

THE ADAPTIVE FUNCTION  
OF DREAMS  
IN DEALING WITH STRESS

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of  
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Charles Théroux

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BY

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A thesis submitted to the Faculty of Graduate Studies of  
the University of Manitoba in partial fulfillment of the requirements  
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## ABSTRACT

Charles P.-E. Thérout

### The Adaptive Function of Dreams in Dealing with Stress

This study was carried out to investigate the possible adaptive function of dreams in dealing with stress. Twenty-four obese female Ss were divided into four groups: two experimental (childhood and adult onset) and two control (childhood and adult onset). All Ss spent five (5) non consecutive nights in the sleep laboratory: adaptation night, two pre-treatment nights and two post-treatment nights. Experimental treatment was a weight reduction program made of three components: weight, behavior and energy changes. The experimental treatment lasted 4 to 5 weeks. Stress impact was measured by a structured questionnaire and the Spielberger Anxiety Scales. Three physiological measures were also taken: sleep onset latency, REM latency and REM density. Dream reports were scored for incorporation of elements from the experimental situation, anxiety, degree of use of defense mechanisms, and body disturbances. Analysis of results showed no significant difference between the experimental and control groups, except for the childhood-onset obese group on diet who, as predicted, showed more body disturbances after treatment.

Most of the results were in the expected direction but failed to reach significance. Possible explanation rests with the short duration of the experimental treatment and the familiarity of the subjects with it. It was suggested that a longitudinal approach be taken to study the adaptive function of dreams in dealing with stress.

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## CHAPTER I

### INTRODUCTION

#### Purpose of the Present Research

In The Interpretation of Dreams, Freud (1953) suggests that dreaming essentially serves two interrelated functions: the fulfillment of repressed infantile wishes and the preservation of sleep. These roles are only defensive in nature. They constitute a means by which the individual satisfies fantasies which may not be possible during waking life. The fantasies or unconscious impulses are gratified at the preconscious level, thus preserving the sleep of the individual.

Unlike Freud, Jones (1970) proposed that dreaming serves to integrate stressful events by playing not only a defensive role but also a synthetic one. The defensive role helps the individual deal with an anxiety-provoking stimulus by keeping all the threatening material out of consciousness. This process is carried out by the basic defense mechanisms learned by the individual, for example the mechanisms of regression, reaction formation, projection, etc. The synthetic or ego synthesis role, as Jones (1970) calls it, allows the individual to reassess and reintegrate his previous failures and successes. An actual conflict, carrying elements similar to the ones from the past,

initiates the process. The individual is pressured to reconsider the previously integrated material. The actual conflict offers a different context or perspective from which the individual can reevaluate the past material. That way, the past is constantly reviewed in the context of present events. The more the individual is able to carry out this process, the more growth he is likely to experience.

The process of integration proposed by Jones (1970) can only take place because dreaming provides certain necessary conditions. Breger (1967) and Breger, Hunter and Lane (1971) consider these conditions to be the greater availability of stored information, the greater fluidity of associational processes, the ability to consider non-socially acceptable solutions, and an increased liberty and facility in manipulating and processing the stored information. Essentially, Breger views dreaming as a very active period during which the individual does not have to take into account the logic of reality.

Greenberg, Pearlman, Fingar, Kantrowitz and Kawliche (1970), and Grieser, Greenberg and Harrison (1972) recognized the two roles proposed by Jones (1970) and integrated them in a more elaborate theory of adaptation to stressful events. They hypothesized that dreaming helps the individual integrate stressful events. This integration is done via two processes: the incorporation in the dreams of

elements from the stressful event and the manipulation of those elements.

The first process, the incorporation of elements from the stressful event, is identical in all situations; the elements simply appear in the dream in a direct or symbolic form. The second process, the manipulation of the incorporated elements, varies according to the nature of the stressful event. Sometimes, a stressful stimulus brings out an unresolved conflict from the past that is so anxiety-provoking that the individual cannot face it. In such a case, dreaming helps the individual by associating the new experience with the unresolved ones from the past and by utilizing previously successful defense mechanisms to keep them at an unconscious level. Even though the individual has dealt with the stressful stimulus, Greenberg considers this experience to be a hindrance to the growth of the individual's personality.

When the stressful stimulus is not too anxiety-provoking, the individual is able to face the actual conflict and the unresolved one from the past. Dreaming, then, allows the individual to reassess the old conflict in the context of the new one. This new evaluation permits the individual to deal with the conflict on a conscious level. Final resolution of the conflict brings about a decrease in the use of defense mechanisms and a modification in the way the individual deals with future conflicts. The

whole experience enhances the individual's personality development.

Several studies have tested the hypothesis that dreams serve an adaptive function which allows the individual to use his characteristic defenses in dealing with stressful events. Using different approaches, a number of authors have concluded that defense mechanisms are at play during REM sleep since subjects who are REM deprived show less adaptation to the stressful stimuli. The most frequently used approach is REM deprivation (Greenberg et al., 1970; Fiss, Klein, Shollar and Levine, 1968; Greenberg, Pillar and Pearlman, 1972; Grieser et al., 1972). This approach consists essentially of presenting subjects with a stressful event and depriving some of the subjects of REM sleep. Psychometric measures of their functioning are taken before and after the subjects have been exposed to the stressful stimulus and REM-deprived or allowed to have their full complement of REM sleep. All four studies reported better functioning, as measured by various scales, in the subjects who had not been REM deprived. The conclusion drawn by the authors is that REM processes enable the individual to deal with the stressful events.

Greenberg, Pearlman and Gampel (1972a) were interested in studying the need to cope with the stress present in nightmares. They used subjects suffering from war neuroses and exhibiting repetitive nightmares. Two types of data

appear to support the adaptation hypothesis. First, the very short REM latency observed in this population of subjects is interpreted as indicative of a greater than normal need to dream. Secondly, the frequency of dream recall following REM awakenings in the laboratory is much lower than the frequency of reported nightmares prior to the sleep study. The security of the laboratory appears to aid subjects in their use of defense mechanisms to keep the stressful material at an unconscious level. Outside the laboratory, their coping mechanisms do not seem sufficient to control the anxiety. Subjects wake up and hence, report nightmares more frequently. It appears then, that dreaming is helpful to subjects suffering from war neuroses but only in the laboratory environment.

Finally, Cohen and Cox (1975) used a supposedly easy IQ test to verify the hypothesis that dream-preoccupation with a stressful event would bring about an improvement in mood from pre to post-sleep. The degree of preoccupation was measured by the amount of incorporation of elements from the stressful event. The results show that the greater the level of preoccupation, the greater the positive change in affect.

The above reports, while supporting the theory of the adaptive function of dreams with more or less success, do not study the specific processes (like incorporation and

manipulation of stressful elements) which may be necessary for the individual to effectively deal with a stressful event. There are some studies which have focussed on the incorporation of elements from stressful events, utilizing both laboratory-created events (different movies) as stressful stimuli (Witkin and Lewis, 1967a, 1967b; Collins, Davison, and Breger, 1967; Cartwright, Bernich and Borowitz, 1969; Cartwright, Kaszniak, Borowitz and Kling, 1972; De Koninck and Koulack, 1975) or real life events (a major surgical operation and a therapy session), as stressful stimuli (Breger et al., 1971). Direct and indirect incorporation of elements from the stressful events were reported in all of these studies. However, a greater amount of incorporation was found in dreams following real life stressful events, presumably due to the greater personal relevancy to the individual.

However, the second process, the manipulation of the incorporated elements in the dream, has not been subjected to experimental investigation although two clinical reports appear in the literature. Breger et al. (1971) presented a clinical interpretation of dream reports collected in the laboratory. The only conclusion drawn by the authors is that each subject has his own style of coping with stressful events. Rossi (1972) offered a psychoanalytic interpretation of a dream sequence of a therapy patient. He showed that the synthetic function of dreams (as proposed by

Jones, 1970) helped the patient in developing her personality by allowing her to reintegrate her past experiences in the perspective of new ones that are more positive. According to Rossi (1972), this process is growth promoting. The two above reports support the general hypothesis that dreams may serve an adaptive function. They show, as predicted by the theory, that each individual has a unique way of coping with stress by using the defense mechanisms he learned.

Although certain facets of the Greenberg et al. (1970) theory have been studied, no objective test has been made of the coping processes implied by the theory. These processes have been described as serving either a defensive function or a synthetic function. The purpose of this present study is to examine these processes.

A real life event was used as the stressful stimulus and particular attention was paid to the two processes identified in the theory, the incorporation of elements from the stressful event and the manipulation of the incorporated elements.

While the theory proposed by Greenberg et al. (1971) essentially discusses the psychological processes involved in dealing with stress, several physiological parameters of sleep have been studied in relation to stress. These studies have utilized only laboratory induced stress, using, in most cases, anxiety-provoking films (Goodenough, Witkin,

Lewis, Koulack, and Cohen, 1974; Goodenough, Witkin, Koulack, and Cohen, 1975; De Koninck and Koulack, 1975; Baekeland, Koulack, and Lasky, 1968) or electrical shocks (Koulack, 1969) as the experimental treatment. The present study allows the opportunity to examine the effects of a real-life stressful event, on some of the same physiological parameters of sleep: sleep onset latency (time from "lights off" to first sleep spindle); REM latency (time from sleep onset to beginning of first REMP); REM density (the ratio of the number of two-second intervals containing one or more eye-movements over the total number of two-second intervals in the REMP).

The sleep onset latency parameter in particular appears strongly linked to stress. An increase in sleep onset latency has been quite often reported in subjects following exposure to a stressful event (Goodenough et al., 1974; Goodenough et al., 1975; Cohen and Cox, 1975; De Koninck and Koulack, 1975). Baekeland, Koulack and Lasky (1968), reported a tendency toward a longer sleep onset latency in the stressful condition although it was not statistically significant. One study using thirst as a stressor (Koulack, 1970) did not demonstrate a change in sleep onset latency.

Studies done on REM onset latency with a laboratory created stressful event have consistently failed to report the expected decrease in REM latency (De Koninck and



Koulack, 1975; Koulack, 1969; Koulack, 1970). Only Natani, Shurley and Pierce (1972) while studying the sleep patterns of men wintering-over at the South Pole, showed a significant decrease in REM latency following a stressful station emergency.

No consistent pattern of changes in REM density has been found. It has been shown to increase following exposure to a stressful event in some studies (Fisher, Byrne, Edwards and Kahn, 1970; Karacan, Goodenough, Shapiro and Starker, 1966; Baekeland et al., 1968; Cohen, 1975), but not in others (De Koninck, 1973; Goodenough et al., 1975; Koulack, 1970).

In summary, the primary purpose of this study was to test the theory of the adaptive function of dreams and the processes involved using a real-life stressful event. In addition, a few of the physiological parameters of sleep which are thought to reflect the effects of stress were also examined.

