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# Structure of sleep disturbances and its relation to symptoms of psychopathology: evidence for specificity

Erin Anne Koffel  
*University of Iowa*

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STRUCTURE OF SLEEP DISTURBANCES AND ITS RELATION TO SYMPTOMS  
OF PSYCHOPATHOLOGY: EVIDENCE FOR SPECIFICITY

by  
Erin Anne Koffel

An Abstract

Of a thesis submitted in partial fulfillment  
of the requirements for the Doctor of  
Philosophy degree in Psychology (Clinical Psychology)  
in the Graduate College of  
The University of Iowa

December 2012

Thesis Supervisor: Professor Emeritus David Watson

## ABSTRACT

A large body of research has demonstrated general relations of sleep complaints with psychological disorders, including anxiety, depression, and dissociation/schizotypy. In contrast, very few studies have focused on the specificity of sleep complaints to daytime symptoms. Identifying sleep disturbances that show evidence of specificity is important for differential diagnosis and assessment. This study used the structure of self-reported sleep complaints as a framework for examining specificity. Comprehensive questionnaire and interview measures of sleep disturbance were submitted to factor analyses in students and psychiatric patients. These analyses revealed the presence of three well defined higher order factors: Lassitude, Insomnia, and Unusual Sleep Experiences. These factors were then correlated with interview and questionnaire measures of daytime symptoms. Lassitude was specific to dysphoria, whereas Insomnia had weaker, nonspecific relations with daytime symptoms. Fatigue, a component of Lassitude, showed the strongest evidence of specificity. Unusual Sleep Experiences was specific to symptoms of posttraumatic stress disorder (PTSD) and dissociation. In particular, the Nightmares component of Unusual Sleep Experiences was strongly related to PTSD and the Sleep Hallucinations component of Unusual Sleep Experiences was strongly related to dissociation.

Abstract Approved: \_\_\_\_\_  
Thesis Supervisor  
\_\_\_\_\_  
Title and Department  
\_\_\_\_\_  
Date

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Graduate College  
The University of Iowa  
Iowa City, Iowa

CERTIFICATE OF APPROVAL

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PH.D. THESIS

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This is to certify that the Ph.D. thesis of

Erin Anne Koffel

has been approved by the Examining Committee  
for the thesis requirement for the Doctor of Philosophy  
degree in Psychology (Clinical Psychology) at the December 2012 graduation.

Thesis Committee: \_\_\_\_\_  
David Watson, Thesis Supervisor

\_\_\_\_\_  
Lee Anna Clark

\_\_\_\_\_  
Michael O'Hara

\_\_\_\_\_  
Kristian Markon

\_\_\_\_\_  
Eric Dyken

To Jonathan and Eleanor

## ACKNOWLEDGMENTS

Funding for this project was received from National Institute of Mental Health (NIMH) Fellowship F31-MH084507 and a Partnership of Student Governments at Iowa grant. I would like to thank my dedicated team of research assistants who made this project possible. I am grateful to my advisor, David Watson, for his guidance and support throughout my graduate training.



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## INTRODUCTION

For over 50 years, researchers have investigated the overlap between sleep disturbances and psychopathology. In this time, a significant body of research has shown that self-reported sleep disturbances are associated with the majority of disorders listed in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association, 2000), including mood disorders, anxiety disorders, eating disorders, substance use disorders, and psychotic disorders (Benca, 2005; Benca & Schenck, 2005; Benson & Zarcone Jr., 2005; Gillin, Drummond, Clark, & Moore, 2005; Stein & Mellman, 2005). Given the wide variety of daytime and nighttime symptoms that are encompassed by this field of study, it is essential to have an organizing framework with which to summarize the existing evidence and to guide future research. Because this study is focused on the correlates of sleep complaints, I will use the structure of self-reported sleep as this framework.

Structural analyses of sleep complaints have consistently found two higher order factors of Lassitude and Insomnia (Buysse et al., 2010; Koffel & Watson, 2009a). Lassitude includes measures of fatigue, sleepiness, and hypersomnia or oversleeping. Insomnia includes problems falling asleep, waking up during the night, waking up too early in the morning, and poor sleep quality. There is also evidence that nightmares, vivid dreaming, and narcolepsy symptoms cohere to form an additional higher order factor that is distinct from Lassitude and Insomnia (Koffel & Watson, 2009b, in press; Watson, 2001). This factor will be referred to as Unusual Sleep Experiences.

First, I will review evidence that measures of lassitude and insomnia show consistently strong relations with depression and anxiety. Although lassitude and insomnia have shown relations with many additional daytime symptoms (e.g., substance abuse, eating disorders), I am limiting this review to depression and anxiety because these disorders are the primary focus in this area of research. I will also present

preliminary evidence indicating that the factor of Unusual Sleep Experiences is related to a select group of psychological disorders involving unusual cognitions and perceptions during the day (including dissociation, schizotypy, and posttraumatic stress disorder (PTSD)). Beyond these broad associations, I examine evidence for the specificity of sleep complaints with daytime symptom dimensions. Studies examining the high rates of comorbidity among disorders (particularly the mood and anxiety disorders) have emphasized the need to focus on symptom dimensions that show greater specificity (Watson, 2009). Identifying which sleep symptoms show specificity will be important for differential diagnosis and assessment. Finally, I review the methodological weaknesses and limitations in the studies to date and present the results of the current study, which was designed to address these concerns and to further our knowledge of the relations between sleep complaints and daytime symptoms.

#### Lassitude and Insomnia: Associations with Depression

Among the most robust findings in the sleep and psychopathology literature are the associations of lassitude and insomnia with depression (Benca, 1996, 2005; Peterson & Benca, 2006). Measures of lassitude and insomnia are significantly related to diagnoses of major depression, with correlations ranging from .34 to .43 (Koffel & Watson, 2009a; Watson, O'Hara et al., 2008). When these analyses are conducted using mean level comparisons of psychiatric patients with and without depression, they result in medium to large effect sizes for insomnia ( $d = .69$ ) and lassitude ( $d = .81$ ) (Watson, O'Hara et al., 2008). It is important to note that these effect sizes decrease ( $d = -.10$  and  $d = .39$ , respectively) when controlling for comorbid anxiety disorders. This suggests that anxiety symptoms partly account for the relation between depression and sleep complaints.

