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Nightmare Proneness and Neuroticism: Related but Empirically Distinguishable Predictors of Nightmares

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ABSTRACT – Nightmare proneness and neuroticism are strongly related constructs which differentially predict variance in nightmares, yet their empirical distinctiveness remains unclear. The current study examined relationships among nightmare proneness, neuroticism, and nightmares in 774 university students. Principal axis exploratory factor analysis indicated that nightmare proneness and neuroticism items formed distinguishable but correlated factors. Neuroticism items loaded strongly on one factor, whereas nightmare proneness items loaded on a separate factor. The heterotrait-monotrait ratio supported adequate construct differentiation despite a substantial zero-order correlation. Nightmare proneness and neuroticism were both associated with nightmares, although consistent with previous research, nightmare proneness demonstrated stronger relationships and predicted incremental variance in nightmares beyond neuroticism. Overall, the results suggest that nightmare proneness is intertwined with neuroticism yet includes separable elements potentially relevant to nightmare production mechanisms.

Keywords:
Nightmares; Neuroticism; Nightmare proneness; Factor analysis; Dream research; Personality

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Introduction

Nightmares, distressing and clearly remembered dreams that often awaken the sleeper (American Psychiatric Association [APA], 2022) are relatively commonly experienced phenomena among adult samples (Bolstad et al., 2025). Nightmares have been associated with worry, hallucinations, unpleasant emotions, negative life events, schizotypy, and hypomanic

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traits (Berquier & Ashton, 1992; Rek et al., 2017). Frequent nightmares with associated distress may warrant a diagnosis of nightmare disorder (APA, 2022). However, most nightmare experiencers do not meet criteria for a diagnosis.

One way to conceptualize nightmares is using a disposition-stress approach; that is, an underlying disposition makes one susceptible to perceived life stress that triggers nightmares (Levin & Nielsen, 2007). Previous psychological models of nightmare dispositions can be synthesized to suggest that negative emotions, thoughts, or unprocessed dysphoric memories are activated and cross into awareness due to weakening of internal psychic structures that decrease sensitivity to negative mental material and separate such material from awareness (Carr & Nielsen, 2017; Freud, 1900/1996, 1933/1990; Hartmann, 1984, 1991; Nielsen, 2017a). These dispositions are conceptually separate yet have received empirical support in relation to nightmares (Daughtry et al., 2025; Hartmann, 1984; Carr et al., 2021; Levin et al., 2011; Nielsen, 2017b) leaving the question of whether they share a common underlying mechanism.

One possible variable that may account for several of the above dispositions and has also been related to nightmares is trait neuroticism (Gieselmann et al., 2019). The nightmare-neuroticism relationship has been observed across several studies (e.g., Blagrove & Fisher, 2009; Carr et al., 2022; Gessert & Schredl, 2023; Kelly & Mathe, 2024; Li et al., 2010; Schredl, 2003), with rare non-findings (Chivers & Blagrove, 1999; Kelly & Mathe, 2025). Longitudinal work indicates that changes in neuroticism levels over time are associated with corresponding changes in nightmare frequency (Schredl & Göritz, 2021). A recent report indicated that across 10 thoroughly screened studies the average effect size for the nightmare-neuroticism relationship was .30 (Roland & Goossens, 2025).

The term neuroticism is often used descriptively to note a temperamentally influenced disposition to experience emotional distress (Kim et al., 2023; Ormel et al., 2004, 2013). On a deeper level neuroticism is a broad cognitive-affective domain that hypothetically influences heightened perception of threat and beliefs that one cannot manage said threats. These tendencies result in readily experiencing a range of negative emotions (Barlow et al., 2014). Barlow and colleagues (Barlow, 2000; Barlow et al., 2021) articulate that temperamental biological and psychological vulnerabilities developed during childhood synergistically influence development of neuroticism. Neuroticism has been related to biological and genetic factors, anxiety and mood disorders, negative self-beliefs, and maladaptive coping (Brown & Barlow, 2009; Meléndez et al., 2020; Otani et al., 2020).

