

Stress and Coping in the Waking and Dreaming States During an Examination Period

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Dream diaries were kept by 35 female undergraduates for two ten-day periods, one of preparation for midterm or final examinations, and an exam-free one. Research questions were whether the stress and negative emotions induced by preparing for exams were reflected in dreams and what types of coping were used both in the waking and dreaming states. There was no consistent impact of the stressful situation on dreams, in terms of incorporation and negative emotions. However, 22 dreamers had incorporation dreams. They reported significantly less active problem-solving strategies in waking than the ones who had no such dreams. While a significant negative correlation was found between harm/threat emotions in waking and negative emotions in dream imagery, a positive correlation was found between positive reappraisal in waking and active problem-solving in dreams. Findings are discussed from the perspective of Lazarus and Folkman's theory of adaptation to stress in waking life.

KEY WORDS: dreams; coping strategies; adaptation to stress.

INTRODUCTION

For some people examinations are stress inducing events. (Folkman & Lazarus, 1985). Dreams occurring during an examination period may incorporate elements of the stressing event. Some of them incorporate it more dramatically than others; the following excerpts from dreams reported by two university students illustrate such differences.

"I was in a philosophy class (. . .) The professor was acting very bizarre (. . .) We were taking an exam.. I didn't even know we were having an exam and I was very frustrated. I couldn't read the questions and I didn 't know a thing. The worst thing was that all the profs were making a hell of a racket (. . .) They were singing loudly, drinking beer, even playing cards (. . .) Finally I stormed out of the room and the rest of the class followed me."

"I was in a classroom. I received the copy of my history exam for which I got a mark of 67%. My friend S's mark was 37%. The prof said we were going to have a supplemental exam. When I put my copy in my bag there was an open jar of peanut butter and it messed up my copy".

While both dreams incorporate an exam, they have strikingly different outcomes. The first dreamer initiates a protest while the second one remains passive and appears to be resigned to her fate. Do the outcomes of these dreams, proactive in the first one and passive in the other, mirror the coping styles of the dreamers in waking life? This question is addressed in the reported study.

The incorporation of stressful waking experiences in dreams has been a focus of modern dream research (De Koninck, 2000). Questions have been asked about the transformations such experiences undergo as they find their way into dreams as well as about the function of the incorporation process. Different dream theories have attempted to explain the psychological processes underlying the incorporation of stressful events in dreams. Continuity theory, for one, is based on the notion that dreams reflect waking life concerns. According to Hall's (1953) cognitive theory of dreams, self-conceptions and

conceptions of one's relationships with the environment monitor the transformations of the waking experience. A competing hypothesis is that of compensation (Dallet, 1973), according to which dreams represent the opposite of the waking experience. Following a stressing event, adaptive dreams would be those that compensate with a content opposite to the waking experience. More recent theoretical formulations refer to the transformations as indicators of mastery. For these theories, dreams have a problem-solving or self-regulating function. One example is the information processing model proposed by Breger (Breger, 1967, 1969, Breger, Hunter & Lane, 1971), which suggests that dreams allow the dreamer to experiment solutions for actual problems and to compare them with solutions which had worked in the past for comparable ones. Relying on clinical observations, Hartmann (1995) proposed, along the same theoretical framework, that during dreaming connections between a current concern and related past material emerge in the memory systems, guided by affect and by previous connections.

To test these notions, a host of studies were conducted in experimental settings such as watching a gruesome movie, or taking a contrived intelligence test (De Koninck & Koulack, 1975; Cohen & Cox, 1975; Koulack, Prévost & De Koninck, 1985), and real life settings, such as a divorce, (Cartwright, Lloyd, Knight & Trenholm, 1984), menstrual stress (Sirois-Berliss & De Koninck, 1982), awaiting surgery (Breger et al, 1971), a natural disaster (Pagel, Vann & Altomare, 1995). While studies involving experimentally induced pre-sleep deprivation or frustration provided evidence of compensatory activity in dreams, it remains that the most common mode of representation of waking activity in dreams is that of continuity. However, Hall's model does not provide explanations about the processes underlying the dream representations of a stressful situation, and in the specific instance of the examination dreams reported earlier, of their outcomes.

