

Low levels of personality functioning are associated with affect dysregulation in dreams

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Summary. The association between psychopathology and dreaming has been investigated for various mental disorders. As for dream reports of patients with severe impairments in personality functioning (IPF), however, with a few exceptions, these contributions are mostly based on conceptual considerations or clinical case studies. As a core component of both personality functioning and contemporary psychodynamic dream theory, the construct of affect regulation is of specific significance in this context. The aim of this study was to compare affect regulation in dream reports as a marker of the level of personality functioning of patients with and without IPF. Affect regulation in $N = 77$ unsolicited dream reports by twenty psychotherapy outpatients with and without IPF was compared. Dream reports were transcribed from recordings of the first parts of Psychotherapy. Capacity for affect regulation was assessed using the Zurich Dream Process Coding System (ZDPCS). Level of Personality Functioning was assessed using the Scales of Psychological Capacities (expert-rating). Group differences were tested for with linear mixed-models controlling for dream length as well as the nested structure of this data set. Results: ZDPCS parameters, such as the extent of involvement of the dream ego or the complexity of the dream elements, indicated that patients with IPF use more preventive affect avoidance strategies when compared to patients without IPF. In addition, the IPF group demonstrated less flexibility in dream-inherent affect regulation as well as a higher frequency of disruptive states. Parallel to waking symptomatology, dreams of patients with IPF reflect an increased need for security, less affective involvement, and impaired affect regulation. Based on these findings, a model of affect regulation in the dreams of patients with IPF is suggested and implications for clinical practice are highlighted.

Keywords: Personality functioning, dreaming, affect regulation, Zurich Dream Process Coding System

1. Introduction

Sleep disturbances are assumed to reflect general impairment in self-regulation (Kelly, 2020). Therefore, it is not surprising that individuals with impairments in personality functioning suffer more frequently from sleep-related problems as disrupted sleep continuity or nightmares than healthy individuals (Winsper et al., 2017). Focusing on dream content and not only nightmare frequency, however, “research on dreaming in patients with personality disorders has been very scarce” (Schredl, 2016, p. 1).

As for the association of dream characteristics with impairments in personality functioning, research has typically focused on patients diagnosed with borderline personality disorder (BPD). Semiz et al. (2008) found significantly more nightmares and heightened levels of dream anxiety in BPD patients compared to a control sample. Increased nightmare frequency and more negatively toned dreams in BPD patients were also found in sleep laboratory (Schredl et al., 2012) as well as in dream diary (Simor et al., 2010) studies. Guralnik et al. (1999) found that dream reports from personality-disordered patients demonstrated “more estrangement

in their dreams, fewer interactions, and more emotionality” (p. 40) as compared to a control sample. Furthermore, they demonstrated “[...] a lower ratio of aggressive interactions yet a higher tendency to view themselves as the aggressor” (p. 40). Taken together, evidence from diverse types of studies suggest a continuity between waking mental health and dreaming.

In addition to studies with a dream content analytic approach, several clinical case studies focused on the so-called borderline-dream. However, a review of case studies by Hau (2009) shows that research in clinical practice does not paint a consistent picture of a typical borderline dream. Rather, two types of dreams can be differentiated. One group of case reports describes archaic forms of representation as e.g., characterized by unintegrated rage, whereas other reports find that flat, realistic dreams are characteristic of BPD. However, methodologically, it is important to note that several clinical case studies point out the potential to focus on the capacity for affect regulation in dream reports as a core criterion for the level of personality functioning (Kempe et al., 2023).

Personality functioning, dreaming and affect regulation

The level of personality functioning is a core criterion in a dimensional classification of personality pathology as introduced in the ICD-11 (WHO, 2020). Moreover, impairment of personality functioning is also a key variable for capturing psychopathology across various mental disorders and symptoms (Vierl et al., 2023) and can thus be used to distinguish patients with personality disorders, mood and anxiety disorders, and healthy controls (Doubková et al., 2022).

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Submitted for publication: January 2024

Accepted for publication: March 2024

DOI: 10.11588/ijodr.2024.1.102039

With regard to the waking mental health, a central marker of personality functioning is the capacity of affect regulation, which was found to be impaired e.g. in patients diagnosed with BPD (Conklin et al., 2006). Affect regulation is typically defined as “the attempt to alter or control one’s mood or emotional state so as to maximize pleasant experiences and minimize unpleasant ones [...]” including strategies such as “[...] cognitive techniques such as reframing and distraction, behavioral methods such as progressive relaxation and meditation, and unconscious processes such as denial and dissociation” (APA, 2022).