Similarly, several epidemiological studies have found higher rates of depression in people with insomnia and hypersomnia compared to those without these sleep



disturbances. Lifetime prevalence of major depression was 31.1% in people with insomnia and 25.3% in people with hypersomnia, compared to 2.7% in people with neither sleep disturbance (Breslau, Roth, Rosenthal, & Andreski, 1996). Further evidence for the association of insomnia and hypersomnia with depression comes from longitudinal studies, which have shown that people with these sleep disturbances are at greater risk for developing depression than those without sleep disturbances, even when controlling for previous diagnoses (Breslau et al., 1996; Buysse et al., 2008; Chang, Ford, Mead, Cooper-Patrick, & Klag, 1997; Ford & Kamerow, 1989; Szklo-Coxe, Young, Peppard, Finn, & Benca, 2010; Weissman, Greenwald, Nino-Murcia, & Dement, 1997).

The association of sleep disturbances with depression is not surprising given that the diagnostic criteria for depression include symptoms of insomnia, hypersomnia, and fatigue (American Psychiatric Association, 2000). However, insomnia and lassitude show moderate to strong correlations with non-sleep-related symptoms of depression (Watson, O'Hara et al., 2008; Watson et al., 2007). In addition, people with self-reported insomnia and hypersomnia at baseline are at increased risk for developing depression in the future compared to those without sleep disturbances, even when depression is diagnosed without the sleep-related symptom criteria (Breslau et al., 1996; Buysse et al., 2008; Szklo-Coxe et al., 2010).

#### Lassitude and Insomnia: Associations with Anxiety

In addition to depression, anxiety disorders consistently show strong associations with self-reported symptoms of lassitude and insomnia (Mellman, 2006; Papadimitriou & Linkowski, 2005; Stein & Mellman, 2005). Most of this research has focused on PTSD, generalized anxiety disorder (GAD), social phobia, and panic disorder, whereas less research has been devoted to the overlap of sleep problems with obsessive compulsive disorder (OCD) and specific phobias.

Insomnia and lassitude are related to diagnoses of GAD, PTSD, panic disorder, social phobia, and OCD, with medium to large effect sizes (Koffel & Watson, 2009a; Watson, O'Hara et al., 2008). Once again it is important to note that these effect sizes decrease when controlling for comorbid depression, especially for diagnoses of OCD, social phobia, and GAD, which did not show effect sizes above  $d = .21$ . In contrast, PTSD and panic disorder continued to show small to moderate effect sizes with insomnia and lassitude, with  $d$ s ranging from .35 to .66 (see Watson, O'Hara et al., 2008). Regression analyses have also suggested that the relation between sleep and anxiety is partially accounted for by depression. For example, social phobia does not predict a significant amount of the variance in insomnia scores when controlling for depression (Buckner, Bernert, Cromer, Joiner, & Schmidt, 2008).

Some studies have attempted to control for the overlap of anxiety and depression by excluding participants with diagnoses of depression. Even after excluding participants with depression, these studies find significant relations between anxiety and sleep. For example, scores on measures of insomnia and lassitude were significantly higher in patients with social phobia and GAD than patients without psychiatric disorders when excluding patients with diagnoses of major depression (Stein, Chartier, & Walker, 1993; Stein, Kroft, & Walker, 1993).

In epidemiological studies, it has been shown that people reporting insomnia or hypersomnia have a higher prevalence of GAD, panic disorder, OCD, PTSD, specific phobia, and social phobia than people without sleep disturbances (Breslau et al., 1996; Roth et al., 2006). People with insomnia or hypersomnia are also at a greater risk for developing anxiety disorders in the future, even after controlling for past psychiatric diagnoses (Breslau et al., 1996; Ford & Kamerow, 1989; Weissman et al., 1997).

Two anxiety disorders, GAD and PTSD, have diagnostic criteria that include sleep-related symptoms; as in the case of depression diagnoses, the sleep-related symptoms may partially account for the overlap of sleep disturbances and diagnoses,

unless the diagnostic criteria are modified. Specifically, the diagnostic criteria for GAD include difficulties falling or staying asleep; restless, unsatisfying sleep at night; and fatigue during the day (American Psychiatric Association, 2000). The criteria for PTSD include difficulties falling or staying asleep (American Psychiatric Association, 2000). Although most of the disorder-based studies reviewed above did not control for these sleep-related criteria, there is evidence that the non-sleep-related symptoms of PTSD (e.g., daytime traumatic intrusions) and GAD (e.g., worry) are related to insomnia and lassitude (Neylan et al., 1998; Watson et al., 2007).

### Unusual Sleep Experiences: Associations with Dissociation and Schizotypy

The third higher order factor of sleep complaints included in this review is Unusual Sleep Experiences. This factor involves unusual cognitions and perceptions during the night (e.g., hallucinations that occur when falling asleep or waking up) and is primarily associated with unusual cognitions and perceptions during the day (e.g., dissociation and schizotypy). Watson (2001) refers to these unusual nighttime experiences as sleep-related experiences and suggests that “measures of dissociation, schizotypy and sleep-related experiences define a common domain that is characterized by unusual cognitions and perceptions” (p. 531). Because less research has been conducted with the Unusual Sleep Experiences factor compared to Lassitude and Insomnia, I will first review the research related to the composition of this factor, and then review the daytime correlates of this higher order dimension.

#### Unusual Sleep Experiences

Most of the research examining the overlap of sleep, dissociation, and schizotypy has been conducted using the Iowa Sleep Experiences Survey (ISES; Watson, 2001). The ISES is a factor-analytically derived instrument that measures unusual sleep experiences, including nightmares, vivid dreams, and narcolepsy symptoms. To create

the instrument, Watson (2001) submitted multiple sleep items to factor analysis. The items included in this analysis referred to symptoms of narcolepsy, such as cataplexy (i.e., muscle weakness during strong emotions) and hypnagogic and hypnopompic hallucinations (i.e., hallucinations that occur when falling asleep or waking up). In addition, the items referred to nightmares, recurring dreams, dream recall, and waking dreams (i.e., a dream in which the person dreams of waking up). These items loaded onto the same factor, which became the ISES General Sleep Experiences scale, with coefficient alphas ranging from .83 to .85. This factor will be referred to as Unusual Sleep Experiences and it is distinct from the Insomnia and Lassitude factors (Koffel & Watson, 2009b, in press)

#### Dissociation/Schizotypy

There is a growing body of evidence showing that the Unusual Sleep Experiences factor is related to unusual cognitive and perceptual experiences during the day. These daytime experiences are captured under the heading of dissociation and schizotypy. Before reviewing the association of sleep complaints with dissociation and schizotypy, it is helpful to define the constructs of dissociation and schizotypy since they encompass a diverse array of symptoms.

Dissociation involves an altered state of consciousness, in which normally integrated mental processes become separated. This separation leads to disruptions in awareness, memory, and identity (American Psychiatric Association, 2000; Butler, Duran, Jasiukaitis, Koopman, & Spiegel, 1996; Kihlstrom, Glisky, & Angiulo, 1994). The dissociative disorders in the *DSM-IV-TR* include dissociative amnesia (i.e., inability to recall personal information), dissociative fugue (i.e., travel away from home with identity confusion and amnesia), dissociative identity disorder (i.e., two or more distinct identities that take control of the person's behavior, along with amnesia for personal information), and depersonalization disorder (i.e., feeling detached from oneself).

