

Nonwaking Responses to Waking Stressors: Dreams and Nightmares¹

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A distinction between self-reported dreams and nightmares made it possible to test the relative sensitivity of these nonwaking cognitions to different kinds of life stressors including combat exposure, childhood and adolescent stressors, and recent life events. Survey interview data were collected on 442 men from the cohort eligible for military duty during the Vietnam Conflict who varied in their participation in that war. Dreams were over 3.5 times more prevalent than nightmares. Nevertheless, it was the prevalence, frequency, and content of nightmares, not dreams, that were consistently associated with life stressors. Links between nonwaking cognitions and life stressors are explored with regard to hypothesized mechanisms involving affect and cognition, wish fulfillment, and working-through processes.

This study compares the effects of social stressors on the frequency, prevalence, and content of nightmares and dreams. The model used in this study is common to the stress literature. It asserts that negative life events and daily hassles, referred to here as stressors, threaten basic needs, and thereby produce psychological and physiological responses, such as anxiety, depression, and somatic responses (e.g., Dohrenwend & Dohrenwend, 1978; Holmes & Rahe, 1967; Lazarus & Folkman, 1984). Tests of this model have generally focused on psychological strain that occurs in the waking lives of people. Our study extends this research by

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examining nightmares and dreams as nonwaking indicators of psychological strain.

The research on stressors and dreaming is essentially a *set* of literatures. One subset suggests that dreaming fulfills a biological need (e.g., Fiss, 1986; Smith, 1984), whereas another subset links dreaming to emotions, particularly negative affect (e.g., Beck & Ward, 1961). A third subset focuses on incorporation, the tendency of dreams to mirror waking events (e.g., Cohen & Cox, 1975; Kramer & Kinney, 1988).

The phenomenon of incorporation has been demonstrated in laboratory experiments, as well as with naturally occurring life events and conditions (Hall & Van de Castle, 1966; Kramer, Schoen, & Kinney, 1987; Breger, Hunter, & Lane, 1971). For example, pregnant women report dreaming about babies and pregnancy as their due date approaches (Van de Castle & Kinder, 1968; Winget & Kapp, 1972), divorced women who are depressed are *less* likely to report dreaming about marital status than their nondepressed counterparts (Cartwright, Lloyd, Knight, & Trenholme, 1984), and suicidal patients are more likely to report dreams about death and violence than nonsuicidal patients (Raphling, 1970). Stressful life event scores have also been positively associated with recurrent dreams (Brown & Donderi, 1985) and with the number of different themes that can be coded from nightmares (Cernovsky, 1984).

Incorporation in Nonwaking Cognitions

This study extends previous lines of research on incorporation in several ways. First, we asked people to identify which of their nonwaking cognitions were nightmares and which were dreams. This inquiry made it possible to examine the unique contribution of nightmares and dreams to the stress process. Second, we asked for a description of the most frequent kind of nightmare and dream that people experienced, as well as a rating of their respective frequencies. These data made it possible to test hypotheses regarding the effects of stressors on the occurrence (prevalence), frequency, and content of nightmares and dreams. Third, this study examined how a wide range of traumatic and everyday stressors affects dreams and nightmares. In addition to an assessment of recent life events (e.g., Paykel et al., 1969; Ross & Mirowsky, 1979; Dohrenwend & Dohrenwend, 1978), we examined two traumatic events from the past that are often associated with poor mental health. These stressors are military duty in Vietnam (e.g., Egendorf, Kadushin, Laufer, Rothbart,

& Sloan, 1981; Horowitz, Wilner, Kaltreider, & Alvare, 1980; Kaylor, King, & King, 1987) and adolescent trauma (e.g. Robins, 1983). This study compares the current effects of these different stressors on dreams and nightmares.

Some writers suggest that dreams and nightmares, particularly recurrent ones, disappear once there is resolution of the underlying stressors (Cartwright, 1979; Jung, cited in Mattoon, 1978). This contention has been empirically supported in Brown and Donderi's (1985) comparison of persons who experienced recurrent dreams at the time of their study, those who experienced them in the past, and those who never had them. Persons reporting only past recurrent dreams had the highest scores on measures of psychological well-being, whereas the current dreamers had the lowest scores and the most negative (aggressive, anxious, and dysphoric) dream content. By examining the link between stressors and nonwaking cognitions, it is possible to determine whether recurrence is more characteristic of nightmares or dreams.

Another issue concerns how stressors influence unpleasant nonwaking cognitions compared to pleasant ones. It has been suggested that negative affect leads people to attend to and retrieve negative cognitions (e.g., Bower, 1981; Blaney, 1986; Clark & Teasdale, 1982). To the degree that stressors induce negative affect, negative affect should, in turn, lead to negative nonwaking cognitions (nightmares) rather than positive ones (dreams).

There is also the hypothesis that stressors lead to wish-fulfilling dreams *and* nightmares as a way to deal with unresolved conflicts (e.g., Freud, 1955; Bokert, 1968). If so, stressors should be equally likely to influence the prevalence, frequency, and content of both nightmares and dreams.

Any hypotheses based on incorporation would lead to the prediction of an isomorphism of content between waking stressors and nonwaking cognitions. In this case, the content and the evaluative tone of the stressors (negative or positive) would be incorporated into nonwaking cognitions. For example, a negative life event should lead to a nightmare about the event, and a positive life event should lead to a dream about the event. This hypothesis would affect the prevalence, frequency, and content of both nightmares and dreams.

By contrast, a "hot cognitions" hypothesis predicts that nonwaking cognitions will reflect the affect generated by waking events but will not necessarily mirror their actual content. Thus, negative affect (e.g., anxiety,

depression) would facilitate the production of negative nonwaking cognitions (nightmares), and positive affect would facilitate the production of positive ones. Finally, the wish-fulfillment hypothesis predicts that stressors increase the prevalence and frequency of nonwaking cognitions, but a distinction between nightmares and dreams cannot be made.

