

Emotions in Diary Dreams¹

Michael Schredl¹ and Evelyn Doll

Sleep Laboratory, Central Institute of Mental Health, Mannheim, Germany

Even though various investigations found a preponderance of negative emotions in dreams, the conclusion that human dream life is, in general, negatively toned is limited by several methodological issues. The present study made use of three different approaches to measure dream emotions: dream intensity rated by the dreamer, intensity rated by a judge, and scoring of explicitly mentioned emotions (Hall & Van de Castle, 1966). Results indicate that only in the case of external raters' estimates do negative emotions outweigh the positive ones; but in the case of self-ratings (i.e., those made by the dreamer himself/herself), the ratio was balanced. Analyses showed that this is mainly due to the underestimation of positive emotions in the external ratings. Additionally, a positive correlation was found between the intensity of dream emotions and dream recall frequency, whereas gender differences were nonsignificant as regards the emotional tone of diary dreams. © 1998

Academic Press

Various former investigations (Calkins, 1893; Weed & Hallam, 1896; Bentley, 1915) and several other more recent studies examining large dream samples (Hall & Van de Castle, 1966; Snyder, 1970; Kramer, Winget, & Whitman, 1971; Ziegler, 1972; Narotra, 1983; Parekh, 1988; Dudley & Ransom, 1988; Merritt, Stickgold, Pace-Schott, Williams, & Hobson, 1994) have shown that negative dream emotions outweigh positive ones. Hall and Van de Castle (1966), for example, who carried out the first large-scale dream content analysis (1000 dream reports) found that only 20% of the explicitly mentioned emotions in dreams were positive. A similar finding was obtained in another representative sample by Kramer et al. (1971), namely that 54% of the dream reports were negatively toned, 26% positively toned, and 20% were rated as neutral. Children's dreams showed a predominance of negative emotions as well (e.g., Fischer, 1928; Garfield, 1984). Despite the considerable amount of empirical data supporting the notion that human dream life is, in general, predominated by negative emotions, there are several limitations that should be taken into account prior to generalizing from such findings. In the present paper, three possible factors which may have influenced the measurement of dream emotions are taken into consideration: (1) using subjects' self-rating (i.e., their own estimation of dream emotions) vs. external rating (i.e., emotion scoring by judges who rate the written or transcribed dream report), (2) measurement of explicitly mentioned emotions vs. additional measurement of vague moods or the overall emotional atmosphere of the dream, and (3) the kind of dream report used in the study, e.g., most recent dream, diary dream, or dreams obtained by awakenings carried out in the sleep laboratory.

Upon examining the differences between self-ratings and external ones carried out

¹ Address correspondence and reprint requests to Dipl. Psych. M. Schredl, Sleep Laboratory, Zentralinstitut für Seelische Gesundheit, Postfach 12 21 20, 68072 Mannheim, Germany.

by judges, a considerable augmentation of reported dream emotions was observed in the case of self-ratings. Whereas judges (external raters) scored about 0.35 emotions per diary dream (Hall & Van de Castle, 1966), dreamers themselves reported about 3.6 emotions per diary dream (Dudley & Ransom, 1988; Merritt et al., 1994) or, in one study, up to 8 emotions per dream (Nielsen, Deslauriers, & Baylor, 1991). In a similar manner, about 30% of laboratory dreams were scored as emotionally charged by external raters (Snyder, 1970) but, in 70% of the laboratory dreams, the subject reported at least one emotion or mood (Foulkes, Sullivan, Kerr, & Brown, 1988; Strauch & Meier, 1996). These findings clearly demonstrated that judges tended to underestimate the number of emotions occurring in a dream. A pilot study (Schredl, 1991) compared estimates of two 4-point scales concerning emotional intensity (positive and negative emotions) to ratings made by judges on similar scales. Interestingly, the results indicated that judges underestimated the intensity of positive emotions in particular but not the intensity of negative ones reported by the dreamer him/herself. Despite the findings that only about 50% or less of the emotions occurring in a dream—which were, in turn, measured by self-ratings—were correctly identified by judges (Stairs & Blick, 1979; Borioli, Meier, & Strauch, 1984; Foulkes et al., 1988), only 5% (Foulkes et al., 1988), or 2.4% (Merritt et al., 1994) of the dream emotions did not correspond to the particular dream situation, i.e., errors due to the possibility that the dream ego experiences unexpected emotions in the course of a dream, are quite small.

