

# When a dream turns into a nightmare: Due to negative dream content or to negative appraisal?

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**Summary.** Nightmares are a well-known phenomenon. The content of aversive dreams seems to be ubiquitous in dreams. Nevertheless, a dream containing aversive contents does not necessarily have to be a nightmare. We hypothesize that nightmares are rather caused by a more negative appraisal of the contents of aversive dreams than by the dream content itself. To investigate this question,  $N = 99$  participants kept dream diaries over 28 consecutive days. An experimental group included persons with frequent nightmares and a control group of persons without nightmares. Violent dream content and emotions during the dream were analyzed by the dreamers themselves and as well as by four external raters. Regarding violent dream content in non-nightmare dream reports, the external raters usually agreed with the dreamers' ratings. However, there was significant disagreement regarding the nightmare reports. Furthermore, external raters significantly rated the dreams as less positive than the dreamers did, and external raters rated the nightmare reports as more negative than the dreamers themselves did. Taken together, the results support the hypothesis that the classification of a dream as a nightmare does not only depend on its content but also on other factors. This suggests that the dreamers' ratings of a dream as a nightmare are based on more factors than dream content.

**Keywords:** Dreams, nightmare, emotions, neuroticism, dream content analysis

## 1. Introduction

Nightmares are very unpleasant dreams which are remembered in detail. They are alerting and often awaken the sleeper (Gieselmann et al., 2019; Hartmann, 1984; Krakow, 2006; Zadra, Pilon, & Donderi, 2006). According to the fifth revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), the dreamer does not have to be awakened by the dream to have it be classified as a nightmare (American Psychiatric Association APA, 2013).

There are also dreams which are not experienced as nightmares by the dreamer, despite the fact that they contain negative content (dreams with negative emotional content that do not wake the dreamer up and are contrasted with nightmares that have negative content and wake the dreamer up). In their attempt to investigate the differences between bad dreams and nightmares, Robert and Zadra (2014) showed that the contents of nightmares were most often related to topics of "being chased", "physical aggression" and "death". Otherwise, the contents of bad dreams were "interpersonal conflicts", "physical aggression" and "apprehension/worry", whereas physical aggression was significantly less frequent in bad dreams than in nightmares. In one study, nightmares contained more intense content than bad dreams (Robert & Zadra, 2014). The frequencies were comparable to former results concerning the nightmare

contents; here the most frequent nightmare contents were "falling" (40%), "being chased" (26%) and "being paralyzed" (25%; Schredl, 2010). Moreover in another study, recurrent nightmares were compared with non-recurrent nightmares and unpleasant dreams. The dream reports were obtained from several online databases and were labeled as non-recurrent nightmares, recurrent nightmares and unpleasant dreams by the dreamers. Overall, 135 recurrent nightmares, 475 nightmares and 433 unpleasant dreams were carried out. Here, physical aggression was found in 68% of all recurrent nightmares, in 53% of all nightmares and only in 30% of all unpleasant dreams. In nightmares, the aggressions caused by humans were most often caused by an unfamiliar male person (16%), whereas bad dreams were mostly about interpersonal conflict and generalized apprehension (McNamara, Minsky, Pae, Harris, Pace-Schott & Auerbach, 2015).

In addition to aggression, nightmares are characterized by the experience of a threat to one's own life or the life of others, e.g., by falling, being paralyzed or from harmful diseases. However, such unpleasant feelings may also occur in dreams not regarded as nightmares by the respective dreamer. But dreams classified as nightmares by the dreamer may include events that seem less aversive by other persons. In other words, are the intense unpleasant feelings evoked by dreams and regarding these dreams as nightmares due to their content, or due to the emotional appraisal? Previous studies were able to show that a higher stress level in waking-life was highly correlated with nightmares (Blagrove, & Fisher, 2009; Schredl, 2003; Soffer-Dudek, & Shahar, 2011), which may indicate that the higher stress level may either induce more threatening dreams or influence the rating of an aversive dream as threatening. Furthermore, a broad spectrum of studies indicates that the trait neuroticism is associated with frequent nightmares (e.g., Berquier, & Ashton, 1992; Blagrove, Farmer, & Wil-

