

Structural differences between waking life narrations and dream reports: A lexical approach

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Summary. Dreams have held the attention of psychology researchers for a long time. One possible explanation for dreams is that they represent the brain's attempt to consolidate impressions and emotions from waking life. However, little is known about how the language in dream reports differs from waking life narrations. Using a lexical approach to examine dream reports can facilitate our understanding of the nature of dreams more deeply. We hypothesize that dream reports are syntactically different from waking life narrations as measured by the percentage of given parts of speech. Moreover, certain frequently used parts of speech may be associated with nightmare frequency and negative dream emotions. Two groups of participants kept a structured dream diary over 28 consecutive days. For comparison, a third sample of students wrote reports about their waking life. Results showed that there were structural differences between dream reports and waking life narrations. These results support the Continuity Hypothesis and also suggest that dream reports may be more negatively toned than those of waking life. Future research could investigate this more deeply.

Keywords: Dreams, nightmares, emotions, parts of speech, dream content analysis

1. Introduction

For a few decades, dreams have held the attention of psychological research, and there have been various attempts to examine what distinguishes experiences in dreams from the experience during wakefulness (Bulkeley, 2016). For example, the Continuity Hypothesis asserts that the experiences from waking life are embedded in dreams (Hall & Nordby, 1972). According to this theory, dream experiences cannot differ significantly from waking life experiences (Domhoff, 2011).

However, the Continuity Hypothesis also has its limits. One could argue that the definition remains too vague, and therefore always continuity could be interpreted from waking life to dreams. Further, a study by Schredl and Hofmann (2003) investigated the activities from both dreams and waking life. To observe continuity, they observed how much time the participants spent reading, writing, calculating and working on a computer. Their results showed that in dreams, writing, calculating and working on a computer rarely occurred in the participants' dreams, although they spent significantly more time with these activities in waking life. On the other hand, they spent more time with talking with friends in dreams than during their waking-lives. These results thus do not completely support the Continuity Hypothesis. The authors explained their results by pointing

to the emotional involvement of waking life experiences: Experiences such as reading, calculating or working at the computer are not as intensely connected with emotions as talking with friends (Schredl & Hofmann, 2003). In addition, brain activity during REM-sleep may not allow a person to focus as intensely on cognitive functions such as writing or calculating as is possible in waking life (Hobson, 1988).

Furthermore, it is evident that the kind of methods that have been used for observing dreams also interfere with the results. For example, voice-recorded dreams are on average three times longer than written dream reports (Schredl et al., 2019). Another study found similar results, that the report modality affected the dream experience representation and spoken dreams were found longer than written dream reports. But controlling for dream length could eliminate any difference between spoken and written dream reports in bizarreness (Casa-Grande & Cortini, 2008). Also, previous studies have shown that dream reports obtained using with the "most recent dream"-method contain significantly more emotional content than dream reports obtained using a dream diary. The authors of these studies explained this by the fact that participants might better remember more emotional dream topics, which is why persons often report more extraordinary dreams when they are asked to report their most recent dream. Dream reports from dream diaries are therefore more mundane (Mathes & Schredl, 2013; 2014). Also, the results are skewed by the way how dreamers describe their dreams. For example, it is possible to extract more information from a longer dream report than from a shorter one. Moreover, a short dream report does not necessarily indicate that the dreamer did not experience more than he or she reported, only that the dreamer did not recall as much. To overcome this bias, many dream studies use the word count of reports as a control variable (e.g., Schredl, 1998; König, Mathes & Schredl, 2016).

To analyze dream reports, several dream content analyses can be used. e.g. the Hall and Van de Castle coding system

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Submitted for publication: September 2024

Accepted for publication: April 2025

DOI: 10.11588/ijodr.2025.2.106987

(HVdC; Hall & Van de Castle, 1966). Previous research mainly focused on the number of words or sentences per dream report (Elce et al., 2021). Newer studies have also developed word categories for dream reports, e.g. “School”, “Walking/Running” or “Transportation” on the basic assumption that conclusions can be drawn about dream content and dream emotions via word frequencies (Sood et al., 2022). However, in addition to investigating dreams via dream content analysis, using a lexical approach is also possible.