Another critical point in evaluating this research is the question whether only explicitly mentioned emotions were elicited or whether moods—e. g., a positive general atmosphere—were also included in the analysis. Since there is no agreement among psychologists on the terms “affect,” “emotion,” “feeling,” and “moods” (e.g., Davidson, 1994) a short description is given as to how the terms are used the present article. Whereas the terms emotion and feelings were used interchangeably, denoting conscious perception of affective qualities, a clear distinction was made between explicit emotions such as anger or sadness and moods as an overall atmosphere. Snyder (1970) who analyzed 635 laboratory dreams pointed out that judges were not able to rate such general moods by reading a dream report. A sophisticated analysis of about 500 laboratory dreams was made by Strauch and Meier (1989); they found explicitly mentioned emotions in 50% of the dream sample but in an additional 23.1% of the dreams, only moods could be detected. Surprisingly, dream moods were estimated as intense as explicitly mentioned emotions: whereas two-thirds of the emotions were negative, three out of four moods were positively toned. As a result, the distribution of the overall emotional tone was as follows: 30.9% of the dreams were positive, 28.9% were negative, in 10.2% both types of emotions were reported by the dreamer (i.e., mixed), and in 28.4%, there were no emotions. In yet another study, Stairs and Blick (1979) asked their subjects to report only the two most intense dream emotions; 44% were negative and 49% positive, i.e., a balanced ratio. In the case of subjects being asked to rate the overall emotional tone of their dream, it seems plausible that both moods—even if they remain unmentioned—and explicit emotions will form the basis of their judgment. For example, such a global classification of diary dreams made by the dreamer himself/herself in four classes (dreams predominated by positive emotions, dreams predominated by negative emotions, mixed dreams,

and dreams with no emotion) yielded the following pattern: 32.9% positive dreams, 20.5% negative dreams, 1% balanced dreams, and 45.6% neutral dreams (McElroy, 1952). A similar classification made by judges scoring children's diary dreams (9 to 12 yrs.) also resulted in a balanced ratio of negative (36%) and positive dreams (40%), while 24% of the dreams were neutral (Niederer, 1990). In Stewart and Koulack's (1993) study, participants were asked to estimate the dream affect quality on a 7-point scale ranging from extremely positive to extremely negative. The mean value of all subjects' dreams pointed slightly in the direction of positive emotions. A large-scale study (Riemann, Löw, Schredl, Wiegand, Dippel, & Berger, 1990) on depressive outpatients ($n = 1707$) indicated that, at the beginning of the treatment with an antidepressive drug, negative dream emotions (46%)—as expected—outweighed positive ones (5.5%). After treatment, however, dreams were rated more positive (42.4%) than negative (15.4%). Another possible factor influencing the measurement of explicit dream emotions (Hall & Van de Castle, 1966) is the intensity of these emotions, especially the intensity of negative dream emotions compared to that of positive ones. McFalls, Roe, and Blick (1980), for example, reported that anxiety feelings, which often occurred in dream reports, were rated as less intense than other emotions such as interest or surprise. Similarly, two other investigations (Strauch & Meier, 1989; Nielsen et al., 1991) found that self-rated positive emotions were slightly more intense than negative ones. This may contribute to the overestimation of negative emotions if solely the occurrence of the emotions was measured.

The kind of dream report, e.g., most recent dream, diary dream, or laboratory dream, which is used for measuring dream emotions may play a role in the study's final results. In many of the large-scale studies (e.g., Kramer et al., 1971; Parekh, 1988), the "most recent dream" approach has been used, i.e., the very last reported dream taken into consideration when conducting content analysis. Some results (Kluger, 1975; Cann & Donderi, 1986; Schredl, 1991) suggested that the emotions of dreams recalled after a long period of time (e.g., childhood dreams or first dreams) were biased in the sense that they were almost exclusively negatively toned. Another factor contributing to this distortion may be the increased occurrence of negative emotions at the end of a dream in comparison to those in the course of a dream (Merriitt et al., 1994). Similarly, Nielsen et al. (1991) reported significantly more shifts from positive to negative emotions in the course of a dream than vice versa. The REM awakening technique is the most appropriate method for obtaining firsthand dream reports even though this paradigm does influence dream content to a certain extent. Accordingly, Strauch and Meier (1996) reported that up to 50% of the dreams contained at least one laboratory-related element. Several authors (Domhoff & Kamiya, 1964; Okuma, Fukuma, & Kobayashi, 1975; Foulkes, 1979; Heyninck & de Jong, 1985) pointed out that laboratory dreams comprise a lower amount of aggression and sexuality than do home dreams, even in such cases in which the applied method (i.e., recording a dream vs. reporting it to the experimenter) is controlled (Weisz & Foulkes, 1970). This may lead to the conclusion that laboratory dreams are less intense than diary dreams recorded at home, even though only one study (Rüf, 1973) supported this view. Weisz and Foulkes (1970) did not find any differences in emotional tone between laboratory and home dreams. Another possible reason for the lower emotional intensity—in particularly of negative feelings—in laboratory dreams is the observation made by Hartmann (1984) that nightmares were drastically

reduced when the subjects were polysomnographically recorded in the lab (i.e., in a caring environment).