In addition to the dissociative disorders, the *DSM-IV-TR* diagnostic criteria for PTSD include the dissociative symptoms of amnesia, detachment, and flashbacks (Butler et al., 1996). Studies have reported strong relations between measures of PTSD and dissociation, presumably due to the dissociative symptoms of PTSD (Carlson & Putnam, 1993; Gershuny & Thayer, 1999; van Ijzendoorn & Schuengel, 1996). It is important to note, however, that PTSD also shows substantial relations with mood disorders and other anxiety disorders (Watson, 2005, 2009); more studies are ultimately needed to determine if PTSD falls within the domain of dissociation.

Structural studies with measures of dissociation have consistently found three symptom dimensions: (1) obliviousness/amnesia, which includes items about trance states and automatic behavior, (2) depersonalization/derealization, which includes items about feelings of unreality and disconnectedness and (3) imagination/absorption, which includes items about fantasizing and internal focus (Goldberg, 1999; Harrison & Watson, 1992; Ross, Ellason, & Anderson, 1995). Based on these studies, dissociation can be viewed as a multidimensional construct, composed of three main symptom dimensions.

As with dissociation, schizotypy is a multidimensional construct that includes the symptoms of schizophrenia and schizotypal personality disorder (STPD) (Claridge, 1997). Given that there are many heterogeneous symptoms grouped under the heading of schizotypy, it is helpful to turn to structural studies to see how many distinct symptom dimensions can be identified. Traditionally, the symptoms of schizotypy have been organized using a two-factor model of positive symptoms (e.g., unusual perceptual and cognitive experiences) and negative symptoms (e.g., anhedonia and flat affect; impairments in social functioning) (Arndt, Alliger, & Andreasen, 1991; Raine et al., 1994). In recent years, however, the symptoms of schizotypy increasingly have been organized using three-factor models. The first factor consists of positive symptoms, such as delusions, hallucinations, unusual perceptual experiences, ideas of reference, odd beliefs, and paranoia. The second factor consists of negative symptoms, such as affective

flattening, anhedonia, avolition, and interpersonal difficulties. The third factor consists of disorganized symptoms, such as odd speech and behavior (Arndt et al., 1991; Bergman et al., 1996; Lenzenweger & Dworkin, 1996; Raine et al., 1994). However, recent evidence suggests that as many as five factors can be extracted from schizotypal symptoms (Chmielewski & Watson, 2008). In this scheme, the positive symptom dimension is divided into unusual beliefs/experiences and mistrust. Negative symptoms are divided into social anhedonia and social anxiety. Disorganized symptoms remain an independent dimension, labeled eccentricity/oddity.

Studies consistently have found that measures of dissociation correlate significantly with the positive and disorganized symptoms of schizotypy (Chmielewski & Watson, 2008; Giesbrecht, Merckelbach, Kater, & Sluis, 2007; Knox, 2008; Merckelbach & Giesbrecht, 2006; Merckelbach, Rassin, & Muris, 2000; Pope & Kwapil, 2000; Watson, 2001; Watson, Clark, & Chmielewski, 2008). Several studies have used structural analyses with measures of dissociation and schizotypy to determine if they are essentially the same construct. Watson (2001) obtained measures of dissociation and schizotypy and found that a two-factor model of dissociation and schizotypy fit the data well, but the two factors were strongly correlated and were only weakly differentiated. Summarizing the studies presented above, it appears that the symptoms of dissociative disorders and the positive/disorganized symptoms of schizotypy can be subsumed within a broad construct that involves unusual cognitions and perceptions.

#### Unusual Sleep Experiences and Dissociation/Schizotypy

Moving on to the relation of Unusual Sleep Experiences with dissociation/schizotypy, Watson (2001) found that the General Sleep Experiences scale of the ISES was significantly related to multiple indicators of dissociation and schizotypy. In particular, the General Sleep Experiences scale showed strong correlations with the imagination/absorption component of dissociation ( $r$ s ranged from

.52 to .57) and the magical ideation component of schizotypy (*r*s ranged from .43 to .45). This pattern was also replicated in a later study (Watson, 2003). In addition, Watson (2001) reported that measures of dissociation and schizotypy were significantly related to 14 of the 15 sleep items that compose the General Sleep Experiences scale. The only item that was unrelated to dissociation and schizotypy was the one that referred to the frequency of dream recall (i.e., “I remember my dreams”).

The association of the ISES General Sleep Experiences scale with dissociation and schizotypy has been replicated in many studies. Several studies have found that measures of dissociation correlate significantly with the ISES General Sleep Experiences scale (*r*s ranging from .35 to .55) (Fassler, Knox, & Lynn, 2006; Giesbrecht, Jongen, Smulders, & Merckelbach, 2006; Giesbrecht & Merckelbach, 2004, 2006). Similarly, Knox (2008) found that the ISES General Sleep Experiences scale was significantly related to dissociation and the positive symptoms of schizotypy. Moreover, the Unusual Sleep Experiences factor, as measured by the ISES, shows specificity to dissociation and schizotypy compared to measures of other daytime symptoms, including depression and anxiety (Koffel & Watson, 2009b).

It is important to show that unusual sleep experiences are associated with dissociation and schizotypy (a) beyond the ISES and (b) in clinical samples. The following section reviews the overlap between individual sleep experiences represented on the ISES and dissociation and schizotypy in clinical and non-clinical samples. It also includes a review of the association of complex behaviors at night with dissociation and schizotypy; although this sleep experience is not included on the ISES, it has shown relations with unusual perceptual experiences during the day and thus may represent an additional facet of Unusual Sleep Experiences.

The most widely studied facet of Unusual Sleep Experiences is nightmares. Nightmares are related to symptoms of dissociation and schizotypy (Levin, 1998; Levin & Fireman, 2002), as well as to non-sleep-related symptoms of PTSD (Neylan et al.,

1998). In addition, narcolepsy symptoms, including sleep hallucinations, cataplexy, and sleep paralysis, are associated with positive symptoms of schizophrenia (Ohayon, Priest, Caulet, & Guilleminault, 1996; Sours, 1963; Wilcox, 1985), symptoms of dissociation and schizotypy (Spanos, McNulty, DuBreuil, & Pires, 1995), and symptoms of PTSD (Mellman, Kulick-Bell, Ashlock, & Nolan, 1995; Ohayon & Shapiro, 2000). Finally, complex and automatic behaviors at night (e.g., punching, kicking, running from bed, acting out dreams) are associated with symptoms of schizophrenia (Ohayon, Caulet, & Priest, 1997), symptoms of dissociation (Agargun et al., 2002), and symptoms of PTSD (Hefez, Metz, & Lavie, 1987; Husain, Miller, & Carwile, 2001; Ohayon & Shapiro, 2000; van der Kolk, Blitz, Burr, Sherry, & Hartmann, 1984). Together, these studies offer compelling evidence that the higher order factor of Unusual Sleep Experiences and its lower order facets are related to symptoms of dissociation, schizotypy, and to a lesser extent, PTSD.