With respect to dreams, the Zurich Dream Process Coding System (ZDPCS; Moser & Hortig, 2019; Moser & von Zeppelin, 1996) quantifies affect regulation also as processes aiming for a balance between two opposing tendencies, the need for security and the need for emotional involvement. Euler et al. (2016) investigated affect regulation in single dream reports of 62 patients with different levels of personality functioning. Markers of the level of personality functioning, were found to be related to the richness and complexity of the dream narrative. Based on single case studies of BPD patients, Moser et al. (Moser & Hortig, 2019; Moser & von Zeppelin, 2004) hypothesized that affect regulation in dream reports is impaired, as is the ability to engage in interpersonal domains, reflecting reduced tolerance for emotional involvement. As a result, an increased need for security permits relational experience only in a reduced form. Thus, dreams on a low level of personality functioning show a preventive strategy of affect avoidance, so that representations can unfold in less detail in the dream narrative. In addition, BPD patients are associated with a lack of identity coherence, which manifests itself in dreams in a disrupted body image. However, these assumptions have not yet been empirically tested adequately. Here, we aim to compare dream-inherent affect regulation in patients with, versus without impairments in personality functioning.

2. Method

2.1. Procedure

Patients provided written informed consent and the research project was approved by the Institutional Review Board of the International Psychoanalytic University (IPU; no. 2019-10). All patients were treated in an outpatient setting, either in a cooperating private practice or in the IPU outpatient clinic. Psychotherapies were conducted by licensed therapists and audio- or video-recorded. Sessions from the first third of psychotherapy (first $M = 64.1$ ($SD = 31.2$) sessions) containing a dream report were identified based on the therapeutic documentation. In two cases this cutoff was missed by 2 and 8 sessions. When examining the inter-rater reliability (IRR) one of the two independent raters was blind as to the level of personality functioning.).

2.2. Sample

$N = 77$ dreams were gathered by ten patients in (modified) psychoanalytic psychotherapy with impairments in personality functioning (IPF) and ten patients in psychoanalytic ($n = 6$) or psychodynamic ($n = 4$) psychotherapy without such impairments (noIPF). The average age of the sample is 32.5 years ($SD = 9.2$) at the time of contact (female sex = 75.0%). Inclusion criteria for the IPF group are an ICD-10 F60 diagnosis and a low level of personality function-

ing (see section measures). In one case, a social behavior disorder (F91.2) was included instead of a personality disorder diagnosis. Inclusion criteria for the noIPF group are a diagnosis of an anxiety or depressive disorder (F40, F41 or F32, F33, F34) and a moderate to high level of personality functioning. For the noIPF group, the presence of a comorbid diagnosis of a personality disorder was an exclusion criterion. On average, all patients received 2.9 diagnoses according to the ICD-10 (for details see Table 1 in supplement material).

2.3. Measures

2.3.1 Assessment of the level of personality functioning

Scales of Psychological Capacities (SPC; Huber et al., 2006). The SPC are an observer-rated assessment tools to quantify personality functioning on the basis of 17 scales (35 subscales in total) such as self-coherence or impulse regulation. Each scale captures the severity of the respective impairment and coping possibilities to handle stressors alone (level 1), with help (level 2), or unable to despite help (level 3) with one intermediate step each (7-point scale). Borderline patients, depressive patients, and healthy controls can be validly differentiated by the SPC (Klug & Huber, 2009). Originally, SPC ratings are based on semi-standardized interviews. In this study, SPC were rated based on the recording of the first two therapy sessions. The validity and IRR of this procedure were assessed using the approach as described in the supplement material.

Therapeutic documentation. Mandatory therapeutic assessment of the impairment in personality functioning was taken from the structured therapeutic documentation. Therapeutic assessments were then validated by the SPC. Patients with IPF scored significantly higher on the SPC total score ($M = 2.0$, $SD = 0.3$) comparing to patients with noIPF ($M = 0.6$, $SD = 0.1$) (Mann-Whitney-U = 0, $p < .001$).

