http://dx.doi.org/xxxxxxxxxxxxxxx

Thematic and Content Analysis of Idiopathic Nightmares and Bad Dreams

Geneviève Robert, PhD; Antonio Zadra, PhD

Department of Psychology, Université de Montréal, Montreal, Quebec, Canada

Study Objectives: To conduct a comprehensive and comparative study of prospectively collected bad dream and nightmare reports using a broad range of dream content variables.

Design: Correlational and descriptive.

Setting: Participants' homes.

Participants: Three hundred thirty-one adult volunteers (55 men, 275 women, 1 not specified; mean age = 32.4 ± 14.8 y).

Interventions: N/A.

Measurement and Results: Five hundred seventy-two participants kept a written record of all of their remembered dreams in a log for 2 to 5 consecutive weeks. A total of 9,796 dream reports were collected and the content of 253 nightmares and 431 bad dreams reported by 331 participants was investigated. Physical aggression was the most frequently reported theme in nightmares, whereas interpersonal conflicts predominated in bad dreams. Nightmares were rated by participants as being substantially more emotionally intense than were bad dreams. Thirty-five percent of nightmares and 55% of bad dreams contained primary emotions other than fear. When compared to bad dreams, nightmares were more bizarre and contained substantially more aggressions, failures, and unfortunate endings.

Conclusions: The results have important implications on how nightmares are conceptualized and defined and support the view that when compared to bad dreams, nightmares represent a somewhat rarer—and more severe—expression of the same basic phenomenon.

Keywords: Bad dreams, dream content, nightmare, parasomnia, sex differences

Citation: Robert G; Zadra A. Thematic and content analysis of idiopathic nightmares and bad dreams. *SLEEP* 2014;37(2):XXX-XXX.

INTRODUCTION

Considerable progress has been made over the past 25 y on the prevalence, etiology, and psychopathological correlates of nightmares[1-3] and theoretical models have been proposed[1,4] Empirical findings on nightmares' actual content, however, remain surprisingly scarce. Although findings exist on the content of trauma-related dreams and nightmares[5-8] as well as recurrent dreams,[9,10] little is known about the contents of idiopathic nightmares, the most common form of disturbed dreaming.[11]

Many reasons underlie the need for a comprehensive picture of idiopathic nightmares' content. First, as detailed in the following paragraphs, much of what is known about nightmare content is based on clinical anecdotes, questionnaire-based studies, or purely descriptive reports. Second, even though standard diagnostic texts such as the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV[12]) and International Classification os Sleep Disorders, Second Edition (ICSD-2[13]) define nightmares as resulting in an awakening from sleep, little is known about the dream content that precedes such awakenings. Third, nightmares have been conceptualized as frightening dreams for more than 40 y,[14] yet few studies[15-17] have actually investigated the range of dysphoric emotions implicated in nightmares. Although these more recent findings are reflected in the revised ICSD-2[13] definition of nightmares as disturbing mental experiences rather than as frightening dreams, they are based on student populations and the results of the most comprehensive of these studies[15] have yet to be replicated. Finally, although women report having substantially more nightmares than do men,[3,18] sex effects in nightmare content remain virtually unexplored.

Table 1 presents the key characteristics and findings from studies of idiopathic nightmares' content. According to Table 1, studies vary greatly in the population examined, on how nightmares are defined, and in the instruments used to investigate nightmare content. In more than half of these studies, the definition provided for nightmares is inconsistent with standard diagnostic texts[12,13] as the awakening criterion is not specified. These studies thus include negatively toned dreams that do not awaken the sleeper, otherwise known as bad dreams.[19,20] Because bad dreams are about four times more frequent than nightmares,[19,21] definitions that encompass bad dreams result in the investigation of a more common and broader dimension of disturbed dreaming. Nightmares have also been shown to be more emotionally intense than bad dreams,[15] leading to the view that nightmares represent a somewhat rarer—and more severe—expression of the same basic phenomenon. The extent to which these two types of disturbed dreaming are related remains unclear and recent reviews outline the importance of addressing this question empirically.[1,3,22]

Although daily prospective logs are considered the gold standard for the study of nightmares,[3] most studies reviewed in Table 1 are based on questionnaire or interview methods. Questionnaires or similar retrospective instruments can yield inaccurate dream reports due to the fragile nature of dreams' long-term recall as well as memory and saliency biases.[23] For instance, one comparison[24] of dream content obtained from participants' questionnaires and 2-w logs found no relationship between the estimated frequency for the appearance of aggressive, friendly, and sexual elements and their actual frequency in the dream reports. Similarly, people's beliefs about the presence

Submitted for publication March, 2013
Submitted in final revised form July, 2013
Accepted for publication July, 2013

Address correspondence to: Antonio Zadra, PhD, Department of Psychology, Université de Montréal, C.P. 6128, succ. Centre-ville, Montreal, Quebec, CANADA H3C 3J7; Tel: (514) 343-6626; Fax: (514) 343-2285; E-mail: antonio.zadra@umontreal.ca