The measures of nightmares and dreams are rough approximations of these phenomena, so this study should be viewed as exploratory. It provides an initial look at the above issues. For example, are certain kinds of stressors more likely than others to influence the prevalence and content of nonwaking cognitions? Is recurrence more characteristic of nightmares as compared to dreams? What kind of stressors (e.g., traumatic, everyday) are related to their recurrence?

Methods

The data were collected through in-person interviews conducted by professional interviewers from the Survey Research Center at the Institute for Social Research. Each interview took approximately one hour and was usually conducted in the respondent's home. Every respondent was paid \$5.00 for his participation in the interview.

The respondents included were 442 men from the third wave of a longitudinal study which began 12 months earlier. Wave 3 data were used because it contained the full set of measures needed to test the above hypotheses. Of the original respondents who participated at Wave 1 ($N = 486$), 91.0% participated in Wave 3. The data were collected in Spring 1983.

The respondents were drawn from Detroit and its outlying areas. These respondents represented employed and unemployed Vietnam veterans (serving in, flying air missions over, or having duty in the coastal waters of Vietnam), Vietnam Era veterans (in the military during the Vietnam Conflict but stationed elsewhere), and nonveterans. The nonveterans were persons who were eligible but did not serve on active duty in the U.S. Armed Forces between August 5, 1964 and May 7, 1975, the dates officially defined as the Vietnam Era (Veterans Administration, 1980).

The original sampling design was developed to examine the ways people cope with job loss—a purpose tangential to this study. To obtain the sample, a group of unemployed men were first recruited from local unemployment offices. Each unemployed respondent then nominated an

employed counterpart to produce demographically matched groups, an intent met successfully (Vinokur, Caplan, & Williams, 1987).⁴

The respondents were predominantly white (88% white, 12% black) males between 24 to 41 years of age (mean = 33, *S.D.* = 4.2), the age range eligible for military service during the Vietnam Conflict. They had an average education of 13 years (*S.D.* = 1.9) and were mostly married (71%). All respondents were males, due to the difficulty of obtaining a large enough sample of female Vietnam veterans. The Vietnam veterans were older than the Vietnam Era veterans and nonveterans, more likely to be married, and more likely to be white ($F = 45.19$, $df = 2,483$, $p < .001$; chi-square = 30.67, $df = 8$, $p < .001$; and chi-square = 18.47, $df = 4$, $p < .001$, respectively).

Measures

Table 1 presents the Pearson product-moment correlations among the major measures used in this study. Where possible, multi-item indices were used to assess each construct. A complete list of the measures used in this study is available from the authors.

Stressful Experiences During Childhood and Adolescence

Past experiences during childhood and adolescence were measured retrospectively. Respondents reported on life-threatening health problems, parental support, parental problems, and exposure to violence. These measures were originally developed by Gold and his associates

⁴Despite the recruitment of respondents based on employment status, the study design was not conducive to examining the effects of job loss on dreams and nightmares. The demographic matching in the original study may have biased the sample by making the employed and unemployed respondents similar to one another in ways that could affect the relationship of job loss to dreams and nightmares (Cook & Campbell, 1979). A rigorous examination of job loss also requires that one distinguish among persons with different reasons for job loss and with different levels of economic hardship. It was not possible to subgroup the unemployed respondents by these variables and maintain adequate cell sizes for the analyses because nightmares were not prevalent enough; however, despite this drawback, we did make global comparisons between the unemployed and employed respondents, but failed to find any significant effects of employment status on dreams and nightmares.

The matching procedure used to obtain the original sample did not interfere with our ability to examine the other stressors in the study because they varied similarly within the unemployed and employed respondents. Analyses also demonstrated that employment status was unrelated to other stressors of interest, including recent life events, childhood and adolescent stressors, and combat, further mitigating concern about its confounding effects.

Table 1
Inter-Item Correlations Between Nightmare Frequency, Dream Frequency, Affect and Stressors (N = 442)

(1) Nightmares																						
(2) Dreams	.09																					
(3) Anxiety	.33**	.11*																				
(4) Depression	.27**	.10*	.81**																			
(5) Veteran/Combat	-.19**	-.04	-.06	-0.6																		
(6) Parental Support	-.14**	-.07	-.16**	-.15**	.09*																	
(7) Parental Problems	.03	-.04	.21**	.15**	-.08	-.23**																
(8) Violent Behavior in Adolescence	.11*	.07	.21**	.18**	.18**	-.07	-.17	.24**														
(9) Illness/Injury in Childhood	.08	.11*	.09*	.01	-.02	-.05	.10*	.11*														
(10) Work Negotiations	.14**	.09	.00	-.01	-.03	-.07	.02	.06	.03													
(11) Personal Achievement	.14**	.02	.04	-.01	.03	.01	.00	.03	.08	.05												
(12) Trouble with Boss	.20**	.00	.17**	.13**	-.02	-.09*	.06	.09*	.05	.08	.13											
(13) Change in Residence	.14**	.03	.15**	.18**	-.09*	-.06	.02	.08	.07	-.04	.08	.15**										
(14) Total Perceived Stress	.23**	.00	.39**	.43**	-.06	-.17**	.17**	.17**	.07	.04	.29**	.26**	.39**									
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)									

p* < .05. *p* < .01.

(Gold & Mann, 1972; Gold & Reimer, 1975) in studies of adolescent behavior.

A 14-item mean index of parental support measured how emotionally supportive the respondent perceived his parents (or guardians) to be and how much he identified with them (mean = 3.46, *S.D.* = .79, alpha coefficient = .91). Examples of these items were: "How much did your (father/mother/guardian) accept and understand you as a person," and "How close did you feel to your (father/mother/guardian)?" A Likert-type scale was used that ranged from 1 = "Not At All" to 5 = "A Great Deal." The number of problems experienced by the respondent's parents or guardians was examined using an additive index of five problems (e.g., alcohol abuse, mental illness, jail term) that could range from 0 to 5 (mean = 1.31, *S.D.* = .34).

