

Dreaming and Psychopathology: Dream Recall and Dream Content of Psychiatric Inpatients

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The present study investigated dream recall frequency and dream content of psychiatric inpatients in comparison with healthy controls and in relation to waking psychopathology. Patients' dream recall frequency was related to low sleep quality, frequent nocturnal awakenings and thin boundaries and did not differ substantially from that of healthy controls if methodological issues are taken into account. Dream content seems to reflect waking-life symptoms, e.g., dreams of depressed patients showed themes of depression more often. The results of our approach, in which we measured waking symptoms psychometrically and correlated these measures with dream content rating scales, indicate that the diagnostic classification is probably not related to dream content primarily but rather the severity of the specific symptoms such as depressive mood or psychotic symptomatology. In addition, specific dream themes may be related to severity of symptoms within a diagnostic subgroup (e.g., death themes in depressed patients). Future studies should investigate these relationships in a longitudinal design and include other variables such as personality, cognitive measures and motivation since these factors may affect dream recall as well as dream content in patients and may help to explain the differences in dream variables between patients and healthy controls. (*Sleep and Hypnosis* 2001;3(1):44-54)

Key words: *dream recall, dream content, psychopathology, depression, schizophrenia*

INTRODUCTION

Two motives have stimulated investigating the relationship between dreaming and mental disorders. First, the dream state itself was conceptualized by several theorists (e.g., 1) as a mental disorder and, in reverse, hallucinations of schizophrenic patients have been thought of as breakthroughs of dreams into the waking state (e.g., 2). Second, many clinicians since Freud have attempted to use dreams in the diagnosis and treatment of their patients (e.g., 3). The basic assumption for the present study is the so-called continuity hypothesis (e.g., 4,5) which states that waking-life experience is reflected in

dreams. For patients with mental disorders, it should thus be possible to detect waking symptomatology by studying the dream reports of these patients.

The literature reviews of Kramer and Roth (6), Mellen, Duffey and Craig (7) and Schredl (8) showed that the majority of empirical studies supports the continuity hypothesis. On the one hand, it was found that hallucinations of schizophrenic patients are not dreams experienced during the waking state (e.g., 9) and that the concept of dreaming as a mental disorder is not very helpful (cf. 10). On the other hand, dreams of schizophrenic patients are typical for this disorder, i.e., the dreams are more bizarre and are characterized by aggression and negative emotions (6). For depressive patients, Beck and Hurvich (11) and Beck and Ward (12) have found an increased amount of "masochistic" themes in their dreams. Subsequent studies (overview: 13) confirmed that dreams of depressive patients are more negatively toned and include unpleasant expe-

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periences more often (definitions of "masochistic" dream content according to Beck & Hurvich [11]) than healthy controls.

Despite the fact that many studies in this field support the continuity hypothesis, Kramer and Roth (6) and Kramer (14) pointed out that the majority of the studies were not carried out in a methodologically adequate way, i.e., a control group was lacking, no details about the medication used in the investigated sample, no adequate methods of dream content analysis (e.g., the absence of "blind" judges and standardized rating scales with high interrater reliability) and inadequate statistical methods. Despite over one hundred studies in the field, if one takes these reservations into account, the data base is not very solid (6,14).

Regarding dream recall, many studies failed to show marked differences among differing diagnostic groups such as schizophrenia, eating disorders etc. and healthy controls (6). An exception are depressive patients who were reported in some studies (15,16) to have a reduced dream recall frequency. Schredl (17) found a significant relationship between Hamilton depression scores and reduced dream recall frequency. The explanations for these findings, however, remain unclear, i.e., the question whether the reduced dream recall is due to the typical sleep architecture of depressive patients (advanced REM sleep), to cognitive impairment often found in severely disturbed patients or to the specific symptomatology of depression can not be answered (17). The review article of Schredl (18) described several important factors influencing dream recall: sleep behavior (frequent nocturnal awakenings, low sleep quality), personality ("thin" boundaries, high absorption), visual memory, fantasy and creativity. These findings are best explained by the arousal-retrieval model (19) and a modified version of the life-style hypothesis (20). Whereas many studies investigated these factors in healthy populations, whether some of these factors play a role in explaining differences in dream recall frequency of patients with mental disorders was not studied.

The present study was carried out to investigate dream contents and dream recall of psychiatric inpatients. The main focus was not the comparison with healthy controls, but to correlate several dream features directly to waking symptomatology which was measured by self-rating questionnaires. This approach is new and was adopted because, for example depressive moods are present in many different disorders besides major depression. In addition,

whether factors such as sleep quality, psychopathology, medication and personality affect dream recall frequency in these patients was also investigated.

METHODS

Research Instruments

Interview. Subsequent to eliciting age and gender, participants were asked to estimate their dream recall frequency over the last months on a seven-point scale (0 = never, 1 = less than once a month, 2 = about once a month, 3 = two or three times a month, 4 = about once a week, 5 = several times a week, 6 = almost every morning). In addition, participants were asked to rate the general emotional tone of their dreams (-1 = predominantly negative, 0 = balanced, + 1 = predominantly positive). Next, the participant was asked to report the most recent dream she/he could recall. The emotional tone of this dream was measured also via a three-point scale (-1 = predominantly negative, 0 = balanced/neutral, + 1 = predominantly positive). Lastly, the occurrence of childhood nightmares was elicited.