Table 1—Summary of studies on the content of idiopathic nightmares in adults

Study	Population	Instrument	Nightmare definition	Awakening criterion	Nightmare themes	Content sex differences	Emotions investigated
Cason (1935)[48]	Adults, "insane" adults, children and blind students (N = 258)	Retrospective interview	Distressing or terrifying dream	No	Animals: 27% Being chased: 27% Death/murder: 26% Misc. People; 24% Home, family; 22% Falling: 21% Misc: 19% Accidents: 17%	Themes of animals, falling, and accidents more common in men. More themes of home and family, and misc. people in women.	Fear: 84% Helplessness, despair, sorrow: 38% Worry, anxiety: 10% Anger: 8% Misc.: 18%
Feldman and Hyman (1968)[49]	70 adults with frequent NM	Retrospective reports	Not specified; assumes that NMs contain themes of catastrophe	N/S	Dreamer usually the victim of death, physical injury and social affront, with unsuccessful attempts to cope with danger	Report that "a few sex differences in the content do not alter the basic picture."	No
Celluci and Lawrence (1978)[50]	29 students NM sufferers	Prospective dream log	Subjectively disturbing or anxiety-provoking dream from which a person usually awakens	Yes	Threat of physical harm: 16% Injury, death of others: 15% Interpersonal conflicts: 15%	No	No
Taub et al. (1978)[28]	42 students	Prospective dream log (only first dream and NM reported)	Any spontaneous awakening or disruption from sleep associated with anxiety.	yes	Fewer friendly interactions and more apprehension, misfortunes, aggressive interactions and physical activity than ordinary dreams	no	no
Kales et al. (1980)[51]	30 adults with a current complaint of NMs	Retrospective interview	Nocturnal episodes of intense anxiety and fear associated with a vivid and emotionally charged dream experience	No	Fear of attack: 73% Fear of falling: 73% Fear of death: 60% Suffocation: 30%	N/A	No
Cernovsky (1984)[52]	154 students	Retrospective questionnaire based on last 6 months	Any frightening dream	No	Family or close friends: 47% Fights, being killed or assaulted: 31% Accidents, falling, drowning: 31%	N/A	No
Dunn and Barrett (1988)[16]	79 students	Retrospective questionnaire	Not provided	No	Being chased : 72% Death of family or friends: 64% Falling : 53% One's own death: 39% Animals, monsters: 33% War, violent crimes, natural disaster: 24%	N/A	Fear: 83% Sadness: 13% Other: 4%
Hearne (1991)[53]	39 NM sufferers	Retrospective questionnaire	Not provided	N/S	Witnessing horror, violence:32% Experiencing attack or danger:29% Flight from someone or something: 13% Sinister presence: 13%	No	No
Desjardins and Zadra (2004) [29]	118 adults	Prospective dream log	Very disturbing dreams	No	Threatening elements: 63%	No	No
Zadra et al. (2004)[30]	125 adult women	Prospective dream log	Very disturbing dream in which the unpleasant visual imagery and/or emotions wake you up	Yes	Physical aggression: 26% Ominous mood: 12% Failure, helplessness: 10% Interpersonal conflicts: 9%	No	Fear: 62% Sadness: 15% Anger: 9% Frustration: 6% Confusion: 3%
Zadra et al. (2006)[15]	90 students	Prospective dream logs	Very disturbing dream in which the unpleasant visual imagery and/or emotions wake you up	Yes	Nightmares were rated as being significantly more intense than bad dreams	No	30% of NMs and 51% of bad dreams contained primary emotions other than fear
Schredl (2010)[40]	1,022 adults reporting many NMs per year	Retrospective questionnaire presenting 23 NM themes	Strongly negatively toned dreams with fear or panic resulting in immediate awakening	Yes	Falling: 40% Being chased: 26% Paralyzed: 25% Being late: 24% Close person disappears or dies: 21%	Themes of physical aggression, war, terror, job loss more common men. More themes of sexual harassment, close person disappearing, dying, and teeth or hair falling out in women.	No

NA, not applicable; NM, nightmare; N/S, not specified.

of anxiety in their dreams is often unrelated to the actual affective tone of their everyday dreams as recorded prospectively in sleep logs.[25] Furthermore, when asked to think of a nightmare, most people are likely to recall particularly intense, unusual, or otherwise salient nightmares rather than more typical experiences. This may explain why themes of falling and of being chased are among the most frequently reported themes in studies based on questionnaire or interview data while appearing much less frequently in prospective logs (see Table 1).

Finally, although well-established and validated coding systems for the quantification of dream content exist,[26,27] they have been rarely used to investigate the contents of disturbed dreaming.[28-30] Furthermore, only one study,[31] which served to refine the current research study's methodology, used a validated instrument to investigate content differences in prospectively collected bad dream and nightmare narratives.

Our aim was to use a range of content variables to obtain a comprehensive and comparative description of prospectively collected bad dream and nightmare narratives. Based on previous findings (see Table 1) and in accordance with the view that nightmares and bad dreams are expressions of same basic phenomenon that varies in intensity, the following predictions were tested: (1) Physical aggressions and interpersonal conflicts will be the most frequently reported themes in bad dreams and nightmares, but a broader range of themes will characterize bad dreams; (2) Emotions in nightmares will be significantly more intense than in bad dreams; (3) Fear will be the most frequently reported emotion in nightmares and bad dreams but a greater proportion of bad dreams will contain other primary emotions; (4) When compared to bad dreams, nightmares will contain more negative dream content, including aggression, failure, and misfortune. Trigger factors within the dream narratives, the nature of the dreams' ending, and their degree of bizarreness were also investigated, as were sex effects. Given the absence of findings in relation to these variables, no specific predictions were formulated

METHODS

Participants

Participants were nonpaid volunteers recruited through media announcements between 2000 and 2010 from undergraduate

classes (n = 295) as well as the general population (n = 277). Prospective participants were told that the study concerned the relation between dreams and measures of personality and that we were interested in both high and low recallers of dreams and in all types of dreams.

Procedures

Participants first completed a series of questionnaires including measures of personality and well-being as part of a separate program of research. They were then required to provide upon awakening a complete written description for each remembered dream in a daily log for 2 to 5 consecutive w. In addition to each recalled dream's narrative, participants had to report the date, the main emotions present (if any), the emotion's intensity on a five-point Likert scale, and to note whether the dream was a lucid dream, a nightmare, a bad dream, or a flying dream, for which participants were provided written definitions. Sleep terrors were also defined to distinguish them from nightmares. The protocol was accepted by the university's Ethics Committee and signed consent obtained from each participant.

Consistent with previous work,[15,19] nightmares were defined as very disturbing dreams in which the unpleasant visual imagery and/or emotions cause the person to wake up (i.e., the dream's unpleasant content woke you the dreamer while the dream was ongoing). Bad dreams were defined as very disturbing dreams that do not cause a person to awaken (e.g., the dream occurred earlier in the night prior to awakening, the person remembered it only after being awakened by external factors such as an alarm clock, or the person only remembered the dream later during the day). Thus, the definitions provided for nightmares and bad dreams were equivalent except for the waking criterion.