Incorporations have been considered by a number of researchers as important indicators of mastery, or in other words, of a working through process. The findings of the studies alluded to above are conflicting, though, in terms of adapting to the stressful event. In some instances, incorporation seems to have been beneficial, as indicated by mood change upon awakening while in other instances dreamers were anxious or remained indifferent toward the casually reported event. The relative severity of a stressor such as watching a morbid movie, compared to the ongoing turmoil of a divorce, could in part explain these inconsistencies. The observation that the divorced women in Cartwright et al's study (1984), who incorporated their spouse into their dreams adapted more readily to their situation than those who did not, is indeed a valuable one. Still, it does not allow to determine what coping mechanism was involved. To sum up briefly, the dream narratives collected under the different reported conditions showed that the dreamers had incorporated different aspects of the same stressful situation, but without any consistent pattern relative to the selection of the ones that made their way into the dreams. No particular attention was paid to the strategies the dreamers used to come to terms with the situation, as was illustrated in the examination dreams reported earlier.

An alternative approach is required to examine the adaptive mechanisms used in dreams in comparison to waking life coping strategies. The question may be phrased: do waking coping strategies influence the selection of the incorporated aspects of the stressful event? This question is a rejoinder to the opinions put forward by a number of researchers (Breger et al 1971; Cohen & Cox, 1975; Koulack, 1991; Lauer, Riemann, Lund & Breger, 1987), who suggested that the investigation of dreams during a stressful situation should be framed within a theoretical perspective of adaptation to stress in waking life. Lauer et al (1987) referred specifically to the Lazarus and Folkman's model (Lazarus & Folkman, 1984; Folkman & Lazarus, 1985; 1988; Folkman et al 1986; De Longis et al, 1988). Their suggestion opened a new avenue for research.

However, only two investigations, which did not adopt the incorporation paradigm, have attempted to operationalize the link between coping strategies in waking life and in dreams (Rim, 1986; Rose & Perlis, 1991). Rim (1986) correlated three dimensions of dream content defined by Lang and O'Connor (1984): personal avoidance, erotic factor and adventuresomeness with their subjects' scores on the Ways of Coping Checklist (Lazarus,

Averill & Opton, 1974). Rose and Perlis (1991) analyzed the content of the home-reported dreams of 22 subjects with ten categories they devised and did correlations with their scores on the Ways of Coping Questionnaire (Folkman et al, 1986). Although links were found between certain coping strategies in waking life and dream content, serious methodological limitations in both studies prevent the generalization of their findings. Rim's dream content categories do not consistently match waking coping strategies and the questionnaire designed to capture the characteristics of dreams remembered from the past involves irrelevant dimensions. In Rose and Perlis's investigation the coping strategies were not targeted toward one particular stressful situation. Still, findings suggest that research in this direction is worth pursuing.

The present natural experiment provides the opportunity to re-examine the links between coping with stress in waking life and dream content in the light of Lazarus and Folkman's theory. Their model emphasizes the dynamic relationship between a person and her environment rather than the structural properties of the stressful event or the stability of a person's coping reactions across situations. A disturbance in that relationship is deemed stressful following primary and secondary appraisal. Primary appraisal refers to the significance of an event or a situation for one's own well-being. Significance can range from irrelevant to stressful, in which case it implies some form of threat, challenge, harm or loss. Secondary appraisal refers to the coping resources and options examined by the person involved. While the primary and secondary appraisal of the disturbed relationship rests on cognitive processes, it elicits emotions that are likely to undergo changes as the person copes with stress. Coping serves two functions: one is to regulate the distressing emotions and the other, to change the problem causing distress. The Ways of Coping Questionnaire devised by Lazarus and Folkman (1980) and revised in later investigations, covers a variety of cognitive, emotional and behavioral ways used by different people to come to terms with a stressful event. One investigation is of particular interest for the present study, as it focuses on the reactions of college students to the stress of a period of examination (Folkman & Lazarus, 1985). Individual differences in the emotions and coping strategies of the students were found. The two dream excerpts reported earlier, as examples of incorporation of an exam, also reflect individual differences. Could the narratives and their outcomes be related to the strategies the dreamers had used in the waking state? Do these strategies mirror the ones used in waking life or are they a substitute for them?

