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Different keys unlock different doors: analyzing content and affect regulation in dream reports

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Abstract

Background: For empirical dream research, numerous scales and rating systems exist for different facets of dreaming.
Objective: The present study aimed to compare two different approaches for dream report analysis focusing on content and affect regulation, respectively.
Materials and methods: The Hall and Van de Castle Coding System (HVCCS), complemented by two global rating scales, as well as the Zurich Dream Process Coding System (ZDPCS) were applied to one dream of a patient with impairments in personality functioning.
Results: The comparison of both approaches reveals clear differences with respect to theoretical presuppositions, coding material, evaluation categories, norm data, time course of dream content, and economic as well as sample size considerations. For instance, while the HVCCS is distinguished by its economic applicability, the ZDPCS allows for a detailed reconstruction of the dynamic development of the dream plot.
Conclusion: Only precise knowledge of the specific characteristics of different approaches to dream content allows researchers to adequately define their analytic strategy.

Keywords
Sleep, REM · Hall and Van de Castle · Zurich Dream Process Coding System · Emotions · Personality

Supplementary Information

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The content, meaning, and function of dreams have fascinated mankind since ancient times. Comparatively, empirical scientific approaches to dream content analysis have a much shorter history [17]. The detection of REM sleep [1] provided the opportunity to systematically collect and influence dream content under various laboratory conditions and make it available to empirical approaches, which has led to an increase in research and the need for reliable evaluation methods. Hall and Van de Castle [7] thereby laid the foundation with their coding system, which is the most often applied method for the evaluation of dream content. The coding system aims to approach the meaning or function of dreams by examining the influence of waking life on dream content in the first step [17]. However, more than a hundred different scales and rating systems ([21] as cited in [19]) for the description of dream content are available. Thus, scientists must select the most adequate assessment tool for specific research questions. Methods of psychological dream research are applied to ensure replicability, reliability, and validity. The possibility of blind judges minimizes experimenter bias. These common scientific criteria are accompanied by the disadvantage that only aspects of dreams can be examined. A certain amount of information is inevitably lost in psychological dream research, since the uniqueness of dreams can only be captured to a limited extent [19].

Dream content analysis

The Hall and Van de Castle Coding System (HVCCS; [7]) is the most extensive standardized coding system for capturing dream content, which has been applied to numerous studies with different populations. The construction of eight main categories of the HVCCS is intentionally not rooted in any theory about the generation or function of dreams. Rather, the focus lies on capturing dream content as objectively and precisely as possible by means of specific coding rules and boundaries for all frequently appearing elements [4]. In addition, the HVCCS includes a theory-based category, with scales such as penis envy, castration anxiety, and regression. The original main scales were created based on empirical studies of more than 10,000 dream reports and comprise eight categories for the frequency of dream characters, social interactions, the dream setting, activities, achievement outcomes, misfortune/fortune, emotions, and descriptive elements. These categories are divided into subscales with over 300 different coding options. Based on 1000 dream reports, Hall and Van de Castle [7] generated normative data which have often been used for comparisons with specific clinical samples [17].

The HVCCS follows the principle of summing up various aspects of the dream content, for example, the number of aggressive interactions. As these parameters may be biased by, e.g., dream length, normative studies have often excluded dream reports shorter than 50 words (e.g., [4]). To overcome some shortcomings of the HVCCS (e.g., no differentiation between mild and strong emotions), global rating scales are often added to more precisely capture specific dream content qualities, e.g., emotional intensity or bizarreness [16].

Analysis of affect regulation

A comparatively recent system that focuses on affect regulation in dream reports is the Zurich Dream Process Coding System (ZDPCS; [12]). Since most dreams are experienced as sensory and realistic, the ZDPCS aims to follow the dreamer through the dream plot and thus reconstruct the sense of self while dreaming. The underlying problem-solving paradigm [6] postulates that a complex, defined as a neurotic conflict or traumatic experience from long-term memory, is to be processed in the dream. The dream translates the abstract interactional representation behind a complex into simulated relational reality. According to ZDPCS, the dream simulates an attempted solution or best possible adaptation to the dream complex with the help of elements of the manifested dream content (so-called cognitive elements) such as persons or inanimate objects. In the dynamics of a dream, these cognitive elements are continuously regulated (e.g., moved or put into interaction).