Measures

Thematic Content

Categories for the classification of the thematic content of bad dreams and nightmares were based on the literature, on a modified version of the Typical Dreams Questionnaire,[32] and pilot testing.[31] Whenever possible, conceptually related categories used in previous studies were grouped to avoid overlap and only categories capturing more than 3% of the narratives' content were retained. Table 2 presents the final 12 thematic categories used to classify nightmare and bad dream narratives. When dream reports contained more than one theme, raters had the option of identifying a secondary theme if its occurrence was not the direct consequence of the main theme (e.g., a character becomes ill only after being physically attacked).

Table 2—Classification of thematic categories in nightmares and bad dreams

Themes	Description
Being chased	Dreamer being chased by another character but not physically attacked.
Physical aggression	Threat or direct attack to one's physical integrity by another character, including sexual aggression, murder, being kidnapped or sequestered.
Interpersonal conflicts	Conflict-based interaction between two characters involving hostility, opposition, insults, humiliation, rejection, infidelity, lying, etc.
Environmental abnormality	Bizarre or implausible events appearing in the dream's environment.
Evil presence	Seeing or feeling the presence of or being possessed by an evil force, including monsters, aliens, vampires, spirits, creatures, ghosts, etc.
Accidents	The dreamer or another character is involved in an accident, including vehicle accidents, drowning, slipping, falling, etc.
Disaster/calamity	Plausible events ranging from relatively small-scale anomalies such as a fire or flood in one's house or neighborhood to larger scale disasters such as earthquakes, war, the end of the world, etc.
Failure or helplessness	Difficulty or incapacity of the dreamer to attain a goal, including being late, lost, unable to talk, losing or forgetting something, and making mistakes.
Insects/vermin	Presence of or infestation, bites or stings from insects, rats, snakes, etc.
Health-related concerns and death	Presence of physical illness, disease, health-related concerns, or death of a character or of the dreamer.
Apprehension/ worry	Dreamer is afraid or worried about someone or something, without an objective threat being present.
Others	Includes idiosyncratic as well as infrequent themes such as being naked, being self-critical, being in an insalubrious environment, and being unable to find/embarrassed to use a toilet.

Emotional Content

Consistent with previous work on emotional content of bad dreams and nightmares,[15] the main dream emotions explicitly reported by the participants were grouped into seven content categories shown to account for approximately 90% of emotions reported in disturbed dreaming. The categories were: fear (e.g., terrified, horrified, frightened, scared, panicky), anger (e.g., furious, angry, irritated, outraged), sadness (e.g., depressed, lonely, hopeless, heartbroken), confusion (e.g., puzzled, perplexed, bewildered), disgust, guilt (e.g., remorse, regret), and frustration. An eighth category encompassed all positive emotions and a ninth category labeled "other" comprised emotions that did not fit into the preceding categories.

Dream Content

The following variables were used from the Hall and Van de Castle[27] system. *Friendly and aggressive interactions*. This scale measures the frequency of emotionally-toned social interactions. *Success and failure*. These variables measure the successful handling of some difficulty encountered by a character or an incapacity of the character to achieve a desired goal because of personal limitations and inadequacies. *Good fortune and misfortune*. Good fortune is scored when something beneficial happens to a character that is completely adventitious whereas misfortunes refer to any mishap, adversity, harm, danger, or threat that happens to a character as a result

of circumstances over which they have no control. Two scales were used to investigate bizarreness. The Rationality Scale[33] measures the likelihood of occurrence of the dream content and the degree of his adherence to natural laws whereas the Everydayness Scale[33] examines the degree to which the dream content approximates that of everyday life.

Narrative Structure

To clarify how and when dreams turn into bad dreams or nightmares, each narrative was scored for the following variables.[31] The presence of triggering factors, which initiate a negative turn of events, were classified into one of four categories: negative event (e.g., "Looking up at the sky I see a missile coming right down at us"); cognitions (e.g., "I suddenly realize that if I am floating in the air, it is because I am dead"); emotions (e.g., "My sister was there and I was very afraid of her"); or a combination thereof. Whether the trigger occurred during the first, second, or last third of the narrative was also determined by dividing the number of words before the trigger by the narrative's total word count. Fewer than 2% of dream reports contained information explicitly noted by the participant as being out of sequence (e.g., remembering a detail from the dream's beginning after having completed the narrative). In these cases the material was moved to its correct place (as specified by the participant) before segmenting the report according to its word count. Each narrative's ending was scored according to the following outcomes: negative (e.g., dying or being caught); partially positive (e.g., dreamer escapes danger but a partner is injured); positive (e.g., dreamer succeeds in fighting off an aggressor). Finally, four categories were used to determine each nightmare's cause of the awakening as reported by the dreamer: emotional intensity (e.g., "I was so afraid that I woke up"); immediate threat (e.g., "The man rushed toward me with a knife and I woke up"); sudden perceptually striking event (e.g., "The officer rang the alarm, it made a loud noise and I woke up"); intentional awakening (e.g., "I realized that I was dreaming so I woke myself up").

All content variables were scored independently by two extensively trained raters who refined their scoring on an unrelated sample of 225 bad dreams and nightmares. Approximately 25% of all the total narratives were scored by both judges. Because kappa coefficients are unreliable when applied to variables with infrequent occurrences (as is the case with several dream content categories), interjudge reliability was assessed with Gwet's[34] AC1 statistic for interrater reliability. Results showed a good to excellent agreement across all dream content categories with AC1 values ranging from 0.62 to 0.98, and 10 of the 15 variables obtaining values above 0.80.

RESULTS

Participants reported a mean of 17.1 ± 11.0 dreams in their logs for a total of 9,796 dream reports. One hundred sixty-four of the 572 participants (29%: 125 women, 36 men, three sex not specified) were excluded from the study because they did not report any nightmares or bad dreams in their logs. Of the 281 nightmares and 1,016 bad dreams collected from the remaining 408 participants, a total of 22 nightmares (8%) and 73 bad dreams (7%) were excluded because they contained too few words (< 25) to permit a reliable content analysis (eight nightmares, 50 bad dreams), the report's content was too vague or confused (12 nightmares and 23 bad dreams), or the experiences appeared to be sleep terrors (two nightmares). Eighty-five bad dreams were further excluded as the participants explicitly reported that the dream's content resulted in an awakening, which was inconsistent with the operational definition provided. Of the remaining 331 participants, 61 (18.4%; 15 men, 46 women) reported nightmares exclusively, 133 (40.2%; 20 men, 113 women) reported bad dreams exclusively, and 136 (41.1%; 20 men, 116 women) reported both. To prevent an overrepresentation of participants reporting many bad dreams or nightmares, a maximum of two nightmares and two bad dreams were selected per participant. The first nightmare or bad dream reported in the log was automatically included and, if available, a second report was randomly selected from the log.