The often reported preponderance of negative dream emotions remains relative, especially considering the above-mentioned methodological issues as regards the measurement of dream emotions (dreamer vs. judge, explicit emotions vs. overall intensity, type of dream report). Investigations using self-ratings of dream intensity as global measures of overall dream affect showed a balanced proportion between positive and negative dream emotions (e.g., McElroy, 1952; Strauch & Meier, 1989; Stewart & Koulack, 1993), despite the fact that the laboratory study (Strauch & Meier, 1989) may have been somewhat biased and has underestimated the negative dream emotions.

Despite the inhomogeneous results, little effort has been made to compare different methods of measurement for dream emotions applied to one sample of dream reports. The present study fills this gap by comparing self-ratings of dream intensity to those made by judges (i.e., external ratings) and explicitly mentioned dream emotions. It also contrasts the ratios of positive and negative affects obtained by the different modes of measurement. In light of previous research, it was hypothesized that negative emotions tend to predominate in the case of explicitly mentioned emotions and in intensity ratings made by judges, whereas in the case of self-ratings—even though the same dreams were analyzed—the affective tone is balanced. The result of a pilot study (Schredl, 1991) led to the assumption that judges will rather underestimate positive than negative emotions.

The present study also has the additional goal of examining the relationship between dream emotions and dream recall. Several investigations (Schonbar, 1961; Cohen & MacNeilage, 1973, 1974; Belicki & Bowers, 1981, 1982) found a positive relationship between dream recall frequency and mean intensity of dream emotions. Furthermore, Belicki, Hunt, and Kelly (1978) and Spanos, Stam, Radtke, and Nightingale (1980) reported that high dream recall was associated with more positive dream emotions. Apart from possible factors influencing dream emotions, such as stress (Hicks, Chancellor, & Clark, 1987; Stewart & Koulack, 1993), life satisfaction (Stefanakis, 1990; Schredl, Schröder, & Löw, 1996), and presleep mood (Cohen, 1974a, 1974b), it was also shown that women tend to have more intense dreams (Hall & Van de Castle, 1966; Winget, Kramer, & Whitman, 1972; Merritt et al., 1994) and more negatively toned ones (McElroy, 1952; Strauch & Meier, 1989) than do men. Similar gender differences were revealed in patients with sleep disorders (Schredl, Kraft, Morlock, & Bozzer, 1998). Therefore, two additional hypotheses were adopted in the present study, namely, that dream recall is positively related to the intensity of dream emotions and second, that women will report more intense and more negatively toned dreams than men.

METHOD

Research instruments

Dream questionnaire. The dream questionnaire is made up of sociodemographic items (age and gender), a 5-point scale measuring dream recall frequency (1 = once a month or less, 2 = about once a month, 3 = twice or 3 times a month, 4 = about once a week, 5 = several times a week), and a 3-point item eliciting the predominance

of positive or negative dream emotions of these recalled dreams (-1 = predominantly negative dreams, 0 = neutral or balanced affect, $+1$ = predominantly positive dreams).

Dream diary. Participants were asked to fill in a dream diary over a 1-week or 2-week period. In a subsample, subjects were asked to complete a checklist indicating whether or not they could recall a dream. The remaining subjects were asked to record their dream experience as completely as possible. In both cases, positive and negative dream emotions were to be rated on two 4-point scales (0 = none, 1 = mild, 2 = moderate, and 3 = strong feelings). Two separate scales instead of one bipolar scale measuring emotional tone were selected, as some dreams (about 13%; Gaillard & Phelipeau, 1977; Strauch & Meier, 1996) comprise both affect qualities. Medians of positive and negative emotions were computed for each diary and the overall intensity of dream emotions was derived by adding both medians. A small subsample rated their feelings shortly upon awakening on two similar 4-point scales. Dream recall frequency was measured by the number of mornings in which at least one dream was recalled and the final score included in the analysis was made up of the number of nights per week in which a dream was recalled.

Dream content analysis. Two approaches were adopted in order to measure emotions in dream reports. First, dream emotions were scored by judges according to the Hall and Van de Castle (1966) classification system, which was translated into German by Riepl (1992). This system scores all explicitly mentioned emotions experienced by the dream ego in five categories: anger, apprehension, happiness, sadness, and confusion. For correlational analysis, two scores were derived indicating whether or not at least one positive or one negative emotion was present in the dream report. The second approach utilized similar 4-point scales as have been used for subjects' self-ratings of their dream emotions. The judge was advised not to score only explicitly mentioned emotions but also any implicit moods or feelings possibly revealed by the dream action. If several emotions belonging to one emotional quality (i.e., positive or negative) occurred, the most intense of them was to be scored. These scales were developed by Riemann, Beyer, Wiegand, and Berger (1985) and have already yielded sufficient interrater reliability in a previous study (Spearman correlations, positive emotions: $r = .714$, negative emotions: $r = .765$, $n = 103$ dreams; Schredl et al., 1996).

