety, Social Affection, and Distrust

Anxiety

Source	SS	df	MS	F	
A (group)	0.605	1	0.605	0.540	
C/A	12.311	11	1.119		
B (treatment)	4.999	1	4.999	10.269	$p < .01$
AxB	1.077	1	1.077	2.213	
BxC/A	5.354	11	0.487		

Social Affection

Source	SS	df	MS	F	
A (group)	5.401	1	5.401	0.609	
C/A	97.557	11	8.869		
B (treatment)	13.739	1	13.739	9.170	$p < .01$
AxB	4.385	1	4.385	2.927	
BxC/A	16.481	11	1.498		

Distrust

Source	SS	df	MS	F	
A (group)	4.234	1	4.234	0.686	
C/A	67.881	11	6.171		
B (treatment)	1.625	1	1.625	3.880	$p < .08$
AxB	1.393	1	1.393	3.326	
BxC/A	4.607	11	0.419		

Table 6

Means of Presleep MACL for Meditation (M) and Relaxation (R) Groups

Scale		Pre-treatment	Post-treatment
Aggression	(M)	.714	.929
	(R)	.250	.167
Anxiety	(M)	.786	.286
	(R)	1.500	.183*
Surgency	(M)	5.000	3.500
	(R)	3.083	3.067
Social Affection	(M)	6.071	3.857**
	(R)	4.333	3.767
Depression	(M)	.000	1.000
	(R)	.167	1.000
Distrust	(M)	1.429	1.357
	(R)	1.083	.083
Quiet	(M)	4.857	4.429
	(R)	5.833	6.383
Detached	(M)	2.357	1.929
	(R)	2.167	3.083

* $t(5) = 4.00$, $p < .02$ (two-tailed test)
** $t(6) = 2.60$, $p < .05$ (two-tailed test)

life {F (1,11) = 5.24, $p < .05$} in which more fantasy elements appeared following treatment for both groups. In addition, the success variable approached significance {F (1,11) = 4.29, $p < .06$} , but not in the predicted direction (i.e. there was less success following treatment). Summary tables displaying analyses of variance for these variables appear in Table 7. No significant results were obtained for aggression, friendliness, failure, good fortune, misfortune, or anxiety. On the ancillary measures, significant treatment effects were observed for the recall dimension {F (1,11) = 10.26, $p < .01$} which merely represents sensitization to dream recall, and bizarreness {F (1,11) = 6.00, $p < .05$} , where both measures increased following treatment. The variable measuring consequences of environmental press when misfortune is transformed into good fortune, approached significance with respect to treatments {F (1,11) = 4.23, $p < .06$}. In this case, the control relaxation group exhibited this transformation to a greater degree than the meditation group. No significant main effects for groups, treatment, or interaction were noted for the other measures of consequences (G.F. — M.F.) or cognitive disturbance. Summary tables of the analyses of variance for the significant ancillary measures appear in Table 8. Table 9 contains the means for the predicted dream content measures, while Table 10 shows means for the ancillary dream dimensions. Summary tables of the analyses of variance for the nonsignificant laboratory dream content scales appear in Appendix F.

Table 7

Analyses of Variance Summary Tables
for Participation, Fantasy Elements (P), and
Success Scales (Lab Dreams)

Participation

Source	SS	df	MS	F	
A (group)	0.561	1	0.561	6.758	$p < .03$
C/A	0.913	11	0.083		
B (treatment)	0.077	1	0.077	0.764	
AxB	0.016	1	0.016	0.159	
BxC/A	1.101	11	0.100		

Fantasy Elements (Personal)

Source	SS	df	MS	F	
A (group)		1	0.022	0.903	
C/A		11	0.025		
B (treatment)		1	0.202	5.236	$p < .04$
AxB		1	0.036	0.938	
BxC/A		11	0.039		

Success

Source	SS	df	MS	F	
A (group)	0.043	1	0.043	0.968	
C/A	0.491	11	0.045		
B (treatment)	0.024	1	0.024	4.295	$p < .06$
AxB	0.001	1	0.001	0.083	
BxC/A	0.062	11	0.006		

Table 8

Analyses of Variance Summary Tables
for Ancillary Measures of Recall,
Bizarreness, and Consequences
(M.F. — G.F.) (Lab Dreams)

Recall

Source	SS	df	MS	F	
A (group)	0.201	1	0.201	0.417	
C/A	5.290	11	0.481		
B (treatment)	1.650	1	1.650	10.263	$p < .01$
AxB	0.032	1	0.032	0.201	
BxC/A	1.769	11	0.161		

Bizarreness

Source	SS	df	MS	F	
A (group)	0.247	1	0.247	0.187	
C/A	14.508	11	1.319		
B (treatment)	4.049	1	4.049	6.004	$p < .03$
AxB	0.065	1	0.065	0.096	
BxC/A	7.418	11	0.674		

Consequences (M.F. — G.F.)

Source	SS	df	MS	F	
A (group)	0.017	1	0.017	4.227	$p < .06$
C/A	0.043	11	0.004		
B (treatment)	0.008	1	0.008	0.849	
AxB	0.006	1	0.006	0.569	
BxC/A	0.105	11	0.010		

Table 9

Means of Predicted Laboratory Dream Content
Scales for Meditation (M) and Relaxation (R) Groups

Scales			Pre-treatment	Post-treatment
Aggression	(M)		2.444	3.233
	(R)		3.233	3.720
Friendliness	(M)		1.159	1.303
	(R)		1.257	1.110
Success	(M)		.110	.041
	(R)		.183	.132
Failure	(M)		.167	.090
	(R)		.260	.107
Participation	(M)		1.790	1.636
	(R)		2.035	1.980
Good Fortune	(M)		.0	0
	(R)		.042	0
Misfortune	(M)		.496	.620
	(R)		.718	.703
Anxiety	(M)		1.099	.789
	(R)		.910	.643
Fantasy Elements (P)		(M)	.044	.151
		(R)	.028	.285

Table 10

Means of Ancillary Laboratory Dream Content
Scales for Meditation (M) and Relaxation (R) Groups

Scale		Pre-treatment	Post-treatment
Recall	(M)	1.981	2.300
	(R)	1.613	2.333*
Bizarreness	(M)	2.600	3.600
	(R)	2.755	4.053**
Consequences (M.F. — G.F.)	(M)	0.020	0.029
	(R)	0.042	0.108
Consequences (G.F. — M.F.)	(M)	0	0
	(R)	0	0
Cognitive Disturbance	(M)	1.837	1.554
	(R)	1.407	1.125

* $t(5) = 4.46$, $p < .01$ (two-tailed test)
** $t(5) = 9.96$, $p < .01$ (two-tailed test)

Effects on Laboratory Dream Mood.