The final sample was thus comprised of 253 nightmares and 431 bad dreams reported by 331 participants (55 men, 275 women, one not specified; mean age = 32.4 ± 14.8 y). Men and women did not differ significantly in age (male = 34.9 ± 15.6 y; female = 31.9 ± 14.6 y). The mean number of words per narrative was 144.4 ± 114.3. Nightmare reports contained significantly more words (165.8 ± 140.9) than did the bad dreams (131.8 ± 93.2), ($t(1, 681) = 3.79$, $P < 0.001$), with a small effect size ($d = 0.30$). The only significant sex difference for report length was that women's bad dreams contained more words (136.8 ± 95.5) than did the men's (103.2 ± 72.1), $t(1, 428) = 2.62$, $P < 0.01$, with a small effect size (0.36).

Thematic Content

Fifty-six percent of the narratives had a single theme and 44% had two themes. Nightmares were significantly more likely than bad dreams to contain two themes (52.2%, versus 39.7%; $\chi^2 = 10.1$, $P = 0.001$) but this difference disappeared when report length was controlled for $t(1, 682) = 0.73$, $P = 0.465$). The distribution of thematic categories across the nightmares and bad dreams are presented in Table 3. Themes involving physical aggression and interpersonal conflicts were the most frequent, followed by failure/helplessness, health-related concerns/death, and apprehension/worry. All other themes appeared in fewer than 10% of the narratives. Nightmares were significantly more likely to contain themes of physical aggression, being chased, evil forces, and accidents, whereas themes of interpersonal conflicts were significantly more frequent in bad dreams.

Emotions

Table 4 presents the mean emotional intensity of nightmares and bad dreams as well as the proportion of different emotions contained by each type of disturbing dream. Nightmares were rated by participants as being significantly more intense than were the bad dreams, with a corresponding large effect size. Fear was the most frequently reported emotion in both types of dreams but appeared in a significantly greater proportion of nightmares. There were no significant differences between nightmares and bad dreams on any of the other categories.

Hall and Van de Castle

Because dream report length differed significantly between nightmares and bad dreams, word count was controlled for

by dividing the total number of mentions of each variable by the report's number of words and the result multiplied by 100. Mann-Whitney U tests were used to compare nightmare and bad dream narratives because content variables were positively skewed. When compared to nightmares, bad dreams contained (per 100 words) significantly more mentions of friendliness (0.46 ± 0.79 versus 0.26 ± 0.49, $P < 0.05$) whereas nightmares contained significantly more mentions of aggression (1.38 ± 1.54 versus 1.09 ± 1.24, $P < 0.05$) and failure (0.09 ± 0.34 versus 03 ± 0.20, $P < 0.01$). The minimal *U* value for the significant effects was 45852.5. Nightmares and bad dreams did not differ on measures of misfortune, good fortune, or success ($P > 0.05$).

To better understand how nightmare and bad dream content differs from everyday dreams, the proportion of the narratives containing at least one mention of each content variable was computed and compared to the Hall and Van de Castle normative data,[27] which have been replicated in several studies.[26,35] Comparisons were made as a function of sex and type of disturbing dream (nightmares, bad dreams, and both combined). Results are presented in Table 5. For both males and females, the proportion of nightmares and of bad dreams containing one or more misfortune was almost twice that of everyday dreams, whereas the proportion containing at least one aggression was about 1.5 times greater. Men's bad dreams and women's nightmares were also significantly less likely to contain friendliness than were normative equivalents. Nightmares and bad dreams contained fewer failures than the established norms, but differences were not always significant due to the variable's infrequent occurrence. Although the aggression/friendliness percent could not be statistically compared to the norms, they appeared equivalent to normative values across sexes.

Narrative Structure

As shown in Table 6, negative events were identified as triggers in about 75% of all dream narratives and appeared in the first third of the dream approximately 60% of the time. Nightmares and bad dreams did not differ significantly on trigger variables ($P > 0.05$). A significantly higher proportion of

Table 3—Nightmare and bad dream themes

Theme	NM n = 253 (%)	BD n = 431 (%)	Total n = 684 (%)	Cramer's *V*
Physical aggression	48.6	21.3[c]	31.5	0.28
Interpersonal conflicts	21.0	34.6***	29.5	0.14
Failure or helplessness	16.2	17.6	17.0	
Health-related concerns and death	9.1	13.9	12.2	
Apprehension/worry	8.7	13.0	11.4	
Being chased	11.1	5.7**	7.6	0.10
Evil force	11.1	4.6**	7.0	0.12
Accidents	8.7	4.9*	6.3	0.08
Disaster and calamity	5.5	5.7	5.4	
Insects	6.7	4.4	5.3	
Environmental abnormality	4.7	4.4	4.5	
Others	6.7	10.4	9.1	

BD, bad dreams; NM, nightmares. *P < 0.05. **P < 0.01. ***P < 0.001.

Table 4—Main emotions and mean emotional intensity in nightmares and bad dreams

Main emotion	NM n = 186	BD n = 364	Total n = 550	Effect size
Mean intensity[a]	4.36 ± 0.76	3.48 ± 1.07***	3.78 ± 1.06	*d* = 0.9
Fear[b]	65.1%	45.2%***	52.2%	*V* = 0.18
Sadness[b]	7.0%	11.8%	10.1%	
Anger[b]	5.0%	6.7%	6.1%	
Confusion[b]	2.5%	7.0%	5.4%	
Positive emotion[b]	4.5%	4.0%	4.2%	
Disgust[b]	3.0%	4.6%	4.0%	
Frustration[b]	2.5%	4.0%	3.5%	
Guilt[b]	1.5%	4.0%	3.1%	
Others[b]	9.0%	12.6%	11.3%	

BD, bad dreams; NM, nightmares. [a]Independent samples *t*-tests. [b]Chi-square tests. ***P < 0.001.