In order to answer these questions, dreams were collected from female university students over two periods, one prior to a stressing exam and an exam-free one. They also reported their reactions to the stress inducing situation in waking life. The independent variable was the examination identified by each participant as the most stressful among all those they were going to take during a midterm or final examination period.

The specific objectives and hypotheses of the study are the following:

- 1) To determine whether the stress provoking situation i.e. preparing for an exam, has a pervasive impact on dream content, as suggested by the continuity and mastery theories. The first hypothesis proposes that dreams experienced during the period prior to the exam judged to be the most stressful will reveal more incorporation of the exam than dreams from the control period, as well as a higher stress level and more harm and threat emotions.
- 2) To compare dreams which incorporate an exam with others which do not. In the light of Lazarus and Folkman's theorizing about the specificity of the stressor, it is hypothesized that more negative emotions and more indices of coping will be found in incorporation dreams than in the others.
- 3) To determine the link between reactions to the impending exam in waking life and dreams which incorporate it. In the light of the continuity hypothesis and of previous investigations of incorporation, a positive correlation is expected between the measures of

stress, emotions and coping strategies reported in waking and those identified in dream content.

Method

Participants

Out of the 75 francophone volunteers who had been recruited in Introduction to Psychology classes at the University of Ottawa, 45 (40 females and 5 males) completed the requirements of the study. The males were eliminated from the study in order to have as homogeneous a sample as possible. Five of the females who had not followed the instructions properly were also eliminated. The 35 remaining students were registered fulltime in different programs. Age ranged from 19 to 21 years ($M = 19.06$). All of them were single, with 19 who had steady boyfriends. The majority lived at home ($N = 21$). A survey of previous dream studies conducted with samples of that size, or even smaller, showed that a moderate size effect could be anticipated. With 35 subjects, statistical power could range from 72% to 76%, depending on the statistical test (Cohen, 1992).

Experimental and Control Periods

The study was conducted over two periods, experimental and control. The experimental period started five days before the exam considered to be the most stressful and continued for five days afterwards. The control one was a period during which there were no exams. Although the dreams and the other measures were collected throughout the two ten-day periods, the ones used for the present study had been collected during the three days prior to the targeted exam and three days during the control period. They represent a subset of the total data. The time and order of the periods were determined with each participant, depending on their midterm or final examination schedule. The effect of this order was verified. The control period took place first for 17 participants, and inversely for the others.

Material

Beside a questionnaire requesting demographical and personal information, the material necessary for each of the two periods, experimental and control, consisted of the following: 1- One set of forms to report daily events before bedtime and to rate the stress and the emotions experienced on that day. The same ratings were done the following morning upon awakening. 2- A dream diary to write down dreams each morning. Instructions emphasized the importance of reporting the dreams with as many details as possible. 3- Two copies of the Ways of Coping Questionnaire were given for the experimental period, one to be filled on the night prior to the targeted exam, the other at the end of the period. A third copy of the WCQ was given during the control period to be filled at the end of it.

Dependent Variables

Two sets of dependent variables were collected in both periods: one in the waking state and the other one derived from the content analysis of dreams.