An advantage of the lexical approach may be a greater objectivity. Dream content analyses are usually done by two different raters, who might possibly evaluate a dream differently due to their own subjective experiences; this is not the case in the lexical approach (Sood et al., 2022). However, one disadvantage compared to the dream content analysis of dream reports is that the information derived from the overall coherence and syntax of a sentence is not further considered (Elce et al., 2021). Sood et al. investigated in their study two dream samples both with the HVdC, and also with an own written language program (SALAD). They found that their codings obtained with SALAD were consistent with the codings obtained with HVdC (Sood et al., 2022). Furthermore, Zheng and Schweickert (2021) conducted a similar study and comparing HVdC ratings with the linguistic Word Count Program (LIWC; Pennebaker et al., 2015), and could confirm that these two different tools show a good comparability (Zheng & Schweickert, 2021). Also, Bulkeley came to the same results when comparing these two measurements (2018).

Moreover, it would also be interesting to focus on the structural differences between nightmares and non-nightmare reports. Per definition, nightmares are frightening and vivid dreams that can be remembered in detail (American Psychiatric Association APA, 2013)], and research also showed that nightmares are emotionally more intensive than non-nightmares (e.g. Hartmann, 1984), therefore the wording structure could be different. Mallett et al. (2021) assessed whether dream content from dream diaries can predict the morning mood of participants. For analyzing the dream diaries, an objective automated word detection approach was applied. The results show that the self-rated morning mood correlated significantly with affect words in dreams, e.g. death or body-related words. Moreover, the usage of the first-person pronoun “I” was lower correlated with a good morning mood than the usage of the first-person pronoun “we”. (Mallett et al., 2021). Paquet et al. investigated the language usage in nightmare reports of PTSD-patients. It was shown that words related to negative emotions were related to increased PTSD-symptoms and nightmare distress. This lets indicate that the word use is impacted by cognitive and emotional processes (2020).

To more deeply understand how the human brain processes dreams differently than waking life experiences, it may be fruitful to take a closer look at dream reports. We assume that there are fundamental differences in the frequencies of several word groups between dream reports and waking life descriptions. Furthermore, we hypothesize that there are correlations between negative dream emotions and the percentage of nouns, verbs and adjectives, as well as for nightmare frequency. To do so, we compared two different samples of dream report with a third sample of waking life narrations. We hypothesize that negative dream emotions and nightmare frequency also have an influence on the relative frequency of verbs, adjectives, and nouns.

This is a primarily mainly explorative and hypothesis-generating study.

2. Methods

2.1. Participants

Overall, three samples were collected, where the participants of the first two samples were instructed to report their dreams, and the participants of the third sample was obtained to record waking life narrations for comparison.

Dream sample 1: The participants of the first sample were recruited via an advertisement on a university campus, as well as via several online platforms. Inclusion criteria for participation included an absence of any mental disorders, an absence of consuming nightmare-influencing drugs and being native German speaker. This first sample consisted out of two sub-groups: The nightmare group, where participants regularly reported more than one nightmare per month, and the control group, where participants reported fewer nightmares than those of the nightmare group. The final sample contained $N = 99$ participants, where $n = 54$ belonged to the nightmare group and $n = 45$ to the control group. 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 stay-at-home-parent. The mean age with standard deviation was 24.74 ± 8.02 years, ranging from 18 to 64 years. There were no significant age differences between males ($n = 14$) and females ($n = 85$; $t_{98} = .226$; $p = .821$).

Dream sample 2: The second sample contained $N = 103$ participants; $n = 13$ participants were male, while $n = 89$ were female. In contrast to the first sample, it was obtained four years later, and consisted solely of nightmare dreamers. Most participants stated that they were students ($n = 60$) or had an occupation ($n = 32$). One participant was in retirement and one participant was still in secondary school. Overall, four participants stated that they did not have any occupation. The mean age with standard deviation was 27.56 ± 7.97 years, ranging from 18 to 61 years. There were no significant age differences between nightmare dreamers and non-nightmare dreamers ($t_{101} = .204$; $p = .838$).