Table 5—Hall and Van de Castle categories: comparisons to male/female norms

	Males				Females			
Variable	NM n = 45 (%)	BD n = 61 (%)	Total n = 106 (%)	Norms (%)	NM n = 207 (%)	BD n = 369 (%)	Total n = 576 (%)	Norms (%)
Aggression[a]	73.3***	62.3*	67.0***	47	66.7***	61.8***	63.5***	44
Friendliness[a]	28.9 NS	16.0***	21.1***	38	30.9**	41.5 NS	37.7 NS	42
Aggression/friendliness percent[b]	62.4	57.0	59.3	59	58.4	50.8	53.5	51
Misfortune[a]	68.9***	65.6***	67.0***	36	70.0***	64.5***	66.5***	33
Good fortune[a]	8.9[c]	6.6[c]	7.5 NS	6	6.8 NS	6.8 NS	6.8 NS	6
Failure[a]	8.9[c]	3.3[c]	5.5**	15	9.2 NS	4.3**	6.1*	10
Success[a]	0[c]	1.6[c]	1.0[c]	15	4.8 NS	5.4 NS	5.2 NS	8

[a]Percentage of dreams with at least one. [b]Number of aggression / (number of aggression + number of friendliness) *100; comparison to norms not possible. [c]Comparison to norms not possible due to overly low frequency. *P < 0.05. **P ≤ 0.01. ***P ≤ 0.001. BD, bad dreams; NM, nightmares; NS, not significant.

Table 6—Other dream content variables

	NM n = 253	BD n = 431	Total n = 684	Effect size
Triggering factor				
Negative event[b]	75.8%	76.7%	76.4%	
Cognitions[b]	6.3%	6.7%	6.6%	
Emotions[b]	8.7%	9.8%	9.4%	
Combination[b]	9.1%	6.7%	7.6%	
1st third[b]	64.7%	57.5%	60.3%	
2nd third[b]	27.0%	32.8%	30.6%	
3rd third[b]	8.3%	9.5%	9.1%	
Type of ending				
Negative[b]	78.2%	61.6%***	67.7%	*V* = 0.17
Partially positive[b]	13.1%	23.0%**	19.4%	*V* = 0.12
Positive[b]	8.7%	15.3%**	12.9%	*V* = 0.10
Bizarreness – rationality[a,c]	4.0 ± 1.8	4.6 ± 1.4***	4.39 ± 1.57	*d* = 0.43
Bizarreness – everydayness[a,c]	3.1 ± 1.5	3.8 ± 1.3***	3.50 ± 1.44	*d* = 0.50

[a]Independent samples *t*-tests. [b]Chi-square tests. [c]Lower scores indicate greater bizarreness. *P < 0.05. **P < 0.01. ***P < 0.001.

Table 7—Comparison of nightmares, bad dreams, and everyday dreams in participants having reported at least one of each in their daily logs

Variable	NM n = 136	BD n = 136	Everyday n = 136
Word count[a]	162.1 ± 130.7	152.6 ± 118.8	124.8 ± 85.3** [1,2]
Emotional intensity[a]	4.5 ± 0.6	4.0 ± 0.9	3.6 ± 1.0*** [1,2,3]
Bizarreness – rationality[a,c]	4.1 ± 1.6	4.5 ± 1.4	5.0 ± 1.0*** [1,2,3]
Bizarreness – everydayness[a,c]	3.1 ± 1.4	3.7 ± 1.4	4.1 ± 1.1*** [1,2,3]
Aggression[b]	65.2%	30.7%	26.3% [1,3]
Friendliness[b]	35.6%	41.5%	43.6%
Misfortune[b]	72.6%	66.7%	42.9% [1,2]
Good Fortune[b]	7.4%	7.4%	10.5%
Failure[b]	8.1%	3.7%	5.3%
Success[b]	5.2%	5.2%	5.3%

BD, bad dreams; Everyday, everyday dreams; NM, nightmares. [a]Repeated-measures analysis of variance with Bonferroni pairwise (*post hoc*) comparisons. [b]Generalized mixed model analyses with adjusted least significant difference (LSD) contrasts for pairwise comparisons. [c]Lower scores indicate greater bizarreness; ANOVA result: *P < 0.05 ; **P < 0.01; ***P < 0.001. [1]Nightmares statistically different from everyday dreams (Ps < 0.01). [2]Bad dreams statistically different from everyday dreams (Ps < 0.01). [3]Nightmares statistically different from bad dreams (Ps < 0.01).

nightmares than bad dreams contained an unfortunate ending whereas partially and totally positive endings characterized a greater proportion of bad dreams. Nightmares were significantly more bizarre (i.e., less rational and more unlike everyday life) than were bad dreams. Finally, participants spontaneously noted the cause of their awakening in 36.5% of the nightmares reports. The most frequently invoked explanations included an immediate threat (42.4%), the intensity of the emotions experienced (25%), a salient element (18.5%), and an intentional awakening from the nightmare (14.1%).

Sex Differences

Sex effects were first separately explored within nightmares and bad dreams but because observed patterns were very similar to those found for all disturbing dreams combined, they are presented for the overall dream dataset. When compared to women, men were significantly more likely to report themes involving disaster/calamity (9.4% versus 4.7%; $\chi^2 = 3.93$, $P < 0.05$), as well as insects (9.4% versus 4.5%; $\chi^2 = 4.33$, $P < 0.05$). Men's dreams contained significantly less friendliness per 100 words (0.21 ± 0.50 versus 42 ± 0.73, $U = 25309$, $P = 0.001$). The occurrence of negative events was significantly more likely to be identified as triggers in men's dreams than in women's (90.6% versus 73.8%; $\chi^2 = 13.98$, $P < 0.001$) but appeared less frequently during the middle portion of the narrative (22.6% versus 32.1%; $\chi^2 = 3.78$, $P < 0.05$). No other significant sex differences were found (e.g., emotional intensity, main emotion, ending, bizarreness).