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liams, 2004; Köthe & Pietrowsky, 2001; Lang, & O'Connor, 1984; Zadra, & Donderi, 2000). From these studies, one may conclude that (a) the subjective impression of a high amount of waking-life distress is caused by the personality style of neuroticism rather than by objective waking-life distress. Further, (b) the appraisal of negative events and emotions (e.g., aversive dream content) as more harmful in high neuroticism compared to individuals with in low neuroticism may be responsible for the higher frequency of (reported) nightmares. Experiencing nightmares causes nightmare distress, which contains several categories: Nightmare intensity, nightmare effects, nightmare related symptoms and the perception of nightmare distress (Böckermann, Gieselmann & Pietrowsky, 2014).

Moreover, a study from Schredl and Doll (1998) showed that external raters and the dreamers themselves drew different conclusions about the same dreams: The external raters rated the dreams (not nightmares) as being less positive than the ratings from the dreamers. In this study, 964 dream reports were collected from a sample of 263 participants. The participants were instructed to keep a narrative dream diary for 14 days, where they had to rate positive and negative emotions they experienced while dreaming. The dream reports were given to a blind external rater, who was also instructed to rate the positive and negative emotions of the dream-self on the same scale. The results show positive correlations between self-reports and external ratings, however, the positive emotions were rated lower by the external raters than by the dreamers themselves (Schredl, & Doll, 1998). The same results were replicated in a different study, such that the external raters underestimated the intensity of positive emotions in dreams (Röver & Schredl, 2017). Further, a similar study of Sikka, Feilhauer, Valli and Revonsuo (2017) also compared self-reported and external rated dream emotions, using the modified Differential Emotions Scale (smDES; Fredrickson, 2013), that contains an item list of positive and negative dream emotions. As well, the external raters rated the dreams less positive compared to the dreamers themselves (Sikka et al., 2017). An explanation for this effect could be that emotions of the dream-self may not necessarily be consistent with those in comparable situations in waking-life (Valli, Strandholm, Sillanmäki & Revonsuo, 2007). However, the studies of Schredl and Doll (1998) and Röver and Schredl (2017) did not explicitly include nightmares. For nightmares of persons with frequent nightmares, we expect an effect in the opposite direction: In nightmares, the dream contents will be more negatively appraised by the dreamers compared to external raters.

Thus, the aim of the present study was to investigate the factors which may determine if a dream is regarded as a nightmare by the dreamer, i.e., which turn a dream into a nightmare. On the one hand, this can be due to the objectively more threatening contents of nightmares compared to other dreams; on the other hand, this can be due to a rather more negative appraisal of the dream content. Thus, nightmares should be compared with dreams, not declared as nightmares (within the group of nightmare dreamers) and with non-nightmare dreams in a control group having no or rare nightmares. To investigate this question, emotions reported during and following non-nightmare dreams and nightmares were rated by four external raters, who also rated whether the dream report was judged as a nightmare or a non-nightmare dream by the dreamer. We hypothesize that nightmare dreamers report more violence, negative emo-

tions and threatening events in nightmares than the control group, indicating that they experience their dreams as more harmful and distressing. Dream reports of nightmares should also be estimated as more positive and less negative in the external rating than as experienced by the participant. Moreover, we hypothesize that external raters will estimate dreams with a significant lower probability as nightmares compared to the nightmare-dreamers, while there should be no difference for non-nightmare reports between dreamers and external raters. Last, we expect interaction effects of self-reported and externally rated negative emotions on nightmare frequency.

## 2. Method

### 2.1. Participants

The participants were recruited via several online platforms (Psychologieforum.de, Stud.IP University of Oldenburg, onmeda.de, patientenfragen.de) and also via an advertisement on the university campus. The study was conducted in German. Participants were divided into two groups: The nightmare group and the control group. Inclusion criteria for participation in the nightmare group included more than one nightmare per month, the absence of any mental disorders and the absence of consuming nightmare-influencing drugs (illegal drug consumption, or psychotropic drugs as antidepressants, antipsychotics and benzodiazepines). Inclusion criteria for the control group ("normal dreamers") were the same, except that the nightmare frequency should be not higher than one nightmare per month. The drop out rate was very low, only  $n = 3$  participants answered the questionnaires and did not return their dream diaries. The final sample contained  $N = 99$  participants,  $n = 54$  nightmare dreamers and  $n = 45$  normal dreamers. The age difference between nightmare dreamers and normal dreamers was not significant ( $t_{98} = -.486; p = .628$ ). Most participants were students ( $n = 88$ ),  $n = 9$  had an occupation, one participant was in retirement and one was a housewife. Mean age with standard deviation was by  $24.74 \pm 8.02$  years with a range between 18 and 64 years. There was no significant difference in age between males ( $n = 14$ ) and females ( $n = 85$ ;  $t_{98} = .226; p = .821$ ).