Procedure

Despite the fact that subjects participated in a variety of different dream studies, the procedure was the same. First, subjects were asked to complete the dream questionnaire; second, dream diaries were handed out with oral instructions as to the best method of enhancing dream recall and the recording of dreams. For the purpose of the present study, one dream per subject was selected for content analysis using the following criteria—where possible—dream length should vary between 30 words and a maximum of 150 words. The dream should contain at least a positive or negative emotion be scored by the dreamer. The upper limit of 150 words was used in order to avoid possible discrepancies between self-ratings and external ratings in those cases in which subjects solely estimate the emotions of the last scene of a long

dream. The lower boundary of 30 words was chosen to facilitate the rating process, especially since estimating emotions in very short dream reports is difficult. In some cases where the criteria were not met by one of the subject's dreams, the dream best matching the given criteria was included in further analysis. Two judges rated the dream reports according to the Hall and Van de Castle system in order to compute interrater reliability. Any resulting incongruencies were solved by discussion. An additional judge rated the dream reports on the two intensity scales (positive and negative emotions) in order to avoid interfering effects between the two approaches. Statistical analysis was carried out using the software SAS for Windows.

Participants

The sample comprised 263 participants whose ages ranged between 13 and 83 years. Most subjects were pupils or psychology students and some were elderly persons. The subject group had served in a variety of dream studies as healthy controls. The mean age was 28.82 ± 15.13 years with the following gender distribution: 190 women and 73 men whose mean age did not differ significantly. One hundred forty-one subjects estimated their overall emotional tone (dream questionnaire), 78 kept a checklist, whereas 78 other subjects kept a dream diary over a 1-week period, and 107 subjects over a two-week period. Medians of dream emotions were available from 210 diaries and emotions upon awakening from 47 diaries. One hundred eighty dreams of different subjects were included in the content analysis. To 133 dreams, all three measurements of dream emotions (self-ratings and two types of external ratings) were applied.

RESULTS

Dream Questionnaire and Dream Diary

The distribution of dream recall was as follows: 131 subjects chose "several times a week," 62 "about once a week," 27 "twice or 3 times a month," 14 "about once a month," and 22 "less than once a month." The overall emotional tone of dreams was described as positive by 34 subjects, as negative by 41 subjects—the difference, however, was not significant (Sign test, $z = 0.6, p = .5161, n = 75$)—and as balanced by 66 subjects. The mean frequency of diary dream recall was 3.12 ± 1.67 dreams per week. The correlation between the two measures of dream recall, i.e. questionnaire and dream diary was remarkably high ($r = .495, p < .0001, n = 255$). Mean word count of the dream reports selected for the content analysis resulted in 70.48 ± 40.82 words (range: 7 to 242 words).

Intensity of Dream Emotions (Self-Ratings)

Participants rated the intensity of their dream emotions in 964 dreams. The resulting difference between positive (1.12 ± 1.07) and negative emotions (1.23 ± 1.13) was not substantial (Sign-rank-test, $p = .0637$). The classification of dreams into predominantly positive, predominantly negative, balanced, and neutral dreams

TABLE 1
Emotions in Diary Dreams Measured by Three Different Scales (Self-Ratings of Intensity, External Ratings, Hall and Van de Castle Scales)

Category	Self-ratings (<i>n</i> = 964)	External ratings (<i>n</i> = 180)	Hall & Van de Castle (<i>n</i> = 180)
No emotions	7.3%	14.4%	60.6%
Balanced emotions	11.9%	8.3%	5.6%
Predominantly negative emotions	42.6%	56.7%	24.4%
Predominantly positive emotions	38.2%	20.6%	9.4%

showed the pattern depicted in Table 1. The dream diary medians were compared in order to control for different numbers of dreams contributed by one subject. Again, the difference was not significant (Positive emotions: 1.23 ± 0.94 vs. negative emotions: 1.29 ± 0.94 , Sign-Rank-test, $p = .5631$).

Intensity of Dream Emotions (External Ratings)

The judge rated negative dream emotions (1.19 ± 1.02) as more intense than positive ones (0.53 ± 0.81) (Sign-Rank-test, $p < .0001$, $n = 180$, one-tailed). The classification of dream reports according to the external ratings of dream emotions is depicted in Table 1.