2.3.2 Zurich Dream Process Coding System (ZDPCS; Moser & Hortig, 2019; Moser & von Zeppelin, 1996)

The ZDPCS assesses affect regulation in dreams by analyzing strategies and capacities for regulating the course of dreams. An extensive introduction into the ZDPCS including a fully coded dream example as well as comparison to other dream content analytic approaches can be found in Kempe et al. (2023). Previously, the ZDPCS has been applied for characterization of dream affect regulation in specific clinical populations (Wittmann et al., 2022) as well as manifestations of psychotherapeutic progress in dreams (Döll-Hentschker, 2008; Fischmann et al., 2021). The ZDPCS is based on a dream generation theory that extends psychoanalytic dream theory with contributions from cognitive science and artificial intelligence research. Following French (1954) in applying a problem-solving paradigm, the function of a dream is understood as an attempt to solve or adapt to a complex. Complexes are defined as representations of interpersonal experiences associated with strong anxiety or disappointment which have not been disaffected during the process of memory consolidation. Complexes originating from long-term memory are supposed to be brought to a solution by transforming the stored affective complex information back into simulated relational reality within the dream. Thereby, the dream ego is caught between the need to have a good enough sense of security (safety principle)

so that the current tolerable degree of involvement of the dream ego in interpersonal processes is not exceeded, as well as the need to recommit to interpersonal relational reality (involvement principle). A condition for this oscillation between security and involvement principle is a rudimentary organization of the self, which has the task of ensuring the coherence and identity of mental processes. Moser and Hortig (2019) associate a fundamentally threatened ability for self-organization with disruptive states in dreams (often accompanied by strong anxiety or panic). Central characteristics of disruptive states are explicit depictions of physical mutilation, fragmentation or death of the dream ego or another dream object.

Coding System. The aim of dream coding using the ZDPCS is to trace the regulatory mechanisms over the course of a dream to infer the currently available capacities for affect regulation. The dynamic shifts of the dream process between the poles of involvement and safety throughout the dream plot can be depicted. Dream reports are firstly edited (translation into presence, deletion of comments) and then segmented. In each segment (comparable to a screenplay for the dreamwork), dream elements are coded in five fields. On the visual-pictorial level, all elements plus their attributes are registered (PF; position field), their motions (LTM; loco time motion field), and their quality of interaction (IAF; interaction field). Moreover, verbal interactions (VR; verbal relation field) and cognitive processes or affective reactions (CP/AFF R) are captured. Detailed introductions to the ZDPCS including segmentation and coding rules can be found in Moser and Hortig (2019). A fully coded dream can be found in the supplemental material (see Table 2).

The IRR of the ZDPCS was examined in a two-step approach based on 10.4% ($n = 8$) randomly selected dreams. In the first step, a sampling rate of four words was applied for testing the agreement of the two independent raters with respect to dream report segmentation. This resulted in 354 ratings and substantial agreement ($\kappa = .73$). In the second step, IRR was computed for codes that were used at least 6 times ($n = 15$). The resulting 1095 ratings indicate a substantial agreement ($\kappa = .76$).

Dream parameters

Dream length: Dream length (word count of edited reports and number of segments) is assumed to reflect specific dimensions of personality, the ability to simulate complex inner-psycho processes, and the capacity for introspection.

Frequencies and quality of codes in the five fields of the ZDPCS: A complex dream narrative is reflected primarily at the visual-pictorial level (PF, LTM, IAF). A comprehensive PF is an indicator of the multifariousness of the cognitive and affective representations of the dream complex. Specific subgroups such as numbers of attributes of elements in the PF are of particular interest by highlighting differences in the complexity of the dream narrative. Motions (captured in the LTM) serve to regulate proximity-distance and thus make interactions more/less likely. The extent of interactions (IAF) and their quality are assumed to represent the current tolerable degree of involvement of the dream ego in interpersonal processes. A categorization is made between six levels which reflect an increasing affectualization. The niveau of affectualization, i.e. the highest point of affectualization in a dream, can be determined, as well as the frequencies of the different forms of interactions (Moser &

von Zeppelin, 1996). A basic condition for this interpersonal domain is that the coherence of the identity of the self is maintained. As a marker for an impaired organization of the self, the number of disruptive states is assessed. A detailed description of the parameters utilized in the present study can be found in the supplemental material.

Regulation between the two central tendencies in dreams (ZDPCS): Transformations within the dream dynamic are tracked from segment to segment and differentiated with regard to whether the affectualization of the dream is increased (involvement principle) or reduced (safety principle). Frequent changes between the two poles are assumed to reflect capacities in affect regulation.

