Emotions in Dream and Waking Event Reports

Tore A. Nielsen[1], Daniel Deslauriers[2], & George W. Baylor[3]

[1]Dream & Nightmare Laboratory, Centre d'étude du sommeil, Hôpital du Sacré-Coeur de Montréal & Département de psychiatrie, Université de Montréal

[2]Department of East/West Psychology, California Institute of Integral Studies

[3]Département de psychologie, Université de Montréal & Centre d'étude des rêves de Montréal

Address for reprints:
Tore A. Nielsen
Dream & Nightmare Laboratory
Centre d'étude du sommeil
Hôpital du Sacré-Coeur
5400 boul. Gouin Ouest
Montréal (Québec) Canada H4J 1C5
(514) 338-2693 (tel) / (514) 338-2531 (fax)
t-nielsen@crhsc.umontreal.ca

Abstract
Twenty participants hand-wrote reports of their dreams and waking life events and used an extensive lexicon of emotion words and types to rate the emotions experienced in each scene of each report. From these ratings, the incidence and intensity of 22 different emotion types in the two kinds of report were assessed. The incidence of emotion categories specified by a cognitive model of emotions was also assessed. Emotions were found to be present in virtually all scenes of all dream reports and only one of the 22 emotion types was never used in the ratings. The incidence of most of the emotion types was similar to that of reports of important life events.

There was also evidence that the incidence of positive emotions was lower in dream reports than event reports, while the incidence of fear was higher. Specifically, the mean number of positive emotions per scene was lower and the proportion of fear was higher in dream reports than in event reports.

These results are consistent with the notion that emotion is as much a part of dream experience as it is of important waking life experience. However, the results also indicate some unique features of these dream reports. The pattern of differences may be due to a process of emotion production that inhibits positive emotions while facilitating fear during dreaming. Such a process might also explain the frequent occurrence of frightening nightmares and may be consistent with a theory of dream function in which dreaming regulates emotion during sleep.

Introduction

Estimates of emotions in dream reports vary widelye. Some early studies suggested that emotions in dreams were both infrequent and lacking in salience. One widely cited study (Snyder, 1970) concluded that emotion is typically either absent during dreaming--appearing in less than 35% of reports--or vague in quality when it appears. Another study found emotion in only 12.5% of laboratory dream reports (McCarley & Hobson, 1979). However, in more recent studies where laboratory participants were directly probed for emotional content or were allowed to rate emotion in their own reports, emotions were found to be more frequent, in the order of 70-75% (Foulkes, et al., 1988; Strauch, 1988; Strauch & Meier, 1989; Strauch, Loepfe, & Meier, 1987; Deslauriers, 1990). Studies of home dreams in which participants were provided with an adapted version of Izard's (1977) differential emotions scale suggested even higher frequencies of emotions (Stairs & Blick, 1979; Howe & Blick, 1983).

Two methodological factors may explain these widely different estimates of emotions in dreams. First, in the earlier studies participants were not queried specifically about emotions. They may thus have inadvertently omitted emotional descriptors from their dream reports, in a manner similar to participants recalling storied material (e.g., Stein & Glenn, 1979). Second, in the early studies independent judges rated emotional content, a procedure known to correlate poorly with participant ratings (e.g., Sandler, Kramer, Trinder, & Fishbein, 1970; Stairs & Blick, 1979). In contrast, when participants themselves report emotions or are given specific scales for rating their emotions, the frequency of emotions is much greater.

It is also noteworthy that some studies have found negative emotions to be more prevalent than positive emotions in dream reports. Several laboratory studies (Foulkes, Kerr, Sullivan & Brown, 1986, see review in Strauch, 1988; Snyder, 1970) and home dream studies (Hall & Van de Castle, 1966) concur on the finding that over 2/3 of dream emotions are negatively toned. Not all laboratory studies report such a high incidence, however (Strauch, 1988; Strauch & Meier, 1989).