#### Sleep and Psychopathology: Evidence for Specificity

A large body of research has demonstrated general relations of sleep complaints with depression, anxiety, and dissociation/schizotypy. In contrast, very few studies have examined whether particular sleep facets or higher order sleep factors are specific to these daytime symptoms. Specificity can be examined in two ways. First, it can be examined by comparing the same sleep disturbances across disorders (i.e., sleep complaints that are hallmarks of psychological disorders). For example, nightmares may be specific to symptoms of PTSD or they may show equivalent correlations with symptoms of PTSD, depression, and other anxiety disorders. Second, specificity can be calculated by comparing the same daytime symptom dimension across sleep complaints (i.e., psychological disorders that manifest a specific sleep disturbance). Nightmares may be the primary sleep disturbance related to symptoms of PTSD, or people who report symptoms of PTSD may report a wide variety of sleep disturbances. In this review, the



primary focus is on the first type of specificity since this is the most relevant for differential diagnosis and assessment. However, I also include examples of the latter type of specificity. Many psychological disorders are linked to more than one sleep disturbance and it is unclear if these sleep disturbances have differential relations with these disorders. Furthermore, sleep complaints that are specific to daytime dimensions relative to other nighttime symptoms, as well as to other daytime symptoms, should be emphasized in diagnostic criteria due to their high degree of specificity.

To demonstrate specific relations of sleep disturbances and daytime symptoms requires comprehensive measures of both sleep experiences (e.g., lassitude, insomnia, and unusual sleep experiences) and daytime symptoms (e.g., depression, anxiety, schizotypy, dissociation). Although very few research studies have utilized an assessment battery with this type of broad coverage, several studies have begun to explore the specificity of sleep disturbances within a more limited range. I review these studies below.

#### Specificity of Lassitude and Insomnia

Several studies have presented evidence that measures of lassitude are specific to depression symptoms compared to anxiety symptoms. For example, lassitude shows significantly stronger correlations with questionnaire measures and diagnoses of depression than with anxiety, including social anxiety, PTSD, and panic (Koffel & Watson, 2009a, in press; Watson, O'Hara et al., 2008). This pattern holds when controlling for sleep-related symptoms of depression on questionnaire measures (Koffel & Watson, 2009a, in press). Epidemiological studies have also shown that people with hypersomnia have higher odds ratios for depression compared to anxiety disorders and substance use disorders (Breslau et al., 1996; Ford & Kamerow, 1989). For example, the odds ratio for lifetime depression in people with hypersomnia was 12.8 (95% CI 6.4-25.4), compared to 3.3 (95% CI 2.0-5.4) for any anxiety disorder, 2.9 (95% CI 1.7-4.8)

for alcohol use disorders and 3.6 (95% CI 2.0-6.4) for drug use disorders (Breslau et al., 1996). When controlling for sleep disturbances in the diagnosis of major depression, the odds ratio for depression decreased to 8.4 (95% CI 4.0-17.4).

In contrast, the findings regarding the specificity of insomnia with daytime symptoms are mixed. Insomnia tends to show more nonspecific relations with depression and anxiety compared to lassitude, although it has shown weak evidence of specificity to depression (Koffel & Watson, 2009a, in press; Watson, O'Hara et al., 2008). For example, lassitude showed specificity to depression compared to other anxiety symptoms in 89.7% of comparisons, whereas insomnia showed specificity to depression in 66.7% of comparisons (Koffel & Watson, 2009a). However, epidemiological studies show that people with insomnia have higher odds ratios for diagnoses of depression than anxiety disorders, substance use disorders, and impulse control disorders (Breslau et al., 1996; Ford & Kamerow, 1989; Roth et al., 2006), which suggests that insomnia shows weak specificity to depression.

When examining the specificity of daytime symptoms to sleep complaints, the findings also tend to be mixed. Some studies have shown that symptoms of depression are significantly more strongly associated with measures of lassitude than measures of insomnia (Koffel & Watson, 2009a, in press; Watson, O'Hara et al., 2008), whereas the odds ratios for depression in people with insomnia or hypersomnia tend to be comparable (Breslau et al., 1996; Ford & Kamerow, 1989). These studies also show that symptoms of anxiety (e.g., panic, social anxiety, PTSD) tend to have similar relations with lassitude and insomnia.

#### Specificity of Unusual Sleep Experiences

The ISES has been shown to be specific to measures of dissociation and schizotypy compared to other sleep disturbances (e.g., insomnia and lassitude) and compared to other daytime symptoms (e.g., depression and anxiety) (Koffel & Watson,

2009b). However, this study was very preliminary and is the only study that has examined the specificity of the ISES to dissociation/schizotypy relative to other sleep complaints. Several studies have shown that nightmares, a facet of the Unusual Sleep Experiences factor, are more strongly related to symptoms of PTSD than to other psychological disorders. For example, nightmares show a significantly stronger correlation with the PTSD symptom of daytime traumatic intrusions ( $r = .55$ ) than with symptoms of depression, panic, and social anxiety ( $r$ s range from .38 to .42) (Koffel & Watson, in press). Krakow et al. (2002) found that nightmare frequency in sexual assault survivors tended to correlate more highly with ratings of PTSD symptom severity ( $r$ s ranged from .46 to .49) than with ratings of anxiety symptoms ( $r$ s ranged from .28 to .37) and depression symptoms ( $r$ s ranged from .30 to .39). All of the correlations among nightmare measures and PTSD reached significance, whereas only 50% of the correlations among nightmare measures and anxiety/depression reached significance. Neylan et al. (1998) also demonstrated that nightmares have strong correlations with non-sleep-related PTSD symptoms ( $r = .69$ ) compared to lifetime diagnoses of alcohol abuse ( $r = .16$ ), drug abuse ( $r = .15$ ), depression ( $r = .28$ ), mania ( $r = .17$ ) and panic disorder ( $r = .19$ ) (Neylan et al., 1998). In this study, most of the variance in nightmare frequency was predicted by non-sleep-related PTSD symptoms, whereas current diagnoses of the other psychological disorders were not significant predictors of nightmares. Finally, nightmares show specificity to measures of dissociation and schizotypy compared to measures of depression and anxiety (Levin & Fireman, 2002). These studies suggest that nightmares are specific to PTSD symptoms within the mood and anxiety disorders, and more broadly, to measures of dissociation and schizotypy.