Operationalization of hypotheses by ZDPCS parameters

Patients with IPF are expected to use more preventive affect avoidance strategies (Hypothesis 1) operationalized as fewer dream elements on the visual-pictorial level and lower level of affectualization. Furthermore, the dreams of the IPF group are expected to be less flexible in dream-inherent affect regulation (Hypothesis 2) operationalized as a diminished number of oscillations between involvement and security processes. Dreams of the IPF group are also expected to contain more disruptive states (Hypothesis 3) operationalized as an increased number of physical mutilation, fragmentation or death of the dream ego or another dream object.

2.4. Data analysis

Statistical analyses were performed using jamovi statistical software (v2.0). Due to the naturalistic study design, the number of dreams differs between patients, and the dreams of the individual patients are not independent of each other (nested data). As pointed out by Schredl (2013) mixed-model approaches are mandatory in order to consider this specific nested data structure of multiple dream reports. Therefore, linear mixed-models are computed to test for group differences in continuous parameters after adjusting for dream length. Random effects are defined by the patient variable. Fixed effects are group (IPF group/ noIPF group), dream length, and the interaction term of these two. Dream length is centered in the mixed-model analysis to reduce multicollinearity when computing the interaction term. For the ordinal parameters, ordinal logistic regression is required. This, however, does not allow for modeling cluster-level variables and random effects. The Shapiro-Wilks test for normality was run on each parameter and was found to be significant several times. Thus, results should be interpreted with caution, although some deviations from this normality assumption seem uncritical (Schielzeth et al., 2020). The significance level for all analyses was set at $p < .05$.

3. Results

3.1. Descriptives

Patients reported 77 dreams (49.0% IPF group; 51.0% noIPF group) during the first third of the therapies. On average 3.8 dreams were reported by patients in the IPF group ($SD = 1.8$, range = 1-6) and 3.9 dreams by patients in the noIPF group ($SD = 2.2$, range = 1-6).

Table 1. Dream characteristics (ZDPCS).

Dream characteristics (ZDPCS)	IPF group (N = 10)		noIPF group (N = 10)		β (SE)	p ^a
	M	SD (Range)	M	SD (Range)		
Dream length (word count)	169.6	117.7 (13-470)	191.5	172.9 (6-743)	-39.8 (51.2)	0.447
Number of segments per dream	7.1	5.1 (1-22)	9.1	7.3 (1-29)	-3.3 (2.3)	0.176
Position field	21.3	15.2 (2-59)	35.8	32.5 (4-154)	-16.5 (7.2)	0.039
Human object processors	4.1	3.5 (0-14)	8.0	8.9 (0-46)	-5.5 (3.0)	0.088
Inanimate cognitive elements	2.9	3.1 (0-15)	5.2	6.1 (0-28)	-1.8 (0.8)	0.024
Attributes	2.9	2.8 (0-12)	5.2	5.5 (0-24)	-1.8 (0.6)	0.004
Anonymizations	2.2	2.5 (0-10)	2.3	2.4 (0-10)	0.2 (0.4)	0.607
Static positioning of relations	0.5	0.8 (0-3)	0.1	0.4 (0-2)	0.4 (0.2)	0.063
Loco time motion field	4.9	5.1 (0-19)	7.1	7.5 (0-32)	-1.7 (1.2)	0.183
Interaction field	6.7	6.5 (0-30)	10.5	9.8 (0-39)	-2.9 (1.2)	0.022
Kinesthetic interactions	0.6	0.9 (0-4)	0.8	1.3 (0-5)	-0.2 (0.2)	0.466
Displacement relations	0.7	1.0 (0-5)	1.3	1.5 (0-5)	-0.5 (0.3)	0.083
Constrained interactions	0.1	0.5 (0-3)	0.3	1.8 (0-11)	-0.2 (0.3)	0.511
Resonant interactions	0.8	1.2 (0-5)	1.3	2.2 (0-9)	-0.4 (0.4)	0.321
Responsive interactions	0.6	1.1 (0-5)	1.2	1.7 (0-6)	-0.6 (0.3)	0.080
Subject feeling	0.1	0.3 (0-1)	0.5	1.1 (0-6)	-0.3 (0.2)	0.067
Object feeling	0.4	1.2 (0-6)	0.3	0.8 (0-4)	0.1 (0.2)	0.615
Verbal relation field	1.5	1.5 (0-6)	1.9	2.1 (0-7)	-0.3 (0.3)	0.454
Cognitive processes	2.8	2.2 (0-8)	2.6	2.7 (0-9)	0.4 (0.3)	0.186
Explicit affective reactions	1.6	1.8 (0-7)	2.1	1.9 (0-7)	-0.3 (0.3)	0.350