Stress and Coping Variables

They represent the primary and secondary appraisal process defined by Lazarus and Folkman. They included: 1- Self-reports of stress level assessed on a five-point Likert-type scale. The participants rated their stress twice daily. Just before bedtime they rated their actual stress and then, in retrospect, they rated the most intense stress they had experienced in the course of that day. Upon awakening the following day, they rated the stress of the moment. 2- Emotions, rated before bedtime and the following morning on a

zero to four scale (Folkman and Lazarus, 1985), which assesses 15 emotions grouped in five categories (threat, harm, loss, challenge and benefit). 3- Ways of coping with stress, measured with the 66 item Lazarus and Folkman Ways of Coping Questionnaire (WCQ) (Lazarus & Folkman, 1984; Folkman & Lazarus, 1985) translated into French according to the back-to-back translation procedure. Ways of coping include a) planful problem solving. The person deals directly with the problem by acting or thinking about it. b) seeking social support. The person looks for emotional support or information from someone else. c) avoidance-resignation. The person ignores the stressing situation or accepts it without attempting to solve it. d) positive reappraisal. The person searches for a positive meaning to the situation. A factor analysis was done on 33 items of the WCQ (Folkman & Lazarus, 1985), a procedure recommended by Scherer, Wiebe, Luther and Adams (1988). The extracted factors were consistent with the ones Folkman and Lazarus (1985) had themselves obtained.

Two copies of the WCQ were appended to the documents used in the experimental period. One was answered the night before the most stressful exam, to identify the coping strategies used during the preparation period. Questions were also asked relative to the anticipated difficulty of the exam, and to the control participants felt they had over the situation. The second copy was filled at the end of the experimental period and the actual difficulty of the exam was evaluated. Another copy of the WCQ was appended to the forms used during the control period. Participants identified the most stressing event that had occurred during that period and their sense of control over it.

Dream Variables

Four variables were selected for the content analysis of dreams. They included; 1.- Direct or indirect incorporation of an exam, which was adapted from Breger et al (1971). Direct incorporation refers to the presence in the dream of an element such as an activity, a setting, a character or an object directly related to an exam. An indirect incorporation was identified by a symbolic or disguised representation of the stressor such as a competition or by an activity such as studying, doing homework, but without direct reference to the exam. 2.- Stress level was measured on a zero to four scale adapted from the Breger et al's (1971) anxiety scale. 3.- Coping strategies were operationalized with respect to the dreamer herself and to other dream characters. 4.- Emotions. Anger, apprehension, sadness and happiness were scored according to Hall and Van de Castle's (1966) definitions. Anger and sadness were combined to represent the feelings of harm defined by Folkman and Lazarus (1985; Folkman et al, 1986). Apprehension corresponds to their definition of feelings of threat, and happiness, to feelings of benefit.

The manifest content of the dreams was analyzed by two pretrained independent judges, blind to the hypotheses of the study. Interjudge reliability, assessed with the Cohen kappa (Norusis 1992) after training, ranged from .72 to .96, depending on the variable. Differences in coding were resolved by discussion and one scoring was retained for the statistical analyses.

Procedure

Before the volunteers signed up for the project, they were informed of its requirements. They were given an explanation of what stress is according to the research literature in psychology and specifically, to Lazarus and Folkman's conception. They completed an informed consent form and were assured of the confidentiality of the collected data. A two hour workshop devoted to dreamwork, with the Ullman (Ullman & Zimmerman, 1979) method, and to dream incubation (Delaney 1990), was offered as a token of appreciation.

At the outset of the study, participants met in small groups with the experimenter to receive the material and instructions for the first period. She kept in touch by

telephone with every one of them once a week to insure that they were following the instructions and to sustain their motivation.

She met them individually at the end of the first period to retrieve the completed forms and give them the packet for the following one. She met them individually again to collect the second set of forms and answer their questions, if any. A last meeting took place with 25 participants who attended the dream workshop.

RESULTS

Preliminary Analysis

A first preliminary analysis was performed to determine whether the independent variable, i.e. the most stressful exam, and the order of the periods, experimental and control, had an effect on the measures of stress and emotions in waking. The data collected during the experimental and control period were compared in a 2 x 2 (period by order) multivariate analysis, (MANOVA) for repeated measures. It yielded a significant main effect for periods (Wilks' lambda = 0.838, $p < .01$), but no effect for order (Wilks' lambda=0.997, $p > .05$). The interaction between factors was not significant either (Wilks' lambda=0.976, $p > 0.05$).

