

ORIGINAL ARTICLE

Facets of The Nightmare Proneness Scale and Their Relationships to Nightmares, Negative Affect, and Psychological Distress

William E. Kelly^{1*}, John R. Mathe²

¹ Department of Psychology, California State University, Bakersfield

² Student Counseling Center, Slippery Rock University

Previous research introduced the Nightmare Proneness Scale (NPS) as a measurement for nightmare proneness, the trait-like disposition to experience frequent nightmares. However, outside predicting nightmares, little is known about the structure of the scale or relationships of its facets with nightmares. The factor structure of the NPS and the scale's statistical independence from psychological distress and negative affect were examined among a sample of 306 university students. The NPS predicted frequent distressing nightmares independent from psychological distress and negative affect. Three NPS facets were found representing general psychical dysregulation, depressiveness, and somatization. The NPS facet representing general dysregulation was the strongest predictor of nightmares and the only NPS facet to independently predict nightmares outside of distress and negative affect. The results, limitations, and directions for future research are noted.

Keywords: Nightmares, Nightmare Frequency, Nightmare Proneness, Psychological Distress, Negative Affect

Introduction

At least one nightmare, a dysphoric dream that is clearly remembered and usually abruptly awakens the sleeper, is experienced by an estimated 85% of adults each year (Nielsen & Carr, 2017) and at least weekly by 2-6% of the population (Levin & Nielsen, 2007). Less often, in about 2-4% of the population (Gaultney, 2010; Ohayon & Shapiro, 2000) frequent nightmares combined with clinically relevant distress or impairment lead to a diagnosable nightmare disorder (American Psychiatric Association [APA], 2013).

*Correspondence: wkelly1@csub.edu, 661-654-2315, Department of Psychology, California State University, Bakersfield, CA 93311, USA.

Received: 15 August 2019 Accepted: 26 June 2020

Sleep and Hypnosis

Journal homepage:

<http://www.sleepandhypnosis.org>

ISSN:1302-1192 (Print) 2458-9101 (Online)

Despite their prevalence and extensive research and theory over the decades, the function and etiology of nightmares has remained a point of contention among researchers and theorists. Various perspectives have been offered to explain nightmare etiology. For instance, Freud (1900, 1920) suggested nightmares result from either intense internal conflict and lessened ego strength during sleep or as an attempt to master past traumas. Hartmann (1984, 1991, 1997) noted that individuals with frequent nightmares also had “thin” psychological boundaries which also result in characteristics such as having more openness, artistic abilities, vulnerability, neuroticism, and fewer psychological defenses. Ostensibly, the thinner boundaries allow unpleasant information to cross through the mind during sleep and waking states. Levin and Nielsen (2007) proposed a neurocognitive model suggesting nightmares result from heightened reactivity among emotional structures in the brain which manifests in increased levels of neuroticism and

susceptibility to psychological distress. Giesemann et al. (2019) summarize existing research on nightmare etiology noting that it is generally agreed that risk factors for frequent distressing nightmares include trait affect distress and hyperarousal.

To better understand the personality structure of individuals prone to frequent nightmares, Kelly (2018) proposed the concept of nightmare proneness, a trait-like disposition to experience frequent nightmares, as well as a metric for the construct, the Nightmare Proneness Scale (NPS). The NPS was developed through empirical means by choosing items from a previously used pool of maladjustment markers (Kelly, 2012a, b) that discriminated between individuals that did and did not report frequent nightmares (Kelly, 2018). As such, a diverse set of markers were selected without regard to theory or psychometric concerns.

The conglomeration of markers included on the NPS are not easily interpreted outside of their ability to predict nightmares. What can be noted by examining item content of both the NPS and existing measures of psychological distress and neuroticism is that similarity exists in measurement of the concepts, especially distress. For instance, the NPS items “It is usually safer to trust no one” and “The future looks bleak and hopeless to me” appear conceptually similar to items from the Symptom Checklist-90R (Derogatis, 1983) considered to measure psychological distress: “Feeling that most people cannot be trusted” and “Feeling hopeless about the future.” Despite similarity of content, the NPS was found to account for unique variance in nightmares above general psychological distress and neuroticism (Kelly & Yu, 2019).