In this process, two tendencies are assumed to struggle with each other: one tendency that brings the dream ego into contact with the affective experience of the complex (involvement principle) and, secondly, a tendency that protects the dream ego from the same (safety principle). Through both principles, the dream organization regulates the level of affective involvement (affectualization). This is characterized by different types of interactions that reflect the extent to which the dream complex is retranslated into simulated interaction reality. If this becomes too high or too low, the dream organization interrupts the current situation (e.g., by removing an aggressor). How and when interrupts occur provides information about available affect-regulatory resources. Beyond scientific evaluation, the coding provides a useful basis for further clinical interpretation.

The present study aims to illustrate and compare two intrinsically different approaches for the analysis of dream reports. On the one hand, the ZDPCS, as a theory-driven approach, was chosen because it focuses on the process of the evolving and developing dream. On the other hand, the HVCCS and two global rating scales were selected because they are most frequently applied in psychological dream research. As a descriptive approach, dream content analysis focuses on the dream as a whole.

Methods

Procedure

This study is part of a larger investigation of dreams in the context of outpatient psychoanalytic psychotherapies with patients who have impairments in personality functioning (IPF). The project was approved by the Institutional Review Board of the International Psychoanalytic University Berlin (no. 2019-10). Dreams spontaneously reported during the sessions were transcribed from the treatment audio recordings. For this study, one dream from the fifth session of a patient diagnosed with emotionally unstable personality disorder (borderline; F60.31) and atypical bulimia nervosa (F50.3) according to ICD-10 was arbitrarily selected. Selection criteria were concise dream length and potential to illustrate the results on the applied rating scales.

Measures

Dream content analysis
Dream content was assessed by three main categories from the HVCCS (see online manual: Schneider and Domhoff [14]) and two additional global rating scales. This selection is based on clinical considerations regarding the study sample (patients with IPF). The inter-rater reliability (IRR) for these scales has been studied several times and commonly ranges between 0.70 and 0.90 (Spearman rank correlation; [19]).

HVCCS scales. *Dream characters*: a dream character is coded according to the manual when an individual (male, female, diverse, or undifferentiated), an animal, or a group appears. It also includes dream figures mentioned in conversations. Then, the identity (degree of familiarity to the dreamer ranging from close relatives to strangers) is included.

Social interactions: aggressive, friendly, or sexual interactions are captured on Likert scales. For instance, aggressive interactions are rated on an eight-point Likert scale (8 = murder to 1 = nonverbal hostility).

Misfortunes: misfortunes, defined as "any mishap, adversity, harm, danger or threat that happens to characters, as a re-

Table 1 Results of dream content analysis (HVCCS, GRS)

	Category	Results
HVCCS	Dream characters	Two male individuals (familiar and husband)
	Social interactions	Kissing = sexual interaction (3) Verbal threat = aggressive interaction (4) Deception = aggressive interaction (3)
	Misfortunes	Injured face of dream ego (5)
GRS	Dream emotions	Joy (4), aggressions (3), anxiety (3), confusion (2), disgust (4), shame (1)
	Realism/bizarreness	One event (injured face) not possible in waking life (3)

Bracketed numbers refer to different Likert scales, see section measures
HVCCS Hall and Van de Castle Coding System, *GRS* Global rating scales

sult of circumstances over which they have no control" [4, p. 247], are rated on a six-point Likert scale (6 = death or accidents to 1 = being lost or late).

Global rating scales. *Dream emotions*: following Schredl and Doll [20], who measured the intensity of positive and negative emotions, explicitly mentioned emotions (aggression, anxiety, joy, confusion, disgust, and shame) as well as implicit moods or feelings possibly revealed by the dream action are rated on a four-point Likert scale (1 = no emotional tone to 4 = very strong emotional tone). With this approach, the risk of underestimating dream emotions can be reduced [17]. The IRR for this procedure (based on *n* = 8 dreams) was found to be good to excellent according to Koo and Li [10].

Realism/bizarreness: the level of bizarreness was assessed on a four-point Likert scale (1 = possible in everyday life to 4 = several bizarre elements or actions; [15] as cited in [19]).