A measure of illness or injury during childhood and adolescence was based on a single item (mean = 1.29, *S.D.* = .63). Respondents who experienced this kind of problem used a 5-point Likert-type scale to rate how much they had been in danger of losing their life or becoming permanently disabled.

A 4-item mean index measured the respondent's involvement in violent behavior during adolescence (mean = 1.80, *S.D.* = .80, alpha coefficient = .67). These items assessed the *number* of times the respondent had physically hurt or threatened to hurt other people, participated in gang fights, and carried weapons. The response scale ranged from 1 = "Never" to 4 = "Three or more times."

Past Military Experience

The veteran status of each respondent was one measure of past military experience. A second measure was the combat experience of Vietnam veterans. It was adapted from a combat scale originally developed by Egendorf and colleagues (1981). A mean index of 15 combat-related items, such as being wounded, being involved in firefights, and seeing close friends seriously injured or killed, was constructed (mean = 2.24, *S.D.* = .93, alpha coefficient = .94). A 5-point Likert-type scale that ranged from 1 = "Never" to 5 = "Very Often" was used to determine how often Vietnam veterans experienced each of these events. Veterans also rated how much they feared for their life and safety when each event occurred (mean = 3.10, *S.D.* = 1.54, alpha coefficient = .95). A 5-point scale was used that ranged from 1 = "Not at All" to 5 = "A Great Deal."

Recent Stressors

Sixty-five recent stressors were measured using an adaptation of the Holmes and Rahe (1967) Schedule of Recent Experience. A self-administered questionnaire was used. Respondents checked off those events that happened to them during the past twelve months. Respondents also rated the degree of stress associated with each event on a 5-point Likert-type scale that range from 1 = "Not at All" to 5 = "A Great Deal."

Affect

Two 7-item mean indices assessed levels of anxiety and depression (respective means = 1.99 and 2.05, *S.D.s* = .72 and .72, alpha coefficients = .85 and .87). These measures were derived from the Hopkins Symptom Checklist (Derogates, Lipman, Rickels, Uhlenhuth, & Covi, 1974). The respondents were asked how often they experienced a variety of symptoms such as nervousness or shakiness inside, trembling, and feeling sad. The frequency of each symptom was rated on a 5-point scale ranging from 1 = "Not at All" to 5 = "Very Often."

Nightmares and Dreams

This study used survey research methods to examine self-reported recollections of nonwaking cognitions. Several studies have addressed the accuracy of such self-reports. Arkin, Toth, Baker, and Haste (1970) used a novel procedure to examine this issue. They identified a set of sleep talkers with good recall and hypnotized them to sleep talk about their dreams (and nightmares) as they occurred. These persons, upon waking, were interviewed and asked to report what they dreamed. The correspondence between sleep talk and recalled dream content was 87%. Fiss (1979) noted that "Arkin came very close to observing a dream while it was unfolding." No other design or study has come as close in shedding light on the link between self-reports and actual dream content.

There has been considerable discussion about whether or not it is better to collect data on dreams in the laboratory or in everyday settings (e.g. Cohen, 1979; Hall & Van de Castle, 1966; Dement, Kahn, & Roffward, 1965). Brown and Donderi (1985) concluded that home (diary) dream reports are desirable for studying the impact of everyday situations

because they (a) contain fewer references to the experimental situation (e.g., Cohen, 1979), (b) have a wider range of themes and affect (e.g., Okuma, Fukuma, & Kobayashi, 1975), and (c) are less influenced by social desirability or self-serving bias (e.g., Domhoff & Kamiya, 1964; Okuma et al., 1975).

The survey approach used in this study is a relatively new method of collecting information on dreams and nightmares. In comparison to laboratory experiments and the diary method, the value of this approach has not been examined in depth. Like the diary method, we assume that it avoids the uniqueness of data that is collected in the laboratory. However, any study of recalled dreams and nightmares will be biased by the limitations of people's ability to recall them and their willingness to describe them to someone else. Previous research suggests that people who report recurrent dreams are not fundamentally different from those who do not report them with regard to social desirability or defensiveness, age, sex, education, and socioeconomic status (Brown & Donderi, 1985).

The respondents in this study were asked the following questions about their nightmares: (a) "In the last three months, have you had any *nightmares* about stressful things that happened in the past?", (b) "Describe the *most* frequent kind of nightmare you've had in the last three months," and (c) "How often have you had this kind of nightmare?" The response scale for the last question ranged from 1 = "Not at All" to 5 = "Very Often." Respondents were also asked: (a) "Have you had any dreams in the last three months that are not nightmares?", (b) "Describe the *most* frequent dream that you have had in the last three months," and (c) "In the last three months, how often have you had this kind of dream?" Like the question on dreams, it would have been desirable to obtain data on nightmares without referring to stressful things that occurred "in the past." Accordingly, comparisons of nightmares and dreams must be interpreted with this limitation in mind.

The content of each reported nightmare and dream was evaluated by three trained coders blind to the rest of the questionnaire. Although the coding categories were similar to those used in other studies of dreams (e.g., Hall & Van de Castle, 1966; Brown & Donderi, 1985), they also contained content codes specifically related to the stressors in this study. The major categories of code schemes are presented in Appendix A. The main content codes included 11 *mutually exclusive* categories, such as death, physical injury, interpersonal relationships, leisure time activities, and

work life. The coders assigned one and only one category to each dream and nightmare, hence the term "main content." A second code scheme dealt with content on military life and violence. Themes of violence included any act that physically injured or killed another person, regardless of whether the respondent viewed himself as the perpetrator, the victim, or the observer. Themes of military duty incorporated content related to experience in Vietnam or general experience in the military. The detailed code schemes can be obtained from the authors.