Considering the myriad of markers on the NPS and the lack of theory used in its development, what the NPS measures remains somewhat obfuscated. However, it has been speculated, consistent with previous theory (Freud, 1900; Hartmann, 1984; Kohut, 1977; Levin & Nielsen, 2007), that nightmare proneness could be a case of trait psychological distress specific to nightmares (Kelly, 2018) or, on a deeper level, represents a disposition towards a sense of vulnerability, dysregulation of mood, and a defensive style that attempts to manage strong unpleasant affect during sleep by concretizing it into images

(Kelly & Yu, 2019). These notions are consistent with previous research on nightmare etiology. For instance, to some degree, the maladjustment markers included on the NPS could reflect the affective distress and hyperarousal domains noted by Giesemann et al. (2019). Further, the NPS could represent lessened ego strength as suggested by Freud (1900, 1920), which previous research found to predict nightmares above neuroticism and psychological distress (Kelly, 2020). Finally, though not previously examined, the NPS could partly incorporate neurotic and vulnerable aspects of Hartmann’s (1991, 1997) thin boundary concept. In short, it could be that nightmare proneness allows a more specific focus on aspects of concepts previously found to predict nightmares which potentially could provide a means of unifying disparate understandings of nightmare etiology. Additional research is needed to confirm or disconfirm this possibility and better understand how the concept reflects previous theory.

Further understanding of the structure of the NPS might both elucidate what the scale measures and provide further insight into the nightmare proneness concept with regards to previous theory and empirical findings. The purpose of the current research was twofold: we aimed first to evaluate the factor structure of the NPS and second, to replicate previous findings (Kelly & Yu, 2019) that the NPS, and thus the nightmare proneness concept, is distinguishable from psychological distress. Relatedly, given assertions that it is foundational for nightmares (Levin & Nielsen, 2009) and can be conceptualized as trait distress (Ormel, 2004), negative affectivity, the tendency to experience negative emotions (Watson & Clark, 1984), was also examined in relation to nightmare proneness.

Considering that combined nightmare frequency and subjective nightmare distress are used to determine clinically significant nightmares (APA, 2013; American Academy of Sleep Medicine, 2014; Krakow et al., 2002), another extension of previous research (Kelly, 2018; Kelly & Yu, 2019) was to include a measure of frequent distressing nightmares rather than examining nightmare frequency and nightmares distress separately. Based on previous research and theory, it was hypothesized that the

NPS would consist of three hypothesized factors that represent vulnerability, mood dysregulation, and a concretization process (Kelly & Yu, 2019). Further, based on previous research (Kelly & Yu, 2019) it was hypothesized that the NPS would account for unique variance in frequent distressing nightmares outside of psychological distress and negative affectivity.

METHOD

Participants

The sample consisted of 306 (167 males, 139 females) students enrolled in introductory psychology courses at a small university in the United States. The average age of the full sample was 20.41 years ($SD=3.12$). The average age was 20.91 ($SD=3.84$) for males and 19.82 ($SD=1.74$) for females. Consistent with the demographics of the university, 70.1% identified themselves as White/Caucasian, 10.5%-African American, 10.5%-Arabian, 3.9%-Hispanic, 1%-Asian, 1%-Native American, 3%-“other.”

MEASURES

Nightmare Proneness

The 14-item NPS (Kelly, 2018) was developed by selecting items from the Ausburg Multidimensional Personality Instrument (Kelly, 2012a, b) that discriminated between individuals who reported frequent nightmares and controls. Participants responded to items using a 7-point scale ranging from (1= “Strongly disagree” to 7= “Strongly agree”). Responses to each item were summed to produce a total NPS score; higher scores indicate more nightmare proneness. Reliability has been supported by internal consistency (.89; Kelly & Yu, 2019) and test-retest (.72, one week; Kelly, 2018). Validity was supported by correlations with nightmare frequency, nightmare distress, and the ability to predict nightmares above measures of maladjustment (Kelly & Yu, 2019). Sample items are “I am disappointed by where I am in life” and “My moods change suddenly for no apparent reason.”

Nightmares

The four-item Nightmare Experience Scale (NExS; Kelly & Mathe, 2019) measures the tendency to experience the unidimensional construct of “frequent distressing nightmares” with two items that target

the frequent occurrence of nightmares and two items that assess general waking suffering from nightmares. Participants responded to items using a 5-point response scale (0= “Strongly disagree” to 4= “Strongly agree”). Responses were summed to produce a total NExS score; higher scores indicated more frequent distressing nightmares. Reliability has been supported by internal consistency (.79-.86) and a test-retest reliability of .86 (two weeks; Kelly & Mathe, 2019). Validity was supported by relationships with other measures of nightmare frequency, nightmare distress, and nightmare disorder. Sample items are “I have nightmares often” and “Intense nightmares are a problem for me.”

