

A diary study of dream recall: Successful dream recall and contentless dreams

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Summary. Contentless dreams or white dreams are defined as waking up with the impression of having dreamed but unable to recall any specific dream content. A sample of 69 students completed a dream recall frequency scale, an attitude towards dreams scale, and kept a diary for a two-week period. Comparable to previous home and lab studies, contentless dreams are quite common (about one third of the mornings). The number of contentless dreams however did not correlate with dream recall frequency (questionnaire), the number of mornings with successful dream recall, and attitude towards dreams. Thus, the findings indicate that contentless dreams are not simply an intermediate category between successful dream recall and no recall. Future research, e.g., using cueing techniques, is necessary to shed light on the phenomenon of contentless dreams whether these are simply forgotten dreams (due to interferences) or a minimal form of conscious experiences during sleep.

Keywords: Dream recall, contentless dreams, attitude towards dreams

1. Introduction

Successful dream recall is the fundamental prerequisite for dream research and clinical dreamwork, so researchers have studied the physiological and psychological factors associated with dream recall (Schredl, 2018). In studying the neuronal correlates of dream recall (Siclari et al., 2017), there was a renewed interest in an intermediate category of recall – between successful recall of dream experience and no recall – that is called “dreaming experience without recall of content” because brain activation patterns measured prior to awakening are distinct for all three categories. This intermediate category is also called “white dreaming” (DeGennaro & Violani, 1990) or contentless dreams (Cohen, 1972). The precise definition is a report of a distinct feeling of having been dreaming but failure to recall specific content (Cohen, 1972). Within a serial awakening paradigm in a laboratory setting awakenings resulting in contentless dreams are quite frequent (33% to 39%) – higher than the “no recall” option (Noreika, Valli, Lahtela, & Revonsuo, 2009; Siclari, LaRocque, Postle, & Tononi, 2013). This raises the question whether contentless dreams are a result of the awakening paradigm (awakenings every 15 to 30 minutes) and how often this phenomenon is occurring outside the lab in the home setting. Using a diary approach, Cohen (1972) and Cohen and Wolfe (1973) found similar percentages, e.g., the percentage of contentless dream reports ranged between 20% and 30% after awakenings at home. Some researchers (Goodenough, 1967) theorized that no specific recall of the content might be due to repression but subsequent research (Cohen & Wolfe, 1973; Goodenough, Witkin,

Lewis, Koulack, & Cohen, 1974) indicate that interferences during the awakening process might explain at least partly the phenomenon, e.g., calling the weather information number after awaking yielded 43% contentless dreams whereas lying quietly for the same amount of time yielded only 18% contentless dreams (Cohen & Wolfe, 1973). That is, contentless dreams are dreams that have been forgotten during the awakening process. Other theorists (Fazekas, Nemeth, & Overgaard, 2019) speculated that contentless dreams might be low quality dream experience with low vividness and less details and, thus, are not recalled. Windt, Nielsen, and Thompson (2016) argued that “white dreams” are indeed imageless dreams that are not associated with specific perceptions, bodily sensations or thoughts – a minimal form of conscious presence. Although one option is the study of neural correlates of contentless dreams in comparison to successful dream recall and no recall (Siclari et al., 2017), it seems also very promising to study the phenomenon and factors affecting the frequency of contentless dreams in a more natural setting.

The aim of the present study was to study the frequency of contentless dreams using a dream diary approach. In an exploratory way, we studied factors that might affect contentless dream frequency like motivation or attitude towards dreams.

2. Method

2.1. Participants

Overall, 69 persons (56 women and 13 men) participated in the study. Most of the participants were psychology students. Mean of age was 22.14 ± 2.68 yrs. (range: 19 to 31 yrs.)

2.2. Measurement instruments

Dream recall frequency was elicited by a seven-point rating scale (Schredl, Berres, Klingauf, Schellhaas, & Göritz, 2014). The wording of the scale was “How often have you

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Submitted for publication: February 2020

Accepted for publication: February 2020

DOI: 10.11588/ijodr.2020.1.70982

recalled your dreams recently (in the past several months)?" with the following categories: 0 = never, 1 = less than once per month, 2 = about once per month, 3 = 2 or 3 times per month, 4 = once per week, 5 = more than once per week, 6 = almost every morning. The retest-reliability of the scale is high is satisfying ($r = .83$, Schredl, 2004). In order to obtain units of mornings per two weeks, the scale was recoded using the class means (0 → 0, 1 → 0.25, 2 → 0.05, 3 → 1.35, 4 → 2.0, 5 → 7.0, 6 → 13.0), e.g., recalling a dream about once per week would result in 2 mornings with dream recall per 2 weeks.