A code was assigned to a nightmare or dream whenever the content code was agreed upon by at least two of the three coders. Two or more coders agreed on the main content code at last 80.0% of the time for nightmares and for dreams. Even higher agreement occurred for themes of military life and violence. Two out of three coders agreed 94.9% of the time for nightmares and 100.0% of the time for dreams.

Comparative analyses were conducted to determine whether or not differences in stressors and affect existed between the respondents whose nightmares and dreams could be coded and the respondents whose nightmares and dreams could not be coded. No significant differences were found.

Table 2 suggests that a valid distinction exists between what respondents report as the content of their nightmares compared to their dreams. The content of nightmares focused mostly on unpleasant events, such as death, injury, personal loss, and difficulties at work. The content of dreams, on the other hand, was more likely than nightmares to focus on pleasant experiences, including leisure time activities and sex. In addition, a larger proportion of respondents refused or could not describe the content of their dreams as compared to their nightmares.

Results

The analyses are presented in four sections. The first section describes the relative frequency of nightmares and dreams. The second section discusses the relationship of affect to nightmares and dreams, and the third section describes the relationship of stressors to nightmares and dreams. Within the second and third sections, findings related to the prevalence and frequency of nightmares and dreams are followed by findings related to their content. The last section examines whether or not negative affect mediates the relationship of stressors to nightmares and dreams. The previously described differences in the wording of questions used to assess

Table 2

Comparison of Nightmares and Dream Control

Main Content	Nonwaking Responses	
	Nightmares (N = 49)	Dreams (N = 195)
Death of Self and Others	10.2%	4.6%
Physical/Psychological Injury of Self & Others	8.2%	5.6%
Personal Loss ¹ (e.g., self, other people, property)	16.4%	3.1%
Work Problems	14.3%	1.5%
Aggression Toward Others	10.2%	1.5%
Sex	2.0%	5.1%
Mastery (Excluding work situations)	10.2%	7.7%
Interpersonal Relationships	2.0%	6.8%
Leisure Time Activities	0.0%	19.5%
Refused to Describe or Cannot Recall	26.5%	44.6%
TOTAL	100.0%	100.0%

¹Content excludes death and injury, as well as loss related to the work environment.

nightmares and dreams should be kept in mind when comparing them, but should not affect the results of analyses that exclusively focus on either one.

Prevalence and Frequency of Nightmares and Dreams

Dreams were reported more often than nightmares. Over half of the respondents reported having dreams (51.8%, $N = 229$), whereas only 14.7% ($N = 64$) reported having nightmares. When dreams and

nightmares did occur, their frequencies were similar (mean = 2.89, *S.D.* = .89 for dreams and mean = 2.80, *S.D.* = .68 for nightmares). Among those who experienced both nightmares and dreams, however, dreams occurred slightly less often than nightmares (mean = 2.24, *S.D.* = 1.33 for dreams and mean = 2.80, *S.D.* = .68 for nightmares with 2 = "Almost Never" and 3 = "Sometimes" on a 5-point scale; difference significant at $p < .01$, pairwise, $t = 2.58$, $df = 54$).

Links with Affect

Relations with Prevalence

Those respondents who reported having nightmares had higher levels of anxiety than those with no nightmares (mean = 2.46, *S.D.* = .78, and mean = 1.91, *S.D.* = .68, respectively; $t = 5.85$, $df = 440$, $p < .001$). Similarly, respondents with nightmares had higher levels of depression than those with no nightmares (mean = 2.32, *S.D.* = .71, and mean = 1.87, *S.D.* = .70, respectively; $t = 4.74$, $df = 440$, $p < .001$). There were no significant differences in levels of anxiety or depression for respondents who reported dreams compared to those who reported no dreams.

Relations with Frequency

Strong positive associations were found between the frequency of nightmares and measures of affect. Nightmares were significantly correlated with anxiety ($r = .33$, $p < .001$) and with depression ($r = .27$, $p < .001$). The frequency of dreams was also correlated with anxiety and depression, but the magnitude was much lower (respective r s = .11 and .10, both $p < .05$). The significance of the differences between the correlations of anxiety and depression with nightmares was $p < .05$ ($t = 2.49$, $df = 439$), whereas there were no significant differences with dreams ($t = .35$, $df = 439$).

Relations with Content

Respondents whose nightmare content dealt with personal loss reported more anxiety than respondents whose nightmares dealt with other main content areas ($F = 2.36$, $df = 8, 40$, $p < .05$). Other nightmare content was not associated significantly with either anxiety or

depression. There also was no significant association between the content of dreams and negative affect.

Links with Stressors

Childhood and Adolescent Stressors

Illness/injury and parental problems experienced during childhood and adolescence were unrelated to the frequency, prevalence, and content of nightmares. This was not the case for involvement in violent behavior during adolescence. Nearly 20% of the respondents who reported they frequently engaged in violent behavior had nightmares as compared to only 8.7% of the respondents who reported they had seldom or never engaged in violent behavior (chi-square = 6.55, $df = 2$, $p < .05$). The mean frequency of nightmares for the infrequently, moderately, and frequently violent groups were 1.13 ($S.D. = .48$), 1.25 ($S.D. = .69$), and 1.34 ($S.D. = .77$), respectively ($F = 3.47$, $df = 2$, 435, $p < .05$). Lack of parental support during adolescence was also significantly associated with the frequency of nightmares ($r = .14$, $p < .05$). The other childhood and adolescent stressors were unrelated to the content of nightmares. None of these stressors were significantly related to either the frequency, prevalence, or content of dreams.