### 2.2. Research instruments

*NEO-FFI.* The NEO-FFI is a multidimensional personality questionnaire which is suited to measure the big five personality traits (Costa & McCrae, 1992). Items are answered on a scale ranging from 0 (strongly disagree) to 4 (strongly agree); retest-reliability is between  $r = .72$  and  $r = .87$ . For the current research, the neuroticism scale was evaluated only, and internal consistency was  $\alpha = .87$  (Costa & McCrae, 1992).

*Offender's questionnaire.* The offender's questionnaire was adapted from the study from Mathes, Renvert, Eichhorn, von Martial, Gieselmann & Pietrowsky (2018). This dream content questionnaire assesses whether the dreamer performs or experiences aggression during dreaming. The questionnaire was answered after every recalled dream by half of the participants. The first four items of the questionnaire are used for screening. If one of these items was answered positively, the participant was instructed to fill out the complete questionnaire. Screening items were formulated as statements: 1 (Somebody had been attacked physi-

cally), 2 (Somebody had been killed), 3 (Somebody had been attacked verbally), 4 (Somebody had been attacked sexually). This was answered on a 3-point scale: 1 (yes, intentionally), 2 (yes, by accident), and 3 (no). Further it was asked how the violent act was caused: 1 (by an accident), 2 (by a natural catastrophe), 3 (by misfortune), 4 (by a dream character). In case the offending act was caused by a dream character, the participant rated what type of relationship the offender had to the victim ("enemy", "acquaintance", "relative", "friend", "stranger", "adversary", "partner", "animal", "mythical creature/beast" or "other"), which tool the offender used ("bare hands/power", "weapon", "magic spell", "ruse", "poison" or "other"), if the act was planned ("accident", "affect", "planned") and the motive of the offender ("anger", "self-defense", "hate", "pleasure", "fun", "force", "jealousy", "love", "to protect/save somebody", "revenge", "money" and "other"). There is no reliability or validity evidence for the questionnaire.

Dream recall frequency was assessed by a questionnaire published by Schredl (2002). The general dream recall frequency is recorded on a 7-point Likert scale ranging from 0 to 6, how frequently the participant is able to recall his or her dreams: 0 (never), 1 (less than once a month), 2 (about once a month), 3 (twice or three times a month), 4 (about once a week), 5 (several times a week) and 6 (almost every morning). The retest-reliability of the questionnaire was reported with  $r = .85$  (Schredl, 2004). Additionally, the nightmare recall frequency was measured on a 8-point Likert scale ranging from 0 to 7: 0 (never), 1 (less than once a year), 2 (about once a year), 3 (about 2 to 4 times a year), 4 (about once a month), 5 (about 2 to 3 times a month), 6 (about once a week), 7 (several times a week). The general mood during the dreams could range from -1 (mostly negative), 0 (equal) and to 1 (mostly positive). The emotional intensity of the dreams were rated on a 5-point Likert scale ranging from 1 (not intense) to 5 (very intense; Schredl, 2002).

*Dream diary.* To record dream content, a structured dream diary was kept over 28 consecutive days by the participants. It consisted of two parts. The first part contained questionnaire items about sleeping behavior that were filled out daily immediately after awakening. Additionally, the participants answered if they were able to recall their dreams every morning: 0 (no recall), 1 (yes, I dreamed last night but I can't remember) and 2 (yes, I can recall at least one dream). If they were able to recall at least one dream, participants were asked to fill out the second part of the questions (on a maximum of twelve days each person). The dream content of the previous night should be described narratively by all participants. More than one dream sequences per night were counted as one dream. The positive emotions (e.g. joy, surprise, happiness) and negative emotions (e.g. fear, disgust, anger) that occurred in each dream were rated on a four-point-scale: 0 (no emotion), 1 (mild), 2 (moderate) and 3 (strong emotions). Furthermore, participants indicated the intensity of the dream on a Visual Analog Scale ranging from 0 (negligible) to 100 (worst conceivable dream). Finally, participants indicated whether or not their dream was intuitively perceived as a nightmare. If participants reached a number of twelve reported dreams, they were required to only complete the first part of the diary.