For measuring attitude towards dreams the six-item scale of the MADRE (Schredl et al., 2014) was used. Each item has a five-point format (0 = Not at all, 1 = Not that much, 2 = Partly, 3 = Somewhat, and 4 = Totally), e. g., "I think that dreaming is in general a very interesting phenomenon." Retest reliability ($r = .842$, two-week interval) and the inter-item consistency ($r = .910$; Cronbach's alpha) were high (Schredl et al., 2014).

Next, the participants completed a dream diary over a 2-week period. The general instruction was as follows: Please state if you can remember last night's dreams. You can tick an intermediate category if you have the impression that you have dreamed, but cannot recall any specific dream content. The specific categories for each morning were: "No recall", "Yes, I have dreamed but forgot the content", and "Yes, I recall one or several dreams." If dream(s) were recalled, the participants were asked to record them as completely as possible. The number of mornings with explicit dream recall and contentless dreams were included in the analysis.

2.3. Procedure

The participants for the study entitled "Dreams and social cognition" were recruited from the University of Mannheim. Participants received course credits. For these kinds of studies (questionnaires, diaries) in healthy controls carried out within the university as a student project no specific approval of the ethics committee is necessary. The participants completed the MADRE questionnaire and afterwards the dream diary over a two-week period.

For the statistical analysis, the SAS 9.4 for Windows software (SAS Institute, Cary, North Carolina, USA) was used.

3. Results

For the total sample ($N = 69$), dream recall frequency (questionnaire) was distributed as follows: almost every morning ($N = 10$), several times a week ($N = 28$), about once a week

($N = 19$), two or three times a month ($N = 9$), about once a month ($N = 2$), less than once a month ($N = 1$), and never ($N = 0$). The recoded dream recall frequency per two weeks is depicted in Table 1. The figures for mornings with explicit dream recall and contentless dreams are also depicted in Table 1. Interestingly, the magnitude of explicit dream recall (diary) is comparable with the recoded questionnaire scale's magnitude. In addition, the correlation between these two measures is much higher compared the correlation between dream recall frequency (questionnaire) and the number of mornings with contentless dreams. The number of mornings with contentless dreams was not associated with the number of mornings with successful dream recall. Whereas a positive attitude towards dreams was associated with dream recall frequency (questionnaire) and number of mornings with explicit dream recall, it was not associated with the number of mornings with contentless dreams (see Table 1).

In Table 2, the changes in dream recall from Week 1 to Week 2 are depicted. Whereas the number of mornings with explicit dream recall decreased the number of mornings with contentless dreams didn't change.

4. Discussion

The findings clearly indicate that contentless dreams, i.e., the impression of having dreamed but not recalling any specific dream content, occur quite often (one thirds of the mornings during the two-week diary period) in the home setting. Whereas the number of successful recalled dreams is associated to attitude towards dreams and subject to decreasing motivation, the number of contentless dreams is not related to these two variables and is also not correlated with successful dream recall frequency and dream recall frequency measured via questionnaire. This indicates that contentless dreams are not simple an intermediate category between successful dream recall and no recall.

Before discussing the findings in detail, several limitations will be addressed. First, as no ambulatory polysomnographic recordings were performed the last sleep stage before awakening is not known. This is of importance as the percentage of contentless dreams in the lab setting is much higher after NREM awakenings compared to REM awakenings (Siclari et al., 2017). In order to study the effect of sleep stages on the occurrence of contentless dreams, ambulatory polysomnographic recordings would be necessary – easy to handle devices that participants can apply themselves have been developed (e.g., Appel, Leugering, & Pipa, 2016). As the study was naturalistic, there weren't any questions about possible interferences during the awakening process

Table 1. All three dream recall measures, their inter-correlations, and the correlations with attitude towards dreams.

Item	Mean ± SD	Correlation with attitude toward dreams scale	Correlation with contentless dreams (Diary)	Correlation with explicit recall (Diary)
Dream recall frequency (Questionnaire, recoded)	5.46 ± 4.02	.538 ($p < .0001$)	.124 ($p = .3154$)	.592 ($p < .0001$)
Number of mornings with explicit dream recall (Dream diary)	4.94 ± 2.52	.410 ($p = .0005$)	-.105 ($p = .3956$)	
Number of mornings with contentless dreams	5.07 ± 2.32	.066 ($p = .5915$)		

Note. For all diary measures: $N = 68$

Table 2. Explicit recall and contentless dreams for the first and second week (Dream diary).