Combat as a Stressor

Prevalence and frequency of nightmares and dreams. Nearly one-fourth (22.7%) of the Vietnam veterans reported having nightmares as compared to only 11.7% of the Vietnam Era veterans and 10.7% of the nonveterans (chi-square = 9.78, $df = 2$, $p < .01$). Vietnam veterans reported the highest frequency of nightmares, followed by Vietnam Era veterans and nonveterans (mean = 1.42, 1.21, and 1.16, respectively; $F = 6.17$, $df = 2$, 346, $p < .01$). Turning to dreams, veteran status was not associated with either their prevalence or frequency.

Examining only those veterans who were stationed in Vietnam, there was a nonsignificant trend for nightmares to be associated with the degree of combat experience. Among the Vietnam veterans involved in heavy combat, nearly one third (32.6%) reported having nightmares, whereas only 16.7% of the Vietnam veterans with moderate combat experience and 19.0% of those with little to no combat experience had nightmares (chi-square = 3.56, $df = 2$, ns). There was a weak tendency for

the frequency of nightmares to increase with combat experience. For little to no, moderate, and high combat experience, the respective mean frequencies were 1.31, 1.31, and 1.65 ($F = 2.35$, $df = 2, 124$, *ns*).

Turning to dreams, combat exposure was significantly associated with their prevalence. Nearly three-fourths (74.4%) of the respondents with heavy combat experience reported having dreams as compared to 40.5% of the respondents with moderate combat experience and 64.3% of the respondents with little to no combat experience (chi-square = 10.70, $df = 2$, $p < .01$).

In addition to assessing exposure to combat, we also examined ratings of fear for one's life and safety in combat. This measure was significantly correlated with the frequency of nightmares ($r = .19$, $p < .01$), but not with the frequency of dreams ($r = .07$, *ns*). The difference between the r s was not significant.

Content of nightmares and dreams. Themes of violence and military duty characterized the content of nightmares experienced by Vietnam veterans. Nearly one third of the Vietnam veterans who had nightmares (29.6%) described them as having violent content, whereas none of the Vietnam Era veterans and only 7.1% of the nonveterans described having nightmares with violent content (chi-square = 7.08, $df = 2$, $p < .05$). Combat exposure among Vietnam veterans was significantly related to the violent nature of their nightmares, regardless of whether or not these nightmares had content related to the military. Sixty percent of the high combat veterans with nightmares reported violent content. By comparison, 53.3% of those with moderate combat experience and 15.4% of those with little to no combat experience reported violent content (chi-square = 6.75, $df = 2$, $p < .05$). Violent nightmares tended to have content involving death, physical injury, and loss, whereas nonviolent nightmares tended to have content involving work life, mastery, and interpersonal relationships (chi-square = 41.07, $df = 6$, $p < .001$).

Vietnam veterans, regardless of their combat status, also reported more nightmares about military life in general than either Vietnam Era veterans or nonveterans (chi-square = 8.04, $df = 2$, $p < .05$). Among Vietnam veterans, those exposed to high levels of combat experienced more military-related nightmares (whether violent or not) than veterans who were less involved in combat (chi-square = 8.42, $df = 2$, $p < .01$). There was no association between dream content and participation in the military during the Vietnam War.

The violent content and military content of nightmares were not necessarily mutually exclusive. Of those nightmares with military

content, over half (58.3%) also had violent content. Of those nightmares with no military content, nearly all of them (95.3%) had nonviolent content (chi-square = 19.76, $df = 1$, $p < .001$).

Recent Life Events as Stressors

This section examines the effects of current stressors on nightmares and dreams. The effects of unpleasant and pleasant life events are described first, followed by a description of the effects of specific life events to nightmares and dreams.

Unpleasant and pleasant life events. The number of unpleasant life events experienced in the previous 12 months was significantly associated with the prevalence of nightmares. Respondents with nightmares reported an average of 8.4 unpleasant life events ($S.D. = 5.14$), whereas respondents with no nightmares reported 6.0 events ($S.D. = 4.38$) ($t = 3.84$, $df = 418$, $p < .001$). Pleasant life events were unrelated to the prevalence of nightmares. Turning to the prevalence of dreams, there was no association with either the number of unpleasant or pleasant events. The average number of unpleasant and pleasant events reported was 6.4 ($S.D. = 4.57$) and 7.7 ($S.D. = 4.09$), respectively.

Specific recent life events and nightmares. Most of the recent life events (e.g., death of significant other, personal illness) were not significantly associated with the prevalence of nightmares. Events that focused on interpersonal relationships, particularly in the domains of work and family life, were an exception (see Table 3). Nearly one third of the respondents with nightmares reported family conflict, whereas approximately one fifth of the respondents without nightmares reported family conflict. Illness or injury of a family member and gain of a family member were also associated positively with the prevalence of nightmares. In the domain of work, trouble with the boss was reported more often by the respondents who had nightmares than those who did not have them.

Stress ratings of life events and nightmares. Previous research indicates that there are individual differences in how upsetting life events are (Vinokur & Selzer, 1975; Vinokur & Caplan, 1986). In this study we obtained stress ratings to examine individual variation in the intensity of life events that were experienced.