The only dream mood variable to approach significance was that of decreased aggression, where a treatment effect was observed {F (1,11) = 4.25, $p < .06$} . All other dream mood variables exhibited nonsignificant results. In addition, subjective measures of dream activity, dreamer activity, dream busy, and vividness showed no significance. Means for dream MACL appear in Table 11, while means on the subjective measures are shown in Table 12. Appendix G contains the analyses of variance summary tables.

Effects on Home Dreams.

A three factor analysis of variance (Factor A - meditation, relaxation, Factor B - treatment, no treatment, and Factor C - first week, fifth week) with repeated measures on the last two factors was used to assess the data. Results were computed on home dreams from the following groups: after first week with meditation treatment (30 dreams); after first week with relaxation treatment (30 dreams); after fifth week of meditation (24 dreams); after fifth week of relaxation (25 dreams); after first week of no meditation (29 dreams); after first week of no relaxation (30 dreams); after fifth week of no meditation (20 dreams); and after fifth week of no relaxation (29 dreams). No significant results were obtained on any of the predicted or ancillary dream content measures. Means for the various predicted dream dimensions appear in Table 13, while means for the ancillary dream measures are shown in Table 14. Analyses of variance summary tables are contained in Appendix H. Home dream contributions for each subject appear in Appendix I.

Table 11

Means of Laboratory Dream MACL for
Meditation (M) and Relaxation (R) Groups

Scale		Pre-treatment	Post-treatment
Aggression	(M)	2.919	1.770
	(R)	2.013	1.958
Anxiety	(M)	2.084	1.889
	(R)	1.568	1.353
Surgency	(M)	1.892	1.654
	(R)	2.178	1.935
Social Affection	(M)	2.666	2.636
	(R)	1.553	1.757
Depression	(M)	2.059	2.303
	(R)	1.705	1.712
Distrust	(M)	2.154	2.051
	(R)	2.137	1.655
Quiet	(M)	2.437	4.149
	(R)	4.077	3.198
Detached	(M)	2.613	3.051
	(R)	3.800	3.372

Table 12

Means on Subjective Measures for
Meditation (M) and Relaxation (R) Groups
(Lab Dreams)

Scale		Pre-treatment	Post-treatment
Dream Active	(M)	1.706	2.057
	(R)	2.566	1.700
Dreamer Active	(M)	1.563	1.623
	(R)	1.040	1.293
Dream Busy	(M)	1.763	1.845
	(R)	2.113	1.590
Vividness	(M)	2.513	2.393
	(R)	3.070	2.348

Table 13

Means of the Predicted Home Dream Content Scales for the Meditation (M) and Relaxation (R) Groups

Scale		Treatment		No Treatment	
		1st week	5th week	1st week	5th week
Aggression	(M)	4.696	4.194	3.536	7.453
	(R)	3.747	3.322	4.280	5.670
Friendliness	(M)	1.897	2.647	2.083	2.176
	(R)	2.462	1.277	2.333	1.582
Success	(M)	0.127	0.200	0.261	0.254
	(R)	0.317	0.208	0.252	0.197
Failure	(M)	0.084	0.143	0.221	0.111
	(R)	0.215	0.160	0.132	0.153
Participation	(M)	1.929	1.976	1.976	1.904
	(R)	2.043	2.205	2.007	2.150
Good Fortune	(M)	0.057	0.047	0	0.036
	(R)	0.108	0.112	0	0.055
Misfortune	(M)	0.909	1.151	1.753	0.839
	(R)	1.017	0.688	0.482	1.230
Anxiety	(M)	1.059	1.143	1.111	1.293
	(R)	1.023	0.552	0.942	0.778
Fantasy Elements (P)	(M)	0.110	0.024	0.066	0.029
	(R)	0.067	0	0.072	0.167

Table 14

Means of the Ancillary Home Dream Content Scales for the Meditation (M) and Relaxation (R) Groups

Scale		Treatment		No Treatment	
		1st week	5th week	1st week	5th week
Recall	(M)	2.956	2.856	2.714	2.750
	(R)	2.772	2.608	2.917	2.552
Bizarreness	(M)	3.980	3.991	4.117	4.403
	(R)	3.953	4.633	3.592	3.397
Consequences (M.F. — G.F.)	(M)	0.133	0.047	0.083	0.100
	(R)	0.092	0.132	0.118	0.042
Consequences (G.F. — M.F.)	(M)	0	0	0	0
	(R)	0	0	0	0
Cognitive Disturbance	(M)	0.904	1.041	0.980	0.949
	(R)	0.717	0.950	0.642	0.725

CHAPTER IV

Discussion

The basic, underlying assumption of this study was that following exposure to a meditation technique (TM), psychological change would be facilitated and consequently, by extension, meditation would also influence dream content. Previous research has indicated that following varying periods of meditation (4 weeks and longer), changes occur on a number of positive psychological dimensions (eg. decreased anxiety, increased self-actualization etc.). This study did not support earlier studies.

Anxiety (16 PF) was the only psychological variable to reach significance. However this significant decrease was due to a greater difference in the control relaxation group from pre-treatment to post-treatment. Trends noted for trait anxiety (STAI) and ego strength (16 PF) might exemplify a forecast for psychological change. Since both meditation and relaxation groups displayed these trends, meditation appears not to be superior to a simple control relaxation condition after the five week practice interval used in this study.

A factor which corroborated the notion of no treatment effect involves an open-ended post-study questionnaire. Comments made by the subjects in the meditation group indicated that they were skeptical as to the supposed effectiveness of the technique. Only one out of seven subjects in this group reported significantly noticeable changes on physiological and

psychological indices. In the control group, three out of six subjects reported noticeable changes on these dimensions. Thus, the attitudes, motivations, and expectancies were not high for this particular group of individuals and possibly interfered with the respective techniques' effectiveness as behavior changing agents. For instance, Luborsky, Chandler, Auerbach, Cohen, and Backrach (1971) and Rosen (1976) have reviewed studies conducted in therapy situations, which have shown that expectation of relief from both the client's and therapist's point of view, can strongly influence the eventual outcome and success of treatment. Therefore, if attitudes, motivations, and expectations are optimal, varying treatments as well as placebo conditions may have equal utility in producing positive psychological change (eg. McReynolds, Barnes, Brooks & Rehagen, 1973). The demand characteristics of the treatment situations play an important role in determining the effectiveness of various techniques.