Hall and Van de Castle Scores

The interrater reliability of the five scales measuring explicit emotions was high, i.e., the exact agreement on 100 dream reports ranged from 93.4 to 98.3%. Overall, 0.55 emotions were scored per dream: anger was represented in 11 times, apprehension 27 times, happiness 33 times, sadness 8 times, and confusion 20 times. According to Hall and Van de Castle, anger, apprehension, sadness, and confusion can be considered as negative emotions; in that case, two-thirds of the explicitly mentioned emotions in this study are negative. At least one positive emotion occurred in 31 dreams and at least one negative one in 54 dreams, the difference between them is shown to be significant ($\chi^2 = 4.1$, $p = .0215$, one-tailed). The classification of all dream reports into four groups is depicted in Table 1.

Relationships between the Three Measures of Dream Emotions

In Table 2, the intercorrelations between self-ratings and the external ones are presented. Interestingly, the correlations between externally rated intensity and the Hall and Van de Castle system were markedly elevated in comparison to the similar correlations between self-ratings and the Hall and Van de Castle scores. The comparison of mean values as regards the self-ratings vs. external ratings resulted in both cases (i.e., positive and negative emotions) in an underestimation of the extent of dream emotions by external raters (Table 3). Additionally, the difference between self and external ratings was more pronounced in the case of positive feelings than in the case of negative ones (Sign-Rank-test, $p = .0009$, $n = 133$, one-tailed). A

TABLE 2
Intercorrelations between Self-Ratings and External Ratings

	Self-ratings (<i>n</i> = 133)	External ratings (<i>n</i> = 180)
Positive emotions		
Intensity (external rated)	.557 (.0001)	
Hall and Van de Castle	.362 (.0001)	.598 (.0001)
Negative emotions		
Intensity (external rated)	.669 (.0001)	
Hall and Van de Castle	.290 (.0007)	.417 (.0001)

TABLE 3
Intensity of Emotion in 133 Dream Reports
(Self-Rating vs. External Ratings)

Dream emotions	Self-ratings	External ratings	Sign-rank-test
Positive emotions	1.18 ± 1.13	0.58 ± 0.84	<i>p</i> < .0001
Negative emotions	1.48 ± 1.11	1.23 ± 1.03	<i>p</i> = .0012

TABLE 4
Emotions in Diary Dreams Measured by Three Different Scales (Self-Ratings of Intensity,
External Ratings of Intensity, Hall and Van de Castle Scales; *n* = 133)

Category	Self-ratings	External ratings	Hall & V. d. Castle
No emotions	0.8%	13.5%	57.9%
Balanced emotions	12.0%	9.0%	6.8%
Predominantly negative emotions	50.4%	56.4%	26.3%
Predominantly positive emotions	36.8%	21.1%	9.0%

direct comparison of the results concerning the three approaches for 133 dreams is depicted in Table 4. The most striking differences between self-ratings, external ratings, and Hall and Van de Castle scores were found in the underestimation of positive feelings by the judges and the high number of dreams externally rated as showing no affect.

Correlations between Dream Emotions and Emotions upon Awakening

Whereas negative dream emotions scored by external raters correlated substantially with the negative feelings reported upon awakening ($r = .286$, $p = .0256$, $n = 47$, one-tailed), on the one hand, positive dream emotions, on the other, showed no correlation to those reported upon awakening ($r = .071$, $p = .3166$, $n = 47$, one-tailed).

Age Effects and Gender Differences

Age correlated negatively with dream intensity (median of dream diary, $r = -.139$, $p = .0440$, $n = 210$), negative dream emotions ($r = -.118$, $p = .0890$, $n = 210$), and word count of dream reports ($r = -.242$, $p = .0011$, $n = 180$).

TABLE 5
Gender Differences in Dream Variables

Variable	Women	Men	Significance
Dream recall (questionnaire)	4.17 ± 1.19	3.70 ± 1.43	z = -2.4 .0075*
Dream recall (dream diary)	3.24 ± 1.64	3.01 ± 1.73	t = -1.0 .3068
Word count (dream report)	73.58 ± 43.33	61.43 ± 31.08	t = -2.1 .0213*
Intensity of emotions (diary)	2.48 ± 1.28	2.61 ± 1.15	z = 0.8 .4008
Intensity of emotions (H. & C.)	0.60 ± 0.84	0.39 ± 0.71	z = -1.5 .0681*
Difference (positive-negative emotions)	-0.01 ± 1.43	-0.19 ± 1.37	z = -0.6 .5312

* One-tailed test (t, t test, z, Mann-Whitney-U-Test)

The following gender differences were found to be significant (Table 5): women reported longer dream reports and higher dream recall frequency in the questionnaire than did men. This was not the case as regards dream recall frequency in the dream diary. As expected, women tend to report slightly more explicit dream emotions than do men but this pattern was not found for medians of self-rated dream intensity. Similarly, women did not have more negative dreams than men as measured by the difference between positive and negative dream emotions.