Various mechanisms have been proposed to explain how neuroticism is related to nightmares. One possibility is that an emotional dysregulation component of neuroticism influences nightmares (Akram et al., 2020; Fireman et al., 2014). This might occur through cross-state continuity whereby waking experiences of dysphoric affect are also experienced during dream states (Schredl, 2017). In such cases, emotional states might influence dream content or intertwine with it to create nightmare experiences. Another possibility is that neurotic cognitive activity (i.e., worry) during extended waking times before sleep primes individuals to experience nightmares (Youngren et al., 2020). Finally, it has been suggested that nightmares are the activation of unextinguished fear-related memories during dreams due to a buildup of negative emotion. (Levin & Nielsen, 2007; Nielsen, 2017b). Recent findings are consistent with both possibilities. However, other findings indicate that when accounting for each other, unpleasant memories, not negative emotion or trauma symptoms, are independently associated with nightmares (Kelly, 2023).

Another recently identified variable that hypothetically influences nightmares is nightmare proneness. Described as a trait-like tendency to experience frequent nightmares (Kelly, 2018), the nightmare proneness concept was identified empirically by selecting items that differentiated frequent nightmare experiencers and controls. Kelly and colleagues (Kelly, 2024a, 2025a; Kelly, & Daughtry, 2022; Kelly & Mathe, 2019; Kelly & Yu, 2019) re-interpreted nightmare proneness markers through the lens of previous nightmare theory (Freud, 1900/1996; Hartmann, 1984; Kohut, 1977; Levin & Nielsen, 2007). This resulted in an integrative model proposing that vague perceptions of helpless vulnerability and psychical dysregulation are experienced as nightmares due to a concretizing cognitive-perceptual style through which vague inner states are experienced more tangibly. Nightmare proneness may develop due to a combination of traumata and a tendency to avoid unpleasant outcomes (Kelly, 2025a).

Support for portions of the nightmare proneness model come through findings of relationships of nightmare proneness with vulnerability and emotional dysregulation (Kelly & Daughtry, 2022) and a concretizing defensive style (Kelly, 2023; Kelly, Daughtry, et al., 2024). Nightmare proneness also has been related to having an evening chronotype (Toscano-Hermoso et al., 2020), sleep disruption (Kelly, 2022), less physical activity (Arbinaga et al., 2019), thin psychological boundaries, more sensory processing sensitivity (Kelly & Mathe, 2025), and deficits in regulating and integrating experiences into the self (Kelly, 2026a). Kelly (2024b) reported that correlations between nightmare proneness and nightmares across several samples were between .25–.51, and that 71.0% of individuals classified as high on nightmare proneness also reported frequent nightmares. These findings suggest the variable indicates a possible predisposition for nightmares rather than a direct causal mechanism.

Perhaps due to how the concept was derived, measurement of nightmare proneness has been saturated with neuroticism. Across five nonoverlapping samples totaling 992 participants (Kelly, 2022; Kelly & Mathe, 2024, 2025; Kelly & Yu, 2019; Kelly, Zamora, et al., 2025), the average reported correlation between nightmare proneness and various measures of neuroticism was .63, ranging from .41–.74. Though substantial, from a theoretical perspective a high correlation seems reasonable given that nightmare proneness is hypothesized to include helpless vulnerability and dysregulation (Kelly & Daughtry, 2022), both of which also are elements of neuroticism (DeYoung et al., 2007). As such, nightmare proneness and neuroticism can be said to share empirical referents; that is, measurable elements of a concept potentially inflating their correlations (Ridner, 2004; Stehr, 1968). Further, it has also been postulated that neuroticism and nightmare proneness develop through similar temperamental and experiential mechanisms (Barlow et al., 2014; Kelly, 2025a).