The experimental treatment used in this study was a weight reduction program for obese people. A low-calorie diet has been shown to be stressful for obese people (Gold, 1976). However, the onset (childhood vs adulthood) of obesity appears to play an important role in determining how stressful the experience of dieting is going to be. For the childhood-onset obese person weight reduction is

particularly stressful because it constitutes a serious threat to a self-concept developed and crystallized in relation to a large body size. Several studies report major disturbances of body image in terms of feelings, attitudes and cognition in such a population (Stunkard and Mendelson, 1957; Glucksman and Hirsch, 1968; Gazet, Pelkington, Kaluci, Crisp and Day, 1974; Gold, 1976). However, this is not the case for the adult-onset obese people whose self-concept is crystallized before they gain weight. Consequently, dieting is much less stressful for this population as there is little or no problem in terms of body image when they are put on a diet (Gold, 1976).

Based on these observations, it seems appropriate to suggest that these two groups, the childhood-onset and the adult-onset obese people, will make different use of dreaming to cope with the stressful event of dieting. One would expect, for example, that dieting, which is perceived as being increasingly more threatening as it proceeds because it constitutes not only a demanding task to carry through but also a threat to the self-concept, would force the individual to resort to a greater use of defense mechanisms. This event may be so threatening that dreaming would serve only a defensive function. The individual would adapt to the situation by keeping the event out of consciousness.

Maintaining a diet is also stressful for the adult-obese but it presumably is not a threat to the self-concept. It liberates the person from a negative self-image acquired only during adulthood. Dreaming, therefore, would allow the individual to associate the new material (diet-related stress) with old conflicts. A reevaluation could take place, allowing the individual to face the conflicts. These conflicts would not be repressed at the unconscious level and resolution would take place at the conscious level, enabling the individual to modify his ways of dealing with future stressful events by reducing his use of defense mechanisms. In that sense, dreaming would serve a synthetic function.

### Hypotheses

Since dieting is a stressful experience for obese subjects, and if dreams serve an adaptive function, dream reports will show incorporation of elements from the stressful situation, as a first step towards resolution.

1. The dream reports of the two groups on the diet (childhood-onset obese and adult-onset obese people) will show greater incorporation of elements of the stressful situation (dieting) than the dream reports of non-dieting obese people.

Since these incorporated elements come from a stressful situation, they will be accompanied by anxiety.

2. The dream reports of the two groups on the diet (childhood-onset obese and adult-onset obese people) will show more anxiety than the dream reports of non-dieting obese people.

Since dieting constitutes for the childhood-onset obese people a progressively more stressful event as it proceeds, we would expect their dreams to show more anxiety as the treatment proceeds than before it started.

3. The dream reports of the childhood-onset obese people will show more anxiety after the obesity treatment has run for 4-5 weeks than before it started.

Since, according to the theory of the adaptive function of dreams, the individual can deal with stressful events by using basic defense mechanisms and since dieting constitutes a progressively more threatening experience for the childhood-onset obese people, they would be expected to show a greater use of defense mechanisms, or integrative mechanisms as they are called by Sheppard and Saul (1958, 1963, 1973).

4. The dream reports of the childhood-onset obese people on diet will show a greater use of defense mechanisms (integrative mechanisms) after the obesity treatment has run for 4-5 weeks than before it started.

Since a large body size constitutes the basis of the personality structure of the childhood-onset obese people, body size reduction per se is perceived as a destruction of

one's self and is very much feared by this group.

5. The dream reports of the childhood-onset obese people will show more images of "body disturbances" after the obesity treatment has run for 4-5 weeks than before it started.

Since dieting may constitute a growth promoting experience for adult-onset obese people, this group would experience less traumatic anxiety as the obesity treatment proceeds.

6. The dream reports of the adult-onset obese people will show less anxiety after the obesity treatment has run for 4-5 weeks than before it started.

Since dieting may constitute a growth promoting experience for the adult-onset obese people, hence reducing the amount of traumatic anxiety, this group need not use its defense mechanisms (integrative mechanisms) with as much intensity.

7. The dream reports of adult-onset obese people will show less use of defense mechanisms (integrative mechanisms) after the obesity treatment has run for 4-5 weeks than before it started.

Since dieting is considered a stressful experience for obese subjects, various physiological sleep parameters should be affected by it.

8. The sleep records of the two groups on diet (childhood-onset obese and adult-onset obese people) will show an increase in sleep latency, a decrease in REM latency and an increase in REM density.

## CHAPTER II

### METHOD

#### Design of the Study

The design of the study is presented in Table 1. Twelve subjects (childhood-onset obese) were randomly assigned to an experimental and a control group (six in each group) and twelve other subjects (adult-onset obese) were randomly assigned to another experimental and another control group (six in each group). The experimental treatment, a weight reduction program, was run for eight weeks. All subjects slept five non-consecutive nights in the laboratory. Electroencephalograms (EEGs) electro-oculograms (EOGs) and electromyograms (EMGs) were recorded through the night, and scored according to the sleep manual of Rechtschaffen and Kales (1968). The first night was an adaptation night and no dream collection took place. Nights II and III were the pre-treatment dream collection nights. After the weight reduction program had run for 4-5 weeks, nights IV and V constituted the post-treatment dream collection nights. A low-calorie weight reduction program constituted the stressful event or the experimental manipulation.

#### Subjects

Twenty-four obese subjects were recruited through newspaper advertisements to participate in a sleep study.

Table 1

## Design of the Study

<u>Subjects</u>	Night I Adaptation No Dream Collection	Nights II-III Pre-Treatment Dream Collection	Treatment Period 4-5 weeks	Nights IV-V Post-Treatment Dream Collection
<u>Group 1</u> Childhood- onset obese N = 6	Adaptation	Dream Collection	Experi- mental Treatment	Dream Collection
<u>Group 2</u> Adult- onset obese N = 6	Adaptation	Dream Collection	Experi- mental Treatment	Dream Collection
<u>Group 3</u> Childhood- onset obese N = 6	Adaptation	Dream Collection	No- treatment	Dream Collection
<u>Group 4</u> Adult- onset obese N = 6	Adaptation	Dream Collection	No- treatment	Dream Collection



Subjects had to meet the following requirements; they had to be 1) between 20 and 50 years of age, 2) female, 3) not pregnant and 4) willing to be put on an eight week weight reduction program. Those satisfying these conditions were asked to come for an interview and to fill out a personal history questionnaire. Measures of weight and height were taken at that time.

Final selection was made using data from the interview and questionnaire. The following criteria were used for eliminating non-suitable subjects: 1) being currently involved in any weight reduction program or psychotherapy, 2) being less than 20% overweight based on the 1959 Metropolitan Life Insurance Company norms [middle category taken as desirable weight (US Department of Health, Education, and Welfare, 1967)], 3) suffering from any obesity-related physical problems such as diabetes, thyroid dysfunction, colitis, or ulcers, 4) being on medication that could affect water retention (including birth control pill), appetite, or metabolism, 5) having a sleeping problem. A physical examination and written permission from a physician were requested from all subjects; a bi-weekly physical examination was also requested for all participants in the experiment. Their consent to use data obtained during the experiment was also asked before proceeding. Subjects were told that they could leave the experiment at any time and

they were paid for their participation. Payment was made only after completion of the experiment.

A summary of the characteristics of the subjects who were finally selected is presented in Table 2.

As can be seen, all subjects except one had a history of dieting. Various dieting approaches have been used, ranging from a starvation diet to a behavior modification based program. Their average success rate is rather low. Success was defined as reaching the goal and maintaining it for a year.

#### Therapist

The weight reduction program was conducted by the author. Experimental subjects were fairly successful in carrying out the program since they averaged a loss of 1.89 pounds per week over the four week duration of the experimental treatment.

#### Procedure

Sleep laboratory procedure: On night I, subjects arrived one hour before their normal bedtime. The experimenter showed them the laboratory, their bedroom and apparatus and explained the general procedure. The bedrooms were simply furnished. A wiring box was located at the head of each bed where subjects were plugged in. Subjects were linked to the EEGs apparatus located in the control room by wires running through the walls. An intercom system allowed

Table 2

Groups and Total Means and Range of the Age, Weight, % Overweight,  
Number of Times on Diet, Success and Weight Loss

	Age	Weight	% Overweight	Number of times on diet	Number of suc- cesses	Weight loss during the 4-week experi- mental treatment
Experimental- Adult	37	77.4	45.34%	4.33	.83	7.65
Control-Adult	45	72.4	36.93%	5.00	.50	
Experimental- Child	32,17	73.6	36.88%	4.17	.67	7.47
Control-Child	35	80.1	52.75%	4.17	.50	
All subjects	37.29	75.9	42.98%	4.42	.63	
Range (all subjects)	20-49	62.7-109	21.95%-91.06%	0-12	0-4	E-A*(6.8-9.1) E-C**(5.8-8.3)

\*EA Experimental-adult

\*\*EC Experimental-child

the subjects to speak to the experimenter at all times without having to press or hold anything. Awakenings and dream collection were done via the intercom. All reports were recorded. On nights II, III, IV and V, subjects arrived half an hour before their normal bedtime. In the morning, subjects were awakened at 7:00 a.m.

Dream collection procedure: Subjects were awakened during rapid eye movement periods by a buzzer played through the intercom. The first awakening took place after five minutes of the first REMP of the night. Subsequent awakenings were done after eight minutes of the second REMP, eleven minutes of the third REMP and so on. If subjects had a body movement, awakenings were delayed until there were three (3) minutes of clear record.

Upon hearing the buzzer, subjects were asked to report anything that was going through their minds in as much detail as possible. For example, subjects were asked 1) to describe the surroundings in the dream, 2) to indicate whether they were participant or observer, 3) to describe any feelings in the dream, 4) to tell whether there was any colour and 5) to indicate if the dream was vivid. Subjects were invited to tell as much as possible without waiting for questions from the experimenter. However if the subject did not start to report, the experimenter asked: "Was there anything going through your mind before the buzzer sounded?"

While the subject was reporting, the experimenter limited his intervention to encouragements to tell more. When the subject had completed his report, the experimenter asked questions about any aspect that was not covered. If the subject reported no dream upon awakening, she was asked to indicate whether she thought she was dreaming but could not recall the dream (ND report) or if she was simply not dreaming (N report).

Obesity treatment procedure: The weight reduction program was based on the approach developed by LeBow and Perry (1977) and ran for eight weeks. The program emphasized three dimensions: weight change, behavior change and energy change. Subjects in each experimental group met once a week as a group. Plans for the coming week were made and discussed at that time.

The stressful event, i.e., the weight reduction program, constituted the experimental treatment. It was therefore crucial that subjects followed the program. Certain measures of compliance with the program were taken to evaluate their level of involvement. Subjects were asked to keep a daily log of calorie intake, physical activities and specific behaviors required by the program. Subjects were also weighed every week. At the weekly meeting, this data was compared to the plans made the previous week. This indicated how closely subjects were following the program. It was made

clear to the subjects that payment depended only on full participation in all parts of the experiment and not on weight loss per se. The daily caloric intake for each subject was determined by multiplying her weight by 15.4. For example, a subject weighing 80 kg was allowed a daily intake of 1232 calories ( $80 \times 15.4$ ).

Measures of stress: The independent variable in this study was the subject's evaluation of the stressfulness of the weight reduction program. Therefore, a specific measure of the level of stress was obtained with a structured questionnaire. Two general measures of stress were also taken using the Spielberger Anxiety Scales. These measures were taken twice, once before treatment and once after 4-5 weeks of treatment.