Negative Affect

The 10-item trait version of the Negative Affect Scale (NAS) of the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) was used to measure negative affect. Participants responded to how much they usually feel descriptors of negative emotions using 5-point scale ranging from (1= Very slightly” to 5= “Extremely”). Responses to each item were totaled to produce a total NAS score; higher scores indicate more trait negative affect. Reliability has been supported through internal consistency (.84-.87) and test-retest reliability of .71 (8 weeks; Watson et al., 1988). Validity was supported by correlations with anxiety and depression ratings (Watson et al., 1988) and a variety of clinical syndromes (Mahaffey, Watson, Clark, & Kotov, 2016). Sample items include “Irritable” and “Afraid.”

Psychological Distress

General psychological distress was assessed using the 10-item short form (SCL-10R; Rosen et al., 2000) of the Symptom Checklist 90-Revised (SCL-90-R; Derogatis, 1983). We altered the instructions to extend the original time period of the scale (one week) and asked participants to describe how much they had been bothered by distress symptoms over the past 14 days using a 5-point scale (0= “Not at all” to 4= “Extremely”). Responses to items were summed to produce a total SCL-10R score; higher scores indicated more psychological distress. Reliability has been supported through internal consistency reliability of .87 (Rosen et al., 2000). Validity was

supported by correlations with anxiety, depression, trauma symptoms, anger and a .95 correlation with the General Severity Index of the SCL-90-R (Rosen et al., 2000). Sample items include “Your feelings being easily hurt” and “Feeling tense or keyed up.”

Procedure

Participants were recruited before classes to complete a questionnaire on “Dreams, Personality, and Stress” as part of a larger study on personality. After providing informed consent, participants completed anonymous “paper and pencil” questionnaires during regular class times. There was no time limit for questionnaire completion and no exclusionary criteria were imposed. Data from all participants was used. SPSS 24 for Windows was used for all statistical analyses.

Statistical Approach

Coefficient alpha was used to examine the internal consistency of scales. Gender differences were examined for all variables using *t*-tests. Pearson correlations were calculated between all variables. To examine the unique variance in frequent distressing nightmares accounted for by negative affect, psychological distress, and nightmare proneness, a linear multiple regression was calculated using NPS, SCL-10R, and NAS scores as predictors and NExS scores as the criterion. Because females tend to report more nightmares than males (Schredl & Reinhard, 2011), gender was also planned as a predictor. To examine the factor structure of the NPS, a maximum

likelihood factor analysis was used given its usefulness in identifying latent factor structures (Costello & Osborne, 2005). A Scree plot was used to confirm the number of factors to be extracted in addition to using the standard Eigenvalue of 1 or higher. We used Varimax rotation when extracting factors in attempts to increase interpretability of the extracted factors.

Pearson correlations were calculated to examine the intercorrelations of the extracted NPS facets and their correlations with NExS, NAS, and SCL-10R scores. To examine the relative predictive power of NPS facets in frequent distressing nightmares, a linear regression was calculated using NPS facet scores and gender as predictors and NExS scores as the criterion. Finally, to investigate what aspects of nightmare proneness are distinct from psychological distress and negative affect in predicting nightmares, a linear regression was calculated to predict NExS scores. SCL-10R, NAS scores, and gender were forced onto Step 1. The NPS facet scores were forced onto Step 2.

RESULTS

Preliminary Analyses

Means and standard deviations of total scale scores and coefficient alpha reliabilities are presented in Table 1. As presented in the table, coefficient alphas of all scales were good. Females scored significantly higher than males on all measures (*t*'s ranging from 1.93 [*p*<.05] for the NPS to 3.75 [*p*<.001] for the NExS). Age had a small but significant correlation with NPS scores, *r*=.13, *p*<.05, but not with other variables, *r*'s<.06.

Table 1: Correlations Between NPS, NExS, SCL-10R, and NAS Scores

Scale	NPS	NExS	SCL-10R	NAS
NExS	.51			
SCL-10R	.73	.52		
NAS	.66	.50	.78	
<i>M (SD)</i>	38.92(16.65)	4.24(4.08)	11.29(9.25)	19.92(7.84)
<i>α</i>	.90	.85	.90	.89

Note: *N*=306. All correlations significant at *p*<.001. NPS=Nightmare Proneness Scale; NExS=Nightmare Experience Scale; SCL-10R= Symptom Checklist=10R; NAS=Negative Affect Scale.

Relationships Between NExS, NPS, SCL-10R, and NAS Scores

As presented in Table 1, all correlations between the NExS, NPS, SCL10-R, and NAS scores were large and statistically significant. Correlations between the SCL-10R and both NPS and NAS scores were particularly strong. The largest correlation was between the SCL-10R and NAS, which shared a large percentage of variance ($R^2=.61$).