Sleep questionnaire. The sleep questionnaire (SF-B; 21) comprises 28 items measuring five composite scores, e.g., sleep quality (average of 11 items), and the frequency of awakenings, dream recall frequency and the extent to which the individual was involved with his/her dreams over the past two weeks. The last three variables were measured by five-point rating-scales (1 = never, 2 = rare, 3 = sometimes, 4 = often, 5 = very often). The composite score for sleep quality which was selected for the analysis also ranged from 1 to 5 since most scales of the sleep questionnaire, e. g., frequency of nocturnal awakenings, followed this five-point format. The reliability of the sleep quality score is high ($r = .87$; interitem consistency; 21). The validity of this score was recently shown for a comparison of patients with various sleep disorders and healthy controls (8).

Symptom Checklist. For the present study, the Symptom-Checklist-90-R (22) was selected. This checklist is a questionnaire comprises 90 five-point self-rating scales. For a large variety of different symptoms, e.g., guilt, sleep disturbances, panic attacks, the participant were asked whether this symptom was not present (= 0) or was mildly (= 1), moderately (= 2), strongly (=3) or very strongly (= 4) experienced during the last seven days. Out of the 90 items, nine syndrome scores (somatization;

obsessive-compulsive, interpersonal sensitivity, depression, anxiety, anger-hostility, phobic anxiety, paranoid ideation, psychoticism) and a general score (general symptomatic index) including all items are derived as averages. The reliability coefficients for the scores vary from .79 to .89 (interitem consistencies; 22). Similarly, the general symptomatic index shows high interitem consistency ($r = .98$; 22). Beyond the face validity of the items, large-scale surveys have proven external validity for the single symptom score, e. g. depression, by comparing different patient groups with healthy controls (22).

Depression scale. The utilized Beck-Depression-Inventory (BDI, 23) is a self-rating instrument for measuring the severity of depression. The general score is the sum of 21 four-point (0 to 3) items measuring aspects such as sadness, pessimism, sleep disturbances, suicidal ideation, lost of appetite etc. The reliability (interitem consistency) is satisfying ($r = .87$ for depressive patients; 23). With regard to validity aspects, high correlation coefficients to other depression scales and significant declines during successful treatment has been shown (23).

Personality questionnaire. The short version of the boundary questionnaire (24) consists of 18 five-point rating-scales. The sum score of the short version correlates high ($r = .893$) with the sum score of the complete boundary questionnaire which comprises 145 items covering 12 areas of boundaries, e. g., sleep/dreams, unusual experiences, thought/feelings/mood, interpersonal relationship and opinions about children. The total score of the short-version is derived by summing up the single scores (ranging from 0 to 4) of 18 items keeping in mind that some of the items are reversed. The overall thinness of boundaries corresponds to the height of sum score ranging from 0 to 72. The interitem consistency was $r = .572$ ($N = 152$; unpublished data).

Dream diary. The participants kept a dream diary over a two-week period. The dream recall frequency (diary) was the number of mornings with explicit remembering of a dream measured by a checklist. If a dream was recalled, participants were asked to record their dream(s) as completely as possible on a separate sheet and rate the dream emotions along two four-point scales (0 = none, 1 = mild, 2 = moderate, 3 = strong) measuring positive and negative emotions respectively. Up to a maximum of five dreams were to be recorded. Medians for positive and negative emotions were derived for each participant. Emotional intensity was derived as a sum score of positive and negative emotions; emotional tone was derived as the difference between positive

and negative emotions.

Dream content analysis. Several rating scales used in the present study were adopted from Schredl et al. (25-27): realism/bizarreness (1 = realistic to 4 = several bizarre associations), positive and negative emotions respectively (0 = none, 1 = mild, 2 = moderate, 3 = strong), number of dream persons, occurrence of verbal interactions (Yes/No) as well as physical interactions (Yes/No) and overall aggression (Yes/No). A score for emotional intensity was achieved by adding the scores of negative and positive emotions. The difference between both measures was used in the analysis as a measure of overall mood tone.

In addition, a scale for assessing the occurrence of depression themes, e. g. low self-esteem, melancholia present in the dreamer, rejection of the dreamer, was developed (Yes/No scale). Another scale was designed for measuring the presence of death themes (graves, murder, death of person etc).

Procedure

The patients of the open wards of the Central Institute of Mental Health (Mannheim, Germany) were approached (at least two weeks following admission) after obtaining the permission of the patient's psychiatrist. The patients were informed about the study and – if they agreed to participate – gave written consent. Participation was voluntary and unpaid. About 30% of the patients who were asked to participate refused. In almost all cases the patients stated that they were not dreaming. Each patient was diagnosed by the treating psychiatrist according to the criteria of the International Classification of Diseases (ICD 10; 28). First, the interview (single sessions, see research instruments) was carried out by one of the authors. Second, the questionnaires (sleep questionnaire, symptom checklist, depression scale, personality questionnaire) and the dream diary were explained to the patient who returned them upon completion.