Waking life narrations: These participants were recruited via an advertisement on a university campus. Inclusion criteria for the study included being at least 18 years old, and being registered as a student at that university. The final sample contained $N = 291$ participants. This third sample was not asked about their age, gender, or occupation. After participation, they received credit points for their studies as a reward.

2.2. Procedure

The procedure for the participants of the two dream report samples was the same. First, they were informed in a telephone interview about their inclusion in the study. After confirming that they fulfilled the inclusion criteria, each participant received a link to fill out an online questionnaire. Following that, they received a second link to an online dream diary, where they were instructed to record their dreams for 28 consecutive days. They were to describe their dreams in as much detailed as possible and answer questions about the dream content.

To conduct the lexical approach, the written dream reports were typed into a text document and then converted into an Excel spreadsheet. This conversion was done using an online tool (woerter-zaehlen.de). The Excel sheet listed all words that occurred at least once in the dream reports in each line. The right column listed the absolute frequencies of the particular words. After that, two further columns named “parts of speech” and “word stem” were created, where all the words in the list were categorized by hand according to part of speech and by their word stem (e.g. “bring”, “brings” and “brought” was clustered to “bring”). This was done by three independent coders that were native German speakers. If a particular word could not be assigned to a specific part of speech without context, the coders manually looked it up in the written reports.

To obtain waking life narrations comparable to the dream reports, the university students were asked to write a report of their last summer break, which they did via an online format. To obtain a word count similar to that of the dream reports, the participants were asked to write a report of about 120 ± 40 words, which was roughly the mean and standard deviation of the dream reports. For this purpose, a word counter was included in the online format.

2.3. Measurement instruments

Dream diary. The participants received a structured online dream diary which they kept over 28 consecutive days. It consisted of two parts. The first part contained a list about sleeping behavior that they were supposed to fill out daily, immediately after awakening. Every morning the participants reported if they recall their dreams: 0 (*no recall*), 1 (*yes, I dreamed something 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, the participants were guided to the second part of the dream diary. This was where they narratively described their dream from the last night. In addition, they could rate the intensity of positive and negative emotions that occurred in each dream on a four-point-scale: 0 (*no emotions*), 1 (*mild*), 2 (*moderate*), and 3 (*strong emotions*). Furthermore, the participants indicated whether or not they intuitively perceived that their dream was a nightmare. If the participants reported a total of twelve reported dreams, they were subsequently only required to complete the first part of the diary.

Noun categorization. After the list was classified according to lexemes, the nouns were assigned to sub-categories: “Person” (which includes all mentioned categories of human beings, e.g. “group”, “man”, “child”, “friend”, “girl”, etc.), “House/Car” (which includes all nouns concerning parts of a house, e.g. “car”, “room”, “window”, “bed”,

“wall”, “door”, etc.), “Family” (which includes all nouns describing a family member, e.g. “mother”, “father”, “family”, “parents”, “grandpa”, etc.), “Time” (which includes all nouns describing a specific period, e.g. “year”, “day”, “semester break”, “week”, “birthday”, “end”, etc.), “Dream” (which includes all nouns concerning dreams, e.g. “dream”, “nightmare”), “Holiday” (which includes all nouns concerning free time and holiday, e.g. “holiday”, “vacation”, “hotel”, “beach”, “weekend”, “fun”, etc.), “Body” (which includes all nouns describing body parts, e.g. “body”, “arm”, “leg”, “head”, etc.), “Feelings” (which includes all nouns concerning emotional states, e.g. “fear”, “feelings”, “joy”, “panic”, “luck”, etc.), “School” (which includes all nouns describing school and education, e.g. “college”, “school”, “teacher”, “exam”, etc.), “Nature” (which includes all nouns concerning nature, e.g. “water”, “woods”, “forest”, “sun”, “island”, “weather”, etc.), “Animals” (e.g. “cat”, “dog”, etc.), “Thing” (which includes all nouns concerning parts of a house, e.g. “thing”, “gadget”, etc.), “Place” (which includes all nouns describing a specific place, e.g. “place”, “location”, “point” etc.), “Work” (which includes all nouns concerning life at work, e.g. “work”, “internship”, “job”, etc.), “Food” (which includes nouns describing different foods. All nouns that occurred at least five times were included in the analysis), and Misc. (“type”, “phone”, “example” and “Corona”).