Note: ^aLinear mixed-model (p-value), ZDPCS = Zurich Dream Process Coding System, IPF = Impairments in personality functioning, noIPF = Without impairments in personality functioning

Hypothesis 1: Affect-intensive experience is tried to be prevented

Neither word count nor number of segments differed significantly between groups (Table 1). Dreams of patients in the IPF group showed significantly fewer codes in PF and IAF. Within the PF, significantly fewer inanimate cognitive elements, as well as attributes, were found in the dreams of patients in the IPF group. A non-significant statistical trend towards fewer object processors and more static positioning of relations was observed for the dreams of patients in the IPF group. The frequency of anonymizations did not significantly differ between both groups. Within the IA-field, non-significant statistical trends emerged for fewer displacement relations, responsive interactions, and subject feeling in the dreams of patients in the IPF group. For most dream parameters, the standard deviation and range were lower in patients in the IPF group.

Significant interaction terms between dream length (word count) and group membership were observed with respect to the total number of codes (PF; $p = 0.005$) as well as the number of attributes in the PF (ATTR; $p = 0.022$). As illustrated by Figure 1a/b, these effects became more pronounced the longer the dreams are.

Figure 2 presents the distribution of dreams of both groups with respect to the six levels of affectualization according to Moser and von Zeppelin (1996). Both groups showed more dreams in the high categories than in the lower categories. However, 74.4% of dreams of the noIPF group were among the two highest levels of affectualization, as compared to 55.3% of IPF dreams. This was reflected by a non-significant statistical trend towards a lower level of affectualization in the dreams of patients in the IPF group ($\beta = -0.698$, $p = 0.094$, OR = 0.498).

Hypothesis 2: Affect regulation is less flexible between safety- and involvement-processes

Dreams of patients in the IPF group demonstrated significantly fewer ($\beta = -1.5$, $p = 0.037$) changes between safety- and the involvement processes ($M = 5.1$, $SD = 3.8$, range = 0-13) as compared to dreams of patients in the noIPF group ($M = 7.0$, $SD = 5.9$, range = 0-23).

Hypothesis 3: Disruptive states occur more often

The IPF group showed significantly more ($\beta = 0.2$, $p = 0.023$) physical mutilation, fragmentation or death of the dream ego or another dream object ($M = 0.3$, $SD = 0.5$, range = 0-1) in their dreams than the group without IPF ($M = 0.1$, $SD = 0.3$, range = 0-1).

4. Discussion

The present study aimed to characterize the dream-inherent affect regulation as a process of the level of personality functioning. Central results showed that IPF are associated with reduced visual-pictorial richness in dream narratives. Furthermore, IPF covaried with reduced affective involvement, fewer alternations between safety- and involvement processes as well as more disruptive states. In summary, it is evident that all (tendentially) significant effects were at the visual-pictorial level, i.e., in PF or IAF. Moreover, dream-inherent strategies for affect regulation were used more flexibly in patients in the noIPF group, as reflected in higher standard deviations and range across most parameters.

The reduced visual-pictorial richness of dreams in the IPF group is in line with the results of Euler et al. (2016) as well as Moser and Hortig's (2019) notion that an increased need

for security requires the dream complex to be less comprehensively represented or to be shaped with limited affect. Interpreted as a function of personality, dreaming is prevented from multifaceted unfolding. Overall, the available equipment of the dreamwork in the IPF group is less extensive. The number of attributes may reflect the dream ego's focus on an element, or how complex it is being perceived (Moser & Hortig, 2019). Thus, cognitive elements in dreams in the noIPF group offer more diverse affective points of contact because they are perceived as more multifaceted. This effect becomes more pronounced the longer a dream is. Interpreted as increased tolerance to affect unfolding, this finding indicates that the ability to simulate complex inner-psychic processes stands out more clearly in correlation with dream length.