Physiological measures: Three physiological measures were taken: REM density, sleep latency and REM latency. REM density was defined as the ratio of the number of two-second intervals containing one or more eye-movements over the total number of two-second intervals in the REMP. Sleep latency was defined as the time from "lights off" to the first sleep spindle; REM latency was the time from sleep onset to the beginning of the first REMP. REMPs were defined by the criteria suggested by Rechtschaffen and Kales (1968). These measures were taken twice, once before treatment and once after 4-5 weeks of treatment. A ten-channel Nihon-Kohden was

used for recording.

### Data Analysis

Analysis of dream content: The dreams were analyzed by two judges who were blind as to the conditions from which they were obtained. The dreams were analyzed along the following dimensions:

#### 1. Incorporation of the stressful situation

Direct: a direct incorporation was scored when a dream contained any element related directly to the stressful situation. Categories were developed based on pilot data (see Appendix VII).

Symbolic: a symbolic incorporation was scored when a dream contained any element that could be related to any part of the stressful situation, for example the weekly meetings, the weighing, the filling of forms, etc. However, as only one instance of symbolic incorporation was reported, this scale was dropped from the analysis.

#### 2. Level of anxiety

A scale of anxiety was used where each dream was scored on an ordinal scale, 0 corresponding to no anxiety at all and 5 to the highest level of anxiety.

#### 3. Defense mechanisms

This dimension was analyzed using the "Ego Rating System: Integrative Mechanisms" developed by Sheppard and Saul

(1958, 1963, 1973). (See Appendix IX).

#### 4. Body disturbances

This dimension was assessed by the following scale: the "Body Image" scale developed by Sheppard and Saul (1958, 1963, 1973).

Inter-judge agreement: The correlations between the ratings of the two judges are presented in Table 3. A correlation of .70 had been set as being the minimum level acceptable.

Statistical analysis: Individual variability on psychological and physiological dimensions of stress has long been recognized (Appley, and Trumbull, 1977). In this study, the high variability of our subjects on the various measures of stress warranted the use of the analysis of covariance as a technique to measure the effect of the experimental treatment on the various groups (Harris, 1975; Porter and Chibucos, 1974).

Specific hypotheses were tested using the t test. This technique has been shown to be quite robust to violation of its assumptions (Boneau, 1960; Cohen, 1965). When multiple significance testing is carried out in psychological research, there is a risk of finding spurious significant differences. As the number of tests increases, the risk increases. To correct this, Miller (1966) has proposed grouping comparisons (families) made under a single hypothesis and testing them



Table 3

Correlations Between Judge's Ratings  
on the Dimensions  
of Dream Analysis

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Direct Incorporation	.95
Anxiety	.89
Body Image	.86
Integrative Mechanisms	.88

---

with a family-wise error rate. Where appropriate, Bonferroni's approach of dividing alpha was followed and a family-wise error rate of .10 was adopted when three comparisons were made and of .05 when two comparisons were made.

## CHAPTER III

### RESULTS

#### Effects of the Diet as a Stressful Stimulus

As a first step, it was necessary to verify that the diet had the stressful effect that was expected. Three pre and post-treatment measures were taken to check this assumption. There was one instrument to measure the stress specific to the diet (Diet Questionnaire) and two other instruments to measure general stress (Spielberger Trait Anxiety Scale and Spielberger State Anxiety Scale). Table 4 presents the results of the analysis of covariance carried out using the pre-treatment scores as covariables. Bonferroni's approach to multiple testing requires using (familywise,  $.10/3$ ) a p value smaller than .033. Results show that there is no significant difference between the groups on the three measures reflecting the stressfulness of the treatment as perceived and self-reported by the subjects.

The results of the covariance analysis indicate that the experimental treatment has had no differential effect on the experimental and control groups. To see if participation in the experiment alone may have increased the stress level of all participants, t tests were carried out on the pre- and post-scores of each group on the three measures used to evaluate the perceived stress level of the subjects.

Table 4

Analysis of Covariance Results for the Three Instruments  
Used to Measure the Stressfulness of the Treatment  
with the Pre-Treatment Scores as Covariables

Source	df	DQ*		STAS*		SSAS*	
		<u>MS</u>	<u>F</u>	<u>MS</u>	<u>F</u>	<u>MS</u>	<u>F</u>
Treatment	1	24.465	1.763	120.388	1.390	52.574	.282
Age	1	2.899	.209	16.977	.196	42.442	.228
Treatment X Age	1	22.696	1.635	70.065	.809	57.379	.308

.033 F (1,19) = 5.42 (Required when using Bonferroni's approach)

.05 F (1,19) = 4.38

.10 F (1,19) = 2.99

\*Note: DQ = Diet Questionnaire, STAS = Spielberger Trait Anxiety Scale,  
SSAS = Spielberger State Anxiety Scale.

Results showed no significant differences. Table 5 presents the details of these analyses. A significance level of .033 was adopted (familywise,  $.10/3$ ).

Even though dieting did not create the expected stress in the experimental groups, at least as defined by self-report, it was decided to examine both the dream reports and the physiological measures anyway on the grounds that they offer another level of analysis where subjects are not consciously aware of the type of responses they are giving. In that sense, the content analysis of dream reports and the physiological measures, being more subtle, may provide additional and/or corroborative evidence of the effects of the stressful stimuli.

After having been exposed to the experimental stimulus, it was expected that the dream reports of the two groups on diet (childhood-onset and adult-onset obese) would show more direct incorporations of elements from the stressful situation and more anxiety than the dream reports of the non-dieting obese people. Table 6 gives the results of these analyses. Even though there was a greater amount of direct incorporation in the dream reports of the dieting subjects, the difference failed to reach the significance level required by the Bonferroni's method (familywise,  $.05/2 = .025$ ).

Table 5

Means and  $t$  Tests of the Pre and Post-Treatment Scores for  
Each Group on the DQ\*, STAS\*, SSAS\*

	Pre	DQ* Post	$t$ (df=5)	Pre	STAS* Post	$t$ (df=5)	Pre	SSAS* Post	$t$ (df=5)
Experimental- Adult	55.16	57.00	.91	37.83	39.33	.18	39.66	44.50	.68
Control- Adult	57.00	54.00	1.07	38.5	39.5	.16	44.66	39.66	.16
Experimental- Child	55.00	55.66	.25	38.16	32.83	.94	45.00	42.66	.73
Control- Child	54.83	55.50	.29	45.00	42.66	.73	42.16	39.83	1.94

$.033^{t_5} = 2.271$  (Required when using Bonferroni's approach)

$.05^{t_5} = 2.015$

$.10^{t_5} = 1.476$

\*Note: DQ = Diet Questionnaire, STAS = Spielberger Trait Anxiety Scale,  
SSAS = Spielberger State Anxiety Scale.

Table 6

Means of Direct Incorporation and Anxiety Scores  
for the Dieting (N=12) and non-Dieting (N=12)  
Subjects After Treatment

	Dieting Subjects	Non-Dieting Subjects	<u>t</u> (df=22)
Direct Incorporation	1.000	.416	1.17
Anxiety	1.872	1.938	0.20

$.025_{t=22} = 2.074$  (Required with Bonferroni's approach)

$.05_{t=22} = 1.717$

On the physiological measures, the two groups on the diet were expected to show an increase in sleep latency, a decrease in REM latency and an increase in REM density. Using the Bonferroni's approach, the required level of significance was  $.10/3=.033$ . The results are given in Table 7. Two of the physiological variables show differences in the expected direction but they also fail to reach the required level of significance.

The third hypothesis predicted that childhood-onset obese subjects would show more anxiety after having been exposed to the experimental treatment. Concomittant with this change, more images of "Body disturbances" were expected as well as a greater use of defense mechanisms. Table 8 presents the results of these analyses. Bonferroni's formula required a familywise error rate of  $.10/3=.033$ . Only the "Body disturbances" mean difference reached significance ( $t=2.67$ ,  $df=5$ ,  $p<.025$ , one tailed). The mean difference on the two other scales ("anxiety" and "defense mechanisms") did not reach significance even though they were in the expected direction.

Finally, a last set of predictions, that the adult-onset obese subjects on the diet would show less anxiety and a reduction in the use of their defense mechanisms after having been exposed to the experimental treatment, were tested. The results of these analyses are presented in



Table 7

Means and t Tests of the Physiological Measures  
for the Two Groups of Subjects  
(Childhood-onset and Adult-onset Obese)  
on Diet (12)

	Pre-treatment nights	Post-treatment nights	<u>t</u> (df=11)
Sleep latency	16.616(minutes)	19.481	1.17
REM latency	97.849(minutes)	89.655	0.55
REM density	15.05	14.252	0.19

$.033^t_{11} = 2.035$  (Required with Bonferroni's approach)

$.05^t_{11} = 1.796$

$.10^t_{11} = 1.363$

Table 8

Means and  $t$  Tests of Anxiety, Body Disturbances and  
Defense Mechanisms Scores for the  
Childhood-onset Obese on Diet (6)

	Pre-treatment nights	Post-treatment nights	$t$ ( $df=5$ )
Anxiety	1.345	1.868	1.24
Body Disturbances	1.071	1.195	2.67
Defense Mechanisms	11.385	12.628	0.94

$.033^t_5 = 2.271$  (Required with Bonferroni's approach)

$.05^t_5 = 2.015$

$.10^t_5 = 1.476$

Table 9. There was no difference between the pre and post-treatment scores on these two dimensions. Here Bonferroni's approach required a significance level of  $.05/2 = .025$ .

Table 9

Means and t Tests of Anxiety  
and Defense Mechanisms Scores  
for the Adult-onset Obese  
on Diet (6)

	Pre-treatment nights	Post-treatment nights	<u>t</u> (df=5)
Anxiety	1.08	1.876	2.30
Defense Mechanisms	12.356	12.331	0.01

$.025^t_5 = 2.571$  (Required when using Bonferroni's approach)

$.05^t_5 = 2.015$

## CHAPTER IV

### DISCUSSION

The present research was based on the assumption that a weight reduction program would bring about a stress reaction in the experimental subjects. The analyses of the data obtained from various sources (self-reported questionnaires, content analysis of dream reports and physiological measures) showed that the expected stress reaction did not occur. Previous studies (Glucksman and Hirsch, 1968; Solomon, Blumer and Converse, 1970; Gold, 1976) have reported stress reaction in obese subjects following a low-calorie diet. Gold (1976) reported a dramatic rise in emotional disturbances when the period of low-calorie dieting went beyond two weeks. Similar emotional reactions are mentioned in Glucksman's and Solomon's studies.

The nature of the stressor, i.e., a low-calorie diet, used in the studies reported above warrants further comments. The weight reduction program used was an extremely low-calorie program ranging from 500 to 600 calories per day for people weighing from 125 to 146.3 kg. Such a drastic program is not advisable for non-hospitalized people. The program used in this study ranged from 966 to 1680 calories per day for subjects weighing from 62.7 to 109 kg. The discrepancy in the degree of severity of the stressor used

could partly explain the differences in results.

The results obtained in the present study appear to support this hypothesis. Dieting subjects showed differences in the expected direction on a number of measures (the amount of direct incorporation, the variations in sleep onset latency and REM latency). Moreover, the analysis done on the childhood-onset obese people on the diet showed the same tendencies: the "Body disturbances" mean difference reached significance while the scales of "anxiety" and "defense mechanisms" indicated differences in the expected direction although non-significant. These results may be an indication that the stressor has had some albeit limited effect on dream content.

