

# The Dimensional Nature of Disturbed Dreaming: Reply to Weiss (2007)

Tore A. Nielsen

Université de Montreal and Montreal Sacré-Coeur Hospital

Ross Levin

Yeshiva University

The authors' proposed model of nightmare formation withstands several criticisms raised in an accompanying commentary article (D. S. Weiss, 2007). A principal criticism, that the model lacks convergent and divergent validity, appears to stem from the commenter's application of a strong categorical, as opposed to the authors' use of a dimensional, approach to the model/construct of nightmares. Furthermore, ongoing research continues to support the authors' assumptions about the basic relationship between nightmares and affect distress. Other criticisms of the model, including a failure to account for robust epidemiological differences in nightmares and an ambiguity in the concept of affect distress, are also countered by reference to relevant research findings. A robust gender difference in nightmares (women > men) is particularly compatible with studies demonstrating gender differences in emotion among the physiological and cognitive systems that the authors propose are centrally implicated in nightmare formation.

*Keywords:* nightmares, distress, neurophysiology of fear memory, posttraumatic stress disorder, psychopathology

We are indebted to Daniel S. Weiss for his careful reading of our article and giving us an opportunity to clarify and elaborate on critical components of our review and model. His primary criticism of our work (Weiss, 2007) has to do with basic epistemological questions about an apparent lack of consistency in our key terminology. He bemoans an alleged absence of a "sharp delimited definition of a nightmare" (p. 529) and questions whether our model applies only to nightmares or to the full spectrum of disturbed dreaming. The breadth of these comments and their severe implications for our review and model incite us to devote a substantial portion of our reply to clarifying what we see as a fundamental difference in how we and Weiss conceptualize nightmares. Weiss's (2007) secondary criticisms are that our model needs to explain some robust epidemiological findings regarding gender and age differences and that the role of affect distress in nightmare production needs to be clarified. We address these issues by illustrating how the AMPHAC (A = amygdala, MP = medial prefrontal cortex, H = hippocampus, AC = anterior cingulate cortex) neural model is consistent with recent findings on gender differences in emotional processes that could explain the robust gender difference for nightmares. We also clarify that affect distress should be considered a phenomenological feature of, and not simply a reaction to, nightmares.

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Tore A. Nielsen, Department of Psychiatry, Université de Montreal, Montreal, Québec, Canada, and Dream and Nightmare Laboratory, Montreal Sacré-Coeur Hospital, Montreal, Quebec, Canada; Ross Levin, Ferkauf Graduate School of Psychology, Yeshiva University.

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Correspondence concerning this article should be addressed to Tore A. Nielsen, Dream and Nightmare Laboratory, Montreal Sacré-Coeur Hospital, 5400 boul Gouin West, Montreal, Quebec, Canada H4J 1C5. E-mail: tore.nielsen@umontreal.ca

## Defining the Domain of Disturbed Dreaming

Regarding the definitional issue, we suggest that the difficulties Weiss (2007) expresses reflect fundamental differences in our viewpoints on how the boundaries of a disorder/construct should be delineated, rather than inconsistencies in terminology per se. By his insistence upon a "sharp delimited definition of nightmares" and his frequent focus on our alleged inconsistent language usage (see his lengthy list of our synonyms for affect distress on p. 530), Weiss appears to adhere to a strong *categorical* view of mental disorders. The pitfalls of categorical classification are well documented (e.g., Brown & Barlow, 2005; First, 2006). In contrast, we view our definition as consistent with the strategic use of *dimensional* classification. Dimensional models receive strong support for disorders within the broad neurotic spectrum, including anxiety and posttraumatic stress disorder (Watson, 2005). Because nightmares are so closely associated with anxiety, we suggest that dimensional models are most appropriate for investigating the spectrum of disturbed dreaming, and we use a variety of synonyms to convey the qualities of this hypothesized underlying dimension. In addition, despite the apparent inconsistencies in terminology and methods of assessment across studies, the reviewed body of work demonstrates a remarkable consistency: no matter how defined, disturbed dreaming is associated with poorer psychological well-being. Similarly, a strong association of waking state negative affect (NA) with nightmare distress, but not with nightmare frequency, is found across studies. We believe that these consistencies support our argument and provide both convergent and divergent validity using the multimethod-multitrait method (Campbell & Fiske, 1959).

Since our article was queued for publication, four independent investigations using different definitions of nightmares have appeared that confirm the centrality of affect distress in mediating relationships between disturbed dreaming and waking psychological functioning. The first (Miro & Martinez, 2005) found that nightmare distress predicts high NA (anxiety, depression, neurot-

icism), emotional reactivity (thin boundaries), and perceived sleep quality after nightmare frequency is held constant. No similar relationships were obtained for psychoticism, demonstrating a clear pattern of convergent and divergent validity for the underlying NA dimension. The second study (Roberts & Lennings, 2006) confirmed that nightmare distress is significantly associated with NA but that nightmare frequency is not correlated with either nightmare distress or waking NA. Further, nightmare distress is uniquely predicted by neuroticism whereas psychoticism is related only to nightmare frequency. Third, an investigation of the phenomenological overlap between bad dreams and nightmares (Zadra, Pilon, & Donderi, 2006) led the authors to conclude that both categories can be conceptualized in relation to NA. Finally, in a study of nightmare complaints in 718 treatment-seeking patients (Krakow, 2006), nightmare distress, independent of any nosological classification, was found to best predict which individuals most warranted clinical intervention.

### Gender Difference in Nightmares

A growing body of research reveals sexual dimorphisms of the emotional memory processes that we stipulate are implicated in nightmare production. This research is commonly taken to explain why women are more likely than men to suffer from affective and anxiety disorders of all kinds. Behavioral studies indicate that women are more likely than men to rate aversive pictures as intense (Sharp, van Goozen, & Goodyer, 2006), to react emotionally to threatening stimuli (Bradley, Codispoti, Sabatinelli, & Lang, 2001), and to accurately remember emotional events (Seidnitz & Diener, 1998). Particularly striking is evidence of gender differences in processes we consider essential for nightmare formation, namely fear memory acquisition and extinction (Cahill, 2006). Structural and functional gender differences have also been found for emotion-related brain regions that we suggest are central to nightmare production (i.e., amygdala, hippocampus, MPFC, and ACC; Butler et al., 2005).

### Affect Distress: Dreamed or Reactive?

We agree that the notion of affect distress remains less than completely specified in our model. However, a central assumption of our model is that distress is embedded within the response elements of dysphoric memory structures and is thus activated to greater or lesser degrees within emerging nightmares (Levin & Nielsen, 2007, p. 502). Contrary to Weiss' (2007) suggestion, we do not view affect distress as a pathological reaction that arises only after awakening from nightmares. This would be tantamount to claiming that distress cannot be represented phenomenologically during dreaming. Although this point has not been investigated specifically, our studies of disturbing nightmares in burn victims (Raymond, Nielsen, Lavigne, & Choinière, 2002) and postpartum mothers (Nielsen & Paquette, 2004), as well as our reading of dreams arising in many different clinical conditions (e.g., intensive care unit "psychosis" nightmares; see review in Nielsen, 2005), suggest that distress of varying degrees is indeed common in nightmares. However, it remains unknown how the prevalence, frequency, and intensity of such distress within a

nightmare is mediated by trait NA and should be assessed in future research.

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