Human dream characters with a simulated inner life of their own, are affect-triggering cognitive elements. A nearly significantly elevated number of human characters in the noIPF group may reflect more tolerance towards affective involvement. Positional relations are assumed to be a direct marker of impaired affect processing resources. According to Moser and Hortig (2019), positional relations, i.e. static linkages of cognitive elements without interaction, represent fixed and affective limited relationship models that contain little potential for change. Our finding that positional rela-

tions tend to occur more frequently in the IPF group implies that relationship regulatory difficulties are reflected in this parameter. The rare overall occurrence of positional relations may explain why this effect did not reach statistical significance ($p = 0.063$).

The extent of involvement of the dream ego in the dream complex is determined by the frequency and quality of interactions. Overall, the dreams of the IPF group show significantly fewer interactions, which is in line with the results of Guralnik et al. (1999). In other words, the interactive narrative is less intense. Assessing the highest observed degree of affective involvement within each dream report, there was an almost significant tendency towards a lower affective level in dreams of the IPF group. Furthermore, an almost significantly increased number of three interaction types (IRD NPR, IRC RESP, Subject feeling) was observed in the noIPF group. Displacement relations (IRD NPR) serve the dream ego to keep affective involvement at bay by being an observer (rather than participating directly), thus can be seen as a compromise solution between safety- and involvement processes. Responsive interactions (IRC RESP) mark distinct involvement and reciprocal regulation of interactions, which is supposed to be a primary marker of increased affect tolerance (Moser & Hortig, 2019). Subject feeling is additionally coded for the experience of self-efficacy. In accordance with hypothesis 2, dreamwork in patients in the IPF group was significantly less capable of oscillating between safety and involvement processes. As expected by hypothesis 3, disruptive states were found significantly more frequently in the IPF group. This is in line with several clinical observations, that associate disruptive states with severe psychopathology (e.g. Benedetti, 1983; for an overview cf. Moser & Hortig, 2019) as well as with the often replicated finding of more nightmares in BPD patients. It is assumed that disruptive states are a marker of attempts to stabilize the dream ego's coherence of identity rather than an interpersonal affect regulation. In extreme cases, strong disruptive states have also been associated with rather short dreams and no interpersonal domain, often described as core self-dreams (Moser & Hortig, 2019). However, as core self-dreams were very rare in the present sample ($n = 2$; one can be found in the supplemental material), the number of disruptive states was determined in dreams with interpersonal domain.

In summary, it can be stated that central parameters of dream-inherent affect regulation vary as a function of the level of personality functioning. This has several implications for clinical practice. According to our findings, dreams could be used as a diagnostic marker for the level of personality functioning. Attention should be paid to two central points: First, an increased need for security and a lack in coherence in identity, in other words affect avoidance strategies and disruptive states, and second, impaired affect regulation. Central characteristics on the visual-pictorial level as a sparsely equipped PF and an IAF reflecting reduced involvement as well as an impaired body image may result from an increased need for security or a lack of coherence in identity. In addition, attention should be paid to whether strategies for regulating affect can be used flexibly (so that involvement in the complex can proceed from relatively safe ground). Furthermore, these diagnostic markers could also be used in longitudinal study designs as indicators of structural personality development.

The relation between the level of personality functioning and dreams is also of interest for the practical work with

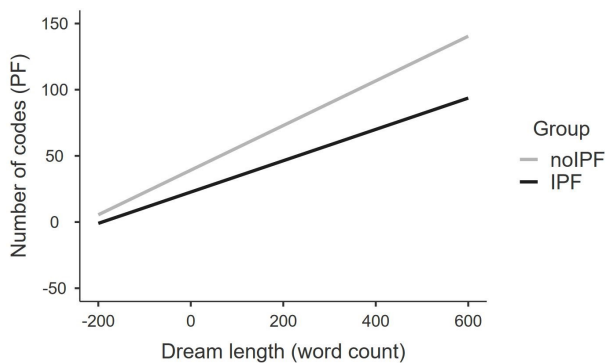


Figure 1a. Interaction term between group and dream length (Position field).