Within-Subject Comparisons

Because 136 participants reported at least one nightmare as well as one or more bad dreams in their logs, additional within-subject analyses were conducted using one nightmare, one bad dream, and one randomly selected control (non-nightmare and non-bad dream) dream report from each of these participants. Hall and Van de Castle content categories were scored per 100 words as well as in accordance with the "at least one per dream" procedure. Because the two methods yielded virtually identical results and given that several content variables were absent from most dream reports, only the proportion of dreams with at least one occurrence of each content category is presented here. As can be seen in Table 7, participants' nightmares and bad dreams contained significantly more words than did their everyday dreams and both types of disturbing dreams were also significantly more emotionally intense, more bizarre, and more likely to contain misfortunes than were the control dreams. In addition, participants' nightmares were significantly more emotionally intense, more bizarre, and more likely to contain aggressions than were their bad dreams.

The top three thematic categories found in our total sample nightmares and bad dreams (i.e., physical aggression, interpersonal conflicts, and failure/helplessness) characterized 81.4% of the 136 participants' nightmares, 71.3% of their bad dreams, and only 38.2% of their control dreams. Moreover, themes involving accidents, insects, and environmental anomalies occurred in fewer than 2% of these participants' everyday dreams whereas themes of being chased and of evil forces were entirely absent from the control dataset.

DISCUSSION

To summarize the main findings of the current study: (1) The most frequently reported theme in nightmares was physical

aggression whereas interpersonal conflicts predominated in bad dreams; (2) Nightmares were rated by participants as being significantly more emotionally intense than were bad dreams; (3) Although fear was the most frequently reported main emotion in nightmares and bad dreams, almost half of all disturbing dreams contained primary emotions other than fear; (4) When compared to bad dreams, nightmares were more bizarre and contained significantly more aggressions, failures, and unfortunate endings; (5) Several content differences differentiate men and women's disturbing dreams; (6) Many of the key findings on nightmares and bad dreams were further supported by within-subject analyses. These findings are discussed in turn.

Although the frequent occurrence of themes involving physical aggression, interpersonal conflict, and failure/helplessness was expected, other content categories described in previously reviewed studies, including themes of falling, being paralyzed, and suffocation were rarely if ever reported in the current study. For instance, five of the studies reviewed in Table 1 reported elevated frequencies for the theme of falling, with percentages ranging between 21-73%. By contrast, themes of falling occurred so rarely in our sample (1.5% of all nightmares and bad dreams) that it was dropped as separate category and reclassified under accidents. Furthermore, themes involving feelings of paralysis or suffocation were entirely absent from our dataset. Two factors may account for these differences. The first concerns the prospective log-based nature of our data versus retrospective reports (e.g., questionnaires) that characterize past studies. Although themes of falling or being paralyzed appear infrequently in dream logs, their high saliency makes them particularly memorable and thus more likely to be recalled in interviews or questionnaires long after their occurrence. Second, themes of falling, being paralyzed, or suffocation may well represent other commonly experienced parasomnias such as hypnic jerks, isolated sleep paralysis, or sleep terrors. When faced with broadly defined questionnaire items, people may be more likely to report these types of sleep experiences as if they were nightmares. Providing participants with definitions for bad dreams, nightmares as well as sleep terrors and requiring actual dream narratives to be reported in their logs may have reduced the inclusion of other sleep phenomena.

Although nightmares and bad dreams shared the same top three thematic categories (i.e., physical aggression, interpersonal conflict, and failure/helplessness), the proportion of nightmares containing physical aggression was more than twice that of bad dreams, and interpersonal conflicts were 1.5 times more frequent in bad dreams than in nightmares. Being chased and the presence of evil force were the next most frequently reported themes for nightmares, whereas themes of health-related concerns and apprehension/worry were next for bad dreams. These findings suggest that nightmare content is more strongly related to themes involving a direct threat to physical integrity than are bad dreams which, in turn, are more likely to present a broader range of thematic contents. The data also lend support to the DSM-IV's[12] clinical description of nightmares as involving threats to survival, security, or self-esteem. In fact, the current findings show that physical threats are more likely to characterize nightmares whereas psychological threats, including threats to self-esteem, are more prominent in bad dreams. Also noteworthy is the fact that these top three thematic categories occurred about twice as often in participants' nightmares and bad dreams than in their everyday control dreams and that other common themes including insects, being chased, and the presence of evil forces was almost entirely absent from the control dreams.

Our data on the intensity and content of emotions in nightmares and bad dreams support the idea that nightmares are significantly more emotionally intense than bad dreams and that a significantly greater proportion of bad dreams than nightmares (55% versus 35%) contain emotions other than fear, including anger, sadness, and frustration. These findings are consistent with another prospectively based study,[15] although participants in that study were not required to provide narrative descriptions of their disturbed dreaming. These data show that the awakening criterion can be used as an indirect measure of disturbing dreams' intensity and support the direction taken by the American Academy of Sleep Medicine[13,35] in defining nightmares as disturbing mental experiences rather than frightening dreams. Moreover, by restricting disturbing dreams to frightening dreams, studies may be losing out on approximately 30% of nightmares and 50% of bad dreams experienced by the general adult population.

Apart from a pilot study on women's nightmares,[30] this was the first study to have investigated the content of nightmares and bad dreams using the Hall and Van de Castle system,[27,36] the best validated and most widely used instrument for quantifying dream content. A comparison of our data to the Hall and Van de Castle norms reveals that men's and women's disturbing dreams contain significantly more aggressions and misfortunes as well as fewer friendly interactions than do everyday dreams. These results are consistent with those reported Taub et al.[28] However, the finding that failures occurred significantly more frequently in the norms than in our disturbing dreams was unexpected. Because failures in dreams result from a character's "personal limitations and inadequacies"[27] this finding suggests that bad dreams and nightmares are less likely to reflect issues of personal competence than do everyday dreams.