Dream Recall and Dream Emotions

Each measure of dream recall (i.e., questionnaire and dream diary) correlated positively with the intensity of dream emotions and the extent of positive dream emotions but did not correlate with that of negative ones (Table 6).

DISCUSSION

The results of the present study indicate that the mode of measurement is crucial for determining the ratio of positive and negative dream emotions. A balanced proportion between positive and negative emotions was found in the case of self-ratings (i.e., emotional intensity estimated by the dreamer him/herself) which, in turn, supports Strauch and Meier’s (1989) findings as regards laboratory dreams. Negative emotions, however, predominate if the same intensity scale was used for external ratings (i.e., emotional intensity estimated by a judge) or in the case of explicitly mentioned dream emotions. This is valid even in the case that the same dream reports were used in the analysis. Hence, the results of previous investigations (e.g., Hall & Van de Castle, 1966; Snyder, 1970) which found a preponderance of negative dream emotions when externally rated were also confirmed. This inconsistency is best explained by the underestimation of emotions by external raters in general but particularly by

TABLE 6
Correlations between Dream Recall and Dream Emotions (Dream Diary)

Dream recall	Positive emotions	Negative emotions	Intensity of emotions
Questionnaire (n = 206)	.198 (.0048)	.021 (.7888)	.134 (.0277)
Dream diary (n = 210)	.197 (.0044)	.073 (.2917)	.180 (.0091)

the strong underestimation of positive emotions and the low rate of explicitly mentioned positive emotions in a dream report. Even though the extent of emotions was underestimated, the correlation between self-rating of intensity and the same ratings scored externally is quite high and is also comparable to the finding ($r = .65$, emotional tone) reported by Riemann et al. (1985).

The relationship between negative dream emotions and negative feelings experienced upon awakening may lead to the assumption that negative emotions are more likely to influence the mood of the following waking period than do positive ones. This may lead to an overestimation of negative emotions, especially in the case of subjects being asked to rate the dream emotions of a recent dream or one dreamed a long time ago.

Two hypotheses may explain the relationship between dream recall frequency and the intensity of dream emotions: first, the salience hypothesis (Cohen & MacNeillage, 1974), which posits that the more intense the dream is, the better it can be remembered. However, it also seems to be plausible that high dream recallers are better trained at remembering dream content and dream emotions. Negative emotions were mentioned more often explicitly than positive ones and, therefore, may be recalled more easily. Hence, the training of dream recording may exert an influence on the extent of positive emotions in recalled dream experiences. To elaborate further on this hypothesis, it would be interesting to carry out a study similar to Reed's (1973), which formed a dream group to increase dream recall frequency in its participants and found an increased extent of positive emotions in diary dreams recorded throughout the course of the study, as well.

The effects of age were similar to those found in Schredl et al.'s (1996) study and were discussed in their paper. Gender differences in the present study support the findings of other large-scale surveys on dream recall using questionnaires (e.g., Borbely, 1984; Schredl, Bozzer, & Morlock, 1997): these stated that women tend to recall their dreams more often than do men. Why this difference in dream recall tends to diminish in the case of the dream diary warrants further research. The hypothesis that women report more intense or rather more negatively toned dreams was not confirmed. Only in the case of explicitly mentioned emotions is there a tendency for women to report emotions more often than do men, but this difference may be partly due to dream length which, in turn, was higher in women. Men's and women's dreams are generally quite comparable in regard to their dream emotions.

To summarize, emotions in diary dreams seem to be balanced, i.e., a preponderance of negative feelings was only found if the measurement was limited to external ratings or to the scoring of explicitly mentioned emotions. To carry this research further, it would be promising to investigate larger samples of different dream types (most recent dreams, diary dreams, and laboratory dreams), using the same measurements of dream emotions as in the present study. A more conclusive statement may then be made about the nature of the interplay between positive and negative dream emotions.

REFERENCES

- Belicki, K., & Bowers, P. (1981). The role of hypnotic ability in dream recall. *Sleep Research*, **10**, 155.
- Belicki, K., & Bowers, P. G. (1982). Consistency in the ability to recall dreams as a moderator in predicting dream recall. *Sleep Research*, **11**, 109.