Dream reports were typed out, randomized and scored along the scales described in the dream content analysis section by an external judge who was blind to the patients' diagnoses. One hundred and thirty dream reports were rated by a second judge in order to compute interrater reliability. One night's entire dream material as recorded in the morning was chosen as unit of analysis. Mean word count was determined as a measure for dream length. If a subject reported dream material on two or more mornings, means, medians or modes (according to

the scales' measurement levels) were computed in order to obtain individual dream scores. For the "death themes", "aggression" and "physical interaction" scales, a score of 1 was coded if the particular theme was present in at least one diary dream of the patient. Statistical analyses included multi-variate ANCOVAs and logistic regressions in order to control for age and gender and – with regard to dream content – additionally for dream length. For ordinal scales, e.g., dream recall frequency, realism/bizarreness, positive and negative dream emotions, rankings were analyzed. Logistic regressions were computed for nominal scales, i.e., variables encoded as 0 or 1. In case of strong evidence cited in the literature for directional hypotheses, one-tailed statistical tests were computed. For all group comparisons (ANCOVA and logistic regression) $df = 1$.

The data of the healthy controls stem from different sources. For the sleep questionnaire, it was drawn from the data of Schredl et al. (29). In the cases of the BDI depression scale (23) and the SCL-90-R symptom checklist (22), the data of the validation sample as reported in the test manual were used for comparisons. The data of the boundary questionnaire as well as the dream data (dream recall frequency, emotional tone of dreaming, occurrence of childhood nightmares, diary dreams) stem partially from the study of Schredl et al. (30), the other part of the data set was not previously published. The subjects answered the same questions about dreaming as the patients (see interview) but did not report a most recent dream. Subsequently, they kept a dream diary over a two-week period and completed the boundary questionnaire. The controls' dreams were analyzed and statistically treated in the same way as described above for the patient sample.

Participants

Patients. Overall, 92 patients (62 women, 30 men) were included in the study. Their mean age was 37.7 ± 17.3 years (range: 12 to 75 years). The following diagnostic categories were found in the present sample: major depression ($N = 36$), anorexia nervosa ($N = 16$), schizophrenia ($N = 13$), bipolar disorder, manic phase ($N = 5$), anxiety disorder ($N = 5$), obsessive-compulsive disorder ($N = 5$), personality disorder ($N = 4$), alcoholism ($N = 2$), major depression and obsessive-compulsive disorder ($N = 2$), schizophrenia with obsessive-compulsive disorder ($N = 2$), sleep apnea ($N = 1$) and bulimia nervosa ($N = 1$). Fourteen patients were drug-free during the

study; 53 patients were treated with antidepressants, 14 with neuroleptics, 10 with anxiolytics and 10 with lithium. Whereas all patients completed the interview, 81 patients filled out the questionnaires. 54 patients reported 163 diary dreams (3.0 dreams per patient).

Healthy controls. The sample of healthy controls who completed the sleep questionnaire comprised 762 persons (256 women and 506 men) whose mean age was 37.4 ± 11.3 years (29). The mean age of the healthy controls of the BDI validation was 55.0 ± 16.1 years. There were 54 women and 32 men. The sample of Derogatis (22) consisted of 1006 healthy controls (505 women, 501 men) whose mean age was 34.0 ± 10.5 years. For the dream interview and the dream diary data, the subjects' mean age was 24.2 ± 7.1 years. 108 women and 44 men participated. Of these, 148 persons reported 517 dreams (3.5 dreams per subject).

RESULTS

Questionnaire Data

Table 1 depicts the comparisons between the patient group and the healthy controls. In addition, the sample was divided into depressed patients (largest subgroup) and non-depressed patients (rest group). As expected, subjective sleep quality was reduced in all patient groups and frequency of nocturnal awakenings was heightened. Interestingly, the difference in depression scores between depressed patients and the rest group were small (BDI: n. s., SCL-90-R, $F = 2.3$; $p < .10$; ANCOVA with gender and age controlled), but all patient groups scored considerably higher than the healthy controls. For the BDI scores, Hautzinger et al. (23) found in psychiatric patients at admission to the hospital an average of 23.2 ± 10.8 and at discharge 12.6 ± 10.3 , so that the mean of the present sample fell in between. Similarly, the general symptomatic index (SCL-90-R) indicated that the patients were profoundly disturbed. All patient groups showed lower boundary scores in comparison to healthy controls; even the schizophrenic patients' scores were not elevated (35.3 ± 9.1 ; $F = 0.2$, $p = .6309$, similar analysis as depicted in Table 1).

Dream Variables

Dream recall frequency as well as the scores of the "concerned with dreams" item were elevated for the total sample and the two subgroups, although

the difference in dream recall frequency between the depressed patients and the healthy controls did not reach significance (see Table 1). Dream recall frequency as measured by the seven-point scale in the course of the interview did not differ between the groups and the dream recall frequency of the diary was significantly reduced in the total sample and in the non-depressed subgroup (see Table 2). There was a trend towards a more negative emotional tone of dreams in general but this tendency was not significant for the self-rated emotions in the dream diary. The patients reported more often that night-

mares occurred during childhood; this was due to the non-depressed subgroup.