A review of a number of other studies examining the interactions between an individual and a stressor may provide an additional basis for understanding our results.

It has been demonstrated in several studies that stress is in the eye of the beholder, or, stated differently, that in order for stress reactions to appear there must be the cognitive appraisal that the situation is in fact stressful (Fritz, 1957; Harris, Mayer & Becker, 1955; Lazarus, Baker, Broverman, and Mayer, 1957; Lazarus, Deese & Osler, 1951; Golberger, 1966; Schacter & Singer, 1962; Wrightsman, 1960; Speisman, Lazarus, Mordkoff, and Davison, 1964).

In order to carry out the process of cognitive appraisal of a stimulus the individual uses his past experiences with

the stimulus, if he has had any. Prior exposure to the stressor allows the individual to pay attention to what is coming and know what he is going to encounter. Knowledge of the stressful stimulus through prior exposure will attenuate its effects if the previous experiences or contacts have been successful, have been of positive affect, or have led to adaptation (Elliot, 1966; Luby, Grisell, Frohman, Lees, Cohen and Gotlieb, 1962). If the previous contacts with the stressor have been negatively reinforcing or have resulted in failures, prior experiences will increase stress (Feather, 1965; Harleston, 1962; Hokanson and Burgess, 1962; Ainsworth, 1958; Darley, 1966; Dittes, 1961; Parkes, 1963). However, failures appear to be accompanied by a lowering of expectations (Feather, 1966; Postman and Brown, 1952; Eriksen, Lazarus, and Strange, 1952), tempering the subjects' reaction to the stressor.

All the subjects except one participating in our experiment had been on a diet before; sixty-two (62%) percent had been on diet three (3) times or more. The average number of times at dieting for all subjects is 4.42 while their average number of successes is .63 (see Table 2). This rather extensive first-hand experience with the experimental treatment, that is going on a diet, may have played a major role in the cognitive appraisal of the stressor used in this experiment. They have had many an occasion for evaluating

the effects of the stressor.

When faced with the same stressor and asked to evaluate their reaction to it, they called upon the knowledge gained from past experiences. The magnitude of their individual reaction reflects what they have experienced in the past.

This reasoning is supported by the scores obtained by the subjects at the pre-treatment evaluation on the specific self-reported measure of the effects of the stressor, the "Diet Questionnaire". The reaction level ( $\bar{M}=55.50$ ;  $\sigma=9.63$ ; range: 37-66) is high, well above the no-stress level which would correspond to a score of 18, while the maximum would be 90. The pre-treatment scores on the Diet Questionnaire reflected their cognitive appraisal of the well-known stressor and consequently when they were asked a second time to give their reaction after another exposure to it, they reported no significant change, as reflected by the post-treatment scores on the same questionnaire (see Table 5). In summary, the nature and duration of the stressor used in this experiment with highly experienced subjects do not seem to be as potent as expected.

#### Duration of the Stressor

In dealing with sophisticated subjects it may be possible to increase the stressfulness of the diet by increasing its duration. Most of the results in this study, although nonsignificant, pointed in the predicted direction, and



increasing the length of the stressful event might make it stressful enough to shake their acquired coping mechanisms and necessitate readaptation.

#### The Dream Collection Procedure

One problem inherent to collecting dream reports to study the possible adaptive function of dream, is that people do not necessarily dream about life stresses on the night immediately following their occurrence. Cartwright et al., (1969) have reported that subjects had more incorporations of elements from the stimulus (an erotic movie) on the second and third night than on the first night following the presentation. De Koninck (1973) alluded to the same phenomenon and wrote that it was possible "that subjects in the present study also 'delayed' their incorporations" (p. 71). Life stresses compete with each other in attracting the waking and sleeping attention and coping mechanisms.

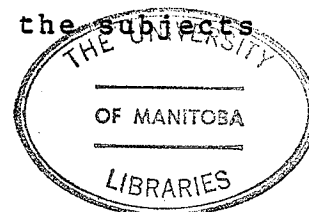
Breger et al., (1971) reported a study where participants in a group therapy session were each in turn the focus of all the other group members. Subjects in this experiment were sleeping in the laboratory on the same night that followed their "grilling". Even in this situation where the stressfulness of the experimental treatment was quite high, they did not report that many more stressor-related incorporations than seen in studies using laboratory induced

stressful stimuli (movies).

The approach of collecting dream reports on only a few nights before and after the application of the experimental treatment appears too restrictive to study the impact of a real life stressful event. It is almost impossible to gather enough data to allow a full analysis and understanding of how the stressful event affects the subjects and how they deal with it. The same reasoning would apply to the physiological parameters of sleep.

#### Suggestions for Further Research

In view of the difficulties encountered with the approach used in this study, it seems appropriate to suggest an alternative procedure. First of all, the selection of subjects should include as a prerequisite the absence of previous contact with the stressor, in this case a diet. These subjects could be trained to recall their dreams and record them at home. Only two groups would be required: a childhood-onset obesity group and an adult-onset obesity group. Subjects would serve as their own controls to mitigate against the great individual variability in terms of how subjects are affected by a stressor and how they react to it. The groups should be asked to record their dreams for a given period of time before starting the treatment. Then, both groups could be put on a weight reduction program that might last as long as six months or until the subjects



reached their goal weight. After having reached their goal, subjects could be asked to record their dreams for the same length of time decided upon for the pre-treatment period.

## CHAPTER V

### CONCLUSION

The present study has shown that it may be necessary to revise our approach to studying the possible adaptive function of dreams in dealing with stress. Up to now, the classical experimental approach has been the favored method. However this approach has not allowed a full scale investigation of the problem raised in the present study.

It appears that the relationship between the stressor and the individual subjects must be monitored not only at two points in time (pre and post measures) but rather on a continual basis. It was suggested that a longitudinal approach could be appropriate, permitting the gathering of data over a prolonged period of time and perhaps providing a better understanding of the dynamics involved when an individual is faced with and has to cope with a stressful event.

## CHAPTER VI

### REVIEW OF THE LITERATURE

#### Function of Dreams

The relationship between dreams and waking life has been given great importance by our ancestors. The Greeks, Romans, and Hebrews considered them messages from the gods. Later, dreams were considered a product of nature and their content was thought to be dependent on waking life.

The observed relationship between dreams and waking life has led scientists to formulate theories dealing with the function of dreams. Among the many theoreticians who have worked on the subject, Freud is still probably the most important. Essentially, the two roles he attributes to dreams are wish fulfillment of repressed infantile fantasies and the preservation of sleep (Freud, 1953).

In a footnote added in the 1914 edition of The Interpretation of Dreams, Freud recognized that Adler (1911) and then Maeder (1912) both said that dreams possess a function of "thinking ahead" in order to solve conflicts, in effect allowing the person to rehearse what will be carried out in reality. However, he does not assign this function to dreams but to preconscious waking thought.

The two roles attributed to dreaming by Freud, i.e., wish fulfillment and preservation of sleep, have been the

subject of criticism. Jones (1970) is very explicit in commenting on the first function; studying Freud's own interpretation of dreams, he writes: "I have made a thorough search of The Interpretation of Dreams and can report that there is not one illustration of wish-fulfillment which meets the criterion of reference to a repressed infantile wish" (p. 12). This should not be interpreted as a contradiction in Freud's position but rather as a consequence of the distinction between dream formation and dream interpretation. According to Jones, Freud held repressed infantile wish-fulfillment to be essential to the formation of dreams but not the interpretation of them.

In Beyond the Pleasure Principle, Freud (1948) discussed another possible function of dreams. This function, though, applies only to dreams of patients suffering from traumatic neuroses who are in this way led back with regularity to the situation in which the trauma occurred. According to Freud, it is an attempt to master the stimulus retrospectively. However, Freud does not give a very important position to this mastering function of dreaming. This is probably due to his motivational theory of the development of the personality in which the id is the source of infantile wishes and of the motivational force and where the ego is considered to have a defensive function to discharge the energy of the repressed wish and to maintain a healthy state of sleep.

However, neo-freudian personality theorists (e.g., Hartman, 1938; Erickson, 1959, 1963, 1968) have given much more importance to the ego. They developed a new "ego psychology" in which the ego is depicted as being a rational institution responsible for intellectual and social achievements and one whose functioning is not solely dependent upon the wishes of the id. It has its own sources of energy, its own motives and interests, and its own objectives. While Freud depicted the ego as serving only defensive functions, the neo-Freudians discussed the auxiliary ego processes of perceiving, remembering, thinking and acting in addition to its defensive role. At the same time, they insisted on the concept of the autonomy of the ego. This new conception led to the development of the integrative or synthetic function of the ego where the individual could use all the ego processes to integrate new experiences. Following that lead, Jones (1970) proposed that dreaming serves ego synthesis functions as well as ego defense functions. The function of ego synthesis is derived from Erik Erikson's theory of adaptive human development. It involves the reevaluation and reintegration of previous successes and failures in the context and under the pressure of contemporary conflicts.

Others have formulated similar theories (French, 1952; French and Fromm, 1964; Breger, 1967; Breger et al., 1971;

Pearlman, 1970; Greenberg et al., 1970). Breger hypothesized that dreams serve to integrate stressful events by keeping them repressed within the memory systems. However certain conditions are necessary for integration to take place. Dreaming provides these conditions, namely: greater access to unresolved conflicts, greater fluidity of associational processes, freedom from "critical" processing for social acceptability, and, in general, greater variety of means of manipulating and transforming old conflicts.

Greenberg et al. (1970) and Grieser et al. (1972), in formulating their version of the theory, elaborated on the adaptive role played by dreams. According to them, dreaming allows the individual to associate his present conflict with unresolved ones from the past. This enables him to use his basic coping mechanisms (defenses) to deal with the situation. The stressful event is repressed and kept at an unconscious level. However, dreaming, by associating a not too stressful event with an unresolved conflict, allows the individual to face the event. Reevaluation permits a reintegration at the conscious level. The individual is then able to modify his way of dealing with future conflicts and will therefore require less use of defense mechanisms. This form of adaptation is growth-promoting for the individual.



The theory of the adaptive function of dreams, as proposed by Greenberg et al. (1970) and others implies certain processes, two of which have been studied in the literature: the incorporation in dreams of elements from the stressful event and the manipulation of these elements. The next section will review studies testing the adaptation hypothesis per se. Subsequent sections will present research on each of the two processes.

#### The Adaptation Hypothesis

Several studies have been conducted to test the hypothesis that dreams serve an adaptive function by allowing the individual to use his defense mechanisms in dealing with conflicts. Using different approaches, these studies do show that the defense mechanisms are at play and that they are necessary for the individual to lead a normal waking life.