The above evidence taken together suggests that emotions may be more frequent in dream reports than previously thought. The accessibility of emotions in dream reports seems to be enhanced when participants themselves score their reports, preferably with the aid of a suitable lexicon of emotional descriptors. Moreover, a large proportion of dream emotions tends to be negative in tone.

Theoretical Roots of the Lexicon-Assisted Scoring Procedure. To facilitate participants' self-reporting of emotions in the present research we used a lexicon-assisted collection and scoring procedure that is based, in part, upon a cognitive model of emotion (Ortony, Clore, & Collins, 1988). The model identifies 11 positively- and 11 negatively-valenced basic emotion types and connects these types to everyday language with a lexicon of 127 alternative emotion 'tokens' (see Appendix 1). Use of the 22 types in conjunction with the expanded lexicon of tokens allows participants to identify and quantify a wide range of basic emotion types while not seriously limiting their preference for particular expressive words.

The model underlying this lexicon reflects but one of many psychological perspectives on emotion production (cf. Frijda, 1986). It regards emotions as valenced reactions to specific external stimuli and it describes the kinds of event, character and object stimuli that lead to qualitatively different reactions (Ortony, et al., 1988). In the case of dreaming, however, it is not necessarily true that emotions are valenced reactions to stimuli that appear in the content of the dream. Emotions may be but

one of several simultaneous expressions of multi-modal, centrally activated, imagery schemas (cf. Lang, 1979), or they may, themselves, determine the selection of actions, characters, and objects in the formation of a dream--perhaps as components of an 'affective script' (e.g., Tomkins, 1979; Kuiken, 1986).

Nevertheless, the Ortony, et al. model was chosen for the present research because its stimulus/response assumptions (reflected in its 18 emotion categories, see Table 2) may specify important associations between dream contents and emotions, regardless of the possible causal relationships between them during dream formation.

To summarize, the principal goal of the present study was to characterize emotions in dream reports using a method which would facilitate participants' identification and reporting of their emotions. A second goal of the study was to compare the emotions in dream reports with those in waking event reports.

Methods

Eight males, aged 23 to 39 years (M=30.1), and 13 females, aged 26 to 40 years (M=30.7), were recruited from three sources: 13 participants from a course on dream psychology at the California Institute of Integral Studies, who received course credit; 7 paid participants from advertisements in a local newspaper in the San Francisco Bay Area; and 1 volunteer participant from a course on dreams at McGill University. All participants filled out questionnaires concerning dreams, psychological health, sleep problems, and use of drugs. No participants reported severe psychological difficulties or sleep problems. All were informed of their right to anonymity, confidentiality and withdrawal from participation, and were asked to sign a consent form. Paid participants were given $25 at the end of the study.

Participants were requested to write out reports of at least 2 dreams and 2 waking events at home over a 2-week period on forms that were provided. They were asked to write down their dream reports after awakening in the morning and their event reports before retiring in the evening. The waking event reports were descriptions of the one event of the day that felt most important. Half of the participants were requested to record, during the first week, their waking events after having first reviewed in detail all important events that had taken place since breakfast, and then, during the second week, to record their events after having first recalled their morning dream. The other half of the subjects recorded their events in the reverse order. These conditions were used to examine other hypotheses about dream influences on waking cognition but, since preliminary analyses found few differences between emotions in these conditions, the waking event reports from both conditions were combined in subsequent analyses.

Participants were given written instructions on use of the lexicon-assisted scoring procedure designed to maximize information about scenes and emotions in their reports. First, they were instructed to specify the temporal order of events in the reports using words such as "then", "later", etc. Second, they were instructed to indicate the end of one scene and the beginning of another by marking a slash and a number. Scenes are one index of temporal sequencing that have been applied in previous narrative analyses of dreams (Kuiken & Nielsen, 1982). Third, they were instructed to specify the emotions that occurred in each scene, if any, using an alphabetized lexicon of 127 emotion tokens (from Ortony, et al., 1988; see Appendix 1) and then to use this lexicon to pick the emotion type assigned to it. Emotion types consisted of the 11 negative and 11 positive types specified in the Ortony, et al. model

(see Table 2). Participants were told to report only feelings that had occurred in the dream and not feelings that they thought should have occurred; if they had no emotions in a scene, they indicated "no emotion" for that scene. Finally, they were instructed to rate the intensity of each emotion type on a 5-point scale.