Despite their strong correlation, conceptual relationship, and correlations of similar magnitudes with nightmares, nightmare proneness accounts for unique variance in nightmares outside of neuroticism (Kelly & Yu, 2019; Kelly, Zamora, et al., 2025; Kelly & Mathe, 2019, 2024, 2025). A recent study found that neuroticism (and state distress) indirectly related to nightmares through nightmare proneness, but not the other direction (Kelly, Zamora, et al., 2025). These findings could indicate that nightmare proneness includes components that may not be included in, but link, neuroticism and nightmares. Other findings indicated that other conceptually separate, but related, variables account for nightmares

outside of neuroticism, such as sensory processing sensitivity (Carr et al., 2022), supporting the feasibility that nightmares are influenced by factors outside neuroticism.

Previous research has not specifically examined the statistical distinction of nightmare proneness and neuroticism measures. The aim of the current study was to factorially examine which markers of nightmare proneness might be statistically separate from neuroticism and how these elements relate to nightmares. It was expected that, given previous findings of distinctiveness of composite measures of these variables, nightmare proneness items be statistically separable from neuroticism items (Hypothesis 1; H1). Further, replicating previous work (Kelly & Mathe, 2019; Kelly, Zamora, et al., 2025), it was expected that a nightmare proneness composite would account for incremental variance in nightmares above a neuroticism composite (Hypothesis 2; H2).

Method

Participants

Participants included 774 (156 males, 615 females, 3 did not identify) students enrolled in undergraduate psychology courses at a university in the United States. The average age of the sample was 20.62 years (*SD* = 5.19). Most of the sample identified themselves as Latinx (71.9%), followed by White/Caucasian (11.3%), Asian (10.2%), African American (3.0%), Native American (0.4%), and "other" or "prefer not to say" (3.2%).

Measures

Nightmare Proneness. The 6-item version of the Nightmare Proneness Scale (NPS-6; Kelly, 2025a) was used to measure nightmare proneness. The NPS-6 includes items from the original 14-item scale that loaded the strongest on a general factor that correlated most nightmares (Kelly, 2018; Kelly & Mathe, 2019). Participants responded using a 1 (*Strongly disagree*) to 7 (*Strongly agree*) scale. Higher total scores indicate more nightmare proneness. The NPS-6 has adequate validity including correlations with the original scale, a unidimensional factor structure, and correlations with nightmares (Kelly, 2025a, 2026b). One-month retest reliability has been reported to be .90 (Kelly, 2026b).

Neuroticism. Neuroticism was assessed using the 6-item neuroticism scale of the NEO-Five Factor Inventory-30 (NEO-30-N; Körner et al., 2008). Participants responded from 0 (*Strongly disagree*) to 4 (*Strongly agree*). Higher total scores indicate more neuroticism. Validity has been supported through factor analysis and correlations with a longer version of the scale (Körner et al., 2008, 2015). Retest reliability across two years was estimated at .80 (Schredl & Göritz, 2021).

Nightmares. The 3-item version of the Nightmare Frequency Index (NFI-3; Kelly, 2024a) was used as a measure perceived frequency of nightmares. Respondents are instructed that "nightmares are defined as unpleasant and clearly remembered dreams that awaken you; after waking, you quickly become alert." Participants responded using a 0 (*Strongly disagree*) to 4 (*Strongly agree*) scale. Higher average total scores indicate more nightmares. Validity of the NFI-3 was supported by factor analysis and correlations with hypothetically related variables (Kelly, 2004a, 2026c). One month retest reliability was estimated at .80 (Kelly, 2026c).

Dream Recall. Dream recall was measured using the item, "In the past several weeks how often have you recalled your dreams?" The item was adapted from Schredl et al.'s (2014) Mannheim Dream Inventory. Participants responded using a 5-point scale: 0 (*Never*), 1

(*Rarely*), 2 (*Sometimes*), 3 (*Usually*), and 4 (*Often*). Support for validity of the item and a two-week retest reliability of .76 were reported (Schredl et al., 2014).

Procedures

The study was approved by the local research ethics board. Data were collected over a two-year period from a psychology student participants pool. Participants could choose to participate in several running studies. The current study was titled "Personality and Dreams." Participants were invited to participate regardless of whether they recalled their dreams. After providing informed consent, participants were directed to an online survey system to complete the questionnaire. Nominal course credit was given in exchange for participation. No time limits were imposed for questionnaire completion, and no exclusionary criteria were used.