A univariate analysis was then performed on the measure of stress experienced throughout the two periods. The effect of the independent variable was significant ($F(1, 66) = 11.55, p = 0.001$) with a higher level of stress during the experimental period ($M = 1.55, SD = 0.61$) than during the control one ($M = 1.00, SD = 0.64$). The same analysis performed on emotions also revealed a significant effect ($F(1, 66) = 7.50, p < 0.01$), with higher scores ($M = 1.29, SD = 0.90$) for the experimental period than for the control one ($M = 0.79, SD = 0.54$).

Comparisons of Dreams During the Experimental and Control Periods (Hypothesis 1)

Dreams reported over the three days prior to the targeted exam only were content analyzed. A similar number of dreams were selected at random from the pool of dreams collected during the control period. Overall 348 dreams were content analyzed with an average of 4.97 dreams per participant. First, a t-test for repeated measures verified that the mean length of dreams, as assessed by word count, was not significantly different across periods ($t(34) = -0.15, p > 0.05$).

Frequencies of the measures of stress, of harm and threat emotions in dreams, as well as the mean scores of incorporation were tabulated for each period. Since the number of dreams reported by each participant was different, frequencies were transformed into scores. In view of their respective small frequencies, harm and threat emotions were pooled to yield a measure of negative emotions. Mean scores for each variable are presented in Table I. Although they are in the expected direction, the mean scores were not significantly different across periods, as revealed by the MANOVA for repeated measures ($T(3, 32) = 0.072, p > .05$). Therefore Hypothesis 1 was not supported.

Table I. Mean Scores and Standard Deviations of the Dream Variables for the Two Periods

Dream variables	Examination period		Control period	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Stress level	0.79	0.43	0.71	0.52
Incorporation	0.48	0.55	0.35	0.47
Negative emotions	0.13	0.20	0.14	0.21

Table I.

Mean scores and standard deviations of the dream variables for the two periods

Comparisons of Dreams with and Without Incorporation Collected During the Experimental Period. (Hypothesis 2).

Out of the 35 participants, 22 reported dreams with an incorporation of the exam during the experimental period, for a total of 38 dreams. Incorporation was direct in ten of them, indirect in the others. Frequencies of the measures of stress, negative emotions and coping strategies were transformed into scores. Mean scores are presented in Table II. A MANOVA for repeated measures was then performed. Although all mean scores are in the expected direction, the incorporation dreams were not significantly different from the without incorporation dreams ($F(3, 19) = 0.217, p > .05$). Hypothesis 2 was not supported.

Table II. Mean Scores and Standard Deviations of the Variables for the with and Without Incorporation Dreams During the Experimental Period

Dream variables	With incorporation		Without incorporation	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Stress level	0.93	0.66	0.76	0.37
Negative emotions	0.20	0.30	0.11	0.17
Coping strategies	0.27	0.36	0.12	0.11

Table II.

Mean scores and standard deviations of the variables for the with and without incorporation dreams during the experimental period

Other statistical analyses were performed to determine how incorporation dreams reflect the stress level, the negative emotions and coping strategies experienced in waking life. These waking measures were used to compare the 22 participants who had incorporation dreams with the 13 who had no such dreams. Their coping strategies scores were calculated according to Folkman and Lazarus' (1988) instructions. Mean scores, presented on Table III, were submitted to a MANOVA analysis, which revealed a significant difference between the two sub-groups. (Wilks' lambda = 0.72 $p < 0.05$). Post hoc Tukey tests for groups of unequal size revealed a significant difference for the measure of active problem-solving in the waking state ($p < 0.03$). The dreamers who did not have incorporation dreams used the problem-solving strategy in waking life more frequently than the others. There were no significant differences, though, for the other coping strategies: seeking social support, avoidance-resignation and positive reappraisal. A *t*-test for groups of unequal size revealed no significant differences on the mean stress level in waking life ($t(17,58) = 0.61, p > 0.05$) which was 1.56 ($SD = 0.49$) for the participants who had incorporation dreams and 1.42 ($SD = 0.79$) for those without such dreams. Similarly the negative emotions experienced in waking life did not differ significantly between the two sub-groups ($t(20,36) = 0.11, p > 0.05$). The mean score of the incorporation sub-group was 0.65 ($SD = 0.41$) and 0.63 ($SD = 0.53$) for the other.