A linear regression was calculated to examine

NPS, SCL-10R, and NAS scores as predictors of NExS scores. Gender was also included as a predictor. Though correlations between scales were high, multicollinearity was not a problem (tolerance statistics were $> .30$ and variable inflation factors < 3.2). The overall model was significant, $F(4, 301)=37.32, p<.001$, accounting for 32.3% (adj. R^2) of the variance in NExS scores. As presented in Table 2, all measures accounted for their own unique variance. The NPS was the strongest predictor of NExS scores.

Table 2: Regression of NPS, SCL-10R, and NAS Scores Predicting NExS Scores

Scale	B	t	p
NPS	.27	3.77	.01
SCL-10R	.17	2.02	.04
NAS	.16	2.12	.04
Gender	.11	2.33	.02

Note: $N=306$. NPS=Nightmare Proneness Scale; NExS=Nightmare Experience Scale; SCL-10R= Symptom Checklist=10R; NAS=Negative Affect Scale. Gender dummy coded as 1=male, 2=female.

NPS Factor Analysis

A maximum likelihood factor analysis with a Varimax rotation was calculated on the 14 NPS items. Three factors with Eigenvalues ≥ 1 emerged accounting for 52.38% of the total systematic variance in responses. A Scree plot supported retaining all three factors. Factor analysis results are presented in Table 3. Factor 1 (Eigenvalue=3.36; $\alpha=.87$) included nine items and accounted for 24.01% of the variance. Item content represented a range of issues including stress reactions (i.e., being stressed easily), mental disquietude (i.e., mind being full of ideas and can't sleep due to worry), suspiciousness (i.e., having to be on guard even around friends), and

difficulty separating internal and external stimuli (i.e., hearing a voice but no one is there). Given the variety of issues represented and the apparent difficulty in regulating aspects of mentation and mood, we interpreted this distress-like factor as general psychological dysregulation. Thus, this factor was termed Dysregulation. Factor 2 (Eigenvalue=2.06; $\alpha=.81$) included three items and accounted for 14.71% of the variance. Items appeared to primarily represent depressive symptoms and were termed Depressiveness. Factor 3 (Eigenvalue=1.91; $\alpha=.76$) included two items and accounted for 13.66% of the variance. Items reflected somatic discomfort. Thus, this factor was termed Somatization.

Table 3: Factor Loadings and Item-Total Correlations for Nightmare Proneness Scale Items

Item	Factor Loading			I-Tr
	1	2	3	
1. I often feel a pain in my head. ^a	.41			.51
2. I am disappointed by where I am in life. ^b		.78		.54
3. I am uncertain why I do the things I do. ^b	.43	.54		.64
4. It is usually safer to trust no one. ^a	.42			.45
5. I often have indigestion. ^c			.68	.46
6. The future looks bleak and hopeless to me. ^b		.83		.49
7. I become stressed easily. ^a	.46			.61
8. Sometimes in the dark, I see shapes or forms but nothing is there. ^a	.58			.62
9. My mind has been so full of different ideas I couldn't focus on one thing. ^a	.73			.68
10. I have to constantly be on my guard, even around friends. ^a	.69			.57
11. Many nights I cannot get to sleep because of worry or tension. ^a	.68			.68
12. Sometimes I think I hear someone talking, though no one is there. ^a	.68			.59
13. My stomach is often upset. ^c			.84	.56
14. 14. My moods change suddenly for no apparent reason. ^a	.57			.69

N = 306. Maximum Likelihood Factor Analysis with Varimax rotation. Loadings $\geq .40$ reported. ^aIncluded on Dysregulation factor. ^bIncluded on Depressiveness factor. ^cIncluded on Somatization factor. *I-Tr* = Corrected item-total scale correlation.

NPS Facet Scale Intercorrelations

The three NPS facets were examined for gender differences. Females scored significantly higher than males on Dysregulation ($t=2.02, p<.05$) and Somatization ($t=2.96, p<.01$). There was no significant gender difference for Depressiveness ($t=0.25, p=.80$).

Intercorrelations of the three NPS facets and their relationships with total NPS scores, frequent distressing nightmares, negative affect, and general psychological distress are presented in Table 4. As seen in the table, the Dysregulation facet was the most strongly related to total NPS scores. This was

reasonable considering this facet had the largest number of items from the NPS. Interestingly, the Depressiveness and Somatization facets had relatively small correlations with the total NPS. The correlation between Dysregulation and frequent distressing nightmares was the same magnitude as the correlation between total NPS and NExS scores. Depressiveness and Somatization correlations with nightmares were somewhat lower than those of the Dysregulation facet. All facets were most strongly related to distress followed by negative affect and then nightmares.