Dream Content Analysis

The interrater reliability coefficients of dream content analysis were comparable to those reported by Schredl et al. (25-27). For ordinal/interval scales they ranged from $r = .66$ (negative emotions; Spearman rank correlation) to $r = .88$ (number of dream persons; Pearson correlation) and for nominal scales – determined as exact agreements – from

Table 1. Comparison between patients and healthy controls: questionnaire data (Means ± SD)

Variable	All Patients (N =)	Depressive Pat. (N =)	Non-depressed Pat. (N =)	Controls (N =)
Sleep quality	3.47 ± 0.68 (74) ***	3.48 ± 0.65 (27) ***	3.47 ± 0.70 (47) ***	4.15 ± 0.66 (635)
Nocturnal awakenings	3.12 ± 1.13 (81) ***	3.16 ± 1.08 (32) *	3.10 ± 1.18 (49) ***	2.42 ± 1.07 (637)
Dream recall frequency	2.65 ± 0.99 (80) *	2.53 ± 0.98 (32)	2.73 ± 1.01 (48) *	2.33 ± 0.96 (761)
Concerned with dreams	2.45 ± 1.11 (80) ***	2.56 ± 1.29 (32) **	2.38 ± 0.98 (48) ***	1.71 ± 0.87 (762)
Beck-Depression-Score	19.3 ± 11.3 (81) ***	19.7 ± 11.2 (32) ***	19.0 ± 11.4 (49) ***	6.5 ± 5.2 (86)
Depression (SCL-90-R)	1.60 ± 0.65 (81) ***	1.81 ± 0.77 (32) ***	1.47 ± 0.89 (49) ***	0.40 ± 0.38 (1006)
General Symptomatic Index (SCL-90-R)	1.18 ± 0.65 (81) ***	1.32 ± 0.62 (32) ***	1.10 ± 0.67 (49) ***	0.37 ± 0.25 (1006)
Boundary Questionnaire	32.8 ± 9.9 (81) ***	32.1 ± 9.9 (32) *	33.3 ± 10.0 (49) **	39.3 ± 9.8 (152)

Statistical test: ANCOVA with factors 'Patients vs. Healthy Controls' (depicted) and 'gender' and with covariate 'age' (for BDI and SCL-90-R scores t-tests were performed)
 *** p < .001. ** p < .01, * p < .05

Table 2. Comparison between patients and healthy controls: dream variables (Means ± SD)

Variable	All Patients (N =)	Depressive Pat. (N =)	Non-depressed Pat. (N =)	Controls (N =)
Dream recall frequency (interview)	3.63 ± 1.46 (91)	3.42 ± 1.62 (38)	3.77 ± 1.32 (53)	4.14 ± 1.38 (152)
General emotional tone of dreams	-0.20 ± 0.74 (84) *	-0.18 ± 0.83 (34)	-0.22 ± 0.68 (50)	0.02 ± 0.74 (149)
Occurrence of childhood nightmares	78.7 % (75) *	71.4 % (28)	83.0 % (47) *	65.1 % (152)
Dream recall frequency (diary)	2.84 ± 2.87 (58) *	3.15 ± 3.12 (27)	2.63 ± 2.72 (41) **	4.34 ± 2.80 (152)
Emotional intensity of dreams (diary)	2.64 ± 1.05 (54)	2.74 ± 1.03 (21)	2.58 ± 1.07 (33)	2.61 ± 1.18 (144)
Emotional tone of dreams (diary)	-0.68 ± 1.75 (54)	-0.69 ± 2.05 (21)	-0.67 ± 1.56 (33)	-0.40 ± 1.43 (144)
Mean word count (diary))	63.2 ± 50.5 (54) **	58.1 ± 55.3 (21) *	66.5 ± 47.8 (33) **	105.0 ± 64.4 (145)

Dream content analysis

Realism/Bizarreness	1.46 ± 0.61 (54) ***	1.45 ± 0.61 (21) **	1.47 ± 0.61 (33) ***	2.18 ± 0.84 (145)
Number of dream persons	1.84 ± 1.51 (54)	1.65 ± 1.58 (21)	1.96 ± 1.47 (33)	2.25 ± 1.22 (145)
Emotional intensity of dreams	1.09 ± 1.06 (54)	1.05 ± 1.15 (21)	1.12 ± 1.02 (33)	1.63 ± 1.23 (145)
Emotional tone of dreams	-0.56 ± 1.29 (54)	-0.67 ± 1.31 (21)	-0.48 ± 1.30 (33)	-0.63 ± 1.08 (145)
Occurrence of verbal interaction	37.0 % (54)	33.3 % (21)	39.4 % (33)	53.8 % (145)
Occurrence of physical interaction	37.0 % (54) **	42.7 % (21) **	33.3 % (33) *	24.1 % (145)
(in at least one dream)				

Statistical test: ANCOVA with factors 'Patients vs. Healthy Controls' (depicted) and 'gender' and with covariate 'age' (for content analysis word count as second covariate), Logistic regression were performed with similar variables for nominal scales.
 *** p < .001. ** p < .01, * p < .05

88.8 % (occurrence of verbal interaction) to 93.8 % (occurrence of themes of depression).