2.4. Statistical Analysis

The statistical analysis was conducted using SPSS Version 27 for Windows. We then calculated Pearson correlations for the relationship between negative dream emotions, nightmare frequency and the number of nouns, verbs and adjectives they used.

3. Results

Out of Dream sample 1, overall $N = 499$ dream reports were carried out. From these sample, $n = 113$ dream reports were identified as nightmares (22.7 %) by the participants. The nightmare dreamer subgroup ($n = 54$) reported on average 12.06 ± 6.25 dreams (range: 1-28 recalled dreams), whereas the non-nightmare dreamer subgroup ($n = 45$) reported on average 10.82 ± 5.16 dreams (range: 1-22 recalled dreams). These differences did not reach statistical significance. The average dream length was $M = 130.05$ words ($SD = 145.76$). Regarding Dream sample 2, from the $N = 890$ obtained dreams were $n = 247$ nightmare reports (27.8 %). During the 28 days interval of the dream diary, the participants reported on average 8.49 ± 6.03 dreams (range: 1-24 recalled dreams). The average dream length was $M = 81.54$ words ($SD = 79.8$).

Table 1. Comparisons of normal dreamers and nightmare dreamers from both dream samples in dream emotions.

Variables	Dream sample 1 ($N = 99$)					Dream sample 2 ($N = 103$)				
	Non-nightmare dreamers $M \pm SD$	Nightmare dreamers $M \pm SD$	df	t	p	Non-nightmare dreamers $M \pm SD$	Nightmare dreamers $M \pm SD$	df	t	p
Positive emotions	1.33 \pm 0.57	1.06 \pm 0.57	97	2.365	.020	1.08 \pm 0.66	0.79 \pm 0.58	93	-2.246	.027
Negative emotions	1.13 \pm 0.56	1.53 \pm 0.55	97	-3.520	<.001	1.08 \pm 0.63	1.90 \pm 0.62	93	-6.565	<.001
Nightmare frequency	0.08 \pm 0.13	0.29 \pm 0.23	97	-5.963	<.001	0.11 \pm 0.20	0.52 \pm 0.32	93	7.585	<.001

Table 2. Differences in parts of speech of dream reports vs. waking life narrations.

Item	Dream sample 1 Number (percent)	Dream sample 2 Number (percent)	Waking life narrations Number (percent)
Nouns	6326 (29.92%)	7690 (29.15%)	3800 (36.04%)
Proper names	170 (0.80%)	426 (1.61%)	314 (2.98%)
Verbs	12060 (57.04%)	15884 (60.21%)	4997 (47.39%)
Adjectives	2588 (12.24%)	2380 (9.02%)	1433 (13.59%)
Total	21144 (100%)	26380 (100%)	10544 (100%)

Comparisons of positive dream emotions, negative dream emotions and nightmare frequency are presented in Table 1.

Table 2 depicts the percentages of all parts of speech. The two dream report samples are similar to each other with respect to noun frequency, but differ from the waking life narrations: In the waking life narrations, participants used more nouns and proper names than in the dream reports. Also, fewer verbs were used in the waking life narrations than in the dream reports. On the other hand, fewer adjectives were used into the dream report Sample 2 (the nightmare dreamers' sample) than in the other two samples (Table 2).

Table 3 shows the ten most frequently occurring words from all three samples. In general, the rankings of all samples from the ten most frequent words are largely the same. In the dream report samples, the lexeme "I/me" was the most frequent, whereas in the waking life narrations, it was in third place. Instead, the first-person plural word "we" is more frequently used in the waking life narrations (Table 3).