Table 4: NPS Facet Intercorrelations and Relationships with Other Variables

Scale	NPS	Dys	Dep	NExS	SCL-10R	NAS
NPS				.51	.73	.66
Dys	.97			.51	.68	.62
Dep	.73	.59		.37	.64	.58
Som	.65	.53	.34	.30	.42	.37

Note: $N=306$. All correlations $p<.001$. NPS=Nightmare Proneness Scale; Dys=NPS Dysregulation; Dep=NPS Depressiveness; Som=NPS Somatization; NExS=Nightmare Experience Scale; SCL-10R= Symptom Checklist=10R; NAS=Negative Affect Scale.

Regression of NPS Facets, SCL-10R and NAS Predicting NExS Scores

A linear regression was calculated using frequent distressing nightmares as the criterion and entering gender and the three NPS facets as predictors. The model was significant, $F(4, 301)=30.70$, $p<.01$,

accounting for 28.2% (adj. R^2) of the variance. As presented in Table 5, after accounting for gender, the Dysregulation and Depressiveness, but not Somatization, facets predicted unique variance in nightmare frequency. It should be noted that Dysregulation was by far the strongest contributor to nightmares.

Table 5: Regression of NPS Facets Predicting NExS Scores

Scale	B	t	p
Dys	.41	6.12	.01
Dep	.12	2.40	.04
Som	.02	0.34	.73
Gender	.16	3.27	.01

Note: $N=306$. NPS=Nightmare Proneness Scale; NExS=Nightmare Experience Scale; Dys=NPS Dysregulation; Dep=NPS Depressiveness; Som=NPS Somatization. Gender dummy coded 1=male, 2=female.

To better understand if aspects of nightmare proneness are distinct from distress and negative affect in predicting nightmares, a linear regression was calculated using NExS scores as the criterion and all other variables as predictors. On Step 1, SCL-10R, NAS scores, and gender were entered. On Step 2 the NPS facets were entered as a group. These results are presented in Table 6. As seen in the table, on Step 1, gender, SCL-10R, and NAS scores as a group predicted a significant proportion of the variance (Model 1). On Step 2, the NPS facets

as a group accounted for significant additional variance in NExS scores (Model 2). Examining the predictors separately, after accounting for gender, SCL-10R, and NAS scores, only the Dysregulation facet added significant unique variance in NExS scores. The Dysregulation facet was the strongest predictor of frequent distressing nightmares above gender, distress, negative affect, Depressiveness, and Somatization. Gender, distress, and negative affect also continued to account for unique variance in frequent distressing nightmares.

Table 6: Regression Predicting NPS Facets After Accounting for SCL-10R and NAS Scores

Scale	B	t	p
Model 1	$\Delta F(3, 302)=43.12, p<.001.$ $\Delta R^2=.30$		
Gender	.10	2.01	.05
SCL-10R	.32	4.15	.01
NAS	.23	2.96	.01
Model 2	$\Delta F(3, 299)=5.45, p<.001$ $\Delta R^2=.04$		
Gender	.11	2.15	.03
SCL-10R	.19	2.16	.03
NAS	.17	2.15	.03
Dys	.26	3.65	.01
Dep	-.01	0.10	.92
Som	.01	0.14	.89
Note: N=306. NPS=Nightmare Proneness Scale; NExS=Nightmare Experience Scale; SCL-10R= Symptom Checklist=10R; NAS=Negative Affect Scale; Dys=NPS Dysregulation; Dep=NPS Depressiveness; Som=NPS Somatization. Gender dummy coded 1=male, 2=female.			

DISCUSSION

The results partially supported the hypotheses. First, as expected three NPS factors were identified. Second, NPS scores predicted unique variance in frequent distressing nightmares outside of negative affect and psychological distress. Though these findings were expected, they were not completely in accord with predictions. For instance, it was expected the three NPS factors would reflect vulnerability, mood dysregulation, and a concretization defensive style (that is, making self-states and affect more concrete). We found evidence of factors representing Dysregulation, Depressiveness, and Somatization.

Perhaps the most clearly predicted factor was Somatization. This factor is consistent with previous findings that nightmares were related to somatic symptoms (Berquier & Ashton, 1992; Kelly, 2016; Levin and Fireman, 2002). Further, finding a clear somatization facet is also consistent with theoretical conjectures. For instance, Kelly and Yu (2019)

suggested that nightmare proneness occurs partly through a concretization defensive strategy. Kohut (1977) suggested that nightmares provide the self with tangible images to face nebulous emotions or fears of self-fragmentation. However, the finding of a somatization facet does not necessarily indicate that somatization represents a concretized defensive process. Watson & Pennebaker (1989) found that in some instances individuals high in negative affect tend to have more somatic complaints though they do not necessarily have more actual health problems. This could reflect somatization as a defensive strategy or merely a negative response style whereby some individuals report a variety of discomfort. It is also possible that individuals with high sensory sensitivity, who are hypothetically more likely to experience nightmares (Carr & Nielsen, 2017) are also more sensitive to internal somatic symptoms whether through additional bodily stress or heightened awareness of physical sensations (Benham, 2006).