*Mini-DIPS (Screening for mental disorders).* The short diagnostic interview for mental disorders was conducted to exclude participants with mental disorders other than nightmare disorder (Margraf, 1994). The structured interview is

based on the DSM-IV (American Psychiatric Association) and the ICD-10 (WHO, 1992) criteria. A benefit of the Mini-DIPS is that a diagnosis by standardized questions can be made in a relatively short time. The reliability of the Mini-DIPS is between .84 and .98, which can be seen as very high (Margraf, 1994).

### 2.3. Dream content analysis

The dream content analysis of the narrative dream reports was conducted with a dream analysis manual based on the offender's questionnaire to ensure optimal comparability to the other subsample that was using the offender's questionnaire. In addition to the items about violence in dreams, the positive and negative emotions of the dream-self were rated in the same way as the questionnaire: 0 (no emotion), 1 (mild), 2 (moderate) and 3 (strong emotions) and the dream intensity ranging from 0 (negligible) to 10 (worst conceivable dream). The dream contents of the narrative version of the dream diary was rated by four raters, who had no access to information about the participants and were blind to their assigned groups (e.g., if the participants were from the control group or from the nightmare group). Considering all scales of the offender's questionnaire, interrater-reliability (Cohen's Kappa) was between  $r = .400$  and  $r = .878$ , which can be seen as sufficiently good. Mean and standard deviation of the rater's Neuroticism score was  $M = 1.61$  ( $SD = 0.89$ ), which is relatively low but in the range, compared to the norm sample (Costa & McCrae, 1992).

### 2.4. Procedure

After the participants expressed interest in the study via e-mail, they were asked to take part in a telephone interview in order to check for inclusion and exclusion criteria. All candidates who were suitable for participations were invited to fill out the questionnaires (see below). In case the participants chose the online version, a link for the online-questionnaires was sent to them, and the other participants received a paper version dream diary. Overall  $n = 42$  (42.4 %) participants chose the online version, whereas  $n = 57$  (57.6 %) chose the pen and paper version. All participants were instructed to record their dreams for 28 consecutive days every morning using a dream diary. The study consisted of two subsamples: One half of the participants received a narrative dream diary, and the other half received a dream diary containing a dream content questionnaire, where no writing was required. This was determined by a random order. After participation, all  $N = 99$  participants returned the dream diary and were paid 24 Euro. A total of  $N = 1047$  dream reports was collected.

### 2.5. Statistical Analysis

The statistical analysis was conducted with SPSS Version 24 for Windows. All analyses were conducted with an alpha level of .05. To investigate statistically significant differences between self-reported and externally rated emotions in dream reports, t-tests for paired samples were calculated. Also, t-tests for unpaired samples were conducted to investigate significant differences in violent dream content and dream emotions between dreamers and nightmare dreamers. One  $\chi^2$ -Test was applied to investigate how many dream- and nightmare reports are estimated as dreams and nightmares by the dreamers themselves and external rat-



Table 1. Comparisons of normal dreamers and nightmare dreamers in neuroticism and dream emotions (N = 99)

	Normal dreamers <i>M ± SD</i>	Nightmare dreamers <i>M ± SD</i>	<i>t</i>	<i>p</i>	<i>d</i>
Neuroticism	1.69 ± 0.69	1.90 ± 0.70	-1.525	.130	-.303
Positive emotions	1.33 ± 0.57	1.06 ± 0.57	2.365	.020	.478
Negative emotions	1.13 ± 0.56	1.53 ± 0.55	-3.520	.001	-.711
Violence in dreams	0.12 ± 0.16	0.25 ± 0.22	-3.189	.002	-.676

ers. Furthermore, the self-reported and external rated negative emotions between normal dreams and nightmares were compared with a one-factor ANOVA for repeated measurements (self-reported and externally rated negative emotions) with the factor nightmare frequency. Lastly, a logistic regression was calculated to investigate which characteristics of the dreams influenced the dreamer and the external rater to rate dreams as normal or as nightmares.