In addition to nightmares, several other facets of the Unusual Sleep Experiences factor have shown specificity to symptoms of dissociation and schizotypy. Ohayon et al. (1996) found that people with positive symptoms of schizophrenia (i.e., visual, olfactory, gustative, or somatic hallucinations while fully awake) were more likely to report

hypnagogic and hypnopompic hallucinations ( $OR = 3.1$  95% CI 2.4-3.7) than those with anxiety ( $OR = 1.4$ , 95% CI 1.1-1.6) or mood disorders ( $OR = 1.4$  95% CI 1.1-1.7). In a later study, they found that participants with positive symptoms of schizophrenia were close to three times more likely to report violent behaviors during sleep (e.g., punching, kicking, leaping, running from bed) than participants with anxiety disorders, mood disorders, and adjustment disorders (Ohayon et al., 1997). Conversely, sleep paralysis has been shown to be relatively nonspecific and shows moderate correlations with measures of depression, PTSD, and dissociation (Abrams, Mulligan, Carleton, & Asmundson, 2008).

Finally, examining the specificity of daytime symptoms to sleep complaints, there is some evidence that PTSD symptoms are more strongly related to nightmares than to insomnia (Neylan et al., 1998). PTSD symptoms are also more strongly related to violent behavior at night than to nonrestorative sleep (i.e., feeling tired in the morning) (Ohayon & Shapiro, 2000). It is unclear if other daytime symptoms encompassed under the heading of dissociation/schizotypy show specificity to unusual sleep experiences compared to insomnia and lassitude, although there is some evidence that they do (Koffel & Watson, 2009b).

#### Specificity: Directions for Future Research

The evidence that sleep complaints show specificity to certain daytime symptoms is still quite preliminary, although the studies reviewed above suggest that lassitude is specific to depression, whereas unusual sleep experiences (particularly nightmares) are specific to dissociation/schizotypy and PTSD. However, most of these studies did not have comprehensive measures of the three higher order sleep factors of Lassitude, Insomnia, and Unusual Sleep Experiences. In addition, most did not comprehensively measure the symptoms of depression, anxiety, and dissociation/schizotypy. As a result, it remains unclear if these three sleep factors (and their lower order facets) have differential

relations with daytime symptoms. It is also not clear whether various sleep complaints should be given equal weights in diagnostic criteria (e.g., major depression and GAD). To continue mapping the specific relations between nighttime and daytime symptoms, it will be necessary for future research to include multiple measures of daytime and nighttime symptoms. In addition to non-comprehensive assessment batteries, there are other limitations in this area of research that will need to be addressed. These limitations are reviewed in the following section.

### Methodological Issues

#### Dichotomous vs. Continuous Data

Many of the studies reviewed in this paper utilize dichotomous diagnoses for either sleep disorders or psychological disorders or both. These types of disorder-based analyses are subject to many problems (including changing diagnostic criteria, diagnostic inconsistency, and diagnostic unreliability; see Watson, 2009). An additional problem with dichotomous diagnoses that is particularly relevant for researching the overlap of sleep and psychopathology is low base rates. The daytime disorders associated with unusual sleep experiences, including dissociative disorders and schizophrenia, tend to have low base-rates. Conversely, the diagnoses of sleep disorders that encompass symptoms of interest also tend to be quite rare. For example, the prevalence of REM sleep behavior disorder, a sleep disorder that involves vivid dreams and automatic behaviors during the night, ranges from .38-.50% in the general population (American Academy of Sleep Medicine, 2005). Narcolepsy, which involves cataplexy and sleep hallucinations, has a prevalence of .02-.16% in the general population (American Psychiatric Association, 2000). Low base rates make it difficult to obtain large samples, which can then lead to problems with power and precision of estimates.

To highlight the extent of this problem, I selected 17 articles that have examined the relation between sleep and dissociation/schizotypy using diagnoses and calculated the

mean and median sample size. The mean sample size was only 59.47, and the median sample size was only 33. In many of these studies, the samples are further divided for group comparisons, making it even more difficult to obtain significant and precise results. For example, one study compared dissociation scores between groups with ( $n = 17$ ) and without ( $n = 13$ ) nightmare disorder (Agargun et al., 2003). Although the effect size was .61, the difference in dissociation scores was nonsignificant.

In contrast to diagnoses, the symptoms of many of these daytime and nighttime disorders are more common. For example, the prevalence of sleep hallucinations in the general population is about 31% (Ohayon, 2000). Use of continuous measures can address the problems associated with low base rates because these analyses include participants with subclinical symptom levels (Widiger & Samuel, 2005).

#### Disorder-based vs. Symptom-based Analyses

Most studies examining the overlap of sleep and psychopathology use diagnoses or total scores for a particular daytime or nighttime construct. Moving beyond general measures/diagnoses and examining specific symptom dimensions will be crucial for future studies for several reasons. First, many psychological disorders have heterogeneous symptom criteria (Watson, 2005). As a result, symptom dimensions within the same diagnosis or within a total score can show differential relations with sleep complaints. For example, research has shown that unusual sleep experiences as measured by the ISES tend to show stronger relations with the imagination/absorption component of dissociation and the positive symptoms of schizotypy, compared to the other dissociation/schizotypy symptom dimensions (Knox, 2008; Watson, 2001, 2003). The value of measuring specific symptom dimensions is not limited to daytime symptoms and applies to nighttime experiences as well. Moving beyond the three higher order factors of sleep complaints and examining facet level information may provide useful

information. For example, individual facets of the Unusual Sleep Experiences factor may show differential relations with daytime symptom dimensions.

A second advantage of a symptom-based perspective is that it would allow studies to explore the continuity of daytime and nighttime experiences. It may be the case that specific nighttime experiences are related to specific daytime experiences. For example, people who have unusual perceptual experiences during the daytime (e.g., visual flashbacks in PTSD, hallucinations in schizophrenia) may be more likely to have unusual perceptual experiences at night (e.g., nightmares, hypnagogic hallucinations). Similarly, people who experience automatic behaviors during the daytime (e.g., dissociative episodes) may be more likely to experience automatic behaviors during the night (e.g., acting out dreams). Studies that report broad associations between sleep complaints and disorders cannot address the question of symptom continuity in a compelling manner.

Finally, it is helpful to take a symptom-based approach because several psychological disorders include sleep-related criteria (e.g., depression, PTSD, GAD), which may inflate the correlation between daytime and nighttime symptoms. Restricting analyses to non-sleep-related symptom scores provides a clearer picture of the nature of the relations between daytime and nighttime functioning.