In comparison to healthy controls, dream length in all three patient groups was reduced (see Table 2). Therefore, statistical tests for the dream content variables were controlled for that variable. Interestingly, no differences in emotional intensity, emotional tone, number of dream persons and occurrence of verbal interaction were found. A marked difference, however, was present for the realism/bizarreness scale and the occurrence of physical interaction, i.e., the patients reported more realistic dreams containing more physical interaction.

Factors Influencing Dream Recall

In Table 3, the correlations between dream recall frequency (seven-point scale; interview) and several factors are depicted. As expected, high dream recall was related to low sleep quality and frequent nocturnal awakenings (not significant for depressed patients). A significant relationship was also found for the "concerned with dreams" item, although the coefficient was not very high for the non-depressed

subgroup. The relationship between dream recall frequency and boundary score was as hypothesized, i.e., patients with thin boundaries recall their dreams more often. Although the coefficient was comparable to the other groups, the correlation for the depressed subgroup did not reach significance due to smaller sample size. For depression scores, a tendency in the expected direction was only found for the non-depressed subgroup, i.e., in this group, elevated depression scores were related to reduced dream recall frequency. On the other hand, the treatment with antidepressants was associated with reduced dream recall only in depressed patients (marginally significant). The general symptomatic index (SCL-90-R) was not related to dream recall.

Dream Content and Psychopathology

Overall, the emotional tone of the dreams (in general, most recent dream, self-ratings of the dream diary, content analysis) correlated in the expected way with the depression scale (SCL-90-R) in all three groups, although some coefficients did not reach significance (see Table 4). Whereas the depression score was not related to mean word count, there

Table 3. Correlation between dream recall frequency (interview) and questionnaire variables

Variable	All Patients	Depressive Pat.	Non-depressed Pat.
Sleep quality	-.299 **	-.352 *	-.254 *
Frequency of nocturnal awakenings	.249 *	.161	.296 *
Concerned with dreams	.356 ***	.561 **	.145
Boundary questionnaire	.258 *	.218	.290 *
Beck-Depression-Score	-.040	.191	-.196 (*)
Depression (SCL-90-R)	-.100	-.011	-.195 (*)
General Symptomatic Index (SCL-90-R)	.017	.158	-.130
Antidepressants (Yes=1; No = 0)	-.155 (*)	-.244 (*)	-.079

*** $p < .001$, ** $p < .01$, * $p < .05$, (*) $p < .10$, one-tailed (except for GSI) partial correlations with age and gender partialled out

Table 4. Correlation between depression score (SCL-90-R) and dream variables

Variable	All Patients	Depressive Pat.	Non-depressed Pat.
General emotional tone of dreams	-.248 *	-.183	-.300 *
Emotional tone of most recent dream	-.393 **	-.350 *	-.366 *
Emotional tone of dreams (dream diary)	-.319 *	-.620 **	-.175
Dream content analysis			
Mean word count	-.036	-.229	.061
Emotional tone of dreams	-.181	-.278	-.138
Aggression	.096	.645 **	-.132
Themes of depression	.391 **	.195	.628 ***
Death themes	.207 (*)	.531 **	.041

*** $p < .001$, ** $p < .01$, * $p < .05$, (*) $p < .10$, one-tailed partial correlations with age and gender partialled out

was a strong relation to aggression and death themes in dreams (for depressed patients) and themes of depression in dreams (for non-depressed patients). Dreams of depressed patients were characterized by depressive themes (29.0% vs. 11.1%, $X^2 = 4.2$, $p < .05$, logistic regression with covariate age) and death themes (45.2% vs. 20.0%, $X^2=2.9$, $p<.05$, similar analysis) significantly more often than the dreams of the other patients. The percentages represent the occurrence of a specific theme in at least one diary dream.

Dream bizarreness was significantly related to the "paranoid ideation" and "psychoticism" scales of the SCL-90-R symptom checklist (see Table 5). Although the correlations within the schizophrenic patients were high, they did not reach significance due to the small sample size. The schizophrenic patients had more bizarre dreams than the rest group of patients (1.75 ± 0.72 vs. 1.41 ± 0.61 , $F = 3.3$, $p<.05$; ANCOVA analyzing ranks and with covariate age).

DISCUSSION

The present study investigated dream recall frequency and dream content of psychiatric inpatients in comparison with healthy controls and in relation to waking psychopathology. With regard to dream recall, similar factors, found to play an important role in healthy persons, also affect dream recall frequency in patients. The dream content data, especially the correlations between waking symptoms and dream content scales, clearly supported the continuity hypothesis. The principal findings will be now discussed in detail.

The questionnaire data (sleep questionnaire, depression scale, symptom checklist) clearly showed that the patients were still markedly disturbed at the beginning of the study (at least two or three weeks after admission and during treatment). Similarly, it is interesting that depressive mood in the non-depressed group was nearly as high as in the depression group.

Table 5. Dream bizarreness and psychopathology

Variable	All Patients (N = 54)	Schizephr. Pat. (N = 8)	Non-schiz. Pat. (N = 46)
Paranoid ideation (SCL-90-R)	.435 ***	.544	.401 **
Psychoticism (SCL-90-R)	.368 **	.684	.305 **

*** $p < .001$, ** $p < .01$, * $p < .05$, (*) $p < .10$, one-tailed partial correlations with age, gender and mean word count partialled out

Boundary Questionnaire and Dream Variables

In Table 6, the correlations between the boundary score and several dream variables are depicted. As expected, thin boundaries were related to high dream recall and long and bizarre dreams. A tendency was found for more intense dreams (dream content analysis), whereas the coefficient for the self-ratings did not reach significance.