Item	Week 1	Week 2	Week 1 vs Week 2
Number of mornings with explicit dream recall (Dream diary)	2.79 ± 1.45	2.15 ± 1.47	t = 3.6 p = .0006
Number of mornings with contentless dreams	2.51 ± 1.38	2.56 ± 1.08	t = -0.2 p = .8066

Note. For all diary measures: N = 68

included. Future studies addressing this topic would help to clarify whether interferences which have been shown to affect the occurrence contentless dreams in an experimental setting (Cohen & Wolfe, 1973) play also a role in everyday dream recall. Interestingly, interferences common in the home setting, e.g., being disturbed by a bed partner, did not affect successful dream recall in a home study (Schredl & Montasser, 1996).

The phenomenon of contentless dream, i.e., having the impression of having dreamed but no recall of content is quite common in the home setting (about 36.2% of all mornings) – comparable to previous home studies (Cohen, 1972; Cohen & Wolfe, 1973) and lab studies (Noreika et al., 2009; Siclari et al., 2013). From a methodological viewpoint, it was interesting that typical retrospective dream frequency scales (“How often have you recalled your dreams recently (in the past several months)?”) seems not to include contentless dreams (no correlation between this measure and the number of contentless dreams in the diary) but only to successful dream recall during the diary period. In addition, the means of the recoded scale with the number of mornings is comparable with the mornings with successful dream recall elicited via dream diary. This findings would suggest that participants themselves view contentless dreams as unsuccessful dream recall.

The well-known correlation between attitude towards dreams and dream recall frequency (e.g., Schredl & Göritz, 2017) was only found for the number of mornings with successful dream recall and not for the number of contentless dreams. As a positive attitude might be associated with paying more attention to dreams (Schredl, 2018), the contentless dreams category would be again more similar to the no recall category, as paying attention is not associated with an increased number of contentless dreams. This might have been expected if contentless dreams were some minimal form of dreaming (Fazekas et al., 2019). On the other hand, the decrease of successful dream recall from the first diary week to the second – probably due to loss of motivation as it is only found if the participants were asked to record the dreams and not in checklists which elicit only dream recall (Zadra & Robert, 2012) – is not paralleled by an increase in contentless dreams but by an increase in mornings with no recall. This might be interpreted that contentless dreams are not just forgotten dreams but a phenomenon with its own characteristics (Fazekas et al., 2019; Windt et al., 2016).

5. Conclusions and future directions

Contentless dreams (waking up with the impression of having dreamed but unable to recall any specific dream con-

tent) are quite common and the question is whether studying their relationship to psychological factors can help to differentiate between dream-encoding theories, that this are different dream types (Fazekas et al., 2019; Windt et al., 2016), or whether contentless dreams is explained by differences in the retrieval process (Schredl, 2018). A possible venue for future research is the effect of cueing on dream recall; Zuger (1966) and Domhoff (1969) reported that a considerable number of dreams were not recalled directly upon awakening but during the day if an experience or thought related to the dream content occurred, e.g., talking about movies has triggered the recall of a dream with Peter Sellers or watching a skiing ad on television brought back a skiing dream. Botman and Crovitz (1989) instructed the participants to think about specific cues whether they can trigger the recall of an additional dream not remembered in the free recall condition. In different experiments using groups of 10 words (colors, events of the previous day, childhood-related words) they were able to increase dream recall from about 20% up to 80%, with the childhood-related words (e.g., animal, damage, mother, play, school) as most effective cues. So, if cueing after reporting contentless dreams dramatically increases the number of successfully recalled dreams, the hypothesis that contentless dreams are forgotten dreams (presumably due to interference) would be supported. Another line of research could study whether the large inter-individual differences in reporting contentless dreams in the lab setting (Siclari et al., 2017) might be associated with impaired memory functioning during the awakening process; this reduced level of cognitive functioning is called sleep inertia and affects simple tasks like reaction time paradigms but also working memory and short-term memory (Tassi & Muzet, 2000). It would also be interesting to study whether personality factors associated with successful dream recall like openness to experience (Schredl & Göritz, 2017) can explain inter-individual differences in reporting contentless dreams. Lastly, it would be helpful to study the effect of dream recall training on the frequency of contentless dreams. Simple methods like keeping a dream journal can increase dream recall frequency (only successful dream recall has been studied) dramatically, especially in low dream recallers (Schredl, 2002). If dream recall can be trained to a level that almost every awakening leads to successful dream recall, this would again support the hypothesis that contentless dreams are forgotten dreams.