Another factor to consider is that if change can be attributed to an actual treatment effect, five weeks may not have been a long enough time period for the treatments to have a full effect. However, previous research has shown that by four weeks, effects appear to be well established. With an extended treatment period, meditation, and also for that matter relaxation, may influence psychological variables. This has been confirmed in some of the earlier studies (eg. Davidson, Goleman & Schwartz, 1976; Ferguson & Gowan, 1976), in which long-versus short-term meditation has induced a greater degree of change. In addition, a differential effect showing meditation to be superior to relaxation training may become apparent with added practice. A gradual change would seem to be more appropriate in order to

account for the assimilation of novel experiences into ongoing waking as well as nightly cognition.

Recent evidence has suggested that there are both somatic and cognitive components which can contribute to a relaxation state in general (Davidson & Schwartz, 1976). Earlier investigations have assumed all relaxation techniques to be essentially similar. However, if one looks at the case of meditation (TM specifically), attention seems to be focused on a cognitive manipulation i.e. attention is paid to silently repeating a personalized mantra. From this passive concentration, the physiological effects of an induced relaxation state develop. However, in essence, the technique springs from a more or less cognitive origin. In contrast, progressive relaxation is a more somatically oriented approach. In other words, attention is focused on bodily processes such as the feeling of tension in various muscle groups, so that as awareness of tension improves and active relaxation intervenes, generalization to the cognition aspects is gained. Within the context of this supposed differentiation of techniques, subjects in the relaxation group did receive some imagery training. This training took place toward the end of the five week practice period, after subjects had mastered the somatic components of the technique. In this way, relaxation probably partially generalized to the cognitive sphere, since the utilization of imagery in conjunction with relaxation obviously represents a cognitive manipulation. Within this context, progressive relaxation would not have been a totally adequate control as a purely somatic technique. Therefore, both techniques contain multi-determined, psychophysiological components. This immediately points to the need for adequate control

conditions. Simply sitting quietly for several periods during the course of the day may produce the same results. Even with this kind of control, one cannot stop an individual from thinking (thoughts, memories, feelings, etc.). Another control to which comparisons could be made, would simply be a group of individuals who do nothing during the corresponding interval of study. Future research will have to look very carefully at these controls in order to partial out the relevant variables contributing to the observed treatment effect.

For the continuity notion to have been supported in the present study, waking psychological change was a prerequisite. It was initially hypothesized that dream content would reflect the alterations taking place during wakefulness. Since psychological change was generally not initiated and maintained, it was not surprising to see no consonant change in dream content. It would seem that for those dream variables which did reach significance, this might have been due to chance because of the large number of dream content measures examined. In addition, since significance was reached on only a few dream content measures on dreams collected in the sleep laboratory, this may reflect a biased sampling procedure. Laboratory dreams represented a cross-sectional sampling when compared to the more lengthy time period of home dream collection. Some of the scales (eg. success, good fortune etc.) have a relatively lower frequency of occurrence even under normal conditions. With this in mind, depending on the sampling, both between and within subjects contributions of dreams may have biased

the results. Similarly, the number of dreams contributed by each individual would have a direct bearing on the frequency issue, since, as the number of dreams increases, the chance of obtaining a dream containing the desired component also increases. Home dreams would have been much more sensitive to changes, within this particular study, because of the number of dreams collected and the longitudinal nature of the design. Since no differences were observed in home dreams, this probably more accurately reflects the no treatment effect observed.

CHAPTER V

Conclusion

Even though the present study showed negative results with respect to dream content, there still remains the possibility that meditation does have an effect. A number of variables are still uncontrolled and this issue cannot be resolved at this point. Future research will have to be cognizant of a number of factors in order to show the possible effect of meditation on dream content. Of most pressing concern, will be the ability to show that meditation does produce true psychological change. It might be that, not until waking alterations are well established and assimilated by the individual's ongoing psychology, will there be significant corresponding changes in night cognition. In conjunction with the perceived treatment effects, attitudes, motivations, and expectancies should also be investigated. In addition, adequate control groups for physiological and cognitive factors will have to be employed to show what mediating components are contributing to these changes.

REFERENCES

Adler, A. On the interpretation of dreams. International Journal of Individual Psychology, 1936, 2, 3-16.

Albert, I.B., & McNeece, B. The reported sleep characteristics of meditators and nonmeditators. Bulletin of the Psychonomic Society, 1974, 3, 73-74.

Allison, J. Respiratory changes during transcendental meditation. Lancet, 1970, No. 7651, 833-834.

Aserinsky, E. & Kleitman, N. Regularly occurring periods of eye motility, and concomitant phenomena, during sleep. Science, 1953, 118, 273-274.

Ballou, D. Transcendental meditation research: Minnesota State Prison. In D.P. Kanellakos & P.C. Ferguson (Eds.), The psychobiology of transcendental meditation. Los Angeles: MIU Press, 1973. (Abstract)

Banquet, J.P. EEG and meditation. Electroencephalography and Clinical Neurophysiology, 1972, 33, 449-458.

Benson, H., Beary, J.F., & Carol, M.P. The relaxation response. Psychiatry, 1974, 37, 37-46.

Blair, M.A. Meditation in the San Francisco Bay area: an introductory survey. Journal of Transpersonal Psychology, 1970, 2, 61-70.

Bloomfield, H.H., Cain, M.P., & Jaffe, D.T. Transcendental meditation: discovering inner energy and overcoming stress. New York: Delacorte Press, 1975.

Boese, E., & Berger, K. In search of a fourth state of consciousness: psychological and physiological correlates of meditation. In D.P. Kanellakos & J.S. Lukas (Eds.), The psychobiology of transcendental meditation: a literature review. Menlo Park, California: W.A. Benjamin, Inc., 1974 (Abstract)

Boneau, C.A. The effects of violations of assumptions underlying the t-test. Psychological Bulletin, 1960, 57, 49-64.

Boss, M. The analysis of dreams. New York: Philosophical Library, 1958.

Breger, L. Function of dreams. Journal of Abnormal Psychology Monograph, 1967, 72, (5, Pt.2, Whole No. 641).

Breger, L., Hunter, I., & Lane, R.W. The effects of stress on dreams. Psychological Issues, 1971, 7, (3, Monograph 27).

Breger, L. Children's dreams and personality development. In J. Fisher & L. Breger (Eds.), The meaning of dreams. California Mental Health Research Symposium, 1969, No. 3, 64-100.

Burns, J.M., & Ascough, J.C. A psychophysiological comparison of two approaches to relaxation and anxiety induction. Behavior Therapy, 1971, 2, 170-176.