ZDPCS coding system

The ZDPCS traces the affect regulatory mechanisms over the course of a dream. Dream reports are firstly edited (translation into presence, deletion of comments) and then segmented. In each segment (comparable to a screenplay for the dream organization), dream elements are coded in five fields. At the visual pictorial level, all elements plus their attributes are registered in the position field (PF), their motions in the loco time motion field (LTM), and the quality of their interactions are described in the interaction field (IAF). Moreover, verbal interactions (VR) and cognitive processes or affective reactions (CP/AFF R) are captured. Based on these codes, the dynamic shifts of the dream process between the poles of involvement and safety can be depicted from segment to segment. Detailed introductions on the ZDPCS including segmentation and coding rules can be found in Moser and Hortig [12]. For the project from which this dream report is taken [9], the IRR of the ZDPCS was examined and found to be substantial according to Landis and Koch [11].

Transcript of the dream report

[E1] I dreamed that I was in a huge apartment, like it was already so loft-like. Totally pleasant atmosphere, plants were standing around everywhere, dividing the room. And I was standing in front of a mirror, looking super unattractive, had an obvious huge pimple in the middle of my face and my hair wasn't trimmed. And X came up all of a sudden and we looked at each other and the feeling from back then came right back. We kissed, and it wasn't so bad at all for me to look so unattractive right now. And somehow it all fit together, it was great. [E2] Then somehow there was a cut, and I was on my way home. But I just wanted to get some stuff and there was my current boyfriend Y and he totally yelled at me about where I had been, and I lied to him that I was just out and about. But he knew that I was lying and that was somehow a huge problem, but I only remember it very vaguely. [E3] Then I only remember one scene, how I'm back in the loft and I look in the mirror again. And suddenly I have something like a facial prosthesis. Like made of three parts, so once the forehead area and both cheek areas. And then I took them off. And my face was just like a hole. So I really have

this cavity, so that's unrealistic, but like muscle fibers and tissue. So I took it all off once, so to speak. Yeah, that was it.

Results

Dream content analysis

In summary, the results of the dream content analysis reflect intense emotions experienced by the dream ego in the context of sexual and aggressive interactions with two familiar individuals (◘ Table 1). The injured face reveals the illogicality and bizarre sensory experience of the dream content. Based on content analysis, the report meets the typical characteristics (visual imagery, bizarre distortions, emotional intensity) of a REM dream report according to Hobson [8]. A detailed analysis of the dream by means of the three methods (HVCCS, GRS, ZDPCS) can be found in the supplementary material.

ZDPCS analysis

In summary, the ZDPCS provides the following analysis of the time course of the dream and the regulatory mechanisms used by the dreamer: the first episode (E) raises the complex from the self-referential (mirroring) to the interpersonal level and finds a wish fulfillment (the kiss). However, this involvement process has an illusory quality and occurs at the expense of reality, as deficient parts of the self and the actual status of a previous relationship are denied. Bringing it closer to reality in E2, the dream ego is confronted with the deficient self-aspects (the infidelity) by the current boyfriend at home. A similar problem-solving attempt (denial) can be seen, but at a lower affect level compared to E1 (verbal instead of physical interaction; see detailed analysis of segment 6 in the supplementary material). The potentially reversible deficit self-aspects in E1 (e.g., pimple) reappear in E3 in the form of an irreversible body image (prosthesis), which marks an intensification of the complex. In parallel, the position field and the interaction field become increasingly empty in the course of the entire dream, which can be understood as a cross-episode defensive tendency in dream complex processing. Due to the change of scenery twice, the

Table 2 Comparison criteria of the three approaches (HVCCS, GRS, ZDPCS)

Criteria	HVCCS	GRS	ZDPCS
Theoretical presuppositions	None (inductive, descriptive approach)	None (inductive, descriptive approach)	Model of dream generation, problem-solving paradigm (deductive approach)
Validity	Face validity	Examined for specific scales, e.g., construct validity for emotions [20]	Criterion validity examined for levels of personality functioning [9]
Reliability	High [17]	Spearman rank correlations commonly range between 0.70 and 0.90 [19]	Substantial to strong [9, 22]
Coding material	Dream reports with a minimum length of 50 words	Dream reports	Edited dream report
Time required (learning the system, evaluation of a dream)	Medium	Low	High
Norm data	Available	None	None
Time course of dream content	Not considered	Not considered	Analysis of the dynamic development of the dream plot
Evaluation focus	Frequencies of categories	Intensity of overall impression	Affect regulation (shifts between involvement and safety principle)
Expedient unit of analysis/design requirements	Large number of dreams	Large number of dreams	Moderate number of dreams
Applicable to single dreams	Limited information	Limited information	Detailed analysis
HVCCS Hall and Van de Castle Coding System, *GRS* Global rating scales, *ZDPCS* Zurich Dream Process Coding System			