Table III. Mean Scores and Standard Deviations of the Waking Coping Strategies of the Dreamers with and Without Incorporation Dreams

Coping strategies	With incorporation (N = 22)		Without incorporation (N = 13)	
	M	SD	M	SD
Social support seeking	1.01	0.89	0.89	0.59
Avoidance/resignation	0.97	0.61	1.28	0.53
Active problem-solving	1.27	0.63	1.79	0.44
Positive reappraisal	1.14	0.74	1.40	0.8

Table III.

Mean scores and standard deviations of the waking coping strategies of the dreamers with and without incorporation dreams.

Correspondence Between Waking Life and Dream Content Measures (Hypothesis 3)

The verification of this hypothesis concerns only the 22 participants who reported incorporation dreams. (N = 38). The waking measures used for the correlations with dream content were the evaluations of stress and negative emotions reported on the three evenings before the targeted exam, and the coping strategies scores. Problem-solving was the only dream coping strategy taken into account, since positive reappraisal and avoidance-resignation were not observed in dream content and seeking social support only once. Measures taken into account for the analyses are presented in Table IV.

Table IV. Mean Scores and Standard Deviations of Waking and Dream Variables During the Experimental Period (22 Dreamers)

Variables	Waking		Dreaming	
	M	SD	M	SD
Stress level	1.57	0.49	0.93	0.63
Negative emotions	0.67	0.39	0.19	0.32
Coping strategies				
active problem-solving	1.27	0.75	0.53	0.72
social support seeking	0.90	0.69	na	
avoidance/resignation	1.03	0.77	na	
positive reappraisal	1.63	0.16	na	

Table IV.

Mean scores and standard deviations of waking and dream variables during the experimental period (22 dreamers)

A Pearson correlation done on the stress measures in the two states was not significant $r = -0.08, p > 0.05$).

As the dream negative emotions and active problem-solving were dichotomous variables, point bi-serial correlations with the same waking measures were performed. The negative relation between negative emotions in the two states was significant $r_{bs} = -0.42, p < 0.05$). The same test was performed for each coping strategy in waking and active problem-solving in dreams, with an adjusted significance level of $\alpha = 0.0125$, in view of the number of comparisons. One of the correlations, between positive reappraisal in waking

and active problem-solving in dreams, was significant, as can be seen on Table V. The other results are also presented on the same table. With these two significant results, partial support for Hypothesis 3 was therefore provided.

Waking strategies	Problem-solving in dreams
Active problem-solving	0.31
Social support seeking	0.33
Avoidance/resignation	-0.05
Positive reappraisal	0.51*

* $p < .05$

Table V.

Bi-serial correlations between coping strategies in waking life and active problem-solving in dreams (22 dreamers)

DISCUSSION

The objectives and design of the reported natural experiment derived from the suggestion that the adaptive functions of dreams would be better understood if they were based on a theory of adaptation to stress in waking life, in this instance, the Lazarus and Folkman's model (Lazarus & Folkman, 1984; Folkman & Lazarus, 1985, 1988; Folkman et al, 1986). Its purpose was to determine to which extent dreams reflected the stress experienced in waking during a period of examination and, specifically, the ways of coping with it. Dreams reported by the 35 participants over the three days before the targeted exam did not incorporate exam-related material more frequently than those of the exam-free phase and did not show either a higher stress level or more negative emotions. Incorporation dreams did not reveal more stress, negative emotions and more coping strategies indices than dreams without incorporation. But a significant negative relationship was found between harm/threat emotions in waking and negative emotions in dream content. Turning to dreamers who had incorporation dreams, they reported significantly less active problem-solving strategies in waking than the ones whose dreams had no incorporation. Moreover, a significant positive relationship was found between positive reappraisal in waking life and problem-solving in dream imagery. These last findings are important and reinforce the idea that had inspired this research project.