Given the importance of symptom-based analyses, it follows that it is essential to have a good understanding of the number of symptom dimensions within the target construct, as well as the composition of each dimension. Structural analyses have been used to clarify the symptom dimensions within depression (Watson, O'Hara et al., 2008; Watson et al., 2007), PTSD (Simms, Watson, & Doebbeling, 2002), dissociative disorders (Goldberg, 1999; Harrison & Watson, 1992; Ross et al., 1995), OCD (Watson & Wu, 2005), specific phobias (Cutshall & Watson, 2004), and schizophrenia/STPD (Arndt et al., 1991; Bergman et al., 1996; Chmielewski & Watson, 2008; Lenzenweger & Dworkin, 1996; Raine et al., 1994). In some cases instruments have been created based on these structural models (Cutshall & Watson, 2004; Watson, O'Hara et al., 2008;

Watson et al., 2007; Watson & Wu, 2005). However, rationally created instruments can also be analyzed/scored according to prevailing structural models.

Compared to depression, anxiety, and dissociation/schizotypy, far less research has been done to explicate the structure of sleep complaints. In the next section, I review my research on the higher and lower order structure of sleep complaints and describe the Iowa Sleep Disturbances Inventory (ISDI), a dimensional sleep measure created through structural analyses.

### Structure and Assessment of Nighttime Variables

There are currently a large number of questionnaires that measure sleep disturbances (Devine, Hakim, & Green, 2005; Moul, Hall, Pilkonis, & Buysse, 2004). Most provide a single score related to a broad sleep complaint, such as insomnia or fatigue, although a few have multiple scales assessing more specific sleep disturbances. The most widely-used sleep questionnaires demonstrate good psychometric properties in terms of reliability and criterion validity and have been used to examine sleep complaints in both sleep disorder and psychiatric patients (Sateia, Doghramji, Hauri, & Morin, 2000). The main limitations of these instruments are in regard to substantive validity and structural validity (Clark & Watson, 1995; Loewinger, 1957).

First, many existing sleep questionnaires are limited to a narrow range of content, most commonly lassitude and insomnia. This becomes particularly problematic when trying to assess the relations between daytime symptoms and more unusual sleep complaints, such as nightmares or narcolepsy symptoms. Although the ISES provides a total score for narcolepsy symptoms and various dreaming experiences, there are additional sleep complaints related to dissociation and schizotypy that it does not measure (e.g., automatic behaviors). Due to the lack of comprehensive instruments, many researchers examining the overlap of unusual nighttime complaints and daytime symptoms use single-item, study specific measures. This assessment strategy leads to



different definitions of sleep phenomena across studies and is vulnerable to measurement error.

A second limitation of the existing measures of sleep is that they were not created using structural analyses. Given the difficulty of creating unidimensional scales and subscales without the use of factor analysis, it is not surprising that many of the existing sleep scales have been found to be multidimensional. For example, several widely used questionnaires—including the Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) and the Insomnia Severity Index (ISI; Morin, 1993)—combine nighttime sleep problems and daytime fatigue in a total sleep disturbance score, which is suggestive of a single, broad factor of sleep disturbances. However, structural analyses have provided evidence that daytime and nighttime disturbances represent distinct dimensions that are only moderately correlated (Koffel & Watson, 2009a). When existing sleep instruments are submitted to factor analysis, the scales often do not replicate (Bastien, Vallieres, & Morin, 2001; Cole et al., 2006; Savard, Savard, Simard, & Ivers, 2005; Spoormaker, Verbeek, van den Bout, & Klip, 2005).

#### Iowa Sleep Disturbances Inventory (ISDI)

To address the limitations of existing measures of sleep disturbances, I have created the ISDI using structural analyses (Koffel & Watson, in press). The ISDI provides a comprehensive assessment of 11 specific dimensions of sleep complaints, including Nightmares, Initial Insomnia, Fragmented Sleep, Anxiety at Night, Light Sleep, Movement at Night, Sensations at Night, Excessive Sleep, Irregular Schedule, Nonrestorative Sleep, and Fatigue. The ISDI has shown good psychometric properties. The scales have high coefficient alphas (most above .80) and the majority of the average interitem correlations (AICs) fall within the acceptable range of .15 to .50 (Clark & Watson, 1995). The ISDI scales are also sufficiently distinct from one another, with most inter-scale correlations falling within the low to moderate range, from .10 to .30. Finally,

the ISDI scales show good convergent and discriminant validity with some of the most widely used sleep measures. In addition to accounting for most of the variance in the existing measures, the ISDI also appears to measure sleep disturbances not captured by the traditional measures (e.g., Sensations at Night, Nightmares, Movement at Night).

To examine the underlying structure of the ISDI, the 11 specific scales were submitted to separate principal factor analyses in student, sleep disorder patient and psychiatric patient samples. Based on previous research examining the higher order structure of sleep complaints, I expected that the scales would load onto two general factors, one representing Insomnia and the other representing Lassitude (Koffel & Watson, 2009a; Watson et al., 2007). In all three samples, I was able to extract two clear, well-defined factors representing Insomnia and Lassitude. These two factors jointly accounted for all of the common variance in students, 93% of the common variance in psychiatric patients, and 92% of the common variance in sleep disorder patients. Specifically, of the 11 nonoverlapping ISDI scales, 5 loaded primarily on Insomnia at  $|\geq .30|$  or greater in all three samples (Fragmented Sleep, Initial Insomnia, Light Sleep, Anxiety at Night, Sensations at Night), and another 3 loaded primarily on Lassitude at  $|\geq .30|$  and greater in all samples (Fatigue, Excessive Sleep, and Nonrestorative Sleep). The three remaining scales (Nightmares, Movement at Night, and Irregular Schedule) tended to split across the two factors in these samples

When a third factor was extracted in students, it was defined by the Movement at Night, Sensations at Night and Nightmares scales. When a third factor was extracted in the psychiatric and sleep disorder patients, it was defined by the Sensations at Night and Movement at Night scales. It is possible that in students this third factor represents Unusual Sleep Experiences, such as those measured by the ISES. In patients, however, the factor consists of the symptoms of restless legs syndrome. Given that this factor did not replicate across samples and that many of the scales had low loadings, it is likely that the third factor is not well defined in the standard ISDI scales.

These analyses have implications for understanding both the ISDI and the structure of self-reported sleep disturbances. Lower order dimensions of sleep disturbances, as measured by the specific ISDI scales, can be grouped under two higher order factors of Insomnia and Lassitude. It is possible that additional higher order factors exist, although more measures of unusual sleep experiences need to be included in the factor analyses to properly define these additional factors.