The total perceived stress of all life events was positively associated with both the prevalence and the frequency of nightmares. An additive index of perceived stress for all life events was constructed (mean = 38.51, $S.D. = 23.50$). Respondents with nightmares had higher stress scores than

Table 3

Significant Associations Between Recent Life Events and Prevalence of Nightmares

Occurrence of Recent Life Events	Prevalence of Nightmares	
	Nightmares (N = 64)	No Nightmares (N = 378)
<i>Family Life</i>		
Conflict with Family		
Yes	32.8%	13.2%
No	67.2%	86.8%
TOTAL:	100.0%	100.0%
	$(\chi^2 = 15.6, df = 1, p < .05)$	
Gain Family Member		
Yes	18.8%	9.5%
No	81.2%	90.5%
TOTAL:	100.0%	100.0%
	$(\chi^2 = 5.8, df = 1, p < .05)$	
Family Illness/Injury		
Yes	29.7%	16.9%
No	70.3%	83.1%
TOTAL:	100.0%	100.0%
	$(\chi^2 = 4.8, df = 1, p < .05)$	
<i>Work Life</i>		
Trouble with Boss		
Yes	27.8%	11.6%
No	72.2%	88.4%
TOTAL:	100.0%	100.0%
	$(\chi^2 = 13.9, df = 1, p < .001)$	
Job Training		
Yes	3.1%	11.4%
No	96.9%	88.6%
TOTAL:	100.0%	100.0%
	$(\chi^2 = 4.1, df = 1, p < .05)$	
<i>Other</i>		
Change in Residence		
Yes	19.7%	16.1%
No	70.3%	83.9%
TOTAL:	100.0%	100.0%
	$(\chi^2 = 6.8, df = 1, p < .01)$	
Crime Victim		
Yes	15.6%	7.9%
No	84.4%	92.1%
TOTAL:	100.0%	100.0%
	$(\chi^2 = 3.9, df = 1, p < .05)$	

respondents with no nightmares (respective scores = 52.5 and 36.2; respective *S.D.s* = 27.2 and 22.0; $t = 5.11$, $df = 416$, $p < .001$). Likewise, the Pearson product-moment correlation between the total stress score and nightmare frequency was .23 ($df = 414$, $p < .001$).

The individual stress ratings of six life events were correlated significantly and positively with the frequency of nightmares. The events were family conflict, conflict with other people, trouble with the boss, end of a romantic relationship, property repair, and personal achievement. Although the effects were weak (r s ranged from .12 to .26, the latter for trouble with the boss), there was a consistent pattern of relations between interpersonal stressors and the frequency of nightmares.

Specific recent life events and dreams. Most recent life events were unrelated to the prevalence of dreams. The type of life events significantly related to dreams tended to be both positive and negative in nature. These events focused on new romantic relationships (67.4% of the dreamers and 32.6% of the nondreamers; chi-square = 5.33, $df = 1$, $p < .05$) and a hobby as a leisure activity (70.3% of the dreamers and 57.0% of the nondreamers; chi-square = 8.35, $df = 1$, $p < .01$). The exceptions were a recent illness or injury (20.0% of the dreamers and 10.6% of the nondreamers; chi-square = 6.16, $df = 1$, $p < .01$) and recovery from a recent illness or injury (11.0% of dreamers and 5.0% of nondreamers; chi-square = 4.88, $df = 1$, $p < .05$).

Stress ratings of life events and dreams. The perceived stress of all recent life events was not significantly associated with either the prevalence or frequency of dreams. The stress ratings of three individual life events were significantly correlated with the frequency of dreams, but these associations were weak. Those events were divorce ($r = .12$, $df = 407$, $p < .05$), personal illness or injury ($r = .11$, $df = 406$, $p < .05$), and recovery from personal illness or injury ($r = .10$, $df = 406$, $p < .05$).

Recent life events and the content of nightmares and dreams. The occurrence of specific life events was not associated with the content of nightmares. However, the overall stress ratings for unpleasant life events were higher for respondents whose dreams had violent content than respondents with other dream content ($t = 3.38$, $df = 231$, $p < .001$; respective means = 40.57 and 23.3, respective *S.D.s* = 27.89 and 17.80). There was no significant link between the overall stress rating for pleasant life events and dream content.

The above findings should be viewed with caution because the number of respondents reporting violent dream content was very small (15 out of 231 persons; 6.5%). The findings, however, fit a largely consistent

literature suggesting that unpleasant life events (not pleasant ones) are most likely to generate psychological upset (e.g., Fontana, Hughes, Marcus, & Dowds, 1979; Ross & Mirowsky, 1979; Vinokur & Caplan, 1986).

Negative Affect and Stressors as Joint Influences on Nightmares

Because negative affect and several stressful life events were significantly related to nightmares, their multivariate effects on both the prevalence and frequency of nightmares were examined. Similar analyses with dreams were not conducted, because most stressors were not significantly related to dreams.

For heuristic purposes, two paths of influence were examined which were reasonable to test within the limits of the study design. Both paths are based on the assumption that the reports of stressors of childhood and adolescence, war, and recent life events largely reflect events antecedent to current levels of negative affect and nightmares. One path represents the hypothesis that stressors operate on the prevalence and frequency of nightmares via current levels of negative affect (i.e., non-waking cognitions are mediated by affective responses to waking stressors), while the other path represents the hypothesis that stressors have direct effects on nightmares.

To compare these two models, multiple regression analyses were used that included and excluded negative affect. Since anxiety and depression were strongly correlated ($r = .81$, $p < .001$) and yielded similar results, they were combined into a single mean index of negative affect to simplify the presentation of results (mean = 1.96, *S.D.* = .68, alpha coefficient = .86).

Prevalence of nightmares. Probit regression analyses were used to examine eight predictors of the prevalence of nightmares. Six stressors which were significantly associated at the $p < .01$ level with the prevalence of nightmares were entered into the regression equation as predictors along with the mean index of total perceived stress of recent life events and negative affect. As shown in Table 4, all of the independent variables combined were significantly related to the prevalence of nightmares (likelihood ratio test = 54.07, $df = 8$, $p < .001$). Trouble with the boss and negative affect were most predictive of nightmares followed by veteran status. Negative affect was then deleted, and the analysis was repeated, yielding a lower likelihood ratio test of 46.50 ($df = 7$, $p < .001$). Comparisons of the two models (one with negative affect and one

Table 4

Negative Affect and Stressful Life Events Predicting the Prevalence of Nightmares Using Probit Regression Analyses