Table 4 presents the most frequent verbs in all samples. In contrast to Table 3, the words here are aggregated according to their word stem. At first glance, there are no majoring differences in their rankings: In all samples, the most frequent verbs are "to be" and "to have". However, in the waking life narrations, various words appeared in the top ranks, that were relatively seldom in the dream report samples: "to drive", "to spend", "to visit" and "to enjoy" were all among the ten most frequent verbs (Table 4).

When looking at the most frequent adjectives, it becomes evident that the three samples differed from each other. In the waking life narrations, "beautiful" and "special" occurred

relatively frequently, whereas in the dream samples, the word "suddenly" occurred quite frequently (Table 5).

Table 6 shows the frequencies of the noun clusters in all three samples. Interestingly, in all samples the "person" cluster was found most frequently. The second most common cluster in the dream reports ("home/car") rarely occurred in the waking life narrations, and the "dream" cluster was not found at all. Instead, the "time" cluster and "holiday" cluster were more frequent in the waking life narrations than in the dream reports. Finally, "feelings" were described about three times more often in dream reports than in waking life narrations (Table 6).

Regarding the nightmare dreamers' sample, no significant correlations emerge between negative dream emotions and nightmare frequency on the one hand, and the frequency of nouns, verbs, and adjectives on the other. Nevertheless, when we consider the dream report length as a control variable, we found an inverse correlation between negative dream emotions and the percentage of nouns ($r = -.322$; $p = .002$), verbs ($r = -.287$; $p = .006$) and adjectives ($r = -.334$; $p = .001$). This was also the same for nightmare frequency, inverse correlations for nouns ($r = -.341$; $p < .001$), verbs ($r = -.321$; $p = .002$) and adjectives ($r = -.349$; $p < .001$) were also significant. In the non-nightmare dreamers' sample, no significant correlations were found.

4. Discussion

The results of this study indicate that the dream reports are more similar to each other in their word frequencies than to the waking life narrations. Participants used more nouns

Table 3. Comparisons of the most frequently used words in all samples, not clustered.

Rank	Dream sample 1 Word	Dream sample 1 (percent)	Dream sample 2 Word	Dream sample 2 (percent)	Waking life narrations Word	Waking life narrations number (percent)
1	I/me	3216 (4.95 %)	I/me	3721 (5.28 %)	and	1250 (3.75 %)
2	and	2404 (3.70 %)	and	2621 (3.72 %)	in	1052 (3.16 %)
3	the (fem)	1404 (2.16 %)	was	1275 (1.81 %)	I/me	993 (2.98 %)
4	in	1012 (1.56 %)	the (fem)	1260 (1.79 %)	we	684 (2.05 %)
5	the (mas)	948 (1.46 %)	in	1156 (1.64 %)	the (fem)	672 (2.02 %)
6	was	883 (1.36 %)	the (mas)	1005 (1.43 %)	was	639 (1.92 %)
7	it	842 (1.30 %)	have	984 (1.40 %)	with	556 (1.67 %)
8	with	815 (1.25 %)	with	958 (1.36 %)	have (sing)	533 (1.60 %)
9	we	805 (1.24 %)	not	843 (1.20 %)	the (mas)	513 (1.54 %)
10	to	794 (1.22 %)	it	800 (1.14 %)	have (pl)	398 (1.20 %)

Note: (sing) = singular form, (pl) = plural form, (fem) = feminine form; (mas) = masculine form.

Table 4. Comparisons of the most frequently used verbs (classified according to word stem) in all samples.