Our exploratory work on negative triggers suggests that events external to the dreamer are typically responsible for turning everyday dreams into disturbing ones and that the first portion of bad dream and nightmare reports can be relatively uneventful. Not surprisingly, nightmares were significantly more likely than bad dreams to end on a negative note (78% versus 62%). However, it should be noted that 22% of all nightmares and 38% of bad dreams contained either a partially positive or entirely positive outcome (e.g., taking control over a situation, being finally saved or rescued). Although positively toned recurrent dreams have been described,[36] this is the first time that positive content elements have been investigated in nightmare and bad dream narratives. The study of these kinds of content variations within nightmares and their possible differential relation to nightmare distress or well-being[19,37,38] warrant further investigation.

Nightmares were significantly more bizarre than bad dreams, a difference that remained significant even after controlling for dream report length. When compared to previous findings[39] based on the same scales, these results suggest that nightmares and bad dreams are more bizarre than are everyday dreams. Moreover, the results from the within subjects analyses directly

support the idea that nightmares are significantly more bizarre than bad dreams which, in turn, are significantly more bizarre than everyday dreams.

Even though men's and women's narratives showed similar content profiles, some significant sex differences were noted. Nightmares in men were more likely than those in women to contain themes of disaster/calamity, a finding consistent with Schredl's[40] retrospective study showing a higher frequency of war/terror themes in men's nightmares. In addition, although themes of interpersonal conflicts occurred in about 34% of men and women's bad dreams, they were twice as frequent in women's nightmares than in men's (23% versus 11%). Dreams of interpersonal conflicts may thus elicit a more intense emotional response in women, leading to a greater proportion of such dreams ending in a nightmare awakening.

Although the current study did not aim to test predictions from theories on nightmares or dream function, our findings may have implications for some of these models. Many of the thematic categories found to characterize a majority of nightmares are globally consistent with the Threat Simulation Theory[4,41] of dreams, which stipulates that the function of dreaming is to simulate threatening events with the intent of improving the dreamer's capability to recognize and avoid threats in real life. However, it remains unclear to what extent nightmares contain realistic threat perceptions and efficient or successful avoidance responses. Our finding that 55% of bad dreams and 35% of nightmares contain primary emotions (as reported by the dreamer) other than fear suggests that the focus on fear memories put forth in recently proposed neurocognitive models[1,3] of disturbed dreaming may need to be broadened. Finally, a large body of evidence[26,42-44] supports the continuity hypothesis of dreaming, which postulates that dream content reflects waking states and concerns. Although the occurrence of idiopathic nightmares has been associated to waking life stressors,[45-47] the extent to which the content of bad dreams and nightmares reflect the nature of these stressors remains unknown. Although emotionally charged dreams may depict such stressors metaphorically, the relation between specific waking concerns and the central themes highlighted in the current study (e.g., interpersonal conflicts, health-related concerns) warrants further study.

Although the current work represents the largest and most in-depth investigation of nightmare and bad dream content to date, it has several limitations. First, our subject pool, although large, was biased toward individuals who were interested in dreams. Second, our sample of bad dreams and nightmares was overrepresented by women. Third, we do not know how many of our participants had a history of trauma and, consequently, what proportion of our disturbing dreams may have been trauma-related.

Finally, based on the 9,796 dream reports collected from the study's 572 participants, nightmares were found to comprise 2.9% of all prospectively collected dream narratives whereas bad dreams were about 3.5 times more prevalent, accounting for 10.8% of the dream reports. Consistent with previous observations,[19] most participants reporting nightmares in their daily logs also reported bad dreams whereas many individuals only experience bad dreams. Our results reveal that bad dreams are significantly more emotionally intense, more bizarre, and more likely to contain misfortunes than everyday control dreams. They also converge in showing that nightmares are in many ways more intense than bad dreams while nevertheless sharing several content characteristics. These findings indicate that nightmares and bad dreams share phenomenological similarities and provide strong support for the view that nightmares represent a rarer and more severe expression of the same basic phenomenon.

DISCLOSURE STATEMENT

This was not an industry supported study. The authors have indicated no financial conflicts of interest. Research supported by the Social Sciences and Humanities Research Council of Canada (grant # 410-2007-1957 to Dr. Zadra).

REFERENCES

1. Nielsen T, Levin R. Nightmares: A new neurocognitive model. Sleep Med Rev 2007;11:295-310.
2. Wittmann L, Schredl M, Kramer M. Dreaming in Posttraumatic Stress Disorder: A critical review of phenomenology, psychophysiology and treatment. Psychother Psychosom 2006;76:25-39.
3. Levin R, Nielsen TA. Disturbed dreaming, posttraumatic stress disorder, and affect distress: A review and neurocognitive model. Psychol Bull 2007;133:482-528.
4. Revonsuo A. The reinterpretation of dreams: an evolutionary hypothesis of the function of dreaming. Behav Brain Sci 2000;23:877-901.
5. Duval M, Zadra A. Frequency and content of dreams associated with trauma. Sleep Med Clinics 2010;5:249-60.
6. Esposito K, Benitez A, Barza L, Mellman T. Evaluation of dream content in combat- related PTSD. J Trauma Stress 1999;12:681-7.
7. Wood JM, Bootzin RR, Rosenhan D, Nolen-Hoeksema S, Jourden F. Effects of the 1989 San Francisco earthquake on frequency and content of nightmares. J Abnorm Psychol 1992;101:219-24.
8. Phelps AJ, Forbes D, Hopwood M, Creamer M. Trauma-related dreams of Australian veterans with PTSD: content, affect and phenomenology. Aust. N Z J Psychiatry 2011;45:853-60.
9. Zadra A, Desjardins S, Marcotte E. Evolutionary function of dreams: A test of the threat simulation theory in recurrent dreams. Conscious Cogn 2006;15:450-63.
10. Robbins PR, Tanck RH. A comparison of recurrent dreams reported from childhood and recent recurrent dreams. Imag Cog Person 1991;11:259-62.
11. Nielsen T, Zadra A. Idiopathic nightmares and dream disturbances associated with sleep- wake transitions. In: Kryger M, Roth T, Dement W, eds. Principles and practice of sleep medicine, 5th ed. Philadelphia: Saunders, 2011:1106-15.
12. American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-IV-TR. 4th ed. Washington, DC: American Psychiatric Association, 2000.
13. American Academy of Sleep Medicine. International classification of sleep disorders: diagnostic and coding manual. 2nd ed. Westchester, IL: American Academy of Sleep Medicine, 2005.
14. Hersen M. Nightmare behavior: A review. Psych Bull 1972;78:37-48.
15. Zadra A, Pilon M, Donderi DC. Variety and intensity of emotions in nightmares and bad dreams. J Nerv Ment Dis 2006;194:249-54.
16. Dunn KK, Barrett D. Characteristics of nightmare subjects and their nightmares. Psychiatr J Univ Ott 1988;13:91-3.
17. Belicki K, Cuddy MA. Nightmares: Facts, fictions and future directions. In: Gackenbach J, Sheikh AA, eds. Dream images: A call to mental arms. New York: Baywood, 1991:99-113.
18. Schredl M, Reinhard I. Gender differences in nightmare frequency: a meta-analysis. Sleep Med Rev 2011;15:115-21.
19. Zadra A, Donderi D. Nightmares and bad dreams: Their prevalence and relationship to well-being. J Abnorm Psychol 2000;109:273-81.
20. Blagrove M, Haywood S. Evaluating the awakening criterion in the definition of nightmares: How certain are people in judging whether a nightmare woke them up? J Sleep Res 2006;15:117-24.
21. Robert G, Zadra A. Measuring nightmare and bad dream frequency: impact of retrospective and prospective instruments. J Sleep Res 2008;17:132-9.