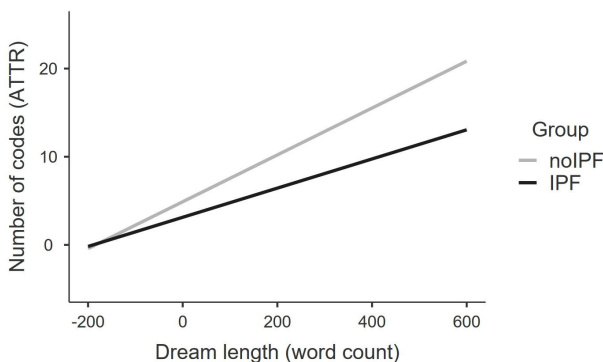


Figure 1b. Interaction term between group and dream length (Attributes)

Figure Note: IPF = Impairments in personality functioning, noIPF = Without impairments in personality functioning, PF = position field, ATTR = attributes, Negative values of dream length in the plot are due to the fact that dream length is centered in the mixed-model analysis to reduce multicollinearity when computing the interaction term.

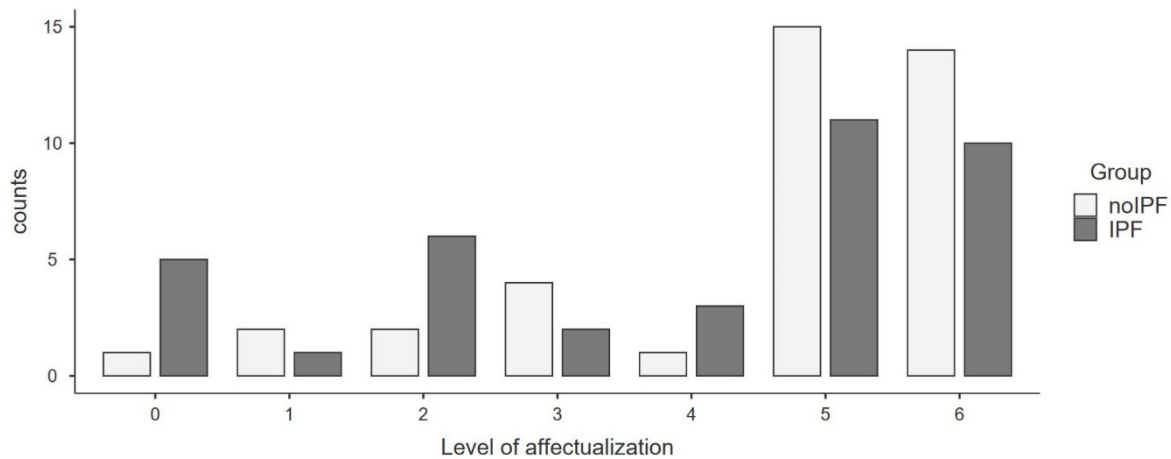


Figure 2. Level of affectualization in dream reports

Figure Note: IPF = Impairments in personality functioning, noIPF = Without impairments in personality functioning

dream reports in psychotherapy. It has been repeatedly emphasized that the severity of the patient's impairment influences clinical approach to dreams (e.g., Blechner, 1983; Fonagy, 2000). According to this view, the impaired affect regulation in dreams in interaction with reduced reflective capacities in waking, negatively impact the patient's ability to work with dreams. Thus, it is assumed that a lack of ability to symbolize leads to more concretistic forms of representation, which make an interpretation obsolete, because the meaning is openly revealed. Rather, the immediate communicative message and expression of affect should be incorporated by the therapist. An approach such as the ZD-PCS may help therapists to decide if a dream contains such signs of structural impairment or not, and which approach to dream interpretation therefore appears to be favorable. This is essential as our results show a rather large range of affect regulation in dreams of the IPF group, i.e., there is no strictly homogenous dream that reflects IPF.

In addition, central methodological implications for research can be derived. Although more pronounced in patients with a higher level of personality functioning, there is substantial variance with respect to all dream report parameters in both patients' groups. Thus, there is no static relation between the level of personality functioning conceptualized as a personality trait and its manifestations in dreams. In consequence, we assume that individual dreams of patients with different levels of personality functioning cannot be reliably categorized, but that dream series can be assigned on the basis of a dominant tendency in the range of available affect regulation resources.

The present findings in the IPF group support the idea that the two contradictory poles as described by Hau (2009) (that either flat and realistic dreams or archaic representations of unintegrated rage etc are characteristic of BPD) can be integrated in a dynamic threshold model: Firstly, due to an increased need for security, an attempt is made to prevent affect-intensive experiences. In consequence, dreams may appear cold or poor in affect and equipment. If efforts of avoiding affective involvement fail, dream content may appear disastrous or overwhelming (here marked by disruptive states) due to lacking affect regulating capacities.