The hierarchical structure of sleep complaints provides an excellent organizing framework for examining the specificity of daytime and nighttime symptoms. For example, it is possible to examine the relations between sleep complaints and psychopathology at a narrow, lower order level (e.g., specificity of nightmares with the PTSD symptom of traumatic intrusions) and at a broader, higher order level (e.g., specificity of Unusual Sleep Experiences with traumatic intrusions). Examining these relations at a higher order level simplifies analyses by combining sleep-related symptoms that tend to covary (Smith, McCarthy, & Zapolski, 2009). However, focusing on higher order factors may obscure meaningful relations between specific sleep problems and daytime symptoms; thus, it is necessary to also examine the relation of the lower order sleep facets to daytime symptoms (Smith et al., 2009).

#### ISDI and Evidence of Specificity

I have begun to examine relations between higher order sleep factors and symptom dimensions of depression and anxiety using the ISDI. To conduct these analyses, I used previously published data consisting of 205 sleep disorder patients and 188 psychiatric patients (Koffel & Watson, in press). For a more efficient presentation of the data and to conduct this structural analysis on a larger number of observations, I combined the samples ( $n = 393$ ). First, I standardized the ISDI scores on a within-sample basis in order to eliminate mean-level differences. Next, I combined the two samples and submitted the ISDI scales to factor analysis. I was able to extract two factors of Insomnia

and Lassitude. I then used regression-based factor scores to examine the relations between these higher order sleep factors and symptoms of depression and anxiety using the Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al., 2007). These analyses are shown in Table 1. The Lassitude factor shows specificity to Dysphoria ( $r = .49$ ), a core symptom of depression, compared to specific symptoms of depression and anxiety ( $r$ s range from  $|.21|$  to  $|.37|$ ). The correlation between Lassitude and the IDAS Dysphoria scale is significantly stronger than the correlation between Lassitude and the other IDAS scales at  $p < .05$ , one-tailed. In contrast, the Insomnia factor tends to have weaker, nonspecific correlations across symptom dimensions (see Table 1). This replicates previous findings (Koffel & Watson, 2009a).

I have also examined correlations between the specific ISDI scales and anxiety and depression symptoms in sleep disorder patients and psychiatric patients (Koffel & Watson, in press). The ISDI Nightmares scale is specific to the PTSD symptom dimension of traumatic intrusions, whereas the ISDI scales measuring lassitude (e.g., Fatigue) tend to be specific to dysphoria. The ISDI Sensations at Night scale is also specific to panic. A number of ISDI scales show more general, nonspecific relations with symptom measures (e.g., Initial Insomnia, Fragmented Sleep). However, it is important to note that my assessment of psychopathology to date has been limited to measures of some anxiety disorder symptoms (PTSD, social anxiety, panic) and depression. An expanded assessment battery, including measures of dissociation and schizotypy, may reveal more meaningful relations between the ISDI scales and psychopathology.

#### Iowa Sleep Disturbances Inventory Clinician Rating Scale (ISDI-CR)

I recently have created a structured clinical interview for the ISDI called the ISDI-CR. The ISDI-CR has 11 items that parallel the ISDI self-report scales and additional items that measure unusual sleep experiences. The creation of this instrument serves

several purposes. The main advantage of creating the ISDI-CR is that it allows me to examine the specificity of sleep disturbances and daytime symptoms using both interview and questionnaire data. The majority of studies that have examined the relation between sleep and psychopathology are based on questionnaire measures. This raises the concern of monomethod bias, whereby correlations may be inflated due to a single source of information. One way to reduce monomethod bias and to prove that associations are robust is to obtain data across multiple methods, such as interviews and questionnaires.

Another advantage of the ISDI-CR is that it allows me to create a multitrait-multimethod matrix for examining the convergent and discriminant validity of the ISDI scales. The research completed thus far to validate the ISDI has been very encouraging; however, a thorough evaluation of convergent and discriminant validity requires more than one method, such as interviews and questionnaires (Campbell & Fiske, 1959). Finally, the ISDI-CR provides a comprehensive, structured sleep interview that can be used by clinicians and researchers. In the evaluation of sleep disturbances for both clinical and research purposes, it is useful to complete a comprehensive assessment that involves both questionnaire and interview data (Morin, 1993; Sateia et al., 2000). It is important to note that there are very few standardized structured sleep interviews that are currently available (a literature review revealed two: Morin, 1993; Schramm et al., 1993).

## CURRENT STUDY

### Goals and Hypotheses

#### Overview

The primary goal of the current study was to determine which sleep disturbances show specificity to daytime symptoms at both higher order (i.e., broad sleep factors) and lower order (i.e., specific sleep facets) levels. Unlike previous research in this area, this symptom-based study utilized a comprehensive assessment battery, with information on both daytime and nighttime symptoms collected via questionnaires and interviews. The assessment battery included both commonly measured sleep problems (e.g., insomnia and lassitude) and sleep experiences that tend to be measured less frequently (e.g., narcolepsy, nightmares). In addition, it contained measures of daytime symptom dimensions that have been the primary focus in this area, including depression, anxiety disorders (e.g., PTSD, social phobia, panic, OCD) and dissociation/schizotypy. I also included measures of alcohol and drug use to begin examining how symptoms within the externalizing spectrum relate to nighttime experiences.

Before examining the relation of sleep and psychopathology, I used the sleep measures to explicate the hierarchical structure of sleep disturbances. Preliminary ISDI scales were included to help define higher order factors that go beyond Insomnia and Lassitude. This structure was used as an organizing framework to examine how sleep complaints are related to daytime symptom dimensions. Secondary goals of the study included further validation of the ISDI and initial validation of the ISDI-CR.

#### Finalizing the Preliminary ISDI Scales

The ISDI is used in the current study to examine both the structure of sleep complaints and the relation of sleep complaints to daytime symptoms. One goal of this study was to expand the current ISDI to measure more unusual sleep experiences; as

such, participants completed an expanded version of the ISDI containing items referring to sleep hallucinations, cataplexy, sleep paralysis, vivid dreams and behaviors during the night. To ensure that the item pool for these additional ISDI scales was comprehensive, the items were first arranged in homogeneous item composites (HICs) or groupings of hypothetically related items (Hogan, 1983). Although I grouped the initial items based on my assumptions of which items potentially might cohere into scales, the final selection of items and creation of scales was done using exploratory factor analyses. This helps to ensure that the final scales are unidimensional and reflect the underlying structure of these sleep disturbances.

#### Finalizing the ISDI-CR

The current study incorporates interview data using the ISDI-CR to reduce monomethod bias and to demonstrate that associations between daytime and nighttime symptoms are replicable across multiple methods. A secondary goal was further validation of the ISDI. A multitrait-multimethod matrix consisting of ISDI and ISDI-CR ratings was created to assess convergent and discriminant validity (Campbell & Fiske, 1959). This matrix was examined prior to examining the relations between daytime and nighttime symptoms to ensure that the ISDI-CR did not have problems with validity.