Cannon, W.B. The emergency function of the adrenal medulla in pain and the major emotions. American Journal of Physiology, 1941, 33, 356

Cattell, R.B., & Eber, H.W. Manual for the Sixteen Personality Factor Questionnaire. Champagne, Illinois: Institute for Personality and Ability Testing, 1967.

Cohen, D.B. Dream recall and total sleep time. Perceptual and Motor Skills, 1972, 34, 456-458.

Cohen, J. Some statistical issues in psychological research. In B. Wolman (Ed.), Handbook of clinical psychology. New York:McGraw-Hill, 1965.

Dallett, J. Theories of dream function. Psychological Bulletin, 1973, 79, 408-416.

Davidson, R.J., Goleman, D.J., & Schwartz, G.E. Attentional and affective concomitants of meditation: a cross-sectional study. Journal of Abnormal Psychology, 1976, 85, 235-238.

Davidson, R.J., & Schwartz, G.E. The psychobiology of relaxation and related states: a multi-process theory. In D.I. Mostofsky (Ed.), Behavior control and modification of physiological activity. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1976.

DeKoninck, J.M., & Koulack, D. Dream content and adaptation to a stressful situation. Journal of Abnormal Psychology, 1975, 84, 250-260.

Dement, W.C. The effect of dream deprivation. Science, 1960, 131,1705-1708.

Dement, W.C., & Kleitman, N. Cyclic variations in EEG during sleep and their relation to eye movements, body motility, and dreaming. Electroencephalography and Clinical Neurophysiology, 1957, 9, 673-690.

Dorus, E., Dorus, W., & Rechtschaffen, A. The incidence of novelty in dreams. Archives of General Psychiatry, 1971, 25, 364-368.

Erikson, E. The dream specimen of psychoanalysis. Journal of the American Psychoanalytic Association, 1954, 2, 5-55.

Eysenck, H.J., & Eysenck, S.B.G. Manual for the Eysenck Personality Inventory. San Diego, California: Educational and Industrial Testing Service, 1968.

Fehr, T., Nerstheimer, U., & Torber, S. Untersuchung von 49 praktizierenden der transzendentalen meditation mit dem Freiburger Personlich Keitsinventar. In D.P. Kanellakos & P.C. Ferguson (Eds.), The psychobiology of transcendental meditation. Los Angeles: MIU Press, 1973. (Abstract)

Ferguson, P., & Gowan, J. TM: some preliminary findings. Journal of Humanistic Psychology, 1976, 16, 51-60.

French, T., & Fromm, E. Dream interpretation. New York: Basic Books, 1964.

Freud, S. The interpretation of dreams. New York: Avon Books, 1965.

Goleman, D. Meditation as meta-therapy: hypotheses toward a proposed fifth state of consciousness. Journal of Transpersonal Psychology, 1971, 3, 1-25.

Goleman, D.J., & Schwartz, G.E. Meditation as an intervention in stress reactivity. Journal of Consulting and Clinical Psychology, 1976, 44, 456-466.

Goodenough, D.R., Witkin, H., Lewis, H.B., Koulack, D., & Cohen, H.D. Repression, interference, and field dependence as factors in dream forgetting. Journal of Abnormal Psychology, 1974, 83, 32-44.

Greenberg, R. Dreaming and memory. In E. Hartmann (Ed.), Sleep and dreaming. Boston: Little, Brown, 1970.

Greenberg, R., & Pearlman, C. A psychoanalytic-dream continuum: the source and function of dreams. International Review of Psycho-analysis, 1975, 2, 441-448.

Hall, C.S. The meaning of dreams. New York: McGraw-Hill, 1966.

Hall, C.S., & Van de Castle, R.L. The content analysis of dreams. New York: Appleton-Century-Crofts, 1966.

Hawkins, D.R. A review of psy-hoanalytic dream theory in the light of recent psychophysiological studies of sleep and dreaming. British Journal of Medical Psychology, 1966, 39, 85-104.

Jacobson, E. Progressive relaxation. Chicago: University of Chicago Press, 1938.

James, W. The principles of psychology (Vol. II). New York: Henry Holt, 1896.

Janda, L.H., & Cash, T.F. Effects of relaxation training upon physiological and self-report indices. Perceptual and Motor Skills, 1976, 42, 444.

Johnson, D.T., & Spielberger, C.D. The effects of relaxation training and the passage of time on measures of state- and trait-anxiety. Journal of Clinical Psychology, 1968, 24, 20-24.

Jones, R.M. The new psychology of dreaming. New York: Grune & Stratton, 1970.

Jung, C.G. On the nature of dreams. In H. Read, M. Fordham, & G. Adler (Eds.), The collected works of C.G. Jung. New York: Pantheon, 1960.

Kanellakos, D.P., & Ferguson, P.C. (Eds.) The psychobiology of transcendental meditation. Los Angeles: MIU Press, 1974.

Kanellakos, D.P., & Lukas, J.S. The psychobiology of transcendental meditation: a literature review. Menlo Park, California: W.A. Benjamin, Inc., 1974.

Kjelle, L.A. Transcendental meditation and psychological health. Perceptual and Motor Skills, 1974, 39, 623-628.

Koulack, D. Effects of somatosensory stimulation on dream content. Archives of General Psychiatry, 1969, 20, 718-725.

Lazarus, A. Daily living: coping with tensions and anxieties. Chicago, Illinois: Instructional Dynamics, Inc., 1970.

Luborsky, L., Chandler, M., Auerbach, A.H., Cohen, J., & Bachrack, H.M. Factors influencing the outcome of psychotherapy: a review of the quantitative research. Psychological Bulletin, 1971, 75, 145-185.

Lunney, G.H. Using analysis of variance with a dichotomous dependent variable: an empirical study. Journal of Educational Measurement, 1970, 4, 263-269.

Luthe, W. Antogenic training: method, research and application in medicine. American Journal of Psychotherapy, 1963, 17, 174-195.

Lykken, D.T., & Katzenmeyer, C. Manual for the Activity Preference Questionnaire. Minneapolis: University of Minnesota Press, 1960.

Maharishi Mahesh Yogi Transcendental meditation: serenity without drugs. New York: Signet, 1968.

Mathews, A.M., & Gelder, M.G. Psycho-physiological investigations of brief relaxation training. Journal of Psychosomatic Research, 1969, 13, 1-12.

McReynolds, W.T., Barnes, A.R., Brooks, S., & Rehagen, N.J. The role of attention-placebo influences in the efficacy of systematic desensitization. Journal of Consulting and Clinical Psychology, 1973, 41, 86-92.

Nidich, S., Seeman, W., & Dreskin, T. Influence of transcendental meditation: a replication. Journal of Counselling Psychology, 1973, 20, 565-566.