Greenberg et al. (1970) used dream deprivation to test the hypothesis that dreaming renders unconscious both daily stressful experiences and the unresolved conflicts they arouse. Each of the four subjects in the study had three baseline nights of sleep in the laboratory followed by three nights of REM period deprivation. Subjects served as their own controls by being awakened as many times during NREM as during REM periods. Various cognitive functions were tested by using a digit symbol test, a vigilance test and

a test involving the learning and remembering of paired-word associates. Also a series of projective tests were given: Rorschach, House-Tree-Person and a modified form of the Holtzan. Greenberg reported little change in any of the cognitive tasks and quite large differences in the projective tests. With dream deprivation, the test protocols of all four subjects clearly show feelings and wishes which had previously been kept out of consciousness. The results are interpreted as being due to the fact that, when REM deprived, the subjects were unable to deal with aroused material in their most characteristic fashion. That is why when the projective tests were presented, the protocols showed evidence of feelings, wishes and conflicts which had previously been defended against. The authors considered the results as supporting the hypothesis that dreams allow the individual to deal with threatening material by using his or her characteristic defenses.

Fiss et al. (1968) arrived at similar results with a different approach. They studied the personality patterns and conflicts of their subjects and then compared dreams collected during a period of REM interruption with dreams collected from uninterrupted REM periods. They showed that in contrast to completed dreams, interrupted dreams were more vivid and more active, and brought the subjects' basic conflicts into sharper focus. As in the study of Greenberg

et al. (1970), REM deprivation prevented the individual from dealing with his conflicts in his usual way; hence, the conflicts appeared more often and with more intensity in the dreams.

The role of dreaming in adaptation to an anxiety-provoking stimulus was examined by Greenberg et al. (1972b). Twenty subjects viewed a film of an autopsy which had been shown to evoke measurable psychological and physiological anxiety reactions. The authors were interested in the effect of dream deprivation on adaptation to a second viewing. Therefore, between the two viewings, 9 subjects were REM deprived, 5 had normal sleep and 6 were awakened during NREM periods. Of the subjects who had shown a significant anxiety response to the first viewing, the group that was REM deprived showed significantly less adaptation to the second viewing than the other two groups. The authors concluded that the group that had been allowed to dream was less anxious because they could now use their defenses to deal with the anxiety-provoking aspects of the film.

Grieser et al. (1972) did a study to investigate the hypothesis that REM sleep serves an adaptive function. The subjects were forty volunteers with high ego strength as measured by the McReynolds Concept Evaluation Technique and the Alper Psychological Insight Task. The stressful event

was represented by very difficult items in an interrupted task paradigm. Some subjects were REM deprived and others were awakened during NREM periods. Subjects were tested the next day to determine the recall ratio of failed and completed items. Both groups recalled the completed items equally well. However, the failed items were better recalled by the NREM deprived group than by the REM deprived group. The authors interpreted the increased ability to recall failed items following dreaming as due to a reintegration done by the defense mechanisms. The anxiety linked to the failed items is presumably kept at an unconscious level robbing the situation of its stressfulness and permitting the individual to adapt to it.

In another study, Greenberg et al. (1972a) tested the adaptive function of dreams by using psychometric data and dream reports of patients with war neuroses. Seven subjects spent at least three nonconsecutive nights in the laboratory and on half of the nights they slept undisturbed while on the other half, they were awakened at the end of each REM period and asked to relate their dreams. In relation to the dream content, the results point to two important facts: first, in contrast to the frequent nightmares reported by subjects prior to the sleep study, there were only two clear war nightmares reported during all the nights spent in the laboratory. Both were associated with REM sleep. This was

supposedly due to the security offered by the laboratory. The second finding was the infrequency of dream recall following REM awakenings. This low frequency of dream recall could have been due to the fact that subjects were sleeping in the "security" of the laboratory and that the defense mechanisms were then more successful in keeping the traumatic experience out of consciousness (repression) than they were when subjects were sleeping at home. There was also a short REM latency which could be interpreted as a much greater than normal pressure to begin to dream on the part of this population. However, their defensive ways of dealing with the aroused material appear to be limited to the laboratory situation.

Cohen and Cox (1975) tested the notion that subjects in a stressful situation who show evidence of some kind of dream preoccupation with the stressful event, would be more likely to improve in mood from pre to post-sleep. Stress was created by having an experimenter administer a short IQ test presented as supposedly very easy while actually being quite difficult, and by timing the test to increase difficulty. This procedure was carried out in a very cold, distant atmosphere created by the experimenter. The results showed a significant increase in positive affect only for the subgroup who incorporated various experimental elements. There was a positive correlation between amount and type of

dream material and affect change, that is, the amount of incorporation of the stressful event was related to a positive change in affect. This was interpreted by the authors as reflecting an underlying adaptive process.

As mentioned in the introductory paragraph to this section, the hypothesis of the adaptive function of dreams is supported by experimental data. However, only one of the studies (Cohen and Cox, 1975) used dream data to test the hypothesis. All the others relied on some type of psychometric data.

Cohen and Cox (1975) studied the representational process and they concluded that the incorporation-nonincorporation distinction is meaningful and supports the adaptation hypothesis. The next section will review the literature on the incorporation process.

#### Incorporation of Elements

The process of incorporation in dreams of elements from the stressful event has been the object of several studies (Witkin and Lewis, 1967a, 1967b; Collins et al., 1967; Cartwright et al., 1969; Cartwright et al., 1972; De Koninck and Koulack, 1975). These studies have used experimentally created stressful events, specifically anxiety-provoking movies shown prior to bedtime. Witkin and Lewis (1967a, 1967b) used two emotionally-charged films, a medical teaching film showing the birth of a baby and an anthropological

documentary of a subincision initiation rite practiced by a primitive Australian tribe. A third neutral film was simply a pleasant travelogue. The authors report clear incorporation of elements from the stressful events but "in many instances, . . . , identification of an element in the dream as related to the presleep stimulus relies on the interpretation of a symbolic or metaphoric dream translation" (p. 163).

Collins et al. (1967) used the same anthropological documentary as Witkin and Lewis (1967), "Subincision", which depicts a crude operation on the penises of adolescent boys in an aboriginal culture. Subjects' reaction to the film was assessed before sleep. Results showed significant correlations between level of emotional arousal as evaluated by the subject and independent rating of incorporation of elements from the film in dream reports. Those who were aroused by the film tended to dream about it while the ones who were not aroused did not.

Cartwright et al. (1969) did a study of the effect of an erotic movie used as a pre-sleep event. The subjects' reports showed a small amount of symbolic representation of the film content.

In another study, Cartwright et al. (1972) explored the differences in dream content between 10 homosexual and 10 heterosexual young male adults. REM dreams were collected

1 night before and 4 nights after presentation of a heterosexual movie. Results show more direct incorporation of laboratory elements than film elements for both groups. Heterosexuals had fewer dreams with direct sexual content and more dreams with symbolic sexual content than expected on the basis of normative data. Homosexuals showed the reverse pattern. Heterosexuals doubled the percentage of "no recall" reports on the first night following the movie compared to a control night; homosexuals showed no change. It is possible that this high percentage of "no recall" reports by heterosexuals corresponds to remembered dreams which were not told to the examiner because they had a sexual content or because they were repressed. It could be that they were more affected by the movie than homosexuals and dreamed more about it but were too embarrassed to report them.

De Koninck and Koulack (1975) used a film depicting industrial accidents along with a soundtrack of the film presented during REM periods. There were four experimental groups made up of four subjects each and a control group of eight subjects. Two experimental groups were exposed to the film-sound condition and two others to the film-alone condition. Dreams of experimental subjects were collected on two nonconsecutive nights, one baseline night and one night following viewing of the film. Results showed that



dream reports of subjects in the film-sound condition had more incorporation of the film content than dream reports of subjects in the film-alone condition. However, the film-alone condition, itself a stressful condition according to the responses of subjects on the Mood Adjective Checklist, did not bring about more incorporation than on the baseline night. This could be due to a too weak stimulus or to lack of personal relevance attached to the film itself. The emotional reaction of subjects upon seeing the film does not necessarily guarantee a degree of personal involvement that would bring the subject to dream about it. In that sense, the interaction of the film and the sound played during REM periods seem to have somewhat forced elements of the film into dreams, hence the greater number of incorporations.

Breger et al. (1971) studied the effect of real life stress on dream content. The two stressful situations were a therapy session and a serious surgical operation. In the first study (therapy session), dreams of four subjects were collected on five baseline nights, and on a night where a particular subject had been the focus of group discussion. In the other study (surgical operation), dream reports of four subjects were collected during the four nights preceding their operation and five nights several weeks after the operation. Dreams of two subjects used as control group

were collected during a similar period of time but without any stress during the interval. The authors reported a significant number of incorporations of stressful material both from the therapy session and surgery as compared to the baseline nights and the control group. The amount of incorporation in these studies is far greater than in the studies using laboratory-created stressful events. The authors interpret these results as being due to the greater personal relevance of the stressful events.

In summary, it does seem that an experimentally created pre-sleep stressful event or a real life stressful event will find its way into the dream content either through direct incorporation or symbolic representation. In the context of the adaptive function of dreams, two points are worth emphasizing. First, only one of the studies examining incorporation used a real life situation and second, the phenomenon of incorporation seems to be considered equivalent to the process of adaptation. Hardly any word is mentioned of how these incorporated elements are integrated or dealt with, except in the Breger et al. (1971) study.

#### Manipulation of Incorporated Elements

What happens to the incorporated elements is crucial to the understanding of the adaptation process. Two reports examine this question (Breger et al., 1971; Rossi, 1972). Breger et al. (1971) have used dream reports collected in the

laboratory situation while studying the effects of real life stressful events on the content of dreams. The authors analyzed the dream reports and found that each subject had an individual style in coping with a threat: some cannot translate their private dreams into public communications, while others show a naive detachment or an abstract intellectuality. In general, subjects attempt to dissociate their production from themselves.

Rossi (1972), in his book Dreams and the Growth of Personality, reports on a series of dreams from a therapy client. He was able to show in an integrative sequence how dreams were actually used by his client to deal with her problem and consequently develop her personality. It appears from his account that the working out of problems in dreams brings about a reduced use of defense mechanisms, as Greenberg et al. (1970) proposed. Rossi's approach is strictly clinical and utilizes psychoanalytic interpretation.

These two reports, while contributing to the understanding of the adaptation process, are limited in scope. The clinical case study approach taken in both reports does not allow an objective study of the phenomenon.

#### Dieting as a Stressful Event

The personal and social implications of dieting make it an interesting situation in which to study how dreams can help the individual to deal with stress. Some studies have

already shown that dieting is stressful (Glucksman and Hirsch, 1968; Solomon et al., 1970; Gold, 1976).

Comparing fasting to a low-calorie diet, Gold (1976) reports that being on a low-calorie diet may be more stressful to an individual than fasting. He points out that once the period of low-calorie dieting extends beyond two weeks, there tends to be a dramatic rise in emotional disturbances, as well as physical symptoms. However, Gold adds that individuals whose obesity started in childhood are more likely to experience psychological as well as physical distress in weight loss programs than people whose obesity began in adult life. Therefore, even though low-calorie dieting is stressful, it does not carry the same implications for all obese people who are dieting.