### 3. Results

In total, the participants of the nightmare group reported 297 dreams from which were 95 nightmares (32 %) while the participants in the control group reported 202 dreams from which 18 were nightmares (8.9 %). During the 28 days, participants from the nightmare group were able to recall on average 12.06 ± 6.25 dreams (range: 1-28 recalled dreams). Their neuroticism score was *M* = 1.90 (*SD* = 0.70) on a scale between 0 and 4. The participants from the control group however reported on average 10.82 ± 5.16 dreams (range: 1-22 recalled dreams) and their neuroticism score was *M* = 1.73 (*SD* = 0.65). These differences did not reach statistical significance. Participants of the control group reported that they suffer on average from *M* = 0.39 (*SD* = 0.76) nightmares per month, whereas the nightmare group reported that they suffer from *M* = 3.93 (*SD* = 2.54) nightmares per month. The number of nightmares during the 28 days study period was *M* = 3.39 (*SD* = 3.18) in the nightmare group and *M* = 0.78 (*SD* = 1.00) in the control group.

There were significantly more positive emotions and less negative emotions in non-nightmare dreams of the control group than in non-nightmare dreams of nightmare dreamers. As well, nightmare dreamers reported significantly more violent dream contents than the non-nightmare dreamers in the non-nightmare dreams. Thus, the first hypothesis is confirmed (Table 1).

Differences between the self-reports and the external ratings of positive and negative emotions in the dream reports and in dream intensity of nightmares are given in Table 2: The second hypothesis is not confirmed that dream reports were estimated as more positive and less positive in the

external rating than as experienced by the participant. In fact, the opposite was the case. The differences in the emotional ratings were statistically significant, while this was not the case for the intensity ratings. Likewise, correlations between self-reports and external ratings of positive and negative emotions and dream intensity were positive and highly statistically significant.

Table 3 shows the number of non-nightmare dreams and nightmares as rated by the dreamers themselves and the external raters. As hypothesized, external raters mostly confirm the dreamer's ratings of normal dreams, whereas more than half of nightmare reports of the dreamers were estimated as normal dreams by the external raters ( $\chi^2 = 132.93$ ;  $p < .001$ ;  $\phi = .519$ ; Table 3). Thus, our third hypothesis was confirmed that external raters agree with the dreamers in their rating of non-nightmare reports, while they significantly differ from the nightmare dreamers in the rating of dream reports as nightmares.

An ANOVA for repeated measures concerning the source of the rating (self-reported and externally rated) of negative emotions (*N* = 499) did not yield any significant differences between the source of the rating ( $F_{5,490} = 2.89$ ;  $p = .090$ ;  $\eta^2 = .006$ ), but on the type of the dream, the interaction between self-reported and externally rated negative emotions and type of dream reached statistical significance ( $F_{5,490} = 5.25$ ;  $p = .022$ ;  $\eta^2 = .011$ ). To specify this interaction effect, separate t-tests were calculated for differences between self-reports and external ratings. These analyses revealed that differences were significant for non-nightmare reports ( $t_{378} = -4.03$ ,  $p < .001$ ;  $d = -.415$ ), but not for nightmares ( $t_{112} = .38$ ,  $p = .703$ ;  $d = .072$ ). The self-estimated negativity of non-nightmare dream reports was *M* = 1.20 (*SD* = 0.93), whereas the externally rated negativity was *M* = 1.38 (*SD* = 1.00). In contrast, the externally rated negativity for nightmares was *M* = 2.58 (*SD* = 0.72), whereas the self-estimated negativity for nightmares was *M* = 2.60 ± .63.