5. Strengths and limitations

This is the first study to systematically evaluate affect regulation in dream report series in patients with and without impairments in personality functioning. Assessing dream report series rather than single dream reports, which is frequently done in previous research, is of importance as dream content intrapersonally varies. Thus, single dream reports provide an inadequate basis of data to establish relationships with personality trait factors (Deserno & Kächele, 2013; Moser & Hortig, 2019). Therefore, unsolicited dream series that were described in psychotherapy were analyzed based on standardized audio or video recordings, which thus far has been done rarely in clinical case studies (e.g., Döll-Hentschker, 2008). Beside clinical case studies, previous research in this field has focused on solicited dream reports acquired in sleep laboratory (Schredl et al., 2012), dream diary (Simor et al., 2010), or interview (Euler et al., 2016) studies. Furthermore, the content validity of the present study is particularly strengthened by a naturalistic clinical sample. The data were analyzed retrospectively and thus were not influenced by the study design. In addition to the therapeutic assessment, the level of personality functioning was assessed by an external rater, which is often lacking in clinical case studies.

However, the present study is not free of limitations which need to be considered for any interpretation of our results. Firstly, the nature of the included convenience sample limits generalizability of our findings. Also, sample size is relatively small lowering statistical power for detecting small effects between group differences. Furthermore, our sample size does not allow for subgroup analyses, e.g., in relation to different diagnostic categories. By entering patients as a clustering variable, it was not possible to additionally include therapist or psychotropic medication as a further level in the linear mixed-models. This would have led to models that do not converge. Furthermore, data analysis was not performed blind with regard to the level of personality functioning. However, reliability checks based on randomly chosen dream reports against a blind second rater indicated that the occurrence of a severe bias due to this shortcoming appears to be improbable.

In a methodical trade-off between systematic data collection via sleep laboratory/dream protocol (limited generalizability) and unsystematic data collection via unsolicited dreams in psychotherapy (limited specification), our focus is one-sided. Further research may be interested in collecting data systematically and thus possibly in larger samples, including self-ratings of dream content. In this context, however, it should be acknowledged that laboratory-based dream content is susceptible to experimenter bias or state factors such as participants' laboratory experience (Picard-Deland et al., 2021).

It should also be taken into account that the diagnostic potential of dreams necessarily needs to be further investigated. In particular, the influence of regression in psychodynamic psychotherapies may lead to limited capacity for affect regulation in dreams. Thus, patients' dreams might provide a too drastic impression of the disorder's severity. It needs to be considered that a dream reflects a patient's current view of their problems and attempts to solve them. Importantly, personality functioning is a fluctuating parameter, particularly depending on current strain and stress. In the present study, both groups are in treatment, but it is unclear whether the effect of regression has a different impact on dreams in both groups. However, the idea that there is a trait influence of the level of personality functions on dream quality is strengthened by the fact that even non-significant differences point in the expected direction and that in almost all parameters the standard deviation and range were larger in the nIOPF group.

6. Conclusions

The results indicate that dreams of patients with versus without impaired personality functioning can be distinguished based on two specific dimensions. Dreams of patients with a low level of personality functioning reflect an increased need for security, a lack of coherence in identity and impaired affect regulation. This finding resembles waking symptomatology and is thus in line with the hypothesis of continuity between dreaming and waking life (Schredl, 2003). If this result can be replicated in larger samples, dream series can complement diagnostics of personality functioning in clinical practice or psychotherapy research.

Acknowledgments

The authors wish to thank Prof. Dr. Lars Kuchinke for statistical support and Prof. Dr. Ulrich Moser and lic. phil. Vera Hortig (Authors of the ZDPCS Manual) for their contribution to the study of inter-rater reliability and for their helpful comments on a previous version of this manuscript.

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Competing interests

The authors report there are no competing interests to declare.

Funding

This study was supported by the Heigl-Stiftung, the Köhler-Stiftung and the Hamburger Stiftung zur Förderung von Wissenschaft und Kultur.

Ethics approval and consent to participate

Patients provided written informed consent and the research project was approved by the Institutional Review Board of the International Psychoanalytic University.

Availability of data and materials

The data file can be shared on request. The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research supporting data is not available.

Supplemental materials

Supplemental Material 1 is available in the online version of the paper.

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