Glucksman and Hirsch (1968) carried out a study, using a clinical evaluation approach, to investigate psychopathological reactions and psychodynamic processes of obese patients during weight loss. The authors report three major threats obese subjects experience during weight reduction: 1) physical and psychological sequelae related to diminished body size, 2) interpersonal transactions in the hospital environment which articulated with earlier injurious experiences, and 3) physiologic changes induced by caloric deprivation (p. 10). Essentially, while they are losing weight, obese subjects are forced to view themselves and the

world around them differently; this constitutes a very traumatic experience for them. This dynamic process comes out during daily interviews and takes different forms for different subjects. Fears that accompany weight reduction are expressed in many different ways such as fear of physical disintegration, loss of sanity, fear of the doctor's anger or disapproval if there is failure to lose weight, fear of physical injury, emasculation by a male authority figure, starvation, helplessness or abandonment.

Fears that make the dieting experience a very stressful one are reported in obese patients who develop psychopathologic adaptive behavior once they have lost a certain amount of weight. A number of authors (Crisp and Stonehill, 1970; Glucksman and Hirsch, 1968; Crisp, 1967) proposed that obese patients following major weight loss are not so much characterized by depression as by a loss of the capacity to deny their interpersonal problems any longer. Depression and other abnormal adaptive behavior follow such as: grandiosity, obsessive-compulsive symptoms, paranoid ideation, homosexual behavior, somatization, and schizoid withdrawal (Glucksman and Hirsch, 1968; Bruch, 1957; Stunkard, 1957; Solomon et al., 1970).

There are other authors who reported several cases where obese patients, upon losing weight, show less abnormal behavior (Crisp and Stonehill, 1970; Shipman and Plesset, 1963;

Biggers, 1966; Kollar and Atkinson, 1966; Bloom, 1959; Drenick, Swendseid, Bland and Tuttle, 1964). But, as Kalucy and Crisp pointed out (1974), factors that play a role in bringing about an increase or a decrease in psychopathology are unknown. There is only one consistent observation in the various reports, that is that clinic subjects who were grossly obese since childhood show major disturbance of body image in terms of feelings, attitudes and cognition (Stunkard and Mendelson, 1957; Glucksman and Hirsch, 1968; Gazet et al., 1974; Gold, 1976). In that context, Gold reports that in childhood or juvenile-onset obesity, there is a crystallization of a negative self-concept based on the body image. Long-term results from dieting in these juvenile-onset obese individuals are especially poor. This notion is supported by the report that massively obese female subjects tend to overestimate their body widths. Such a tendency often persists especially in those whose obesity has been life-long (Glucksman and Hirsch, 1969). On the other hand, adult-onset obese individuals whose self-concepts essentially crystallized prior to their weight gain, show less severe or no problem with body image when put on a diet. Hence, dieting tends to bring about a reduction in neurotic behavior (Crisp and Stonehill, 1970; Shipman and Plesset, 1963; Biggers, 1966; Kollar and Atkinson, 1966; Bloom, 1959; Drenick et al., 1964).

In conclusion, it seems that there is a developmental factor which differentiates those who develop abnormal adaptive behavior following weight loss from those who show less neurotic behavior, specifically the body image that each individual has acquired through the years. Thus, one would expect that while the two groups would experience dieting as a stressful experience, the stress would be more encompassing for childhood-onset obese people because the weight reduction program, while bringing about a reduction in body size, is a threat to the self-concept which has been crystallized on a large body size. For adult-onset obese people, the stressfulness of dieting is not so global because it does not constitute a threat to their self-concept.

#### Physiological Correlates of Stress

Studies have been done to examine the effect of stress on various physiological parameters. REM density has often been associated with active and vivid dreams (Roffwarg, Dement, Muzio and Fisher, 1962; Dement and Kleitman, 1957; Berger and Oswald, 1962; Verdone, 1965). It has also been shown to increase in relation to a stressful stimulus (Fisher et al., 1970; Karacan et al., 1966; Baekeland et al., 1968; Cohen, 1975). Fisher et al. (1970) studied the dreams of subjects who had nightmares. They reported an increase in REM density associated with anxious dreams.

The three other studies reporting a significant increase in REM density were conducted with a laboratory-created stressful event, i.e., either a stressful movie or a "rigged intelligence test".

Other reports appear in the literature where the phenomenon, i.e., increased REM density following a stressful stimulus, failed to be supported (De Koninck, 1973; Goodenough et al., 1974; Goodenough et al., 1975; Koulack, 1970). In all cases, a laboratory-created stressful stimulus was used (a stressful movie or water deprivation). It appears impossible at this point to explain why the phenomenon is observed in some studies and not in others. Various explanations have been offered. In some cases, it could be due to the lack of personal relevancy of the "stressful" stimulus used; in others, it could be due to the small number of subjects used, thereby reducing the power of the statistical analysis.

Another physiological parameter that appears relevant to this study, is REM onset latency defined as time from sleep onset to onset of  $REMP_1$ . Three studies done with a laboratory-created stressful event (a movie) have failed to report a decrease in REM latency as expected when subjects are exposed to the stimulus (De Koninck and Koulack, 1975; Koulack, 1969; Koulack, 1970). Only one report (Natani et al., 1972) studied the effects of a real life stressful



event on REM onset latency. Sleep patterns of men wintering-over at the South Pole were recorded for three consecutive nights at approximately two months intervals, i.e., early, mid and late winter. The mid-winter data were taken following a stressful station emergency. The data obtained under the stressful condition showed a decrease in REM onset latency when compared to the other conditions.

A third parameter frequently studied in relation to stress is sleep onset latency. The expected phenomenon, i.e., an increase in sleep onset latency under the stressful condition, is fairly well supported by several studies (Goodenough et al., 1974; Goodenough et al., 1975; Cohen and Cox, 1975; De Koninck and Koulack, 1975). These studies were done with a movie or a "rigged intelligence test" as stressful stimuli. Baekeland et al. (1968), using an emotionally charged movie as stressful event, reported a tendency toward a longer sleep onset latency period in the stressful condition but it failed to reach statistical significance. Finally, one study (Koulack, 1970) done with water-deprived (stressful stimulus) subjects did not report significant results.

In summary, it appears that there is a statistically significant relationship between stress and REM density, REM onset latency and sleep onset latency. However, most of the reported studies have been done with laboratory-

created stressful events. Very few reports have taken a measure of the degree of stressfulness of the stimuli used. It was assumed that subjects reacted to them as expected. This study will be carried out with a real life stress event which has a high degree of personal relevancy and a measure will be taken of the degree of stressfulness created by the stimulus. Hopefully this approach will help to clarify some of the reported discrepancies.

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APPENDIX I

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## CONSENT FORM FOR USE OF DATA

M. Charles Thérout has my permission to use at his discretion data obtained while I participated in a sleep and dreams study and a weight reduction program conducted at the University of Ottawa. I understand that my anonymity will be preserved.

Signed by \_\_\_\_\_

Date \_\_\_\_\_

## CONSENT FORM FOR USE OF DATA

M. Charles Thérout has my permission to use at his discretion data obtained while I participated in a sleep and dreams study conducted at the University of Ottawa. I understand that my anonymity will be preserved.

Signed by \_\_\_\_\_

Date \_\_\_\_\_

**APPENDIX II**

## ATTENDANCE CONTRACT

I agree to participate in a sleep and dreams study conducted at the University of Ottawa by M. Charles Thérroux. My participation will require that I spend five (5) nights in the sleep laboratory and follow a weight reduction program for eight (8) weeks. In return, I will receive \_\_\_\_\_ as payment for my participation.

Signed by \_\_\_\_\_

Date \_\_\_\_\_

## ATTENDANCE CONTRACT

I agree to participate in a sleep and dreams study conducted at the University of Ottawa by M. Charles Thérourx. My participation will require that I spend five (5) nights in the sleep laboratory. In return, I will receive \_\_\_\_\_ as payment for my participation.

Signed by \_\_\_\_\_

Date \_\_\_\_\_

APPENDIX III



## PHYSICIAN CONSENT FORM

Ms. \_\_\_\_\_ has had a physical examination. There appears to be no medical reason to prevent her from participating in a weight reduction program.

Signed by \_\_\_\_\_

Date \_\_\_\_\_

APPENDIX IV

## SLEEP PATTERNS QUESTIONNAIRE

When do you normally go to bed? \_\_\_\_\_

When do you normally get up? \_\_\_\_\_

Do you have trouble going back to sleep if awakened? \_\_\_\_\_

Do you generally have trouble sleeping in strange surroundings? \_\_\_\_\_

Would you classify yourself as a good sleeper \_\_\_\_\_

poor sleeper \_\_\_\_\_

fair sleeper \_\_\_\_\_

How often do you dream? once a night \_\_\_\_\_ once a week \_\_\_\_\_  
once a month \_\_\_\_\_ less than once a month \_\_\_\_\_

Do you have nightmares? \_\_\_\_\_ once a night \_\_\_\_\_ once a week \_\_\_\_\_  
\_\_\_\_\_ once a month \_\_\_\_\_ less than once a month \_\_\_\_\_

Have you ever participated in a sleep and dream experiment? \_\_\_\_\_

If yes, please describe:

Name: \_\_\_\_\_ Date \_\_\_\_\_

APPENDIX V

Eating and Activity  
Assessment Questionnaire

Name: \_\_\_\_\_ Sex: M F Age: \_\_\_\_\_ years

Birthdate: \_\_\_\_\_

Address: \_\_\_\_\_ Home phone: \_\_\_\_\_

\_\_\_\_\_ Office phone: \_\_\_\_\_

WEIGHT HISTORY

1. Your present weight \_\_\_\_\_ Height \_\_\_\_\_
2. How would you describe your present weight (circle one)?  

very overweight	slightly overweight	about average
--------------------	------------------------	------------------
3. At what weight have you felt your best or do you think that you would feel your best? \_\_\_\_\_ pounds.
4. How much weight would you like to lose? \_\_\_\_\_ pounds.
5. How dissatisfied are you with the way you look at this weight?  

completely satisfied	moderately satisfied	neutral	moderately dissatisfied	very dissatisfied
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6. Do other people react to your weight problem? Yes \_\_\_ No \_\_\_  
 If yes, how do they react? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
7. Why do you want to lose weight at this time? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
8. What are the attitudes of the following people about your attempt(s) to lose weight?

	Negative (disapprove, resentful)	Indifferent (e.g. don't care or help)	Positive (e.g. encourage)
Husband	( )	( )	( )
Wife	( )	( )	( )
Children	( )	( )	( )
Parents	( )	( )	( )
Employer	( )	( )	( )
Friends	( )	( )	( )

9. Do the attitudes or behavior of your spouse or children affect your weight loss or gain? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, please describe: \_\_\_\_\_

10. Indicate the periods in your life when you have been overweight on the following table. Where appropriate, list your maximum weight for each period and number of pounds you were overweight. Briefly, describe any methods you used to lose weight, e.g., diet pills, diet, in that five-year period. Also list any significant life events you feel were related to either weight gain or loss, e.g., college tests, marriage, pregnancies, illness.

Age	Maximum weight	Number pounds overweight	Methods used to lose weight	Significant events related to weight change
Birth				
0-5				
5-10				
10-15				
15-20				
20-25				
25-30				
30-35				
35-40				
40-45				
45-50				
50-55				
55-60				
60-65				

11. How do you feel your weight affects your daily activities?  
(circle one)

No  
effect

Some  
effect

Often  
interferes

Extreme  
effect

12. How physically active are you? (Circle one)

very active      active      average      inactive      very inactive

13. What do you do for physical activity and how often do you do it?

Frequency  
(daily, weekly, monthly)

Activity  
(Swimming, jogging, dancing,  
walking, etc.)