Statistical Analyses

Analyses were conducted using SPSS for Windows. Exploratory factor analysis (EFA) was conducted to examine the latent structure of nightmare proneness and neuroticism items. Because the goal was to identify shared latent variance, principal axis factoring was used with oblimin rotation to allow factors to correlate. Factor retention was evaluated using eigenvalues, inspection of the scree plot (Cattell, 1966), and interpretability of the rotated solution (Fabrigar et al., 1999; Costello & Osborne, 2005). Factor loadings ≥ .40 were considered significant. Factor interpretation was based on the pattern matrix, and factor correlations were examined to assess the degree of overlap between dimensions.

The Heterotrait-Monotrait (HTMT) ratio criterion (Henseler et al., 2015) was calculated to examine differentiation between nightmare proneness and neuroticism. Using this approach, ratios of item-level cross construct and within construct correlations are examined to estimate how strongly two constructs overlap. Values below .85 indicate adequate differentiation, whereas higher values may suggest insufficient distinction between constructs (Henseler et al., 2015).

Pearson's correlations were computed among neuroticism, nightmare proneness, and nightmares. Because of its ordinal nature, Spearman correlations were used for dream recall frequency. To examine nightmare proneness as an incremental predictor above neuroticism, a hierarchical multiple regression was used. Gender and dream recall were included as covariates due to known relationships with nightmares (Putois et al., 2020; Schredl & Reinhard, 2008). Results were significant if $p < .050$ (two-tailed).

Results

The principal axis EFA was conducted on the 12 items comprising the nightmare proneness and neuroticism scales. Examination of eigenvalues indicated two factors with values greater than 1.0 (5.25 and 1.39 for Factors 1 and 2, respectively). Inspection of the scree plot showed a pronounced decline from the first to the second factor followed by a shallow leveling-off, consistent with retention of a two-factor solution.

The two-factor solution was readily interpretable and yielded a clear structure (Table 1). The six neuroticism items loaded strongly on Factor 1 (loadings .61–.78), which accounted for 39.3% of the variance with negligible cross-loadings onto Factor 2. NPS-6 items loaded on Factor 2 (loadings .44–.72), which accounted for 7.1% of the variance, with only modest cross-loadings on Factor 1 (the largest was .30 for a mood lability item). The two factors were

moderately correlated (r = .57), indicating shared variance while retaining meaningful non-overlapping variance. Examining patterns of loadings in Table 1, it appears that sensory-processing items and dysregulation-related items were less and more related to neuroticism, respectively.

Table 1: Pattern Matrix for the Principal Axis Factor Analysis of NEO-30 Neuroticism and Nightmare Proneness Scale-6 Items

Item Content	Factor	
	1	2
Nightmare Proneness Scale-6		
1. See shapes or forms	−.02	**.66**
2. Many ideas and couldn't focus	.25	**.55**
3. On guard even around friends	.18	**.50**
4. Can't sleep due to worry or tension	.25	**.45**
5. Hear someone talking	−.15	**.72**
6. Moods change suddenly	.30	**.44**
NEO-30-Neuroticism		
1. Feel inferior	**.61**	.03
2. Feel like going to pieces	**.75**	−.05
3. Tense and jittery	**.64**	.11
4. Feel worthless	**.71**	.06
5. Get discouraged	**.78**	−.03
6. Want someone to solve my problems	**.68**	−.01

Note: Loadings above .40 are presented in bold type. NEO=Neuroticism, Extraversion, Openness.

To compare nightmare occurrences to previous samples, a classification strategy using NFI-3 average scores was applied (Kelly, 2026a). Using this approach, 45.6% of the sample was stratified as having nightmares "rarely" (average NFI-3 scores < 1.0), 45.0% as "occasionally" (≥ 1 to < 3), and 9.4% as "often" (≥ 3.0).

Zero-order correlations among study variables are shown in Table 2. Neuroticism and nightmare proneness had a strong Pearson's correlation. Both constructs were significantly associated with nightmares, although the association was modestly stronger for nightmare proneness than for neuroticism. Spearman's correlations for dream recall were strongest for nightmares.