Incidence of Emotion Types. Incidence of the 22 emotion types was calculated as the number of occurrences of each type in the report divided by the total number of types in the report. The incidences of all negative and all positive emotion types were calculated in a similar way, i.e., as the sum of all negative or positive types divided by the total number of types.

The use of proportional measures effectively controlled for differences in overall length between reports. However, to compare the proportions of negative and positive emotions in the two types of report more effectively, we calculated the incidence by dividing both of these by the total number of scenes instead of the total number of types.

To test whether the categories of emotions in the Ortony, et al. model differentiated dream and waking event reports, the 18 emotion categories (see Table 2) were compared (For a description of these categories see Ortony, et al., 1988, pp. 18-25.). These categories were calculated as the number of emotion types comprising a category divided by the total number of types.

Average frequency and proportion measures for dream and event protocols were statistically compared with BMDP-4V MANOVAs using Report Type (dream, event) and Emotion Type (1 to 22) as within-groups factors. Tests of differences on each level of the Emotion Type factor were accomplished with simple effects univariate contrasts of the Report Type factor. The emotion categories were similarly compared using Report Type (dream, event) and Model Category (1 to 18) as within-groups factors and by calculating separate univariate Fs for each of the Model Category levels. An error rate of $p<.05$ was adopted for all multivariate signficance tests, but because a large number of univariate contrasts was conducted, an error rate of $p<.005$ was arbitrarily chosen for univariate tests.

Emotion Type Salience. Mean negative intensity and **mean positive intensity** were calculated as the mean intensity ratings for all negative and all positive emotion types in a report, respectively. These scores were statistically assessed using MANOVAs as described above.

RESULTS

Emotion Type Incidence. One participant submitted dream reports with no accompanying waking event reports and was thus dropped from further comparisons. The remaining 20 participants contributed approximately equal numbers of dreams and waking event reports (range: 2-6) for a total of 79 dream reports and 75 waking event reports. The mean number of scenes per report was larger for dream (4.1 +/-1.8) than for event (2.8 +/-1.7; $F(1,19)=21.27$, $p=.0002$) reports. Only .01% (3/327) of scenes from dream reports and 0% (0/210) of scenes from event reports contained no emotions.

There were a total of 599 emotion tokens in dreams (M=1.83 tokens/scene) and 427 tokens in events (M=2.03 tokens/scenes). The proportion of negative tokens was greater in dreams (.60 +/-.18) than in events (.47+/-.17; $F(1,19)=7.80$, $p=.012$). However, there was approximately the same number of negative tokens per **scene** in dreams (1.17) and events (1.11; $F(1,19)=0.27$, $p=.6110$), but significantly fewer positive tokens per scene in dreams (.73) than in events (1.25; $F(1,19)=18.92$, $p=.0003$). These results indicate that positive emotions were relatively infrequent when compared either with negative emotions in dreams or positive emotions in waking events.

All of the emotion types except Gloating were scored by at least one participant in their dream and event reports (see Table 1). The only outstanding difference in emotion types was that dream reports (.203) more often than event reports (.082) contained Fear (F(1,19)=15.95, p=.0008).[1] Fear was also the most frequently occurring emotion type in dream reports (20%); it occurred in 54 of the 79 reports (68%) and was scored in at least one dream report by all 20 participants. By contrast, Fear accounted for only 8% of emotion types in event reports, occurred in 26 of 75 reports (35%), and was scored in at least one event report by 16 participants.

Table 1. Mean Proportions of Emotion Types for Dream and Event Reports.