Table 6. Boundary questionnaire score and dream variables

Variable	All Patients
Dream recall frequency (interview)	.258 **
Dream recall frequency (dream diary)	.312 **
Emotional intensity (dream diary)	.150
Mean word count	.388 **
Bizarreness ¹	.252 *
Emotional intensity (content analysis) ¹	.217 (*)

*** $p < .001$, ** $p < .01$, * $p < .05$, (*) $p < .10$, one-tailed partial correlations with age and gender and partialled out

¹ mean word count was additionally partialled out

Regarding dream recall, the findings were contradictory. Patients' dream recall frequency (sleep questionnaire) was higher in comparison to that of an unselected control group (participants in sleep studies) and comparable to dream recall frequency of participants in dream studies. If one takes into account that about 30% of the initially approached patients refused to participate (reason: no recollection of dreams), it seems obvious that this selection explains the heightened dream recall. A similar selection is quite probable in the case of recruiting healthy persons for dream studies. On the other hand, dream recall as measured by dream diaries was reduced, although dream recall was not different at the beginning of the study. This finding may be explained by a reduced motivation in the patient group (as part of the depressive symptomatology) since Schredl (31) has shown that motivation clearly influences dream recall during keeping a dream diary over a two-week period (i.e., dream recall dropped from the first to the second week).

The factors influencing dream recall in the

patient group were similar to those which were reported as playing a role for healthy persons (cf. 18). Low sleep quality and frequent nocturnal awakenings are related to heightened dream recall frequency (cf. 26). Similarly, the variable "engagement with dreams" was also strongly related to heightened dream recall (cf. 32,33). In addition, the well-established relationship between thin boundaries and dream recall in healthy controls (30) and sleep disordered patients (34) was also found in the present sample. Therefore, the arousal-retrieval model (19) and the modified life-style hypothesis (20) seems also to be valid for psychiatric patients. The general symptomatic index did not correlate with dream recall frequency, but the depressive symptoms are related in the non-depressed group with dream recall in the expected way. In contrast to Schredl (17) who found a significant relationship between depression scores (expert ratings) and dream recall frequency in untreated depressed patients, almost all patients in the present sample were medicated. This might explain the failure of finding a substantial correlation in the depressed group. Interestingly, there was a relation between antidepressant medication and dream recall; i.e., patients with antidepressants tend to recall their dreams less often than patients without this type of medication. This relationship was previously shown for healthy persons (35), patients with insomnia (26) and depressed patients (16). The possible effects of these different factors such as sleep behavior, personality, depressive symptoms and medication suggests that future studies which compare patients' dreams with those of healthy controls should also elicit these factors in order to ascertain their influence. In addition, variables such as visual memory and creativity may play an important role in explaining differences between patients with mental disorders and healthy controls and not psychopathology per se.

Although the symptomatology of the patients was severe (see above), very few differences for dream emotions and dream content in comparison to healthy controls emerged. The hypothesis that negatively-toned dreams were found more often in psychiatric patients was only partly supported by the difference in the global estimate of dream emotions (interview). Whereas the differences for the self-rated dream emotions (dream diary) were as expected but small, no differences in the emotional tone was detected by the dream content analysis.

First, a methodological issue should be considered: Schredl and Doll (36) have shown that scoring dream emotions by external judges considerably

underestimates the occurrence and intensity of dream emotions and that, therefore, the dream content analysis scales for measuring emotions are not that valid. Second, the global estimate of dream emotions include certainly more dreams than the diary measure which encompasses the ratings of three dreams on average. This can lead to the conclusion that there is a trend towards more negatively-toned dreams in patients which will be more easily detectable by analyzing more dreams per subject over a longer time period. Additionally, it must be considered that the patients did not participate at the beginning of their illness but during treatment in hospital.

Another finding was the heightened occurrence of childhood nightmares in the patient group, especially in the non-depressed subgroup. Although the retrospective measure eliciting the occurrence of childhood nightmares might be biased by actual psychopathology, it seems promising to investigate this topic in a more detailed way, since nightmares can reflect stressors or traumata experienced by the child (37).

Regarding dream length, the findings indicated that patients' dreams were considerably shorter than those of the controls. Beside a small correlation in the expected way ($r = -.229$) for depressed patients, no influence of depression on dream length was detected. Since a previous study (25) in healthy persons have shown that verbal memory and possibly motivation play an important role in explaining differences in dream length, it will be fruitful to include cognitive measures in future studies.

Marked differences, however, were found for dream bizarreness, i. e. patients' dreams were less bizarre than those of healthy controls. Within this context, the finding of Schredl, Montasser and Pallmer (38) that waking anxiety is related to more realistic bad dreams is interesting. It may be possible that waking-life stressors are reflected in a more realistic way in the dreams of the patient group. Regarding general aspects of the dream such as number of dream persons and the occurrence of verbal interactions, no differences were found; solely physical interaction was more often present in the patients' dreams. This may also be interpreted as a "closer" mode of interaction with persons which may be conflict-laden. But one has to keep in mind that in the comparison of patients' dreams to dreams of healthy controls several confounding variables can be of importance, e.g., the different setting. Whereas the patients stayed in a hospital with its particular daily routines, the healthy persons lived in

their usual home setting. This methodological issue was one of the reasons why a correlation analysis within the patient groups were carried out.