Also, it has not been examined if perhaps associated sleep disruptions from nightmares or nightmare prone dysregulation cause somatic issues rather than predict nightmares, as found for sleep disruption and coronary heart disease (McAlpine et al., 2019). Additional research is needed in this area to better differentiate defense strategy, reporting style, and sensory sensitivity and how they are part of nightmare proneness.

The hypothesized vulnerability dimension was not identified in its predicted form. It could be that feelings of vulnerability result from experiencing elements included in the Dysregulation and Depressiveness facets. For instance, if individuals feel overwhelmed by internal and external stimuli such as mood changes, confusion about inner states, and feelings of external threat (i.e., suspiciousness), it is possible that vulnerability would result. However, this was not examined in the current study and is an opportunity for future research.

Finally, a clear mood dysregulation factor also was not found. The Depressiveness facet perhaps most closely reflected mood dysregulation. Yet, Depressiveness, like the Somatization facet, could simply be an offshoot of reporting style, general discomfort, or neuroticism. However, dysregulation was more broadly reflected on the NPS through the Dysregulation facet. This dimension seemed to reflect mental dysregulation on a broad scale including mood, uncontrolled cognitive activity, perceptions of external threat, and difficulty separating internal and external reality. This factor perhaps reflects some combination of Gieselmann et al.'s (2019) hyperarousal and negative affect etiological mechanisms for nightmares and is somewhat consistent with Kelly & Yu's (2019) assertion that hyperarousal reflects weakened psychic structures that allow dysregulation. With regards to psychic structures, the Dysregulation facet appears somewhat akin to low ego strength, which is hypothesized to regulate mood, reality testing, and general executive functioning (Cabaniss, Cherry, Douglas, & Schwartz, 2011).

The Dysregulation facet was the strongest aspect of nightmare proneness in terms of accounting for total NPS variance and predicting nightmares making

its meaning important for understanding nightmare proneness. Dysregulation could indicate less perceived mastery over oneself or one's fate, a notion that has been related to nightmares (i.e., Rousseau, & Belleville, 2018). Another possibility is that the Dysregulation facet partly reflects Hartmann's (1984) notion of "thin" boundaries, which are theorized as influential in nightmares. Individuals with thin boundaries are hypothesized to have characteristics such as vulnerability, difficulty separating thoughts from feelings, and separating inner and outer realities (Hartmann, 1984, 1991, 1997). It seems plausible that individuals who score high on the NPS Dysregulation facet would have thinner boundaries. Hartmann (1991, 1997) suggests individuals with thin boundaries have fewer protective factors against stress and inability to regulate mentation. This is consistent with items on the NPS Dysregulation facet such as difficulty focusing and becoming stressed easily. To gain more insights regarding these possible connections, future research is needed.

Just as nightmare proneness independently predicted nightmares, psychological distress, negative affectivity, and gender also predicted unique variance in nightmares outside of nightmare proneness. These findings were consistent with previous research that indicated that nightmare proneness was an independent construct, separate from neuroticism and distress despite their conceptual similarity (Kelly & Yu, 2019). Though the current findings support the notion that nightmare proneness is distinct from distress and negative affect, they do not answer the question of *how* nightmare proneness is different from distress and negative affect in predicting nightmares.

As suggested previously, it could be that nightmare proneness includes a vulnerability to being overwhelmed, mood dysregulation, and a concretized defensive style (Kelly & Yu, 2019), which are likely continuous from waking to sleeping states (Schredl, 2012). It also remains possible that nightmare proneness is a special form of maladjustment that is particular to nightmares (Kelly, 2018). However, given its statistical independence from distress and negative affect, this seems less likely. Considering that Dysregulation was the strongest predictor of

nightmares and appeared to be the most separate from distress and negative affect, it could be conjectured that this factor is the heart of nightmare proneness. These findings extend Levin and Nielsen's (2007) neurocognitive model which suggests that dysregulation of mood is foundational for nightmares. It is noteworthy, however, that the current results suggest that a general dysregulation of mentation, not only mood, influences the experience of nightmares. Further examination of the Dysregulation facet would be warranted.