Nowlis, V. Research with the mood adjective checklist. In S. Tomkins & L. Izard (Eds.), Affects cognition and personality. New York: Springer, 1965.

Orme-Johnson, D.W. Autonomic stability and transcendental meditation. Psychosomatic Medicine, 1973, 35, 341-349.

Orme-Johnson, D.W., Authur, G., Franklin, L., O'Connell, J., & Zold, T. Transcendental meditation and drug abuse counselors. In D.P. Kanellakos & J.S. Lukas (Eds.), The psychobiology of transcendental meditation: a literature review. Menlo Park, California: W.A. Benjamin, Inc., 1974. (Abstract)

Paul, G.L. Physiological effects of relaxation training and hypnotic suggestion. Journal of Abnormal Psychology, 1969, 74, 425-437.

Pearlman, C.A., Jr. The adaptive function of dreaming. In E. Hartmann (Ed.), Sleep and dreaming. Boston: Little, Brown, 1970.

Prevost, F.R.W. Effet de l'inversion du champ visuel sur le sommeil paradoxal consecutif. Unpublished Master's thesis, University of Ottawa, 1974.

Rechtschaffen, A., & Kales, A. A manual of standardized terminology techniques and scoring system for sleep stages of human subjects. (U.S. Public Health Service Publication No. 204). Washington, D.C.: U.S. Government Printing Office, 1968.

Reinking, R.H., & Kohl, M.L. Effects of various forms of relaxation training on physiological and self-report measures of relaxation. Journal of Consulting and Clinical Psychology, 1975, 43, 595-600.

Robbins, J., & Fisher, D. Tranquility without pills. New York: Peter H. Wyden, Inc., 1972.

Rosen, G.M. Subjects' initial therapeutic expectancies and subjects' awareness of therapeutic goals in systematic desensitization: a review. Behavior Therapy, 1976, 7, 14-27.

Rossi, E.L. Dreams and the growth of personality. New York: Pergamon Press, 1972.

Seeman, W., Nidich, S., & Banta, T. The influence of transcendental meditation on a measure of self-actualization. Journal of Counseling Psychology, 1972, 19, 184-187.

Shapiro, A. A theoretical model for empirical data on the psychophysiology of sleep and dreaming. Psychophysiology, 1968, 4, 375-376.

Shostrom, E.L. Personal Orientation Inventory: an inventory for the measurement of self-actualization. San Diego, California: Educational and Industrial Testing Service, 1966.

Smith, J.C. Meditation as psychotherapy: a review of the literature. Psychological Bulletin, 1975, 82, 558-564.

Spielberger, C.D., Gorsuch, R.L., & Lushene, R.E. STAI Manual. Palo Alto, California: Consulting Psychologists Press, 1970.

Stoudenmire, J. Effects of muscle relaxation training on state and trait anxiety in introverts and extraverts. Journal of Personality and Social Psychology, 1972, 24, 273-275.

Stoyva, J., & Budzynski, T. Cultivated low arousal-- an anti-stress response? In L.V. DiCara (Ed.), Recent advances in limbic and autonomic nervous system research. New York: Plenum, 1973.

Tart, C.T. A psychologist's experiences with transcendental meditation. Journal of Transpersonal Psychology, 1971, 3, 135-143.

Ullman, M. The adaptive significance of the dream. Journal of Nervous and Mental Disease, 1959, 129, 144-149.

Wallace, R.K. Physiological effects of transcendental meditation. Science, 1970, 167, 1751-1754.

Wallace, R.K., Benson, H., & Wilson, A.F. A wakeful hypometabolic physiologic state. American Journal of Physiology, 1971, 221, 795-799.

Witkin, H.A. Influencing dream content. In M. Kramer (Ed.), Dream psychology and the new biology of dreaming. Springfield, Illinois: Charles C. Thomas, 1969.

Wolpe, J. Psychotherapy by reciprocal inhibition. Stanford: Stanford University Press, 1958.

APPENDIX A

Sleep and Dream Questionnaire

Sleep and Dream Questionnaire

Name: Phone #:
Age:

When he wakes up, a person may realize that he was "dreaming". Or, a person may have absolutely no sense of having been dreaming. Naturally, recalling or not recalling are both common experiences.

Below is a list of rather typical answers to a question about dreaming. Please put a cross (X) next to the item below that is most characteristic of you, the item which bests answers the question.

During the LAST TWO (2) WEEKS, immediately upon waking up in the morning, I could recall having been dreaming:

_____	every morning	_____	about two mornings a week
_____	just about every morning	_____	about one morning a week
_____	most mornings of the week	_____	once during the two weeks
_____	about every other morning	_____	not once

How many hours of sleep do you usually have at night? _____

At what time do you usually go to bed? _____

At what time do you wake up? _____

How long does it take for you to fall asleep? _____

Do you consider yourself a: good sleeper _____
fair sleeper _____
poor sleeper _____

Are you under a doctor's care? _____

Are you taking any medicated or non-medicated drugs? _____

Do you suffer from epilepsy? _____

Have you recently experienced any kind of head trauma? _____

APPENDIX B

Sample Dream and its Analysis

Sample Dream and its Analysis

A transcript of a laboratory dream (pretreatment) is presented followed by scoring by one judge on a rating sheet. This dream was selected because it exhibits a majority of the selected dream content scales. S refers to subject, while E to the experimenter.

Subject # 6, Dream # 2.

E: Was there anything going through your mind, Peter?

S: Yeah, O.K. Going chronologically backwards, the last thing I remember was climbing up a snowy hill, sort of straddled on a motorcycle, you know, walking it up a hill. I had just noticed someone I knew from the University use the bottom path at the bottom of the hill. He was looking up at me just before you woke me up. Then before that, I was in a car chase in my little Vega, but the Vega seemed to have changed into a motorcycle just before the end. The chase was not on streets familiar to me. Oh, yes they are, they're on streets that I take home from school. On this day, it was extremely slippery or icy and I had very little control. I left from the Mathematic building and was going down King Edward and for some reason, something is chasing me. I have to go fast. I came to the hill and started down when I lost all control of the brakes. I end up running through the stop sign, just missing cars and end up at the bottom of King Edward. But its really not King Edward, but a street over which is narrower. It was so slippery that day that I wasn't able to control it and there was a car coming up and I slid into the side, just missing the car. Then I was sliding toward a parked car and just missed it. At the bottom there is a corner and I just barely managed to slide around that. The next thing I know, I'm driving up an unfamiliar, steep, bumpy hill. I tried to go fast and the car won't go up the hill. It seems to be a motorcycle now and I'm trying to walk it up the hill. I'm slipping and sliding and then I see my friend at the bottom. Emotion wise, this was a very perceptual dream. I had a feeling of insecurity or insufficiency. I had no control. Most of the dream... I wouldn't call it exactly fear ... it's like sudden fear and then between I'm quite calm. I was quite frustrated that I couldn't get up the hill. I know there is someone chasing me and I have to get up that hill.