Emotion Type	DREAM			EVENT				
	Mean	sd	N[a]	Mean	sd	N	F[b]	p
1. Admiration	.036	.07	11	.022	.04	9	1.98	.175
2. Anger	.075	.07	14	.084	.10	14	0.10	.761
3. Disappoint	.064	.07	14	.064	.06	13	0.00	.964
4. Distress	.106	.11	16	.101	.08	15	0.04	.853
5. Fear	.203	.13	20	.082	.06	16	15.95	.001*
6. Fear-confirmed	.005	.01	4	.004	.01	2	0.11	.739
7. Gloating	.000	.00	0	.000	.00	0	--	--
8. Gratification	.032	.04	11	.025	.04	9	0.49	.494
9. Gratitude	.011	.02	8	.011	.02	4	0.00	.954
10. Happy-for	.005	.02	1	.004	.01	2	0.06	.804
11. Hate	.031	.04	12	.011	.03	3	3.39	.081
12. Hope	.085	.08	14	.074	.07	12	0.35	.563
13. Joy	.158	.08	20	.230	.15	19	4.36	.051
14. Love	.014	.03	6	.030	.04	8	4.70	.043
15. Pity	.020	.04	7	.067	.12	13	3.11	.094
16. Pride	.014	.03	5	.010	.03	3	0.19	.670
17. Relief	.035	.04	13	.072	.07	15	3.71	.069
18. Remorse	.001	.00	1	.002	.01	2	0.51	.483
19. Reproach	.013	.02	9	.005	.01	2	3.93	.062
20. Resentment	.028	.06	7	.007	.02	4	2.07	.167
21. Satisfaction	.015	.03	6	.056	.10	8	4.06	.058
22. Shame	.048	.07	11	.042	.05	11	0.11	.746

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[a]N=number of participants using the emotion type in at least 1 report.
[b]Df for all tests=1,19.

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[1]A similar analysis using number of scenes as a control for length of report produced highly similar results to those displayed in Table 1. Specifically, dream reports contained more instances of Fear per scene (.401) than did event reports (.215; F(1,19)=7.84, p=.011).

Categories of Emotion Types. Dream and event reports showed few differences when emotion types were categorized according to the structural model (see Table 2). The only outstanding difference was for the **Prospects-Unconfirmed** emotions (Hope + Fear) within the 'Prospects Relevant' grouping (F(1,19)=18.87, p=.0008). This difference is largely attributable to the disproportionate frequency of Fear in dream reports. There were also trends for other subgroupings of the 'Prospects Relevant' group to be less frequent in dream reports, specifically, 'Prospects-Disconfirmed' (comprised of Relief + Disappointment) and 'Prospects-Confirmed' (Satisfaction + Fear-Confirmed).

Finally, the 'Actions of Agents: Other' grouping (Admiration + Reproach) tended to be more frequent in dream reports F(1,19)=5.39, p=.0316).

Table 2. Proportions of Emotion Types for Dream and Event Reports For 18 Categories of the Model.

VAR#	CATEGORY	DREAM	EVENT		
		Mean	Mean	F	p
1.	(a) Consequences of Events[1-6]	.724	.759	0.59	.452
2.	1. Self[1-4]	.671	.681	0.04	.836
3.	a. Prospects Relevant[1-3]	.407	.351	1.92	.182
4.	1) Prospects-Unconfirmed[1]	.287	.156	18.87	.000*
5.	2) Prospects-Con/Dis[2,3]	.120	.197	6.33	.021
6.	Confirmed[2]	.020	.061	3.84	.065
7.	Disconfirmed[3]	.100	.136	3.40	.081
8.	b. Prospects Irrelevant[4]	.264	.330	2.89	.106
9.	2. Other[5,6]	.053	.078	0.62	.440
10.	a. Desirable[5]	.033	.011	2.12	.161
11.	b. Undesirable[6]	.020	.067	3.11	.094
12.	(b) Actions of Agents[7,8]	.111	.079	2.34	.128
13.	1. Self[7]	.062	.052	0.27	.608
14.	2. Other[8]	.049	.027	5.39	.032
15.	(c) Aspects of Objects[9]	.045	.040	0.14	.711
16.	(d) Event/Agent Compounds[10,11]	.119	.122	0.01	.933
17.	1. Self[10]	.033	.027	0.36	.553
18.	2. Other[11]	.086	.095	0.08	.776

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[1]Hope, Fear. [2]Satisfaction, Fear-confirmed. [3]Relief, Disappointment. [4]Joy, Distress. [5]Happy-for, Resentment. [6]Gloating, Pity. [7]Pride, Shame. [8]Admiration, Reproach. [9]Love, Hate. [10]Gratification, Remorse. [11]Gratitude, Anger.