Given the predictive power of the Dysregulation facet, it remains curious why the items from the Depressiveness and Somatization facets are useful in identifying frequent nightmare sufferers. It is possible items reflecting these facets differentiated nightmare sufferers from controls simply because they were "offshoots" of Dysregulation and distress (i.e., Levin & Fireman, 2002). Other possible underlying mechanisms and reasons for their differentiation of nightmare sufferers remain unknown. For this reason, until additional research can determine if the Depressiveness and Somatization facets are superfluous to the concept of nightmare proneness, it is recommended that investigations utilize the full NPS when investigating nightmare proneness. Additional theoretical consideration and empirical research continues to be warranted to better understand nightmare proneness and the NPS.

The current research has limitations which make the results tentative. For example, the sample was

relatively homogeneous and consisted of college students. Though a college student sample might be adequate for conceptual research, inclusion of more a more heterogeneous community samples and clinical samples in future research could make the results more generalizable to different populations. Further, with quantitative questionnaire studies there is the possibility of exaggerated self-reports that could threaten integrity of the research. The variables investigated in this study are complex and speculations remain regarding their meaning and relationships. The NPS and its identified facets have yet to be thoroughly understood in the context of previous theory. For instance, the relationship between Dysregulation and thin boundaries might be connected. Also, it has been conjectured that sensory sensitivity could play a role in nightmare proneness (Carr & Nielsen, 2017). Further research examining these possibilities are needed. Finally, it would be important to conduct longitudinal studies to examine if nightmare proneness predicts the onset of frequent nightmares rather than being secondary to nightmares or other experiences that can cause nightmares such as trauma.

Acknowledgements: None declared.

Conflicts of interest: The authors do not declare any conflict of interest.

Informed consent: Informed consent was obtained from all the participants included in the study.

Funding: The current study was not financially supported by any institution or organization.

References

- American Academy of Sleep Medicine (2014). The international Classification of Sleep Disorders. (ICSD-3). 3rd ed. Darien, IL: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5th ed)*. Washington, DC: Author.
- Benham, G. (2006). The Highly Sensitive Person: Stress and physical symptom reports. *Personality and Individual Differences, 40*, 1433-1440.
- Berquier A., & Ashton, R. (1992). Characteristics of the frequent nightmare sufferer. *Journal of Abnormal Psychology, 101*, 246-250.
- Cabaniss, D.L., Cherry, S., Douglas, C.J., Schwartz, A. (2011). *Psychodynamic psychotherapy: A clinical manual*. West Sussex: Wiley.
- Carr, M., & Nielsen, T. (2017). A novel Differential Susceptibility framework for the study of nightmares: Evidence for trait sensory processing sensitivity. *Clinical Psychology Review, 58*, 86-96.
- Costello, A.B., & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment Research & Evaluation, 10*(7). Retrieved from: <http://pareonline.net/getvn.asp?v=10&n=7>
- Derogatis, L.R. (1983). *SCL-90-R administration, scoring, and procedures manual II*. Towson, MD: Clinical Psychometric Research.
- Freud, S. (1900). The interpretation of dreams. In J. Strachey (Ed. & Trans.), *The standard ed. of the complete works of Sigmund Freud (Vols. 4-5)*. London, England: Hogarth Press.
- Freud, S. (1920). Beyond the pleasure principle. In J. Strachey (Ed.