E: Was there any color?

S: I remember the Vega was white. The person had red hair. Going up the hill, it was white like snow. I was alone. There weren't any other people until the end of the dream.

E: Can you describe the other person?

S: I can't remember his name, but he's someone I see quite often in lectures and I talk with him. He has fairly short, curly, red hair. He had a beige suede coat on. He was carrying some books (long pause).

E: Is there anything more you can describe about the situation?

S: Yes, one other thing, the street was one way. There was a person walking down the middle of the street, but he wasn't looking in my direction. I couldn't do anything to get him out of the way but he was gone by the time I reached him.

E: Anything more?

S: No, that's it.

Dream Scale Scores

Subject No. _____ Type of Report
Dream No. _____ L H

I SOCIAL INTERACTIONS:

Aggressive		Friendly	
A1	(hostility feeling)	F1	(felt only)
A2	(verbal expressive)	F2	(verbal gestural)
A3	(aggressive attempt)	F3	(gift-loan)
A4	(accusation threat)	F4	(assistance)
A5	(theft destruction)	F5	(social activity)
✓A6	(chose-capture)	F6	(physical)
A7	(physical harm)	F7	(close relationship)
A8	(aggression - death)		

II ACHIEVEMENT OUTCOMES: Success (Failure)

III ENVIRONMENTAL PRESS:

Misfortune		Good Fortune	Consequences
✓M1	(barrier-obstacle)		Misfortune
M2	(falling)		1. (transformation)
✓M3	(threat)		✓2. (success in coping)
✓M4	(loss-defect)		3. (another character)
M5	(injury)		Good Fortune
M6	(death)		1. (transformation)
			2. (failure in coping)
			3. (another character)

IV PARTICIPATION: none passive active (marked)

V RECALL: NR Frag. Inc. Av. (Comp.)

VI Bizarreness: 1 2 3 (4) 5 6

VII COGNITIVE DISTURBANCE: (none) slight moderate high very high

VIII ANXIETY: observe somewhat (moderately) quiet extremely

IX FANTASY ELEMENTS (P):

APPENDIX C

Mood Adjective Checklist Form

NAME: _____ DATE: _____ NITE: _____ REM PERIOD _____

MOOD ADJECTIVE CHECK LIST

AGGRESSION	ANXIETY	SURGENCY	SOCIAL AFFECTION	DEPRESSION	DISTRUST	QUIET	DETACHED
	jittery ___	playful ___			suspicious ___	quiet ___	detached ___
defiant ___ angry ___			warm-hearted ___	sad ___			
	fearful ___	carefree ___	affectionate ___	regretful ___			distant ___
rebellious ___	clutched up ___				skeptical ___	placid ___	remote ___
		witty ___	kindly ___	sorry ___	dubious ___	still ___	
Total							

Dream active _____ Dream busy _____

Dreamer active _____ Vividness _____

Much 3
Little 2
Don't know 1
No 0

APPENDIX D

Summary Tables of Analyses of Variance for Personality Variables

Summary Tables of Analyses of Variance
for Personality Variables

State Anxiety (Spielberger)

Source	SS	df	MS	F
A (group)	88.572	1	88.572	1.712
C/A	569.274	11	51.752	
B (treatment)	1.385	1	1.385	0.038
AxB	16.199	1	16.199	0.447
BxC/A	398.417	11	36.220	

Affectothymia (Factor A - 16 PF)

Source	SS	df	MS	F
A (group)	0.180	1	0.180	0.077
C/A	25.667	11	2.333	
B (treatment)	0.039	1	0.039	0.014
AxB	4.747	1	4.747	1.757
BxC/A	29.714	11	2.701	

Spontaneity (Factor H - 16 PF)

Source	SS	df	MS	F
A (group)	4.880	1	4.880	0.454
C/A	118.274	11	10.752	
B (treatment)	0.039	1	0.039	0.041
AxB	3.188	1	3.188	3.413
BxC/A	10.274	11	0.934	

Guilt Proneness (Factor O - 16 PF)

Source	SS	df	MS	F
A (group)	0.824	1	0.824	0.103
C/A	87.714	11	7.974	
B (treatment)	0.154	1	0.154	0.110
AxB	1.465	1	1.465	1.048
BxC/A	15.381	11	1.398	

Appendix D cont'd

Ergic Tension (Factor Q_4 - 16 PF)

Source	SS	df	MS	F
A (group)	0.180	1	0.180	0.038
C/A	52.667	11	4.788	
B (treatment)	3.115	1	3.115	1.864
AxB	0.004	1	0.004	0.002
BxC/A	18.381	11	1.671	

APPENDIX E

Summary Tables of Analyses of Variance for Presleep Mood Variables

Summary Tables of Analyses of Variance
for Presleep Mood Variables

Aggression

Source	SS	df	MS	F
A (group)	2.429	1	2.429	1.693
C/A	15.783	11	1.435	
B (treatment)	0.039	1	0.039	0.037
AxB	0.143	1	0.143	0.136
BxC/A	11.569	11	1.052	

Surgency

Source	SS	df	MS	F
A (group)	8.921	1	8.921	0.641
C/A	152.988	11	13.908	
B (treatment)	4.322	1	4.322	2.508
AxB	3.554	1	3.554	2.063
BxC/A	18.954	11	1.723	

Depression

Source	SS	df	MS	F
A (group)	0.045	1	0.045	0.025
C/A	19.417	11	1.765	
B (treatment)	5.539	1	5.539	2.845
AxB	0.045	1	0.045	0.023
BxC/A	21.417	11	1.947	

Quiet

Source	SS	df	MS	F
A (group)	13.877	1	13.877	1.565
C/A	97.569	11	8.870	
B (treatment)	0.003	1	0.003	0.002
AxB	1.547	1	1.547	0.748
BxC/A	22.745	11	2.068	

Appendix E cont'd

Source	SS	df	MS	F
A (group)	1.502	1	1.502	0.157
C/A	105.152	11	9.559	
B (treatment)	0.240	1	0.240	0.115
AxB	2.923	1	2.923	1.401
BxC/A	22.961	11	2.087	