The HTMT estimation ratio for neuroticism and nightmare proneness was .72. This was adequately below the recommended .85 ratio for construct differentiation (Henseler et al., 2015). To examine the extent that the relationship between the constructs was influenced by attenuation due to measurement error, a correlation correcting coefficient alphas the current sample was calculated. After correcting attenuation, the correlation between nightmare proneness and neuroticism increased from .60 (R^2 = .360) to .72 (R^2 = .518), suggesting substantial but incomplete overlap between the constructs.

The hierarchical multiple regression results are presented in Table 3. On Step 1, gender, dream recall, and neuroticism accounted for a significant 13.2% of the variance in nightmares.

Dream recall and neuroticism were both significant predictors. On Step 2, adding nightmare proneness to the model, resulted in a significant increase of 5.5% in explained variance in nightmares. On this step, nightmare proneness emerged as the strongest predictor of nightmares, dream recall remained significant, but neuroticism was no longer a significant predictor. Gender was not significant in either model. Collinearity diagnostics were acceptable (VIFs ≤ 1.59).

Table 2: Descriptive Statistics and Zero-Order Correlations Among Neuroticism, Nightmare Proneness, and Nightmares

Scale	1	2	3†	*M*(*SD*)	Skewness	*α*
1. Nightmare Proneness				21.32(8.06)	0.08	.802
2. Neuroticism	.60**			11.98(5.62)	– 0.18	.856
3. Nightmares	.36**	.26**		1.18(1.07)	0.69	.791
4. Dream Recall†	.08*	.05	.29**	2.13 (1.02)	0.23	--

Note: *N*=774. *p < .050, **p < .010. †Denotes Spearman correlations.

Table 3: Hierarchical Regression Predicting Nightmares

	Model 1			Model 2		
	β	*t*	*p*	*β*	*t*	*p*
Gender (1 = male, 2 = female)	.07	1.92	.055	.05	1.54	.125
Dream recall	.25	7.29	<.001	.24	7.19	<.001
Neuroticism	.23	6.62	<.001	.06	1.43	.154
Nightmare proneness				.29	7.21	<.001
	ΔR^2 = .132, F = 39.08, p < .001			ΔR^2 = .055, F = 51.96, p < .001		

Discussion

The findings in current study were consistent with the hypotheses. First, despite a strong correlation at the composite level, exploratory factor analysis and the HTMT supported separation of nightmare proneness and neuroticism items into statistically distinguishable dimensions. Second, nightmare proneness demonstrated incremental prediction of nightmares beyond neuroticism.

The strong relationship between nightmare proneness and neuroticism was consistent with previous findings (Kelly & Mathe, 2024, 2025; Kelly, Zamora, et al., 2025). This overlap is theoretically unsurprising given that both constructs appear to involve heightened sensitivity to distress, vulnerability, dysregulation, and threat-related cognitive-affective processing (Barlow et al., 2014; Kelly & Daughtry, 2022). Indeed, the corrected correlation between nightmare proneness and neuroticism suggested substantial shared variance, though nearly 50% of the variance between them was not shared. This was consistent with the other findings in the current study indicating that the constructs are not redundant. The HTMT ratio remained below recommended thresholds indicating sufficient differentiation (Henseler et al., 2015), factor analysis supported a separable latent structure, and nightmare proneness

predicted nightmares after accounting for neuroticism, gender, and dream recall. Collectively, these findings suggest that nightmare proneness reflects more than neuroticism alone.

The factor analytic findings were particularly informative. Neuroticism items formed a relatively coherent factor characterized by negative self-evaluation, emotional distress, and perceived inability to cope. Nightmare proneness items, while related to this factor, clustered separately and included markers involving unusual sensory-perceptual experiences, hypervigilance, sleep-disruptive worry, lessened attentional control, and affective lability. Importantly, items with sensory-perceptual content ("seeing shapes or forms," "hearing someone talking") demonstrated comparatively weak relationships with neuroticism indicators while loading on the nightmare proneness factor. These findings may partly explain why nightmare proneness has repeatedly accounted for variance in nightmares beyond neuroticism in previous studies (Kelly & Yu, 2019; Kelly & Mathe, 2024; Kelly, Zamora, et al., 2025). Interestingly, even more dysregulation-related content was separable from neuroticism and loaded on the nightmare proneness factor.