- Belicki, K., Hunt, H., & Kelly, P. (1978). The function of dream and dreamer variables in the question of dream recall. *Sleep Research*, *7*, 167.
- Bentley, M. (1915). The study of dreams. *American Journal of Psychology*, *26*, 196–210.
- Borbély, A. (1984). Schlafgewohnheiten, Schlafqualität und Schlafmittelkonsum der Schweizer Bevölkerung: Ergebnisse einer Repräsentativumfrage. *Schweizerische Ärztezeitung*, *65*(34), 1606–1613.
- Borioli, M., Meier, B., & Strauch, I. (1984). The rating of emotions in dreams: Self-rating vs. rating by judge (abstract). 7th European Sleep Congress (Sept. 3–7), Munich, Germany.
- Calkins, M. W. (1893). Statistics of dream. *American Journal of Psychology*, *5*, 311–343.
- Cann, D. R., & Donderi, D. C. (1986). Jungian personality typology and the recall of everyday and archetypal dreams. *Journal of Personality and Social Psychology*, *50*(5), 1021–1030.
- Cohen, D. B. (1974a). Effect of personality and presleep mood on dream recall. *Journal of Abnormal Psychology*, *83*, 151–156.
- Cohen, D. B. (1974b). Presleep mood and dream recall. *Journal of Abnormal Psychology*, *83*, 45–51.
- Cohen, D. B., & MacNeilage, P. F. (1973). Dream salience and postsleep interference factors that differentiate frequent and infrequent dream recallers. *Sleep Research*, *2*, 111.
- Cohen, D. B., & MacNeilage, P. F. (1974). A test of the salience hypothesis of dream recall. *Journal of Consulting and Clinical Psychology*, *42*, 699–703.
- Davidson, R. J. (1994). On emotion, mood, and related affective constructs. In P. Ekman & R. J. Davidson (Eds.), *The nature of emotion: Fundamental questions* (pp. 51–58). New York: Oxford Univ. Press.
- Domhoff, B., & Kamiya, J. (1964). Problems in dream content study with objective indicators: I. A comparison of home and laboratory dream reports. *Archives of General Psychiatry*, *11*, 519–524.
- Dudley, L. M., & Ransom, L. (1988). Emotional content of women's dreams. *Association for the Study of Dreams Newsletter*, *5*(3), 3.
- Fischer, E. (1928). *Kinderträume: Eine psychologisch-pädagogische Studie*. Stuttgart, Germany: Julius Püttmann.
- Foulkes, D. (1979). Home and laboratory dreams: Four empirical studies and conceptual reevaluation. *Sleep*, *2*, 233–251.
- Foulkes, D., Sullivan, B., Kerr, N. H., & Brown, L. (1988). Appropriateness of dream feelings to dreamed situations. *Cognition and Emotion*, *2*(1), 29–39.
- Gaillard, J. M., & Phelippeau, M. (1977). Analysis of dream contents by scaled and rated measurements. *Psychological Medicine*, *7*, 275–282.
- Garfield, P. (1984). *Your child's dreams*. New York: Ballentine.
- Hall, C. S., & Van de Castle, R. L. (1966). *The content analysis of dream*. New York: Appleton-Century-Crofts.
- Hartmann, E. (1984). *The nightmare: The psychology and biology of terrifying dreams*. New York: Basic Books.
- Hauri, P., Sawyer, J., & Rechtschaffen, A. (1967). Dimensions of dreaming: A functional scale for rating dream reports. *Journal of Abnormal Psychology*, *72*, 16–22.
- Heynincq, F., & de Jong, M. A. (1985). Dreams elicited by telephone: A comparative content analysis. In W. P. Koella, E. Rüther, & H. Schulz (Eds.), *Sleep 1984* (pp. 341–343). Stuttgart, Germany: Gustav Fischer Verlag.
- Hicks, R. A., Chancellor, C., & Clark, T. (1987). The valence of dreams by type A–B college students. *Perceptual and Motor Skills*, *65*, 748–750.
- Kluger, H. Y. 1975. Archetypal dreams and “everyday” dreams. *Israel Annals of Psychiatry*, *13*, 6–47.
- Kramer, M., Winget, C., & Whitman, R. M. (1971). A city dream: A survey approach to normative dream content. *American Journal of Psychiatry*, *127*, 1350–1356.
- McElroy, W. A. (1952). The frequency of dreams. *Quarterly Bulletin of the British Psychological Society*, *3*, 91–94.