22. Spoormaker VI, Schredl M, van den Bout J. Nightmares: from anxiety symptom to sleep disorder. Sleep Med Rev 2006;10:19-31.
23. Schredl M. Questionnaires and diaries as research instruments in dream research: Methodological issues. Dreaming 2002;12:17-26.
24. Bernstein DM, Belicki K. On the psychometric properties of retrospective dream content questionnaires. Imag Cogn Person 1995;15:351-64.
25. Beaulieu-Prevost D, Zadra A. How dream recall frequency shapes people's beliefs about the content of their dreams. N Am J Psychol 2005;7:253-64.
26. Domhoff GW. Finding meaning in dreams: A quantitative approach. New York: Plenum, 1996.
27. Hall CS, Van de Castle RL. The content analysis of dreams. New York: Appleton-Century-Crofts, 1966.
28. Taub JM, Kramer M, Arand D, Jacobs GA. Nightmare dreams and nightmare confabulations. Compr Psychiatry 1978;19:285-91.
29. Desjardins S, Zadra A. Threat simulation in nightmares. Sleep 2004;27(Abstract Supplement):A61.
30. Zadra A, Duval M, Begin E, Pilon M. Content analysis of nightmares. Sleep 2004;27(Abstract Supplement):A64.
31. Zadra A, Robert G. Why do some dreams become nightmares? Int J Dream Res 2010;3:S11-2.
32. Nielsen TA, Zadra AL, Simard V, et al. The typical dreams of Canadian university students. Dreaming 2003;13:211-35.
33. Cann DR, Donderi DC. Jungian personality typology and the recall of everyday and archetypal dreams. J Pers Soc Psychol 1986;50:1021-30.
34. Gwet KL. Computing inter-rater reliability and its variance in the presence of high agreement. Br J Math Stat Psychol 2008;61:29-48.
35. Tonay V. California women and their dreams: A historical and sub-cultural comparison of dream content. Imag Cogn Pers 1990/1991;10:83-97.
36. Zadra L. Recurrent dreams: Their relation to life events. In: Barrett D, ed. Trauma and dreams. Cambridge, MA: Harvard University Press, 1996:231-47.
37. Belicki K. Nightmare frequency versus nightmare distress: Relations to psychopathology and cognitive style. J Abnorm Psychol 1992;101:592-7.
38. Blagrove M, Farmer L, Williams E. The relationship of nightmare frequency and nightmare distress to well-being. J Sleep Res 2004;13:129-36.
39. Lusignan F-A, Zadra A, Dubuc M-J, Daoust A-M, Mottard J-P, Godbout R. Dream content in chronically-treated persons with schizophrenia. Schizophr Res 2009;112:164-73.
40. Schredl M. Nightmare frequency and nightmare topics in a representative German sample. Eur Arch Psychiatry Clin Neurosci 2010;260:565-70.
41. Valli K, Revonsuo A, Valli K, Revonsuo A. The threat simulation theory in light of recent empirical evidence: a review. Am J Psychol 2009;122:17-38.
42. Domhoff B. Dreams are embodied simulations that dramatize conceptions and concerns: The continuity hypothesis in empirical, theoretical, and historical context. Int J Dream Res 2011;4:50-62.
43. Pesant N, Zadra A. Dream content and psychological well-being: A longitudinal study of the continuity hypothesis. J Clin Psychol 2006;62:111-21.
44. Schredl M. Characteristics and contents of dreams. Int Rev Neurobiol 2010;92:135-54.
45. Soffer-Dudek N, Shahar G. Daily stress interacts with trait dissociation to predict sleep- related experiences in young adults. J Abnorm Psychol 2011;120:719-29.
46. Blagrove M, Fisher S. Trait-state interactions in the etiology of nightmares. Dreaming 2009;19:65-74.
47. Schredl M. Effects of state and trait factors on nightmare frequency. Eur Arch Psychiatry Clin Neurosci 2003;253:241-7.
48. Cason H. The nightmare dream. Psychol Monogr 1935;46:1-51.
49. Feldman MJ, Hyman E. Content analysis of nightmare reports. Psychophysiol 1968;5:221.
50. Cellucci AJ, Lawrence P. The efficacy of systematic desensitization in reducing nightmares. J Behav Ther Exp Psychiatry 1978;9:109-14.
51. Kales JD, Kales A, Soldatos CR, Caldwell AB, Charney DS, Martin ED. Night terrors: Clinical characteristics and personality patterns. Arch Gen Psychiatry 1980;37:1413-7.
52. Cernovsky ZZ. Content of waking life events and of nightmare themes. Percept Mot Skills 1984;58:899-902.
53. Hearne KM. A questionnaire and personality study of nightmare sufferers. J Ment Imagery 1991;15:55-64.