APPENDIX F

Analyses of Variance Summary Tables for Laboratory Dream Content Measures

Analyses of Variance Summary Tables
for Laboratory Dream Content Measures

Aggression

Source	SS	df	MS	F
A (group)	2.631	1	2.631	0.460
C/A	62.961	11	5.724	
B (treatment)	2.740	1	2.740	0.318
AxB	0.147	1	0.147	0.017
BxC/A	94.880	11	8.626	

Friendliness

Source	SS	df	MS	F
A (group)	0.015	1	0.015	0.010
C/A	16.370	11	0.149	
B (treatment)	0.001	1	0.001	0.001
AxB	0.137	1	0.137	0.221
BxC/A	6.802	11	0.618	

Failure

Source	SS	df	MS	F
A (group)	0.019	1	0.019	0.282
C/A	0.757	11	0.069	
B (treatment)	0.082	1	0.082	1.468
AxB	0.009	1	0.009	0.168
BxC/A	0.615	11	0.056	

Good Fortune

Source	SS	df	MS	F
A (group)	0.003	1	0.003	1.185
C/A	0.026	11	0.002	
B (treatment)	0.002	1	0.002	1.015
AxB	0.003	1	0.003	1.185
BxC/A	0.026	11	0.002	

Appendix F cont'd

Misfortune

Source	SS	df	MS	F
A (group)	0.051	1	0.051	0.154
C/A	10.813	11	0.983	
B (treatment)	0.023	1	0.023	0.040
AxB	0.031	1	0.031	0.053
BxC/A	6.511	11	0.592	

Cognitive Disturbance

Source	SS	df	MS	F
A (group)	1.194	1	1.194	2.591
C/A	5.069	11	0.461	
B (treatment)	0.518	1	0.518	0.812
AxB	0.000	1	0.000	0.000
BxC/A	7.016	11	0.638	

Anxiety

Source	SS	df	MS	F
A (group)	0.180	1	0.180	1.032
C/A	1.919	11	0.175	
B (treatment)	0.547	1	0.547	2.369
AxB	0.003	1	0.003	0.013
BxC/A	2.538	11	0.231	

APPENDIX G

Analysis of Variance Summary Tables for MACL of Laboratory Dreams

Analysis of Variance Summary Tables
for MACL of Laboratory Dreams

Aggression

Source	SS	df	MS	F	
A (group)	0.830	1	0.830	0.172	
C/A	53.007	11	4.819		
B (treatment)	2.695	1	2.695	4.251	$p < .06$
AxB	1.932	1	1.932	3.048	
BxC/A	6.972	11	0.634		

Anxiety

Source	SS	df	MS	F
A (group)	1.785	1	1.785	0.725
C/A	27.085	11	2.462	
B (treatment)	0.272	1	0.272	0.351
AxB	0.001	1	0.001	0.001
BxC/A	8.540	11	0.776	

Surgency

Source	SS	df	MS	F
A (group)	0.515	1	0.515	0.775
C/A	7.310	11	0.665	
B (treatment)	0.379	1	0.379	0.439
AxB	0.000	1	0.000	0.000
BxC/A	9.497	11	0.863	

Social Affection

Source	SS	df	MS	F
A (group)	6.404	1	6.406	2.788
C/A	25.274	11	2.298	
B (treatment)	0.039	1	0.039	0.035
AxB	0.088	1	0.088	0.079
BxC/A	12.203	11	1.109	

Appendix G cont'd

Depression

Source	SS	df	MS	F
A (group)	6.110	1	6.110	1.644
C/A	40.889	11	3.717	
B (treatment)	0.695	1	0.695	0.376
AxB	2.474	1	2.474	1.339
BxC/A	20.329	11	1.848	

Distrust

Source	SS	df	MS	F
A (group)	0.277	1	0.277	0.116
C/A	26.376	11	2.398	
B (treatment)	0.501	1	0.501	0.746
AxB	0.232	1	0.232	0.345
BxC/A	7.387	11	0.672	

Quiet

Source	SS	df	MS	F
A (group)	0.767	1	0.767	0.249
C/A	33.966	11	3.088	
B (treatment)	1.732	1	1.732	0.519
AxB	10.834	1	10.834	3.249
BxC/A	36.686	11	3.325	

Detached

Source	SS	df	MS	F
A (group)	3.670	1	3.670	0.772
C/A	52.297	11	4.754	
B (treatment)	0.010	1	0.010	0.004
AxB	1.214	1	1.214	0.530
BxC/A	25.215	11	2.292	

Appendix G cont'd

Dream Active

Source	SS	df	MS	F
A (group)	0.434	1	0.434	0.359
C/A	13.286	11	1.208	
B (treatment)	0.573	1	0.573	0.390
AxB	2.404	1	2.404	1.638
BxC/A	16.149	11	1.468	

Dreamer Active

Source	SS	df	MS	F
A (group)	0.159	1	0.159	0.419
C/A	4.173	11	0.379	
B (treatment)	1.223	1	1.223	2.587
AxB	0.060	1	0.060	0.127
BxC/A	5.202	11	0.473	

Dream Busy

Source	SS	df	MS	F
A (group)	0.314	1	0.314	0.142
C/A	24.325	11	2.211	
B (treatment)	0.033	1	0.033	0.022
AxB	0.591	1	0.591	0.396
BxC/A	16.411	11	1.492	

Vividness

Source	SS	df	MS	F
A (group)	1.143	1	1.143	0.435
C/A	28.889	11	2.626	
B (treatment)	0.507	1	0.507	0.287
AxB	0.586	1	0.586	0.332
BxC/A	19.396	11	1.763	

APPENDIX H

Analysis of Variance Summary Tables for Home Dream Content Measures

Analysis of Variance Summary Tables for
Home Dream Content Measures

Aggression

Source	SS	df	MS	F
A	38.012	1	38.012	1.855
D/A	225.384	11	20.490	
B	7.677	1	7.677	0.725
AxB	1.196	1	1.196	0.113
BxD/A	116.494	11	10.590	
C	0.625	1	0.625	0.066
AxC	33.610	1	33.610	3.522
CxD/A	104.973	11	9.543	
BxC	17.101	1	17.101	3.847
AxBxC	17.117	1	17.117	3.851
BxCxD/A	48.894	11	4.445	

Friendliness

Source	SS	df	MS	F
A	1.067	1	1.067	0.489
D/A	24.032	11	2.185	
B	0.017	1	0.017	0.008
AxB	0.173	1	0.173	0.086
BxD/A	22.126	11	2.011	
C	0.629	1	0.629	0.431
AxC	6.240	1	6.240	4.273
CxD/A	16.064	11	1.460	
BxC	0.077	1	0.077	0.039
AxBxC	0.961	1	0.961	0.490
BxCxD/A	21.563	11	1.960	