Predictors	Model with Affect as Predictor			Model without Affect as Predictor		
	b	SE	t	b	SE	t
Constant	-2.28	.93	-2.46	-1.12	.82	-1.38
Parental Support	.28	.21	1.32	.31	.21	1.52
Veteran Status	.34	.15	2.27	.32	.15	2.15
Work Negotiations	-.30	.15	-1.92	-.29	.15	-1.92
Personal Achievement	-.17	.10	-1.62	-.14	.10	-1.33
Total Perceived Loss	-.01	-.01	-1.35	-.02	-.01	-2.51
Trouble with Boss	-.24	.08	-2.96	-.24	.08	-3.02
Change in Residence	-.07	.11	-.61	-.73	.11	-.67
Affect	-.65	.24	-2.76	—	—	—
Likelihood Ratio Test	54.07, $df = 8, p < .001$			46.50, $df = 7, p < .001$		

without negative affect) were determined by computing the difference between the two likelihood ratio test statistics. Such differences have an asymptotic chi-square distribution. A significant difference was found (chi-square = 7.57, $df = 1, p < .01$), supporting the hypothesis that stressors operate on the prevalence of nightmares via negative affect.

Frequency of nightmares. Multiple regression analyses were used to examine whether or not the link between stressors and the frequency of nightmares operated via negative affect. The six stressors which were significantly associated with the frequency of nightmares were entered into the regression equation as predictors along with total perceived stress and negative affect. The same analysis was then repeated except that negative affect was deleted. As shown in Figure 1, the beta coefficients of the predictors changed little in response to deleting affect from the regression equation.

The predictors of nightmare frequency, excluding negative affect, accounted for 14% of its variance ($R = .37, p < .001$). When negative affect was a predictor of nightmares, a 4% increase in the variance occurred

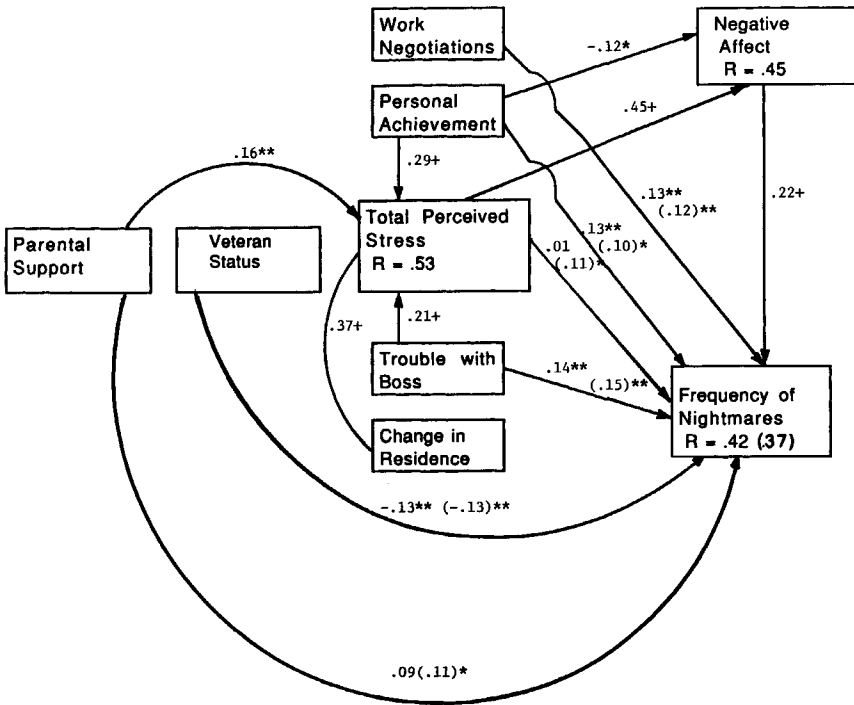


Figure 1. Path analytic model of the predictors of nightmare frequency.¹ Note. * $p < .05$; ** $p < .01$; + $p < .001$. The beta coefficients in parentheses do not have affect entered as an independent variable. The first R for frequency of nightmares includes negative affect; the second R for frequency of nightmares in parentheses does not include negative affect.

($R = .42, p < .001$). A comparison of these two regression analyses indicates that 22.2% of the total explainable variance in nightmares was attributed to negative affect, and 77.8% was attributed to the stressor variables.

Only one stressor, recent personal achievement, was associated with both negative affect and the frequency of nightmares. Controlling for its effects had no influence on the link between negative affect and frequency of nightmares. Similarly, controlling for the effects of negative affect had a negligible influence on the link between recent personal achievement and the frequency of nightmares. These findings suggest

¹Although the dependent variable was skewed, violating the assumption of normality does not affect the beta coefficients or Rs reported in this model (Lewis-Beck, 1980).

that the effect of personal achievement on nightmare frequency was direct and did not occur via negative affect.

Discussion

This study examined the relation of nonwaking cognitive responses to waking stressors. The findings suggest that nightmares have potential value as indicators of psychological adjustment to stressful life events, because they covary with these stressors. Although the cross-sectional nature of this study does not rule out the possibility that nightmares enhanced the retrieval of stressful events, it is unlikely that this mechanism accounts for why pre-existing veteran status was associated with nightmare frequency and content. The link between nightmares and veteran status has also been demonstrated in other studies (e.g., Egendorf et al., 1981; Van der Kolk, Blitz, Burt, Sherry, & Hartmann, 1984).

The Relationship of Nightmares and Dreams to Stressors and Negative Affect

Self-reported dreams were more prevalent than nightmares. Nevertheless, nightmares were more closely linked to negative affect and stressors. It was the *presence* of nightmares, not dreams, that was associated with elevated levels of anxiety and depression. It was also the presence of nightmares, not dreams, that was associated with both exposure to violence during adolescence and the total number of unpleasant life events that people experienced. The recent life events associated with nightmares tended to be unpleasant experiences, whereas those associated with dreams tended to be both pleasant and unpleasant experiences.