- & Trans.), *The standard ed. of the complete works of Sigmund Freud (Vol. 18)*. London, England: Hogarth Press.
- Gaultney, J.F. (2010) The prevalence of sleep disorders in college students: Impact on academic performance. *Journal of American College Health, 59*, 91-97.
- Gieselmann, A., Ait Aoudia, M., Carr, M., Germain, A., Gorzka, R., Holzinger, B,... & Pietrowsky, R. (2019). Aetiology and treatment of nightmare disorder: State of the art and future perspectives. *Journal of Sleep Research, e12820*.
- Hartmann, E. (1984). *The nightmare*. New York: Basic Books.
- Hartmann, E. (1991). *Boundaries in the mind: A new psychology of personality*. New York, NY: Basic Books.
- Hartmann, E. (1997). The concept of boundaries in counselling and psychotherapy. *British Journal of Guidance & Counselling, 25*, 147-162.
- Kelly, W.E. (2012a). The Ausburg Multidimensional Personality Instrument (AMPI) "clinical" scales: Brief MMPI relevant scales for undergraduate lab assignments and research. *Psychology Journal, 9*, 86-96.
- Kelly, W.E. (2012b). Preliminary validity scales for the Ausburg Multidimensional Personality Instrument (AMPI). *Individual Differences Research, 10*, 182-192.
- Kelly, W.E. (2016). Some personality characteristics of college students reporting frequent nightmares. *Sleep and Hypnosis, 18*, 69-73.
- Kelly, W.E. (2018). The Nightmare Proneness Scale: A proposed measure for the tendency to experience nightmares. *Sleep and Hypnosis, 20*, 120-127.
- Kelly, W.E. (2020). Nightmares and ego strength revisited: Ego strength predicts nightmares above neuroticism and general psychological distress. *Dreaming, 30*, 29-44.
- Kelly, W.E., & Mathe, J.R., (2019). A brief self-report measure for frequent distressing nightmares: The Nightmare Experience Scale (NExS). *Dreaming, 29*, 180-195.
- Kelly, W.E. & Yu, Q. (2019). Convergent, discriminant, and incremental validity of the Nightmare Proneness Scale. *Dreaming, 29*, 100-111.
- Kohut, H. (1977). *The restoration of the self*. New York: International Universities Press.
- Krakov, B. J., Melendrez, D. C., Johnston, L. G., Clark, J. O., Santana, E. M., Warner, T. D., . . . Lee, S. A. (2002). Sleep dynamic therapy for Cerro Grande Fire evacuees with posttraumatic stress symptoms: A preliminary report. *The Journal of Clinical Psychiatry, 63*, 673-684.
- Levin R., & Fireman, G. (2002). Nightmare prevalence, nightmare distress, and self-reported psychological disturbance. *Sleep, 25*, 205-212.
- Levin, R., & Nielsen, T.A. (2007). Disturbed dreaming, posttraumatic stress disorder, and affect distress: A review and neurocognitive model. *Psychological Bulletin, 133*, 482-528.
- Levin, R., & Nielsen, T.A. (2009). Nightmares, bad dreams, and emotion dysregulation. *Current Directions in Psychological Science, 18*, 84-88.
- Mahaffey, B.L., Watson, D., Clark, L.A., & Kotov, R. (2016). Clinical and personality traits in emotional disorders: Evidence of a common framework. *Journal of Abnormal Psychology, 125*, 758-767.
- McAlpine, C.S., Kiss, M.G., Rattik, S., He, S., Vassalli, A., Valet, C.,... Swirski, F.K. (2019). Sleep modulates hematopoiesis and protects against atherosclerosis. *Nature, 566*, 383-387.
- Miró, E., & Martínez, M. P. (2005). Affective and personality characteristics in function of nightmare prevalence, nightmare distress and interference due to nightmares. *Dreaming, 15*, 89-105.
- Nielsen, T., & Carr, M. (2017). Nightmares and nightmare function. In: M. Kryger, B. Roth, W. Dement (Eds.). *Principles and Practice of Sleep Medicine (Vol. 6)* (pp. 546-554). New York: Elsevier.
- Ohayon, M. M., & Shapiro, C. M. (2000). Sleep disturbances and psychiatric disorders associated with posttraumatic stress disorder in the general population. *Comprehensive Psychiatry, 41*, 469-478.
- Ormel, J., Rosmalen, J., Farmer, A. (2004). Neuroticism: A non-informative marker of vulnerability to psychopathology. *Social Psychiatry and Psychiatric Epidemiology 39*, 906-912.
- Rosen, C.S., Drescher, K.D., Moos, R.H., Finney, J.W., Murphy, R.T., & Gusman, F. (2000). Six- and ten-item indexes of psychological distress based on the Symptom Checklist-90. *Assessment, 7*, 103-111.
- Rousseau, A., & Belleville, G. (2018). The mechanisms of action underlying the efficacy of psychological nightmare treatments: A systematic review and thematic analysis of discussed hypotheses. *Sleep Medicine Reviews, 39*, 122-133.
- Schredl, M. (2012). Continuity in studying the continuity hypothesis of dreaming is needed. *International Journal of Dream Research, 5*, 1-8.
- Schredl, M. (2013). Nightmare frequency in a representative German sample. *International Journal of Dream Research, 6*, 119-122.
- Schredl, M., & Reinhard, I. (2011). Gender differences in nightmare frequency: A meta-analysis. *Sleep Medicine Reviews, 15*, 115-121.
- Watson, D., & Clark, L.A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin, 96*, 465-490.
- Watson, D., Clark, L.A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-1070.
- Watson, D., & Pennebaker, J.W. (1989). Health complaints, stress, and distress: Exploring the central role of negative affectivity. *Psychological Review, 96*, 234-254.
- Yu, C.K-C. (2009). Confirming the factor structure of the Dream Intensity Inventory. *Dreaming, 19*, 97-107.