2. Emotion Type Salience. Dream and event reports were not differentiated by the mean intensity ratings of positive (3.23 v. 3.45; F(1,19)=1.43, p=.247) or negative (3.10 v. 3.10;

F(1,19)=0.04, p=.841) emotion types.

DISCUSSION

The present results indicate that when participants provide self-reports of emotions with the assistance of a detailed lexicon the incidence of emotions in dream reports is very high--at least as high as it is in reports of important waking events. Participants in the present study indicated that emotion was present to some degree in every dream they reported and that multiple emotions occurred in most of these reports. Moreover, with some exceptions, the relative proportions of emotion types in dream reports were similar to those in waking event reports. This was the case for assessments of individual emotion types, where all emotions but fear were markedly different for dream reports, and also for emotion types grouped according to categories of the structural model, where only the category 'Prospects-Unconfirmed' clearly differentiated the groups. Thus, the present results suggest that in general emotions are as integral to dream experiences as they are to important waking experiences.

In addition to the high frequency of emotions in dreams, the present study shows that participants use a diversity of emotion types to describe their dream reports. Twenty-one of the 22 basic emotion types provided in the emotions lexicon were identified in dreams by at least one participant. The single exception to this was Gloating, which was also the only emotion type found to be absent from the waking event reports.

Finally, the present results show that emotional intensity in dream reports is equivalent to that found in waking event reports. In this respect, dream emotions are more like emotional reactions to waking events than they are like emotions in waking fantasies (cf. Strauch & Meier, 1989).

The proportions of emotions reported in the present study appear to be reliable estimates of the frequency of emotions in home dream reports more generally. Comparisons with results from the Stairs and Blick (1979) study, for example, reveal striking similarities for all common negative emotions: Fear (17% v. 20%), Distress (11% v. 11%), Anger (6% v. 8%), Shame (5% v. 5%), and Contempt (1% v. 1%), as well as for the positive emotion Joy (15% v. 16%).

However, the overall frequency of dream emotions in the present study is higher than frequencies reported in other studies. The average dream report in the present study contained 4.1 scenes and the average scene 1.9 emotion tokens; thus the average dream report contained a sequence of about 8 emotion tokens. This estimate is larger than estimates from the Howe and Blick (1983) study (1.83) and the Dudley and Ransom (1988) study (3.59). The estimate is also larger than estimates from laboratory studies, which are typically less than 1 emotion per report (Foulkes, et al., 1988; McCarley & Hobson, 1979; Snyder, 1970; Strauch, et al., 1987).

Part of the discrepancy between the present results and those of previous studies may be due to the fact that participants in the present study were requested to score emotions over several scenes. With this procedure, persistent emotions may have been scored as appearing in more than just one scene. However, it seems unlikely that such a reporting artifact could account for all instances of multiple emotions in our reports. Although we report no statistics on this point, most of the reports in our data set consisted of a series of different emotion types.

It is also possible that the high occurrence of dream emotions in the present results is due to 'secondary elaboration' or other demand characteristics of the procedure. It may be, for example, that

while writing out their dreams according to the protocol provided participants constructed some emotions that were not, in fact, part of their original experience but which seemed compellingly appropriate to the dreamed situations. This may have occurred despite our explicit instructions to the contrary. Nevertheless, until the intensive scene-by-scene procedure for assessing emotion is replicated in other home dream studies and is used under various conditions to assess laboratory dreams, it would be inappropriate to attribute the present findings entirely to such an experimental artifact.