However, taken together, these findings appear discordant with important segments of the dream incorporation literature. Although the preparation for exams induced negative emotions and a state of stress, as expected from Folkman and Lazarus's (1985) findings, it had no pervasive influence on all the dreams of that period. The finding that negative emotions and stress level were not higher in incorporation dreams than in the others is at odds with Breger et al's (1971), Cartwright et al's (1984), Koulack et al's (1975), Sirois-Berliss and De Koninck's (1982) findings, but consistent with those of Cohen and Cox (1975), De Koninck and Koulack (1975). The differences could be attributed to the specifics of the situations, experimental in some instances and real life in others. This is a matter of importance with regards to the cognitive appraisal of the potentially stressful event and to coping strategies (Folkman & Lazarus 1985). Although the preparation for exams created a stress, it was not high and probably not severe enough to penetrate dreams as an imminent surgery (Breger et al, 1971) or living through a divorce (Cartwright

et al, 1984) did. Exams are a recurrent and predictable fact of students' life that induce a temporary state of stress in the midst of daily concerns over courses and workload. But these concerns are intermingled with others, relative to romantic relationships, for example, as was observed in a few dreams. As Hartmann comments:

“For many of us leading fairly ordinary lives, there are many emotional concerns active at any one time, and it is not easy to determine one dominant emotion; thus our dreams often seem confused and almost random” (Hartmann, 1996; p. 153).

The relative severity of the stressor is therefore a limiting factor that bears on the results of the analysis of incorporation dreams and commands a cautious approach to their discussion.

Yet, 22 of the dreamers had incorporation dreams which could reflect their concern with exams and courses. Despite the failure to find a significant correlation between the level of stress and the negative emotions in waking and in incorporation dreams, seventeen of these 22 dreamers reported at least one dream with stressing elements. But in other instances, incorporation dreams were neutral in tone, and even quite pleasant and self-gratifying. The following excerpts from the dreams of the same student illustrate the direct and indirect incorporation of the exam as well as the difference in tone from one night to another:

“I was in a restaurant with my boyfriend. I suddenly remember I had an exam in philosophy at 4 o'clock. I hadn't even started to study for it. . . I panicked. . .” and the other: “I was somewhere, discussing questions of sociology with some people. . .”

One direct incorporation dream from another student, prototypic of examination dreams that some people experience later in life (Halliday, 1993), reflects her stress dramatically:

“I was in a hurry to go to the psychology exam (. . .) I felt lost. I didn't know where to go I was panicky (. . .) I missed the test.” But the same student had a totally different dream which projects a sense of success and accomplishment: “I was attending my convocation. I had only four tickets (. . .). My boyfriend's mother asked for eight tickets. I had to explain I had none left (. . .) and that my graduation wasn't a concert.”

These examples show how dreams incorporate alternately and in a fragmented fashion the different, even contradictory facets of the complex mix of hope, anxiety and fears examinations induce in waking life.

The negative relationship between negative emotions in waking and in incorporation dreams is an interesting finding. Students who reported highly negative emotions in waking had dreams whose emotional tone is neutral: “I was in the biology lab with one of my friends, who is in my class, in real life. She was pregnant,” or very pleasant: “A two-week outing had been organized for the whole class. We had arrived at our destination. There were natural water whirlpools”... Inversely, dreamers who had not reported intense negative emotions in waking had harm or threat emotions in their incorporation dreams, as this one who wrote: “I was in a classroom (...) Suddenly water started to fall from the ceiling and dampened my book. I was mad at my neighbor who had not protected it. The whole class was laughing at me and it made me more angry (...) We were going to take an exam on a film we had just seen.”