Rank	Dream sample 1 Word	Dream sample 1 (percent)	Dream sample 2 Word	Dream sample 2 (percent)	Waking life narrations Word	Waking life narrations number (percent)
1	to be	2434 (20.18 %)	to be	2885 (18.16 %)	to be	1353 (27.08 %)
2	to have	1502 (12.45 %)	to have	2388 (15.03 %)	to have	1309 (26.20 %)
3	to go	394 (2.89 %)	to go	372 (2.34 %)	to do	182 (3.64 %)
4	to come	306 (2.54 %)	to can	363 (2.29 %)	to drive	149 (2.98 %)
5	to want	297 (2.46 %)	to want	352 (2.22 %)	to can	138 (2.76 %)
6	to can	291 (2.41 %)	to become	339 (2.13 %)	to spend	133 (2.66 %)
7	to see	269 (2.23 %)	to come	299 (1.88 %)	to go	124 (2.48 %)
8	to become	262 (2.17 %)	to see	270 (1.70 %)	to must	87 (1.74 %)
9	to must	238 (1.97 %)	to must	245 (1.54 %)	to visit	59 (1.18 %)
10	to say	202 (1.68 %)	to do	191 (1.20 %)	to enjoy	59 (1.18 %)

and proper names in their reports on waking life, and fewer verbs than in dream reports. This allows us to assume that structural differences exist between dream reports and waking life narrations. However, this is not the case for adjectives.

The fact that the most frequent words are nearly in the same order in all three samples, may be due to the general structure of the German language. Further, it is salient that “we” occurs more frequently in waking life narrations than in the dream reports. This is also in line with the findings of Mallett et al. (2021), in which first-person singular references were associated with a higher negative morning mood. These findings could be explained by the Mastery Hypothesis, which states that dreams serve the adaptive function to rehearse problem-solving situations (Wright & Koulack, 1987). Even if “spending time with friends” is a common reported topic in dreams and more salient than in waking life (Schredl & Hofmann, 2003), it lets assume that in dreams where the dream-self is not supported by other dream characters, problem situations could be solved less successful.

Furthermore, the finding that the verbs “driving”, “spending” and “enjoying” and the adjectives “beautiful” and “special” frequently occur in the waking life narrations may also lead us to the assumption that dream reports may be more negative than reports from waking life. On the other hand,

one could argue that the explicitly positive descriptions could also mainly be due to the method of obtaining the reports: If the participants were asked to write about their usual daily life, the results may be different and less positive. It is also interesting that the word “suddenly” was mentioned so frequently in dream reports. This can be explained by the frequent changes of sequences that occur in dreams (Cariola, 2008), but not in waking life.

When looking at the nouns participants used, it is obvious that they often refer to the dream-self or other dream-characters. This is also in line with the findings of Schredl and Hofmann (2003), who reported that cognitive activities such as reading and working on a computer, occurred less often in dream reports than interactions with other dream characters did. In fact, the word “computer” did not even appear in the word lists of the dream reports, despite it coming from a mainly student sample (which would imply that it would not be unusual for the participants to use high-tech devices in their waking-lives). The fact that expressions that belong to the category “house” are frequently used can be explained by the Continuity Hypothesis: In Western culture, people spend at substantial part of their lifetime inside a house, and therefore this content frequently embeds itself in dreams. Also, the frequent occurrence of words from the “family” noun category” also support the Continuity Hypothesis. In-

Table 5. Comparisons of the most frequently adjectives (classified according to word stem) used in all samples.

Rank	Dream sample 1 Word	Dream sample 1 (percent)	Dream sample 2 Word	Dream sample 2 (percent)	Waking life narrations Word	Waking life narrations number (percent)
1	quite	191 (7.38 %)	good	135 (5.67 %)	much/many	339 (23.66 %)
2	good	147 (5.68 %)	quite	134 (5.63 %)	beautiful	170 (11.86 %)
3	big	114 (4.41 %)	suddenly	129 (5.42 %)	good	126 (8.79 %)
4	small	114 (4.41 %)	much/many	111 (4.66 %)	long	64 (4.47 %)
5	suddenly	113 (4.37 %)	big	109 (4.58 %)	new	58 (4.05 %)
6	much/many	112 (4.33 %)	small	83 (3.49 %)	more	54 (3.77 %)
7	old	97 (3.75 %)	old	80 (3.36 %)	small	49 (3.42 %)
8	fast	68 (2.63 %)	short	66 (2.77 %)	special	32 (2.23 %)
9	exact	64 (2.47 %)	long	64 (2.69 %)	quite	29 (2.02 %)
10	easy	62 (2.40 %)	new	57 (2.40 %)	free	27 1.88 %)

Table 6. Comparisons of noun clusters in all three samples.