A prediction for estimating a dream report as a nightmare or a normal dream based on a logistic regression is shown in Table 4. Here, also the word count was included for con-

Table 2. Differences between self-reports and external ratings of positive and negative emotions and dream intensity of narrative dream reports, and also correlations between self-ratings and external ratings

	Self-reports <i>M ± SD</i>	External ratings <i>M ± SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>	Correlation between self-reports and external ratings	<i>p</i>
Neuroticism	1.09 ± 1.00	0.88 ± 0.98	5.042	490	<.001	.456	.540	<.001
Positive emotions	1.52 ± 1.06	1.66 ± 1.07	-3.479	491	.001	-.314	.684	<.001
Intensity	27.78 ± 26.50	29.78 ± 25.73	-1.612	493	.108	-.145	.411	<.001

Table 3. Participants' ratings and external ratings of dreams as nightmares or non-nightmare dreams (N = 494\*)

	External rated normal dream	External rated nightmare	Total
Self-reported normal dreams	364 (95.54 %)	17 (4.46 %)	381 (100 %)
Self-reported nightmares	59 (52.21 %)	54 (47.79 %)	113 (100 %)

Note: \* The dream length of n = 5 nightmare reports was too short to estimate adequately as normal dreams or nightmares.

trolling purposes. The total variance explained (Nagelkerke  $R^2$ ) was  $R^2 = .383$  and the model was highly significant ( $p < .001$ ). The results showed that the externally rated negative emotions, but not the externally rated positive emotions of a dream are influencing the classifying a dream report as a nightmare. However, the self-reported emotions by the participants were not significantly influencing the rater's classification.

#### 4. Discussion

The results of the present study indicate that only about half of the dreams that were regarded as nightmares by the dreamer were also regarded as nightmares by external raters. This indicates that the impression of a dream as a nightmare may be caused by factors other than pure content alone. On the other hand, the external raters rated negative emotions during nightmares as not significantly different from the dreamers themselves. It can thus not be concluded that the probability to regard a dream as a nightmare was caused by generally more negative emotions in the dreamers.

In line with these results, the logistic regression revealed that the rated negative emotions by the external rater, but not by the dreamer predicted the classification of a dream as a nightmare by the external rater. In other words, not the reported negative emotions of the dreamers, but only the emotional rating of the external raters affected their classification. The estimated intensity of positive and negative emotions in dream reports of external raters was highly significantly correlated with the self-reported emotions of the participants; whereas the external raters rated the negative emotions higher and the positive emotions lower than the participants did in normal dreams. This could be explained in two ways: First, due to a general under-estimation of positive emotions during the external ratings, positive emotion descriptions are not as detailed as negative emotion descriptions in dream reports, which may lead to the conclusion that dreams are less positive. Another explanation

is that experienced emotions in dreams do not necessarily need to be consistent with the dream content and situations the dream-self is exposed to. So external raters may be biased in rating the emotions in dreams of other persons. There should be kept in mind that they had only words from the dreamers to make judgments while the dreamers had actual memories and dream context from their life and possibly emotions when they completed their ratings.

Limitations of the present study are that the sample contains more females than males, which may be not representative for a nightmare dreamer population. Another problem is that the participants may have a different definition or understanding of a nightmare than the external raters. Moreover, the external raters had only the verbal dream report while the dreamers had the multisensory dream experience as basis for their judgment. Thus, these possible differences in the experience and understanding of the nightmare could also explain some of the results.

Taken together, the results support the hypothesis that the classification of a dream as a nightmare does not only depend on its content but also on other factors. About 50 % of the nightmares were not rated as nightmares by external raters. This suggests that only the dreamers themselves can decide whether they have had a nightmare or whether it was just a normal dream. Results indicate that nightmare frequency can be decreased by a lower emotional appraisal both during waking-life and dreaming. Further research is needed to substantiate the differences between dreamers and external raters in the appraisal of a nightmare.

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Table 4. Logistic regression for externally rated dream reports as a nightmare, including nightmares per participant, self-reported and externally rated positive and negative dream emotions and word count (N = 490)

Predictors	Wald $\chi^2$	<i>p</i>	Odds Ratio	Low	High
Nightmare by participant	12.899	<.001	5.405	2.152	13.576
Positive emotions self-reported	.059	.808	.935	.542	1.611
Negative emotions self-reported	.009	.926	1.032	.530	2.009
Positive emotions externally rated	2.948	.086	.581	.313	1.080
Negative emotions externally rated	25.949	<.001	53.932	11.628	250.146
Word count	6.806	.009	1.003	1.001	1.005

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