One interpretation of these findings is that nightmare proneness includes a cognitive-perceptual style not fully represented by neuroticism measures. Previous theoretical work proposed that nightmare proneness involves concretization-like processes in which vague feelings of vulnerability or dysregulation become experienced in more tangible sensory or imagistic forms (Kelly & Daughtry, 2022; Kelly et al., 2024). The current findings are broadly consistent with that interpretation. Specifically, the sensory-perceptual nightmare proneness items appeared more distinct from neuroticism than did the affective dysregulation items. From this perspective, neuroticism-related distress may provide emotional activation, whereas nightmare proneness may may reflect tendencies associated with vivid perceptual and dream experiences (Kelly, 2024a).

At the same time, caution is warranted in interpreting the meaning of these sensory-perceptual items. The present data do not establish that concretization is the mechanism involved, nor does it exclude alternative explanations. As with correlates of nightmares themselves, the nightmare proneness factor may partially reflect heightened perceptual sensitivity (Carr et al., 2022), interoceptive amplification (Faccini et al. 2023), dissociative tendencies (Cheung, 2012), unusual sleep-wake boundary experiences (Hartmann, 1984), or schizotypal-like cognitive-perceptual traits (Levin & Raulin, 1991). These possibilities are not mutually exclusive and may overlap meaningfully. Future research using multimethod approaches, including physiological assessment, prospective dream sampling, and measures of perceptual sensitivity or schizotypy along with nightmare proneness may help clarify the nature of these experiences and their role in nightmare production.

The current findings have broader implications for understanding nightmares. Neuroticism has consistently been linked to nightmares across studies (Roland & Goossens, 2025), and the current findings support this relationship. However, the results suggest that broad negative affectivity and self-concept alone may not fully explain why some individuals experience frequent nightmares. Nightmare proneness may represent a somewhat more specific nightmare-relevant disposition that incorporates both dysregulation-related vulnerability and cognitive-perceptual tendencies associated with vivid or concretized experience formation. In this way, nightmare proneness may partially mediate or operationalize pathways through which neuroticism contributes to nightmares.

Several limitations to the current study should be acknowledged. Participants were primarily young university students and mostly identified as female and Latinx, which may limit generalizability. All variables were assessed using self-report measures, raising the possibility of shared method variance and response biases. Additionally, the cross-sectional design precludes causal inference regarding the relationships among neuroticism, nightmare proneness, and nightmares. Additionally, the shortened NPS-6 was used to measure nightmare proneness. The additional markers omitted from the original NPS (Kelly, 2018) may have changed the results of this study if they were included.

Future research might further examine the specific elements of nightmare proneness that distinguish it from neuroticism. For instance, additional study of sensory-perceptual experiences, concretization-like tendencies, interoceptive sensitivity, and autonomic arousal may help clarify the mechanisms through which affective dysregulation becomes transformed into nightmare experiences. Additionally, including neuroticism facets and nightmare proneness simultaneously might provide information on whether specific elements of neuroticism interact with nightmare proneness in relation to nightmares. Such work may also contribute to refinement of nightmare proneness measurement and theory. Replication of the current study and extension using longitudinal and community-based samples would be useful. Future work using confirmatory factor analytic and structural equation approaches may help further clarify the latent structure of nightmare proneness relative to neuroticism.

In conclusion, the current findings suggest that nightmare proneness and neuroticism are strongly related but empirically distinguishable constructs. Nightmare proneness appears to include elements beyond generalized negative emotionality and self-concept, particularly sensory-perceptual and dysregulation-related experiences that may be relevant to nightmare production. These findings support the possibility that nightmare proneness represents a more specific nightmare-relevant disposition through which neuroticism and related vulnerabilities influence nightmares.

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