The correlation between psychopathology (for Table 4, the depressive symptomatology was selected) and dream emotions within the patient groups were as expected, i.e., the more severe the depression the more negatively toned were the dreams. That the correlation coefficients of the dream content scales were considerably smaller may be explained by the low validity of these scales (36). The strong relationship between depressive mood and negative dream emotions supports the continuity hypothesis introduced above. The approach of measuring psychopathology psychometrically and correlating these measures directly with dream content scales avoids the shortcomings of the comparison to healthy controls (e. g. different setting), but longitudinal studies will be very valuable to elicit the course of the depressive symptoms as well as the course of the dream emotions. With this design, it will be possible to test whether the therapeutic effect of the treatment is reflected in changes of dream content. As mentioned in the introduction, previous findings on this topic (e. g. 15,16,39) are contradictory.

Similarly, the finding that elevated scores of depression are related to a heightened occurrence of themes of depression in dreams supports the continuity hypothesis. This relationship was especially valid for the non-depressed patients. In addition, the depressed group had experienced more dreams with depression themes than the non-depressed rest group. This may be explain the low correlation in the depressed group as a floor effect, i.e., depressive themes can not occur more often. But there were also different patterns found in the two patient groups. Whereas the occurrence of depression themes was related to elevated depression scores in the non-depressed patients, the occurrence of death themes and aggression was related to more severe depressive symptoms in depressed patients. This confirms the findings of Firth et al. (40) and Steiner and Mackinger (41). These relationships and the

finding that death themes were more present in the dreams of depressed patients may result in clinical applications, since dream content may point to very severe symptoms of depression such as a suicidal tendency.

Likewise, the relationship between psychotic symptoms and dream bizarreness was strong. This was clear for the comparison between the schizophrenic patients and the rest group of patients as well as for the correlations within the patient groups. This also points to the advantage of the selected approach of measuring symptoms psychometrically since not the diagnostic categories are directly related to dream content but the intensity of the particular waking symptoms.

As for dream recall (see above), the personality dimension "thin vs. thick boundaries" was related to several aspects of dreaming (dream length, bizarreness and emotional intensity) in a similar way as has been shown for healthy controls (e. g. 24,30,41). This finding emphasizes the demand to include other measures such as personality inventories in dream content analysis studies of psychiatric patients.

To summarize, the present findings support the continuity hypothesis of dreaming (cf.,4,5). Particularly, the approach of measuring waking symptoms psychometrically and to correlate these measures with dream content rating scales, indicate that probably not the diagnostic classification is primarily related to dream content but the severity of the specific symptoms such as depressive mood or psychotic symptomatology. In addition, specific dream themes may be related to severity of symptoms within a diagnostic group of patients (e.g., death themes in depressed patients). Future studies should investigate these relationships in a longitudinal design and include other variables such as personality, cognitive measures and motivation since these factors may affect dream recall as well as dream content in patients and may help to explain the differences in dream variables between patients and healthy controls.

REFERENCES

1. Hobson JA. *Dreaming as delirium: a mental status examination of our nightly madness. Seminars in Neurology* 1997;17:121-128.
2. Noble D. *A study of dreams in schizophrenia and allied states. American Journal of Psychiatry* 1950;107:612-616.
3. Whitman RM, Kramer M, Ornstein PH, Baldrige BJ. *The varying uses of the dream in clinical psychiatry. In: Madow L, Snow LH, eds. The Psychodynamic Implications of the Physiological Studies on Dreams. Springfield: Charles C. Thomas, 1970:24-46.*
4. Domhoff GW. *Finding meaning in dreams: a quantitative approach. New York: Plenum Press, 1996.*