affective level is set to low, which reflects the potential of the dreamer to reset the dream complex twice and not having to stop the dream prematurely (e.g. by awakening). Presenting both interpersonal relations and the deficit self-aspects at the same time appears to be impossible at this time. For a clinical interpretation based on ZDPCS coding, additional clinical material from the case is mandatory. Based on the dream report alone, it can only be speculated that the dream presents a narcissistic complex: self-image as deficient. Looking into the mirror can be understood as an attempt to find affective reassurance through self-control. This culminates in the image of the hole in the face when abandoning the prosthesis, which can be understood as a crisis of identity instability. The focus on the face may reflect a basic bodily communicative structure of the dream complex. Resetting the dream twice may prove the determination of the patient to work on this conflict for which they have so far, however, only limited affect regulation capacities as evident from the early interrupts and the impossibility of presenting object relations and deficit self-aspects at the same time.

Discussion

In the following, the results of both approaches to dream report analysis will be compared with respect to several selected criteria (◘ Table 2).

Theoretical presuppositions

The ZDPCS is based on a dream-generation theory. Following French [6], dreams are viewed as attempts to deal with unresolved problems (complexes) such as neurotic conflicts or traumatic experiences. The dream process aims to find a solution or the currently best possible adaptation to the reenacted complex. To achieve this objective, a set of cognitive-affective procedures termed dream organization simulates, positions, and regulates cognitive elements. By transforming affective information from the dream complex into a simulated interactional experience, the dream receives its problem-solving potential; the dream ego can strive for better solutions in terms of interactive outcomes. In contrast, dream content analysis abstains from assumptions on how dreams are generated and what function they serve, resulting in its descriptive, inductive approach.

Coding material

Both approaches use the transcribed dream report. However, the ZDPCS refers to the actual content of the dream report and deletes specific narrative artifacts such as comments. Likewise, the order of the dream plot is restored if, for example, information about the beginning of the dream is reported at the end. The analysis is then based solely on this edited version. Thus, information such as comments from the dreamer is lost. Dream content analysis works with the unaltered dream report including comments of the dreamer which can help external raters to, e.g., clarify complicated narratives or the intensity of emotions. A trade-off between loss of information and merging dream and waking experience is revealed.

Evaluation categories

Two main categories of evaluation in HVCCS and ZDPCS focus on dream characters and social interactions; thus, both approaches capture the two characters that feature. HVCCS captures the male gender and categorizes the connection to the dreamer (familiar and husband). In the ZDPCS, the familiar quality is also captured but not gender, unless it is explicitly stated as an attribute. Moreover,

in the ZDPCS, persons are coded in each segment in which they appear, whereas in the dream content analysis, they are coded once, regardless of the duration/number of appearance(s).

Both social interactions in the dream, the kiss and the verbal interaction are captured from both systems. HVCCS captures their intensity based on content aspects; sexual intercourse is more intense than a kiss, as a verbal threat is less intense than physical harm. The intensity of interactions is captured in the ZDPCS based on formal characteristics (affective involvement of dream ego and complexity of simulated relationship model). A kiss or sexual intercourse results in the same code, which marks mutually regulated interaction with physical contact between a dream ego and a human person. Playing soccer is less intense than watching others play soccer and a soccer match on TV reflects even more distance.

Economic considerations

Whereas dream content analysis can be applied relatively easily, the ZDPCS requires intensive training. Likewise, the effort required to assess a single dream is much higher. Studies using dream content analysis require the selection of relevant scales. If scales on specific content aspects are not available, new scales need to be developed, leading to problems related to reliability and validity [19]. Parameters of interest can be constructed for statistical analysis, e.g., by the ratio of positive to negative emotions. The ZDPCS, on the other hand, does not directly provide global ratings for a single dream but offers a broader range of options for creating additional categories.

Empirical findings illustrate these differences. For example, when examining the dreams of veterans with respect to trauma-related psychopathology, analysis of dream content reveals that, among others, more "weapons," "aggression," "death," "threat," and "combat," and fewer "friendly interactions" are characteristic [2].

In comparison, an analysis of patterns of affect regulation dynamics in dreams of trauma survivors reveals that "an abrupt overwhelming beginning, passivity of the dream ego, absence of or failing of trials

to leave this passive position by means of interactions or locomotion, absence of or failing of metacognitions and metarelations, as well as a sudden ending and resulting on-off-character of the dreams" [22, p. 1] are characteristic.