References

- Appel, K., Leugering, J., & Pipa, G. (2016). ‘Traumschreiber’: Measuring and manipulating human sleep with a portable high-quality but low-cost polysomnographic system. *Journal of Sleep Research*, 25(Suppl 1), 158.
- Botman, H. I., & Crovitz, H. F. (1989). Facilitating the reportage of dreams with semantic cues. *Imagination, Cognition and Personality*, 9, 115-129.
- Cohen, D. B. (1972). Failure to recall dream content: contentless vs dreamless reports. *Perceptual and Motor Skills*, 34, 1000-1002.
- Cohen, D. B., & Wolfe, G. (1973). Dream recall and repression: evidence for an alternative hypothesis. *Journal of Consulting and Clinical Psychology*, 41, 349-355.
- DeGennaro, L., & Violani, C. (1990). White dreams: The relationship between the failure in dream recall and degree of hemispheric lateralization. *Association for the Study of Dreams Newsletter*, 7(5), 7.

- Domhoff, B. (1969). Home dreams versus laboratory dreams - home dreams are better. In M. Kramer, R. M. Whitman, B. J. Baldrige & P. H. Ornstein (Eds.), *Dream psychology and the new biology of dreaming* (pp. 199-217). Springfield: Charles C. Thomas.
- Fazekas, P., Nemeth, G., & Overgaard, M. (2019). White dreams are made of colours: What studying contentless dreams can teach about the neural basis of dreaming and conscious experiences. *Sleep Medicine Reviews*, 43, 84-91.
- Goodenough, D. R. (1967). Some recent studies of dream recall. In H. A. Witkin & H. B. Lewis (Eds.), *Experimental studies of dreaming* (pp. 128-147). New York: Random House.
- Goodenough, D. R., Witkin, H. A., Lewis, H. B., Koulack, D., & Cohen, H. (1974). Repression interference and field dependence as factors in dream forgetting. *Journal of Abnormal Psychology*, 83, 32-44.
- Noreika, V., Valli, K., Lahtela, H., & Revonsuo, A. (2009). Early-night serial awakenings as a new paradigm for studies on NREM dreaming. *International Journal of Psychophysiology*, 74(1), 14-18.
- Schredl, M. (2002). Questionnaire and diaries as research instruments in dream research: methodological issues. *Dreaming*, 12, 17-26.
- Schredl, M. (2004). Reliability and stability of a dream recall frequency scale. *Perceptual and Motor Skills*, 98, 1422-1426.
- Schredl, M. (2018). *Researching Dreams: The Fundamentals*. Cham: Palgrave Macmillan.
- Schredl, M., Berres, S., Klingauf, A., Schellhaas, S., & Göritz, A. S. (2014). The Mannheim Dream questionnaire (MADRE): Retest reliability, age and gender effects. *International Journal of Dream Research*, 7, 141-147.
- Schredl, M., & Göritz, A. S. (2017). Dream recall frequency, attitude toward dreams, and the Big Five personality factors. *Dreaming*, 27(1), 49-58.
- Schredl, M., & Montasser, A. (1996). Dream recall: State or trait variable? Part II: State factors, investigations, and final conclusions. *Imagination, Cognition and Personality*, 16, 231-261.
- Siclari, F., Baird, B., Perogamvros, L., Bernardi, G., LaRocque, J. J., Riedner, B., Boly, M., Postle, B. R., & Tononi, G. (2017). The neural correlates of dreaming. *Nature Neuroscience*, 20, 872-878
- Siclari, F., LaRocque, J. J., Postle, B. R., & Tononi, G. (2013). Assessing sleep consciousness within subjects using a serial awakening paradigm. [10.3389/fpsyg.2013.00542]. *Frontiers in Psychology*, 4.
- Tassi, P., & Muzet, A. (2000). Sleep inertia. *Sleep Medicine Reviews*, 4, 341-353.
- Windt, J. M., Nielsen, T., & Thompson, E. (2016). Does consciousness disappear in dreamless sleep? *Trends in Cognitive Sciences*, 20(12), 871-882.
- Zadra, A. L., & Robert, G. (2012). Dream recall frequency: Impact of prospective measures and motivational factors. *Consciousness and Cognition*, 21, 1695-1702.
- Zuger, B. (1966). The time of dreaming and the *deja vu*. *Comprehensive Psychiatry*, 7, 191-196.