5. Schredl M. Die nächtliche Traumwelt: Eine Einführung in die psychologische Traumforschung. Stuttgart: Kohlhammer, 1999.
6. Kramer M, Roth T. Dreams in psychopathologic patient groups. In: Williams RL, Karacan I, eds. *Sleep Disorders: Diagnosis and Treatment*. New York: John Wiley & Sons, 1978:323-349.
7. Mellen RR, Duffey TH, Craig SM. Manifest content in the dreams of clinical populations. *Journal of Mental Health Counseling* 1993;15:170-183.
8. Schredl M. Träume und Schlafstörungen: Empirische Studie zur Traumerinnerungshäufigkeit und zum Trauminhalt schlafgestörter PatientInnen. Marburg: Tectum, 1998.
9. Fischman LG. Dreams, hallucinogenic drug states and schizophrenia: a psychological and biological comparison. *Schizophrenia Bulletin* 1983;9:73-94.
10. States BO. Dreaming as psychosis: re-reading Allan Hobson. *Dreaming* 1998;8:137-148.
11. Beck AT, Hurvich MS. Psychological correlates of depression: I. frequency of "masochistic" dream content in a private practice sample. *Psychosomatic Medicine* 1959;1:50-55.
12. Beck AT, Ward CH. Dreams of depressed patients. *Archives of General Psychiatry* 1961;5:462-467.
13. Schredl M, Schmitzler M. Träume und Depression: Eine Literaturübersicht. *Psycho* (in press).
14. Kramer M. Dream studies of psychiatric patients: a review of their scientific adequacy. *Sleep Supplement* 1999;22:S178-S179.
15. Riemann D, Löw H, Schredl M, Wiegand M, Dippel B, Berger M. 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* 1990;15:93-99.
16. Armitage R, Rochlen A, Fitch T, Trivedi M, Rush AJ. Dream recall and major depression: a preliminary report. *Dreaming* 1995;5:189-198.
17. Schredl M. Traumerinnerung bei depressiven Patienten. *Psychotherapie, Psychosomatik und Medizinische Psychologie* 1995;45:414-417.
18. Schredl M. Dream recall: research, clinical implications and future directions. *Sleep and Hypnosis* 1999;1:72-81, A2-A4.
19. Koulack D, Goodenough DR. Dream recall and dream recall failure: an arousal-retrieval model. *Psychological Bulletin* 1976;83:975-984.
20. Schonbar RA. Differential dream recall frequency as a component of "life style". *Journal of Consulting Psychology* 1965;29:468-474.
21. Görtelmeyer R. Schlaf-Fragebogen A und B (Sf-A, Sf-B). In: *Collegium Internationale Psychiatriae Scalarum, ed. Internationale Skalen für Psychiatrie*. Weinheim: Beltz, 1986.
22. Derogatis LR. Symptom-Check-Liste (SCL-90-R). In: *Collegium Internationale Psychiatriae Scalarum, ed. Internationale Skalen für Psychiatrie*. Weinheim: Beltz, 1986.
23. Hautzinger M, Bailer M, Worall H, Keller F. *Beck-Depressions-Inventar (BDI)*. Bern: Hans Huber, 1994.
24. Hartmann E. *Boundaries in the Mind*. New York: Basic Books, 1991.
25. Schredl M, Schröder A, Löw, H. Traumerleben von älteren Menschen - Teil 2: Empirische Studie und Diskussion. *Zeitschrift für Gerontopsychologie und -psychiatrie* 1996;9:43-53.
26. Schredl M, Schäfer G, Weber B, Heuser I. Dreaming and insomnia: dream recall and dream content of patients with insomnia. *Journal of Sleep Research* 1998;7:191-198.
27. Schredl M, Sahin V, Schäfer G. Gender differences in dreams: do they reflect gender differences in waking life? *Personality and Individual Differences* 1998;25:433-442.
28. Deutsches Institut für Medizinische Dokumentation und Information (DIMDI). *Internationale statistische Klassifikation der Krankheiten und verwandter Gesundheitsprobleme (ICD-10)*. Bern: Hans Huber, 1994.
29. Schredl M, Schenck W, Görtelmeyer R, Heuser I. Einflussfaktoren auf die Schlafqualität bei Gesunden. *Somnologie* 1998;2:99-103.
30. Schredl M, Schäfer G, Hofmann F, Jacob S. Dream content and personality: thick vs. thin boundaries. *Dreaming* (in press).
31. Schredl M. Traumerinnerungshäufigkeit und Trauminhalt bei Schlafgestörten, psychiatrischen Patienten und Gesunden. Universität Mannheim: unveröffentlichte Diplomarbeit, 1991.
32. Robbins PR, Tanck RH. Interest in dreams and dream recall. *Perceptual and Motor Skills* 1988;66:291-294.
33. Schredl M, Nürnberg C, Weiler S. Dream recall, attitude toward dreams, and personality. *Personality and Individual Differences* 1996;20:613-618.
34. Hartmann E, Rosen R, Rand W. Personality and dreaming: boundary structure and dream content. *Dreaming* 1998;8:31-39.
35. Whitman RM, Pierce CM, Mass JW, Baldrige BJ. Drugs and dreams II: Imipramine and prochlorperazine. *Comprehensive Psychiatry* 1961;2:219-226.
36. Schredl M, Doll E. Emotions in diary dreams. *Consciousness and Cognition* 1998;7:634-646.
37. Schredl M, Pallmer R. Alpträume bei Kindern. *Praxis der Kinderpsychologie und Kinderpsychiatrie* 1997;46:36-56.
38. Schredl M, Pallmer R, Montasser A. Anxiety dreams in school-aged children. *Dreaming* 1996;6:265-270.
39. Hauri P. Dreams in patients remitted from reactive depression. *Journal of Abnormal Psychology* 1976;85:1-10.

40. Firth ST, Blouin J, Natarajan C, Blouin A. A comparison of the manifest content in dreams of suicidal, depressed and violent patients. *Canadian Journal of Psychiatry* 1986;31:48-53.
41. Steiner C, Mackinger H. Der Aggressionsgehalt Depressiver in Träumen und Kindheitserinnerungen. *Zeitschrift für Klinische Psychologie, Psychiatry and Psychotherapie* 1996;44:382-390.
42. Schredl M, Kleinfurchner P, Gell T. Dreaming and personality: thick vs. thin boundaries. *Dreaming* 1996;6:219-223.