Item	Dream sample 1 Number (percent)	Dream sample 2 Num- ber (percent)	Waking life narrations Number (percent)	Total
Person	1062 (31.23%)	1217 (30.59 %)	436 (15.59 %)	2715 (26.68 %)
Home/Car	879 (25.85 %)	901 (22.65 %)	216 (7.72 %)	1996 (19.62 %)
Family	402 (11.82 %)	416 (10.46 %)	192 (6.87 %)	1010 (9.93 %)
Time	262 (7.70%)	294 (7.39 %)	1010 (36.11 %)	1566 (15.39 %)
Dream	195 (5.73 %)	400 (10.01 %)	0 (0 %)	595 (5.85 %)
Body	106 (3.12 %)	97 (2.44 %)	11 (0.39 %)	214 (2.10 %)
Feelings	84 (2.47 %)	149 (3.75 %)	20 (0.72 %)	253 (2.49 %)
School	68 (2.00 %)	101 (2.54 %)	83 (2.97 %)	252 (2.48 %)
Animal	62 (1.82 %)	95 (2.39 %)	14 (0.50%)	171 (1.68 %)
Nature	56 (1.65 %)	58 (1.46 %)	107 (3.83 %)	221 (2.17 %)
Thing	41 (1.21 %)	37 (0.93 %)	21 (0.75 %)	99 (0.97 %)
Place	41 (1.21 %)	36 (0.90 %)	51 (1.82 %)	128 (1.26 %)
Holiday	38 (1.12 %)	44 (1.11 %)	525 (18.77 %)	607 (5.97 %)
Food	20 (0.60 %)	31 (0.80 %)	26 (0.93 %)	77 (0.76 %)
Work	0 (0 %)	0 (0 %)	42 (1.50 %)	42 (0.41 %)
Misc.	85 (2.50 %)	102 (2.56 %)	43 (1.54 %)	230 (2.26 %)

terestingly, nouns in the “time” category were rarely found in the dream report samples, whereas they were frequently mentioned in the waking life narrations. This leads us to the assumption that perceptions of time in dreams are different from that in waking life; leaps of time are frequently reported in dreams (Cariola, 2008). That nouns of the “emotion” category were mentioned more frequently in dream reports than in waking life narrations, lets us conclude that dreams are experienced with more emotion than waking life is. This would also support the Mastery hypothesis (Wright & Koulack, 1987).

Turning to the Pearson correlations, it is remarkable that nightmare frequency and negative dream emotions tend to be associated with fewer verbs, nouns, and adjectives. A short dream length cannot explain these results, as the word count was included as a control variable. The correlations suggest that dreamers tend to describe extremely negative dreams less. This would suggest that people who tend to have very negative dreams avoid dealing with them and do not describe their dreams in detail. After all, adjectives are used to make language more vivid. This is another indication that dream reports do not necessarily reflect what was actually dreamed and that experience of a nightmare was probably worse than described.

Of course, there are also methodological limitations. First of all, it is possible to argue that waking life reports cannot be compared with dream reports, moreover, the topic of the waking life reports (describing the semester break) may have already created a bias, since this is presumably perceived as predominantly positive. Future studies could take this insight as an incentive to recalibrate the method, and instruct test subjects to describe their normal everyday life, for example. The waking life narrations also can from a different sample of participants; this may also decrease the comparability of the narrations and the dream reports.

These findings nevertheless show that the lexical approach may be a useful way to analyze dream reports more deeply. Due to the methodological limitations, we recom-

mend applying it as a complement to dream content analysis. Future studies could compare the dream reports and standardized waking life narrations from the same cohort, investigating if dream reports were still more negative than those of waking life. Furthermore, different lexical units could be categorized in more detail, to look for relationships concerning specific dream content.

Acknowledgements

We thank Matthew Ch. Rees and Teresa Gehrs of Lingua-Connect for language editing.

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