Norm data

Extensive normative data on dream content are available for the HVCCS. However, Hall and Van de Castle [7] collected their data in the middle of the last century from mainly white students at universities in the USA. Accordingly, dreams of men more often take place in an outdoor setting, whereas explicit emotions are more frequently found in dream reports of women. On the one hand, one could thus assume that heteronormative gender roles from the 1950s are reflected in the results. However, surprisingly, these norms have been replicated several times (e.g. [4]). On the other hand, even though gender is a relatively simple trait factor, matching the dreamer's gender from a single dream report is difficult [18]. Especially for associations between clinical trait factors and dream content, large samples are necessary. Regarding the ZDPCS, no norm data are available thus far.

Time course of dream content

Dream content analysis assigns selections of content to categories or rates the intensity of overall impressions without considering the development of the dream plot. This may be comparable to the substitution of a movie by a photograph. However, the order of events carries more information than their presence alone. For instance, whether the dream ego confronts an enemy and then runs away or instead at first runs away but then turns to confront makes a significant difference from the perspective of dream regulation. Analyzing the transformations that lead from each segment to the next over the time course of the dream plot is a central advantage of the ZDPCS. Transformations from each segment to the next can be systematized according to whether the result is an increase or decrease in the level of affectualization of the dream [12].

Sample size considerations

Dream content analysis is usually performed to examine a rather large number of dreams due to its advantages in quantifying and identifying patterns within different samples. For instance, Rimsh and Pietrowsky [13] showed by using the HVCCS that dreams of anxiety patients contain, among other things, more characters, higher numbers of aggressive interactions, lower numbers of friendly interactions, and higher frequencies of misfortunes and negative emotions. Due to its descriptive character, dream content analysis for single dreams—as illustrated here—offers limited information.

The analysis of affect regulation by the ZDPCS focuses primarily on the dynamics of a single dream. However, the ZDPCS offers a wide range of options for quantifying specific aspects of dynamic affect regulation in dreams [3, 5, 22]. Capacities for affect regulation can be quantified, e.g., by the number of alternations between involvement and safety processes.

Conclusion

Only precise knowledge of the specific characteristics of different approaches to dream content allows researchers to adequately define their analytic strategy. This study illustrated the main differences between a descriptive and a theory-driven approach to dream content. A further intriguing option lies in a potential combination of both systems. For instance, dream reports could be assessed in the first step according to whether the capacity for affect regulation is high or low. In the second step, differences in dream content between both dream types could be evaluated.

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Declarations

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Zusammenfassung

Verschiedene Schlüssel öffnen verschiedene Türen: Analyse von Inhalt und Affektregulation in Traumberichten

Hintergrund: In der empirischen Traumforschung existieren zahlreiche Skalen und Ratingsysteme für verschiedene Facetten des Träumens.
Ziel der Arbeit: Vergleich zweier verschiedener Methoden zur Analyse von Traumberichten, die sich auf den Inhalt bzw. die Affektregulation konzentrieren.
Material und Methoden: Das Hall and Van de Castle Coding System (HVCCS), ergänzt durch zwei globale Ratingskalen, und das Zurich Dream Process Coding System (ZDPCS) wurden auf einen Traum eines Patienten mit Beeinträchtigungen der Persönlichkeitsfunktionen angewendet.
Ergebnisse: Der Vergleich beider Methoden zeigt deutliche Unterschiede hinsichtlich der theoretischen Voraussetzungen, des Kodiermaterials, der Auswertungskategorien, der Normdaten, des zeitlichen Verlaufs der Trauminhalte und ökonomischer bzw. die Stichprobengröße betreffende Erwägungen. Während sich das HVCCS beispielsweise durch seine ökonomische Anwendbarkeit auszeichnet, ermöglicht das ZDPCS eine detaillierte Rekonstruktion der dynamischen Entwicklung der Traumhandlung.
Diskussion: Nur die genaue Kenntnis der spezifischen Merkmale der verschiedenen Methoden zur Erfassung von Trauminhalten ermöglicht es Wissenschaftler:innen, ihre Analysestrategie adäquat zu definieren.

Schlüsselwörter
REM-Schlaf · Hall and Van de Castle · Zurich Dream Process Coding System · Emotionen · Persönlichkeit