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14. A number of different ways of losing weight are listed below. Please indicate which methods you have used by filling the appropriate blanks.

	Ages used	Number of times used	Maximum weight lost	Comments: length of time weight loss maintained, success, failure
TOPS				
Weight Watchers				
Streamliners				
Pills				
Supervised diet				
Unsupervised diet				
Starvation diet				
Behavior mod				
Psychotherapy				
Hypnosis				
Other				

15. Which method did you use for the longest period of time? \_\_\_\_\_

16. In your attempts to lose weight, have you ever had a physical or emotional reaction of such severity that it impaired your family and/or work relationships or functioning? Yes \_\_\_ No \_\_\_ If yes, please describe the symptoms and how long they lasted.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

17. What usually goes wrong with your weight loss programs?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

MEDICAL HISTORY

18. What are your present medical problems? \_\_\_\_\_

\_\_\_\_\_

19. What medications or drugs are you taking? \_\_\_\_\_

\_\_\_\_\_

20. Are you allergic to medications, drugs, or foods? \_\_\_\_\_

\_\_\_\_\_

21. Please list any hospitalization or operations. Indicate your age for each hospital admission.

Age	Reason for hospitalization
_____	_____
_____	_____
_____	_____



22. Please list, by age, any serious illnesses you have had which have not required hospitalization or operations.

Age	Illness
_____	_____
_____	_____
_____	_____

23. Please describe any medical problems you have which are complicated by your weight.

\_\_\_\_\_

\_\_\_\_\_

24. When did you last have a complete physical exam? \_\_\_\_\_

25. Who is your current doctor? \_\_\_\_\_

26. Please list any psychiatric contact, individual counseling, or marital counseling that you have had or are now having.

Age	Reason for contact and type of therapy
_____	_____
_____	_____
_____	_____

SOCIAL HISTORY

27. Please describe your present occupation \_\_\_\_\_

28. How long have you worked for your present employer? \_\_\_\_\_

29. Circle the last year of school attended:

1 2 3 4 5 6 7 8      9 10 11 12      1 2 3 4      M.A.      Ph.D.  
 Grade school      High school      College

Other: \_\_\_\_\_

30. Please answer the following questions for each marriage:

Date of marriage \_\_\_\_\_

Date of termination \_\_\_\_\_

Reason (death, divorce, etc.) \_\_\_\_\_

Number of children \_\_\_\_\_

31. Yearly income (circle one)

0-\$5,000    5,000-10,000    10,000-15,000    15,000-20,000    <sup>over</sup> 20,000

32. Please describe your spouse's occupation in detail. \_\_\_\_\_

33. Spouse's age \_\_\_\_\_ Weight \_\_\_\_\_ Height \_\_\_\_\_

34. How would you describe your spouse's weight (circle one)

Very                      Slightly                      About                      Slightly                      Very  
 overweight      overweight      average      underweight      underweight

35. Please list your children's age, sex, height, weight, and circle whether they are overweight, underweight, or average. Include any children from previous marriages whether they are living with you or not.

Age	Sex	Weight	Height	Overweight	Average	Underweight		
_____	_____	_____	_____	very	slightly	average	slightly	very
_____	_____	_____	_____	very	slightly	average	slightly	very
_____	_____	_____	_____	very	slightly	average	slightly	very
_____	_____	_____	_____	very	slightly	average	slightly	very
_____	_____	_____	_____	very	slightly	average	slightly	very
_____	_____	_____	_____	very	slightly	average	slightly	very

36. Who lives in your house with you? \_\_\_\_\_

37. Is your father living? Yes \_\_\_\_\_ No \_\_\_\_\_ Father's age now or age and cause of death \_\_\_\_\_

38. Is your mother living? Yes \_\_\_ No \_\_\_ Mother's age now or age and cause of death \_\_\_\_\_

39. Describe your father's occupation \_\_\_\_\_

40. Describe your mother's occupation \_\_\_\_\_

41. Describe your father's weight while you were growing up (circle one).  
 very slightly about slightly very  
 overweight overweight average underweight underweight

42. Describe your mother's weight while you were growing up (circle one).  
 very slightly about slightly very  
 overweight overweight average underweight underweight

43. Please describe your family attitudes toward food and eating while you were growing up. \_\_\_\_\_  
 \_\_\_\_\_

44. Who raised you as a child? \_\_\_\_\_

45. Please list your brothers' and sisters' ages, sex, present weight, height, and circle whether they are overweight, underweight, or average.

Age	Sex	Weight	Height	Overweight	Average	Underweight		
_____	_____	_____	_____	very	slightly	average	slightly	very
_____	_____	_____	_____	very	slightly	average	slightly	very
_____	_____	_____	_____	very	slightly	average	slightly	very
_____	_____	_____	_____	very	slightly	average	slightly	very
_____	_____	_____	_____	very	slightly	average	slightly	very

46. Please write any other information you feel is relevant to your weight problem below. This would include interactions with your family and friends that might sabotage a weight loss program.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

APPENDIX VI

## DIET QUESTIONNAIRE

1. How often do you think about food?

Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Very often (5)
--------------	---------------	------------------	--------------	-------------------

2. How aware are you of what you eat while you are eating it?

Not at all (1)	Mildly (2)	Moderately (3)	Very much (4)	Extremely (5)
-------------------	---------------	-------------------	------------------	------------------

3. How aware are you of how much you are eating while you are eating it?

Not at all (1)	Mildly (2)	Moderately (3)	Very much (4)	Extremely (5)
-------------------	---------------	-------------------	------------------	------------------

4. How often do you think about diets?

Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Very often (5)
--------------	---------------	------------------	--------------	-------------------

5. How do you feel about dieting?

Dislike very much (1)	Dislike somewhat (2)	Neither like nor dislike (3)	Like somewhat (4)	Like very much (5)
-----------------------------	----------------------------	------------------------------------	-------------------------	--------------------------

6. How much would dieting upset you emotionally?

Not at all (1)	Mildly (2)	Moderately (3)	Very much (4)	Extremely (5)
-------------------	---------------	-------------------	------------------	------------------

7. If you think dieting would upset you emotionally, how much would being upset affect your relationships with other people?

Not at all (1)	Mildly (2)	Moderately (3)	Very much (4)	Extremely (5)
-------------------	---------------	-------------------	------------------	------------------

8. If you think dieting would upset you emotionally, how much do you worry about controlling your emotions?

Not at all (1)	Mildly (2)	Moderately (3)	Very much (4)	Extremely (5)
-------------------	---------------	-------------------	------------------	------------------

9. How much do you think dieting will affect your body?

Not at all (1)	Mildly (2)	Moderately (3)	Very much (4)	Extremely (5)
-------------------	---------------	-------------------	------------------	------------------

10. If you think dieting will affect your body, how do you think it will affect it?

Very negatively	Negatively	Neither posi- tively nor negatively	Positively	Very positively
(1)	(2)	(3)	(4)	(5)

11. If you think dieting will affect your body negatively, how worried are you about this?

Not at all	Mildly	Moderately	Very much	Extremely
(1)	(2)	(3)	(4)	(5)

12. How extensive do you expect the behavior change required by dieting to be?

Very minor	Minor	Moderate	Major	Very major
(1)	(2)	(3)	(4)	(5)

13. How difficult do you expect this behavior change to be?

Not difficult	Mildly	Moderately	Very	Extremely
difficult	difficult	difficult	difficult	difficult
(1)	(2)	(3)	(4)	(5)

14. How worried are you about making this behavior change?

Not at all	Mildly	Moderately	Very much	Extremely
(1)	(2)	(3)	(4)	(5)

15. How confident are you that you will be able to make this behavior change?

Not at all	Mildly	Moderately	Very	Extremely
(1)	(2)	(3)	(4)	(5)

16. How upset would you be if you were unable to make this behavior change?

Not at all	Mildly	Moderately	Very	Extremely
(1)	(2)	(3)	(4)	(5)

17. If you were unable at first to make this behavior change, how hesitant would you be to try again?

Not at all	Mildly	Moderately	Very	Extremely
(1)	(2)	(3)	(4)	(5)

18. Overall, how stressful do you expect dieting to be?

Not at all	Mildly	Moderately	Very much	Extremely
(1)	(2)	(3)	(4)	(5)

APPENDIX VII

## DIRECT INCORPORATION CATEGORIES

Direct incorporations of elements from the stressful situations were given a score of one (1) when they fitted one of the following categories.

1. Dieting (diet programs).
2. Food being taken away from them (being deprived by someone else).
3. Looking at food without buying.
4. Weighing (scale).
5. Big meals being eaten by someone else.
6. Food buying.
7. Doing physical exercise.



APPENDIX VIII

## DREAM REPORT ANXIETY SCALE

Scoring sheet

Rating: 0 \_\_\_\_\_ 5

Name: \_\_\_\_\_

1 <sup>st</sup> night	1 <sup>st</sup> period	of	REM	( )
" "	2 <sup>nd</sup> "	"	"	( )
" "	3 <sup>rd</sup> "	"	"	( )
" "	4 <sup>th</sup> "	"	"	( )
" "	5 <sup>th</sup> "	"	"	( )
" "	6 <sup>th</sup> "	"	"	( )
2 <sup>nd</sup> night	1 <sup>st</sup> period	of	REM	( )
" "	2 <sup>nd</sup> "	"	"	( )
" "	3 <sup>rd</sup> "	"	"	( )
" "	4 <sup>th</sup> "	"	"	( )
" "	5 <sup>th</sup> "	"	"	( )
" "	6 <sup>th</sup> "	"	"	( )
3 <sup>rd</sup> night	1 <sup>st</sup> period	of	REM	( )
" "	2 <sup>nd</sup> "	"	"	( )
" "	3 <sup>rd</sup> "	"	"	( )
" "	4 <sup>th</sup> "	"	"	( )
" "	5 <sup>th</sup> "	"	"	( )
" "	6 <sup>th</sup> "	"	"	( )
4 <sup>th</sup> night	1 <sup>st</sup> period	of	REM	( )
" "	2 <sup>nd</sup> "	"	"	( )
" "	3 <sup>rd</sup> "	"	"	( )
" "	4 <sup>th</sup> "	"	"	( )
" "	5 <sup>th</sup> "	"	"	( )
" "	6 <sup>th</sup> "	"	"	( )

APPENDIX IX

## EGO RATING SYSTEM: INTEGRATIVE MECHANISMS

### General Instructions

All dreams presented for scoring on the scales, regardless of their scores on the other scales, are to be rated on the ego scale. The various categories listed below are presumed to indicate several of the aspects of the ego's integrative mechanisms operative in the dream.

### A. Category: Reality of Setting

The degree to which the environment of the dream story conforms to realistic environments, or to the environment in which the dreamer lives, is scored in this category.

#### Class 8: Bizarre, Opposite

A score is given in this class when the setting of the dream is described as bizarre, unrealistic, weird, or impossible, or is the direct opposite of the dreamer's waking present day environment. Examples: "I dreamt I was on Mars," "I was driving in a car that had no steering wheel," "We were walking on something like a boardwalk except that it was very narrow and on high stilts," "I dreamt I was out of jail and home," "I dreamt I was not in the hospital but in another city."