The inverse relationship between negative emotions in dream imagery and in waking parallels one of Breger et al's (1971) findings. The authors had interpreted it as a form of continuity and they saw the absence of emotions in dreams as a displacement or inhibition of emotions aroused by the stressor. This clinical interpretation, which would

not be in contradiction with the fragmentation process alluded to, is in need of further research.

Turning to the links between the ways of coping with stress in waking life and dream content, a first finding is noteworthy: the absence of incorporation in the dreams of those students who had privileged problem-solving while preparing for exams. This strategy consists of analyzing the situation, planning, and acting accordingly. Following Folkman and Lazarus' (1985) theorizing, that strategy would have achieved its objective of providing relief from the negative emotions and/or changing the distress-causing problem, thus making incorporation superfluous. On the other hand, dreamers who did not prepare themselves as actively would have attempted to cope with the problem in their dreams.

The positive relationship between positive reappraisal in waking and active problem-solving in dreaming is an equally important finding. The following dream was reported by a student who had used positive reappraisal in waking: "I was in a classroom, and I was wearing an army like uniform (. . .) We were taught how to make bombs (. . .) And I secretly made one which emitted toxic fumes (. . .) I was waiting for the right time to use it and liberate all the workers." Although giving a positive meaning to the stressing situation may provide relief from it, it does not address the problem directly. The dream imagery that surfaced afterwards suggests that this cognitive coping strategy shifted the problem to the unconscious where a new attempt to master it took place.

Although the design of this study does not allow the identification of a causal relationship it can be hypothesized that two coping strategies used in waking, problem-solving and positive reappraisal, have played a significant role relative to the incorporation process. While the first one appears to have made incorporation needless, the second would have fostered problem-solving in the dreaming state. These interpretations are consistent with the mastery hypothesis which holds that dreams have a problem-solving function. If a problem or a concern is left unsolved before falling asleep, the dream would allow in some cases to rehearse ways to come to terms with it. It would be premature to generalize this finding to the impact of other coping strategies on the incorporation process. Another stressful event might have called for other strategies, such as seeking social support, which was used only once. Their impact could have been different. Conducting research in various stressful situations, including some that could be experimentally created, is needed to insure the validity of the present interpretation. It would provide stronger support for the notion that the reactions to a stressing encounter in waking life intervene in the incorporation process, either by making it unnecessary or by fostering it.

Examination stress, that could be qualified as mild for the sample as a whole, allowed to conduct this natural experiment with some degree of methodological control and to keep the participants motivated throughout the experimental and control periods. However, the limitations of relying on self-collected data at home rather than in a sleep laboratory should not be overlooked. Beside that limitation, the task was demanding for students who were preparing for exams. Evaluating one's stress level and emotions twice daily could have induced occasional routine or careless rating. Similarly, keeping a dream diary was time consuming. Failure to recall dreams, hasty or faulty reporting are among the factors that may have affected the quality and quantity of the dream data. Even though the selected stressor was not forceful enough to yield more conclusive results, its impact was significant for a number of the participants. It brought to light the fragmented reflection of it in dream imagery and a problem-solving rehearsal process, that had previously been observed in clinical situations by Breger et al (1971) Cartwright et al (1984).

But a number of questions could be raised regarding this rehearsal process. While our findings suggest that it takes place as a complement and consequence of positive reappraisal in waking they do not preclude the possibility that dreaming could be a substitute for the primary and/or secondary appraisal conducive to coping in the conscious state. This speculation cannot be substantiated at this point. A first step toward this

objective requires a reexamination of dream theories based on the continuity and mastery hypotheses in order to include coping with stress in waking as an integral part of them. It should take into account, beside the processes that constitute the tenets of Lazarus and Folkman's theory, the nature of the stressor and the individual factors that condition different ways of coping with it.

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