Success

Source	SS	df	MS	F
A	0.014	1	0.014	0.139
D/A	1.087	11	0.099	
B	0.014	1	0.014	0.146
AxB	0.057	1	0.057	0.591
BxD/A	1.058	11	0.096	
C	0.005	1	0.005	0.129
AxC	0.042	1	0.042	1.047
CxD/A	0.445	11	0.041	
BxC	0.001	1	0.001	0.024
AxBxC	0.014	1	0.014	0.314
BxCxD/A	0.503	11	0.046	

Appendix H cont'd

Failure

Source	SS	df	MS	F
A	0.008	1	0.008	0.131
D/A	0.677	11	0.062	
B	0.001	1	0.001	0.015
AxB	0.031	1	0.031	0.605
BxD/A	0.562	11	0.051	
C	0.006	1	0.006	0.159
AxC	0.000	1	0.000	0.007
CxD/A	0.416	11	0.038	
BxC	0.010	1	0.010	0.301
AxBxC	0.049	1	0.049	1.464
BxCxD/A	0.365	11	0.033	

Participation

Source	SS	df	MS	F
A	0.311	1	0.311	1.811
D/A	1.890	11	0.172	
B	0.010	1	0.010	0.069
AxB	0.004	1	0.004	0.025
BxD/A	1.593	11	0.145	
C	0.053	1	0.053	0.415
AxC	0.088	1	0.088	0.686
CxD/A	1.405	11	0.128	
BxC	0.017	1	0.017	0.138
AxBxC	0.008	1	0.008	0.066
BxCxD/A	1.353	11	0.123	

Misfortune

Source	SS	df	MS	F
A	1.231	1	1.231	0.688
D/A	19.680	11	1.789	
B	0.272	1	0.272	0.102
AxB	0.222	1	0.222	0.083
BxD/A	29.472	11	2.679	
C	0.091	1	0.091	0.045
AxC	0.962	1	0.962	0.471
CxD/A	22.451	11	2.041	
BxC	0.052	1	0.052	0.027
AxBxC	4.030	1	4.030	2.074
BxCxD/A	21.378	11	1.943	

Appendix H cont'd

Good Fortune

Source	SS	df	MS	F
A	0.015	1	0.015	0.320
D/A	0.507	11	0.046	
B	0.042	1	0.042	1.812
AxB	0.008	1	0.008	0.327
BxD/A	0.252	11	0.023	
C	0.005	1	0.005	0.511
AxC	0.001	1	0.001	0.081
CxD/A	0.116	11	0.011	
BxC	0.008	1	0.008	3.265
AxBxC	0.000	1	0.000	0.012
BxCxD/A	0.026	11	0.002	

Anxiety

Source	SS	df	MS	F
A	1.388	1	1.388	3.342
D/A	3.516	11	0.320	
B	0.101	1	0.101	0.177
AxB	0.003	1	0.003	0.005
BxD/A	6.268	11	0.570	
C	0.073	1	0.073	0.203
AxC	0.655	1	0.655	1.815
CxD/A	3.972	11	0.361	
BxC	0.123	1	0.123	0.400
AxBxC	0.036	1	0.036	0.117
BxCxD/A	3.383	11	0.308	

Fantasy Elements (P)

Source	SS	df	MS	F
A	0.005	1	0.005	0.153
D/A	0.338	11	0.031	
B	0.011	1	0.011	0.668
AxB	0.036	1	0.036	2.234
BxD/A	0.178	11	0.016	
C	0.009	1	0.009	0.913
AxC	0.019	1	0.019	1.842
CxD/A	0.110	11	0.010	
BxC	0.033	1	0.033	1.631
AxBxC	0.010	1	0.010	0.511
BxCxD/A	0.223	11	0.020	

Appendix H cont'd

Recall

Source	SS	df	MS	F
A	0.148	1	0.148	0.187
D/A	8.687	11	0.790	
B	0.069	1	0.069	0.183
AxB	0.153	1	0.153	0.404
BxD/A	4.175	11	0.380	
C	0.252	1	0.252	2.289
AxC	0.174	1	0.174	1.580
CxD/A	1.211	11	0.110	
BxC	0.001	1	0.001	0.008
AxBxC	0.092	1	0.092	0.543
BxCxD/A	1.863	11	0.169	

Bizarreness

Source	SS	df	MS	F
A	0.678	1	0.678	0.182
D/A	41.071	11	3.734	
B	0.636	1	0.636	0.537
AxB	3.723	1	3.723	3.142
BxD/A	13.035	11	1.185	
C	0.479	1	0.479	0.636
AxC	0.029	1	0.029	0.038
CxD/A	8.286	11	0.753	
BxC	0.213	1	0.213	0.361
AxBxC	1.067	1	1.067	1.807
BxCxD/A	6.596	11	0.591	

Consequences (M.F. — G.F.)

Source	SS	df	MS	F
A	0.000	1	0.000	0.014
D/A	0.276	11	0.025	
B	0.003	1	0.003	0.070
AxB	0.004	1	0.004	0.100
BxD/A	0.391	11	0.036	
C	0.009	1	0.009	0.576
AxC	0.001	1	0.001	0.050
CxD/A	0.180	11	0.016	
BxC	0.000	1	0.000	0.000
AxBxC	0.039	1	0.039	1.354
BxCxD/A	0.316	11	0.029	

Appendix H cont'd

Cognitive Disturbance

Source	SS	df	MS	F
A	0.571	1	0.571	0.910
D/A	6.902	11	0.628	
B	0.071	1	0.071	0.139
AxB	0.065	1	0.065	0.127
BxD/A	5.597	11	0.509	
C	0.134	1	0.134	1.204
AxC	0.036	1	0.036	0.323
CxD/A	1.224	11	0.111	
BxC	0.083	1	0.083	0.902
AxBxC	0.000	1	0.000	0.003
BxCxD/A	1.015	11	0.092	

APPENDIX I

Individual Subject Contributions to Home Dream Analysis

Individual Subject Contributions to
Home Dream Analysis

	Treatment		No Treatment	
Subject	1st week	5 week	1st week	5 week
Meditation				
(1)	4	5	5	4
(2)	2	2	3	1
(3)	3	3	3	2
(4)	5	3	3	4
(5)	5	3	3	3
(6)	7	6	8	5
(7)	4	2	4	3
Relaxation				
(8)	4	5	7	4
(9)	5	3	3	3
(10)	3	2	3	6
(11)	9	8	7	4
(12)	5	3	4	4
(13)	4	2	6	7