Another explanation of the high frequency of emotions in the present study is that the scene-by-scene reporting procedure allowed participants to identify more of the subtle and unspecific emotions in their dreams. Such unspecific emotions may be of a positive character, as reported in previous studies (Strauch & Meier, 1989; Snyder, 1970), although the proportion of positive emotions in our dream reports (40%) was only slightly higher than those reported in other studies (from 24-39%; Foulkes, Sullivan, Kerr, & Brown, 1986; Snyder, 1970; Strauch, Loepfe & Meier, 1987).

Distinguishing Features of Dream Reports. Although the present results indicate that emotions are well-represented in dream reports, and that many of these emotions parallel those in waking event reports, they also reflect some significant differences between the two types of reports. Specifically, positive emotions overall were less frequent and fear emotions in particular were relatively more frequent in dream reports. In addition, the analysis of emotion categories from the structural model indicated that emotion types under categories implicated in the confirmation of prospects for the self tend to characterize dream reports.

With respect to the first result, one possibility is that the differences in positive emotions and fear are due to social or psychological factors influencing the final communication of the dream or event report. For example, participants may have experienced or may have chosen to report waking events that were more positively toned than usual, thus giving the impression that positive emotions were relatively less frequent in their dream reports. Such a reporting bias might explain some cultural differences in the emotional content of dreams (see comparisons in Strauch, 1988) but it seems insufficient to account for the overall pattern of the present results.

Rather, we propose that the present pattern of results is consistent with the notion that emotion regulation is an integral part of dream function (e.g., Kramer, 1991; Nielsen, 1991) and that typical patterns of emotion in dream reports reflect this regulatory function. In the present data, the occurrence of fewer positive emotions and more fear in dream reports may reflect some aspects of this regulatory function. In particular, the emotional pattern may reflect the fact that during dreaming there is a specific process that both inhibits positive emotion and facilitates fearful or anxious emotions.

The notion of emotional inhibition was previously proposed to account for the results of a laboratory study in which emotions were reduced after reflection upon dream imagery relative to reflection upon fantasy imagery (Nielsen, Kuiken, & McGregor, 1989). This reduction, moreover, was found to be associated with measures of sensory and motor inhibition in REM sleep. The present results suggest that if REM sleep inhibition is a factor in emotion production during dreaming, this inhibitory activity may be more likely to affect positive emotions.

With respect to the results from the structural model, there is only mild evidence that the association of emotions with particular categories of dream content distinguishes dream reports from waking event reports. The largest difference between the kinds of report was seen for the Prospects-Unconfirmed subcategory of major category Consequences of Events for the Self, a difference that can

be attributed primarily to the finding that fear was significantly more predominant in dream reports. However, the fact that a cluster of 3 other subcategories within the same major category also tended to discriminate between dream and event reports suggests that the prospects of event consequences and their relevance to the self may be of particular importance in the organization of emotions in dream reports.

In sum, the present results suggest that when subjects are permitted to report emotions with the aid of an extensive emotions lexicon, the occurrence of emotions in dream reports is highly similar to that in reports of personally important waking life events. These results could thus be considered consistent with the continuity hypothesis, i.e., the hypothesis that waking life and dream content are consistent with one another (e.g., Kramer, Roth, Arand & Bonnet, 1981; Schwartz, Weinstein & Arkin, 1978). The present results do not, of course, speak to whether the emotions in dream reports are organized in a manner similar to those in waking event reports, but they do indicate that dream emotions can occur in extended sequences. Further analyses are required to determine whether these sequences reflect meaningful progressions or repetitions (e.g., Kuiken, 1986; Tomkins, 1987; 1979) or are simply 'random' fluctuations of emotion types or intensities (e.g., Hobson, 1988). However, other analyses indicate that the dream reports in our sample in fact contain more non-random positive-to-negative emotion sequences than do waking event reports (Nielsen, Deslauriers & Baylor, 1991).

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