- McFalls, H. M., Roe, K. E., & Blick, K. A. (1980). Intensity of emotional content in dreams recalled by college students. *Perceptual and Motor Skills*, **51**, 654.
- Merritt, J. M., Stickgold, R., Pace-Schott, E., Williams, J., & Hobson, J. A. (1994). Emotion profiles in the dreams of men and women. *Consciousness and Cognition*, **3**, 46–60.
- Narotra, R. S. (1983). A study of dream analysis. *Asian Journal of Psychology and Education*, **11**(2), 14–18.
- Niederer, U. (1990). Children's home dreams: Content and relation to anxiety. *Association for the Study of Dreams Newsletter*, **7**(1), 3–4.
- Nielsen, T. A., Deslauriers, D., & Baylor, G. W. (1991). Emotions on dream and waking event reports. *Dreaming*, **1**, 287–300.
- Okuma, T., Fukuma, E., & Kobayashi, K. (1975). "Dream detector" and comparison of laboratory and home dreams collected by REM-awakening technique. In E. D. Weitzman (Ed.), *Advances in sleep research: Vol. 2* (pp. 223–231). New York: Spectrum Publications.
- Parekh, H. (1988). Träume der "Gesunden"—Inhaltsanalyse von manifesten Traumtexten aus einer Zufallsstichprobe einer Großstadtpopulation. Universität Heidelberg: Dissertation für Klinische Medizin Mannheim.
- Reed, H. (1973). Learning to remember dreams. *Journal of Humanistic Psychology*, **13**(3), 33–48.
- Riemann, D., Beyer, J., Wiegand, M., & Berger, M. (1985). A comprehensive manual for scoring manifest dream content. In W. P. Koella, E. Rüther, & H. Schulz (Eds.), *Sleep 1984* (pp. 355–357). Stuttgart, Germany: Gustav Fischer Verlag.
- Riemann, D., Löw, H., Schredl, M., Wiegand, M., Dippel, B., & Berger, M. (1990). Investigations of morning and laboratory dream recall and content in depressive patients during baseline conditions and under antidepressive treatment with trimipramine. *Psychiatric Journal of the University of Ottawa*, **15**, 93–99.
- Riepl, M. (1992). *Contentanalysis und der Diskurs in Paarträumen*. Universität München: unveröffentlichte Diplomarbeit.
- Rüf, H. (1973). Traum und Traumerinnerung: Home dreams and laboratory dreams. *Psychosomatische Medizin*, **4**, 273–287.
- Schonbar, R. A. (1961). Temporal and emotional factors in the selective recall of dreams. *Journal of Consulting Psychology*, **25**, 67–73.
- Schredl, M. (1991). *Traumerinnerungshäufigkeit und Trauminhalt bei Schlafgestörten, psychiatrischen Patienten und Gesunden*. Universität Mannheim: unveröffentlichte Diplomarbeit.
- Schredl, M., Bozzer, A., & Morlock, M. (1997). Traumerinnerung und Schlafstörungen. *Psychotherapie, Psychosomatik und Medizinische Psychologie*, **47**, 108–116.
- Schredl, M., Kraft, B., Morlock, M., & Bozzer, A. (1998). Traum inhalte bei Patienten und Patientinnen mit Schlafstörungen. *Psychotherapie, Psychosomatik und Medizinische Psychologie*, **48**, 39–45.
- Schredl, M., Schröder, A., & Löw, H. (1996). Traumerleben von älteren Menschen—Teil 2: Empirische Studie und Diskussion. *Zeitschrift für Gerontopsychologie und -psychiatrie*, **9**, 43–53.
- Snyder, F. (1970). The phenomenology of dreaming. In L. Madow & L. H. Snow (Eds.), *The psychodynamic implications of the physiological studies on dreams* (pp. 124–151). Springfield: Charles C. Thomas.
- Spanos, N. P., Stam, H. J., Radtke, H. L., & Nightingale, M. E. (1980). Absorption in imaginings, sex-role orientation and the recall of dreams by males and females. *Journal of Personality Assessment*, **44**, 227–282.
- Stairs, P. W., & Blick, K. A. (1979). A survey of emotional content of dreams recalled by college students. *Psychological Reports*, **45**, 839–842.
- Stefanakakis, H., Zadra, A., & Donderi, D. (1990). A correlational analysis of dream content variables with measures of self-reported well-being. *Association for the Study of Dreams Newsletter*, **7**(4), 1–3, 16.
- Stewart, D. W., & Koulack, D. (1993). The functions of dreams in adaptation to stress over time. *Dreaming*, **3**, 259–268.

- Strauch, I., & Meier, B. (1989). Das emotionale Erleben im REM-Traum. *Schweizerische Zeitschrift für Psychologie*, **48**, 233–240.
- Strauch, I., & Meier, B. (1996). *In search of dreams: results of experimental dream research*. Albany: State Univ. of New York Press.
- Weed, S. C., & Hallam, F. M. (1896). A study of the dream consciousness. *American Journal of Psychology*, **7**, 405–411.
- Weisz, R., & Foulkes, D. (1970). Home and laboratory dreams collected under uniform sampling conditions. *Psychophysiology*, **6**, 588–596.
- Winget, C., Kramer, M., & Whitman, R. M. (1972). Dreams and demography. *Canadian Psychiatric Association Journal*, **17**, 203–208.
- Ziegler, A. J. (1972). Die Erhaltung der Unlust. *Psychosomatische Medizin*, **3**, 294–299.

Received May 27, 1998