Similarly, the *frequency* of nightmares, but not dreams, was strongly associated with elevated levels of anxiety and depression. The same was true with exposure to combat in Vietnam, the total perceived stress of recent life events, and the number of unpleasant life events.

When the contents of dreams and nightmares were examined, elevated levels of anxiety were associated with nightmares about personal loss. Serving in Vietnam (rather than elsewhere or not at all) and being exposed to combat were associated with the violent content in nightmares. Neither of these stressors was related to the content of dreams. The perceived stress of recent unpleasant life events (but not pleasant ones), however, was associated with dreams that had *violent*

content. Consequently, even when negative life events influenced dreams, they were dreams with potentially negative content.

The results do not clearly delineate the mechanisms behind the greater sensitivity of nightmares to stressors. The lack of comparability between the measures of nightmares and dreams could have been one contributing factor. To the extent that this is not a consideration, it is unlikely that negative affect leads to the retrieval of negative nonwaking cognitions. Support for this mechanism requires that negative affect serve as an intervening variable or as a variable related both to the recollection of stressors and to nightmares. The findings were mixed. The analyses suggested that stressors operate on the prevalence (but not the frequency or content) of nightmares via negative affect.

The viewpoint that nightmares and dreams are a way for people to work through unresolved problems (Horowitz et al., 1980) was partly supported in this study. Vietnam veterans were more likely to report violent nightmare content as their exposure to combat increased. To fully explore the validity of this hypothesis, however, longitudinal *within*-person designs (multiwave panel studies, for example) are required to examine changes in the frequency and content of nightmares as people "work through" a stressful event. Furthermore, it would be necessary to study the current meaning of such events, rather than their mere occurrence. Several studies suggest that unresolved threats to one's sense of control, predictability, and meaning (Rothbaum, Weisz, & Snyder, 1982; Sutton & Kahn, 1986) are the key characteristics of events that evoke emotional distress. It is possible that these characteristics are also key elements in the "working through" process.

Future research might entertain the possibility that several mechanisms might be operating simultaneously, depending on the nature of the stressor. For example, events that promise one thing (patriotism, glory, the chance to become a "man") and deliver something else (failure, dishonor, helplessness), as was the case in Vietnam (Marin, 1981; Harrington & Jay, 1982), might lead to dreams and nightmares that serve a wish-fulfillment function. The dissipation of these dreams and nightmares might be studied as the way people work through or resolve unpredictable or uncontrollable events in their lives. Alternatively, interventions aimed at helping persons resolve the lingering conflicts created by stressful events might be examined to determine how they influence the meaning of such events. In turn, the hypothesized effects of such meanings could be examined for their effects on the occurrence and content of nightmares.

The Effect of Negative and Positive Life Events on Nightmares

Several studies have found that negative, rather than positive, life events have the strongest effects on anxiety and depression (Thoits, 1983; Vinokur & Caplan, 1986). Similarly, negative rather than positive social support is more likely to influence negative affect (Abbey, Abramis, & Caplan, 1985). This study found that negative events were more closely associated with nightmares than positive events. Likewise, positive events tended to be more closely associated with dreams than negative events. To the extent that these findings cannot be attributed to differences in the wording of questions on dreams and nightmares, there may be evidence of isomorphism between the tone of recollected waking events and nonwaking cognitions.

If so, the findings would also suggest a modification in the incorporation/isomorphism hypothesis. The negative life events in this study were more strongly associated with nightmares than the positive life events were associated with dreams. Part of the explanation may be related to people's general tendency to have optimistic rather than pessimistic expectations (Taylor, 1983). If this is the case, then negative life events would be more likely than positive ones to violate general expectations, thus threatening fundamental needs for control, predictability, and the ability to derive meaning from experiences (Rothbaum, Weisz, & Snyder, 1982). Threatening these fundamental needs may evoke psychological distress that is manifested in one's nonwaking life, as well as in one's waking life. This model could be tested directly in future research by examining the expectancies that people attach to the likelihood of unpleasant life events.

Why are Negative Affect and Stressors More Strongly Related to the Prevalence and Frequency of Nightmares Rather Than to the Content of Nightmares?

The interviewers did not conduct in-depth assessments of the dreams and nightmares in this study, and consequently, the findings on content should probably be viewed as a lower bound estimate of their effects. Future studies using survey methodology can improve the assessment of dream and nightmare content by including a set of probes for specific categories of content and by administering standardized rating scales to assess aspects of these content areas. Surveys can also elicit content about both infrequent and recurrent nonwaking cognitions to determine how they are related to stressors and negative affect.

Despite the exploratory nature of this study, the consistency of findings suggests that the link between stressors and dreams and nightmares are amenable to study using survey research methods. By administering short, open-ended questions, it was possible to produce codable results that were significantly associated with the hypothesized dependent variables. The results suggest that it is possible to move out of the laboratory to study nonwaking cognitions in the general population. In the study of other selected populations, particularly people who have experienced traumatic life events, studying the prevalence, frequency, and content of nonwaking cognitions could provide an additional window into the process of psychological adjustment.

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Appendix A

Code Categories for Content of Nightmares and Dreams

Main Content:

- I. Death
- II. Physical injury
- III. Psychic injury
- IV. Work
- V. Mastery
- VI. Loss
- VII. Gains
- VIII. Assertive injury toward others
- IX. Sexual
- X. Interpersonal relationships
- XI. Other pleasures
- XII. Refuses to answer or can't remember

Themes of Military Life and/or Violence:

- A. Military experience in Vietnam and physical violence
- B. Military experience in Vietnam and no physical violence
- C. General military experience (excluding Vietnam) and physical violence
- D. Nonmilitary experience and physical violence
- E. Nonmilitary experience and *no* physical violence