#### Class 4: Possible but not Probable, Realistic, Terrifying

A score is given in this class when the setting of the dream is possible realistically, though improbable, or when the dream is set against a disturbed realistic background as in a storm. Examples: "The beach had been hit by a great tidal wave," "We were in a rowboat in the midst of a storm," "I was standing in the bell tower of the church when it began to sway," "I dreamt I was a construction worker on one of those new steel skyscrapers they were putting up, and I was out on the edge of a beam," "They were running along the edge of an enormous cliff."

#### Class 2: Familiar Setting Altered

A score is given in this class when the dream setting is described as realistic and familiar but contains some minor problem. A score would be given in this class where the dreamer has the feeling that there was something wrong in the place. Hospital settings,

brothels, prisons, and one's childhood home would score in this class. Examples: "We were driving in the country and it began to rain," "The house was in a mess," "We were back in our home where we used to live," "I went to visit my former school."

#### Class 1: Realistic, Benign

A score is given in this class when the setting of the dream may be considered as conforming to reality and to be of a nonthreatening nature. If there is no setting specified as previously mentioned, or at all, a score would be given in this class. Examples: "We went to the movies," "We went for a walk through the park."

### B. Category: Body Image

The degree to which the personae of the dream are represented as in good health is scored in this category. The same score is given for threatened, imagined, feared, or negatively presented states of impaired health as for actual impairment of health.

#### Class 8: Bizarre

A score is given in this class when any of the characters in the dream are depicted as having a bizarre deformity, or illness, as having a psychosis, or described as suicidal or homicidal. Examples: "The woman had a snake growing out of her head," "I was changed from a man into a woman," "The child was barking like a dog," "It was not a dwarf but a kid," "Her skull was crushed." A score is also given in this class when gruesome details of illness or injury are depicted.

#### Class 4: Mutilation, Critical Injury

A score is given in this class when any of the characters are described as having suffered a mutilation or critical injury. Examples: "His leg was cut off," "She was thrown out of the car," "No one was critically injured," "I could not stop the machine. I was afraid it would slice off his hand."

#### Class 2: Mild Illness, Something Wrong

A score is given in this class when any of the characters of the dream are described as having a mild, curable illness or have something mildly wrong with them. Examples: "She said she didn't feel like going out," "I had flunked my exam," "I couldn't concentrate on the

lecture," "I met Harry, but he didn't recognize me,"  
 "She sounded funny because she had a cold."

### Class 1: Healthy

A score is given in this class when any of the dream characters are described as healthy, or when there is no mention made of ill health or disturbance for at least one of the personae in the dream. The dream may contain healthy and various degrees of unhealthy characters, and if so, is scored accordingly.

## C. Category: Interpersonal Relationships

A score is given in this category for the nature of the relationships between the personae of the dream.

### Class 8: Solitary, Nonproductive

A score is given in this class where any of the dream characters are described as being unrelated to the other characters, and where the solitary state appears to be a withdrawal from reality, work and productivity.

Examples: "I was alone in a barren land," "While the party was going on John was brooding by himself in one of the rooms," "The village was deserted. There was no sign of any life."

### Class 4: Taking Care of

A score is given in this class where any of the dream characters are described as being in a nurturing, mothering, or giving role with any of the other characters, where a condition of one character's dependence upon another is described, or any of the characters demonstrates a need to be taken care of by another.

Examples: "The mothers were there with their babies," "He took me out to dinner," "I waited for him to phone me but he never called," "I was at a parent-teacher meeting."

### Class 2: Rivalry, Enmity

A score is given in this class when the dream contains competitive elements of either a friendly or unfriendly nature. Examples: "He was trying to get my girlfriend away from me," "We were having a political argument," "We didn't care if we were the first to get there," "We went to the football game."

Class 1: Friendly, Work

A score is given in this class when the dream story contains elements indicating friendly interpersonal relationships or productive work by solitary characters. Examples: "I was trying to get some work done," "We were going to a party," "I met an old friend."

D. Category: Sequence of Themes

The dream story is scored in this category for its lucidity, logic, organization, and rational thinking. Where the dream contains several of the classes listed below it is so scored. Thus part of the dream may be logical and part illogical, and would be scored accordingly.

Class 8: Illogical, Confused

A score is given in this class when the dream story at least in part appears to be illogical, where the story seems to be disconnected in some of its parts, where the action seems to be without meaning or unrelated to other parts of the dream, or where the dream story has a confused plot. A score is also given in this class where the characters are said to be motivated by irrational drives. Examples: "The faces of the girls were distorted. It was as if my doctor was very angry with me," "I get on the top of a staircase and I reach down to the bottom of it."

Class 4: Retreat, Restitution, Flight

A score is given in this class where the dream story describes any of the characters giving up a previously held position, retreating from a situation, or apologizing or trying to make amends. A shift of scene is also scored in this class. Examples: "I was running from somebody," "My co-star was supposed to come on stage. Instead she just walked off talking to somebody," "I was in the hospital and my mother-in-law brought me flowers," "I was at a party where everyone was having a good time. I left by the back door," "We were at the beach. The scene shifted and we were at a party."

Class 2: Repetition of Similar Themes

A score is given in this class when the dream story consists of a repetition of any of its major themes, regardless of whether stated goals are reached or stated problems are solved. Examples: "I went someplace with

my daughter. As soon as she got there she wanted to go somewhere else," "People kept coming into the party. First some old friends who were invited came. Then my parents who were not invited came."

Class 1: Action and Reaction, Cause and Effect, Logical Story

A score is given in this class when any part of the dream story is related in a logical and readily understandable form. Obvious or stated causes bringing forth reasonable expected effects, rational goals being reached, or rational problems being solved would score in this class. Examples: "He was trying to show off by driving too fast. I screamed at him to slow down before we got hurt. He seemed humiliated," "The car wouldn't start. I lifted the hood to see if I could fix it."

E. Category: Problem in Dream

In this category the dream is scored on the nature of the problem, wish or fear presented.

Class 8: Wish Fulfillment

A score is given in this class when the dream contains any element that would ordinarily be considered pleasurable and wish fulfilling. Examples: "We were at a lovely resort," "I found a thousand dollar bill," "I was a movie star," "I was out of the hospital."

Class 4: Insoluble Problem or Confused Problem

A score is given in this class when the dream contains any element that would ordinarily be considered an insoluble problem, or where the dreamer indicates that he is unable to solve the problem. A score is also given in this class when the theme or problem of the dream appears confused or unclear. Examples: "My dog died. Then it changed to a cat," "There were a lot of hot dogs left over. She put them in a suitcase," "The wedding was a farce. Everybody was all mixed up."

Class 2: Problem of Anxiety, Embarrassment, Frustration

A score is given in this class when the dream contains any themes of apparent anxiety, frustration of any of the characters or difficulty in solving problems. Examples: "I had an appointment with the dentist and I couldn't remember when it was for," "I was afraid



the professor would flunk me if I didn't hand my paper in on time."

Class 1: Problem of Interest, Work, Game

A score is given in this class when the dream story contains any themes or problems of interest to the dreamer or any of the characters. Themes pertaining to work or games would score in this class. Examples: "I was doing the laundry," "I was shopping for a new car," "We visited some antique shops looking for a chest," "My husband was fixing the car."

F. Category: Time

In this category the time element of the dream story is described.

Class 8: Never, Bizarre, Impossible Future

A score is given in this class when the dream story contains a reference to time that is bizarre or fantastic. Example: "I was a little girl again and I had just given birth to my baby."

Class 4: Past-Childhood-Distant Past

A score is given in this class when the dream story contains a reference to past time of the dreamer's childhood. Example: "I was a little girl again." A reference to the distant past is also scored here.

Class 2: Past-Adolescence-Recent Past

A score is given in this class when the dream story contains a reference to past time of the dreamer's teen age years. Example: "I was back in high school." A reference to the recent past is also scored in this class.

Class 1: Present, Immediate Future

A score is given in this class when the dream story contains a reference to the dreamer's current life situation. Examples: "I dreamt it was time to go to the hospital for delivery of my baby. I couldn't find my suitcase." "The gang at work were laughing at the foreman for being upset."

### G. Category: Characters

This category describes the characters who appear in the dream story.

#### Class 8: Bizarre, None, Wrong Face, Dead Person, Animal

A score is given in this class when there are no people in the dream story, when the people are described as bizarre or changed in appearance, when a person appears in the dream who is said to be dead in reality.

Examples: "Jack had a green face and he was grinning."  
"I dreamt that my brother had been crippled." "I was charged by a pure white cat."

#### Class 4: Strangers

A score is given in this class when the people in the dream are stated as unknown to the dreamer. Example: "I got on a bus with a lot of people. I didn't recognize any of them." A score is also given in this class when there are characters in the dream. When the dreamer identifies people as having undergone some change from how they have been known in reality.

#### Class 2: Unidentified Characters

A score is given in this class when the people in the dream are not described by the dreamer. Example: "I was in a crowd."

#### Class 1: Current Realistic Characters

A score is given in this class when any of the people in the dream are currently known to the dreamer.

Examples: "I dreamt about my brother." "My girlfriend's husband came in."

### H. Category: Affect

The emotions of the dream story are described in this category. The emotions may be stated in terms of feeling or in terms of behavior.

#### Class 8: Bizarre, Inappropriate

A score is given in this class when an emotion expressed directly or indirectly in the dream story is bizarre or inappropriate to the context of the story. Example: "Jack had a green face and he was grinning."

Class 4: Exaggerated

A score is given in this class when an emotion expressed in the dream story appears exaggerated in relation to the stimulus of the emotion. Example: "There was a picture of a nude woman showing a baby in the womb. My daughter asked why. I gave her a big explanation."

Class 2: Minimized, Absent, Ambivalent

A score is given in this class when an emotion expressed in the dream story appears minimized, absent or ambivalent to the stimulus of the emotion. Examples: "The policeman said to me, 'You can come along with me to the police station too.' I reply with a big grin, 'That's fine.'" "I dreamt about my sister's fiance. He was out of a job. He said he would be sure to be back with some other firm very shortly."

Class 1: Appropriate and Relevant

A score is given in this class when an emotion expressed in the dream story appears appropriate to the stimulus which aroused it. Example: "I danced with him and felt sexy."

## EGO RATING SYSTEM: INTEGRATIVE MECHANISMS

## Scoring Sheet

Name: \_\_\_\_\_

\_\_\_\_\_ night, \_\_\_\_\_ period of REM.

Category: A. Reality of Setting	8	4	2	1
B. Body Image	8	4	2	1
C. Interpersonal Relationships	8	4	2	1
D. Sequence of Themes	8	4	2	1
E. Problem in Dream	8	4	2	1
F. Time	8	4	2	1
G. Characters	8	4	2	1
H. Affect	8	4	2	1

\_\_\_\_\_ night, \_\_\_\_\_ period of REM.

Category: A. Reality of Setting	8	4	2	1
B. Body Image	8	4	2	1
C. Interpersonal Relationships	8	4	2	1
D. Sequence of Themes	8	4	2	1
E. Problem in Dream	8	4	2	1
F. Time	8	4	2	1
G. Characters	8	4	2	1
H. Affect	8	4	2	1