#### Structure of Sleep Complaints

To determine the structure of sleep complaints, the questionnaire and interview measures of sleep complaints were submitted to exploratory factor analysis in two separate samples: psychiatric patients and students. Based on previous analyses with the standard ISDI scales, I hypothesized that I would be able to extract at least two factors representing Insomnia and Lassitude. In addition, I expected to be able to extract a third and possibly a fourth factor representing Unusual Sleep Experiences and Restless Legs Syndrome.

## Relation of Sleep Complaints Across Daytime Symptoms

### Higher Order Sleep Factors

The relations between higher order sleep factors and daytime symptom dimensions were examined using regression-based factor scores obtained from the factor analysis of the sleep measures. I calculated the correlations of these sleep factors with both interview and questionnaire measures of a variety of symptom dimensions, including symptoms of depression, panic, social phobia, agoraphobia, OCD, PTSD, bipolar disorder, dissociation, schizotypy, and drug and alcohol use.

Based on previous research (Koffel & Watson, 2009a, 2009b, in press), I hypothesized that the Lassitude factor would be specific to depression compared to other symptom dimensions, whereas the Insomnia factor would show more non-specific relations with most symptom dimensions. I have found that Insomnia tends to be more highly correlated with dysphoria than with anxiety, but I predicted that this specificity would be less robust than that seen with Lassitude (Koffel & Watson, 2009a). I also hypothesized that the Unusual Sleep Experiences factor would show specificity to symptoms of dissociation and schizotypy (particularly the symptom dimensions of imagination/absorption and unusual beliefs/experiences; see Watson, 2001). Given that nightmares are traditionally included in the Unusual Sleep Experiences factor, this factor may also show strong relations with symptoms of PTSD, particularly with traumatic intrusions (Koffel & Watson, in press). There is also some evidence that Unusual Sleep Experiences will show specificity to OCD symptoms (Chmielewski & Watson, 2007, October). Dissociation shows stronger relations with the OCD symptoms of checking and obsessive intrusions than to washing, ordering and hoarding (Watson, Wu, & Cutshall, 2004). Given the association between Unusual Sleep Experiences and dissociation, it is likely that Unusual Sleep Experiences will follow this same pattern. Finally, there is some evidence that a higher order factor of Restless Legs Syndrome, if it



emerges in these analyses, would show specificity to symptoms of panic (Cho et al., 2009; Koffel & Watson, in press; Lee et al., 2008; Winkelmann et al., 2005).

### Lower Order Sleep Facets

Next I examined the relation of the individual ISDI scales with daytime symptoms. These analyses were conducted within and across methods to examine whether patterns of correlations replicated (i.e., self-report sleep vs. self-report daytime symptoms, interview sleep vs. interview daytime symptoms, self-report sleep vs. interview daytime symptoms, interview sleep vs. self-report daytime symptoms). Based on the research that was reviewed earlier, I hypothesized that the ISDI Fatigue scale would be specific to the symptom dimension of dysphoria compared to other daytime symptoms, whereas the ISDI Initial Insomnia scale would be relatively nonspecific. I also hypothesized that the ISDI Nightmares scale would show specificity to the PTSD symptom of traumatic intrusions and to symptoms of dissociation and schizotypy.

The following hypotheses were tentative since there was much less research to support them. I expected that the ISDI Sensations at Night scale would be specific to panic. It was possible that ISDI scales measuring sleep hallucinations and behaviors in the night would be specific to symptoms of schizotypy, given that there is some support for this in the literature. I did not expect the ISDI scale measuring sleep paralysis to show strong evidence of specificity.

Finally, the symptom continuity hypothesis would suggest that unusual perceptual experiences during the daytime (traumatic intrusions, imagination/absorption, unusual beliefs/experience) would show specificity to unusual perceptual experiences at night (nightmares, vivid dreams, sleep-related hallucinations) and that automatic, unremembered behaviors during the day (obliviousness/amnesia) would be related to behaviors performed during sleep.

### Relation of Daytime Symptoms Across Sleep Complaints

Although it is not the main focus of this study, I also examined how the same daytime symptom dimension related to various lower order sleep dimensions. Based on the research that was reviewed earlier, I hypothesized that depression would be more strongly related to measures of lassitude than to measures of insomnia and that anxiety (i.e., symptoms of panic, social anxiety, PTSD) would show similar relations to both measures of lassitude and insomnia. Finally, I hypothesized that PTSD symptoms would show stronger relations to measures of nightmares compared to measures of insomnia and lassitude. Although it appears that dissociation/schizotypy are more strongly related to sleep experiences included under the Unusual Sleep Experiences factor than to measures of insomnia and lassitude (Koffel & Watson, 2009b), there is not enough evidence to make specific predictions in this regard.

### Methods

#### Participants and Procedure

*Student sample.* This sample consisted of 219 college students enrolled in an introductory psychology course. Students were recruited from September 2009 to November 2009 and received research credit upon completion of the study. They signed up for an appointment time to come into the lab after reading a description of the study online. To help participants remember their times correctly, they were sent email reminders. When they arrived for their appointment, they were consented by study proctors and completed a questionnaire packet, which took about an hour and consisted of 536 items. Participants also completed an hour long clinical interview in a separate office with an undergraduate research assistant who had successfully completed IRB and interview training (the interview training protocol is described subsequently). The interviews were taped with permission for interrater reliability and training purposes.

At the beginning of the study, participants were informed that they could skip any questions that they preferred not to answer in both the questionnaire and the interview. The following procedures were in place for dealing with participants who endorsed suicidality during the course of the study. Before beginning the study, participants were informed verbally by the study proctor and in writing on the consent form that they would be asked several questions that related to their current psychological symptoms. If they had concerns about their responses to these questions and were currently receiving care from a health or mental health provider, they were asked to discuss their concerns with that person. If they were not receiving mental health treatment and had concerns about their responses, they were asked to speak with study staff, who gave them a sheet with treatment/referral options. In addition, if participants endorsed suicidality during the interview (a score of subthreshold or present on the interview rating scale), the interviewer completed an in-depth suicidality screen with them.

First, they were asked if they had discussed their thoughts of suicide with a care provider and if not, they were encouraged to do so. If they did not have care provider, they were given a list of referrals. Next, they were asked if they had an emergency plan in place. If not, they were given the list of referrals, including a 24-hour emergency line at the University of Iowa Hospitals and Clinics and the crisis center hotline. Finally, they were asked if they felt that they were in danger of harming themselves. If they endorsed this item, an in-person consultation was conducted to determine whether the participant was at risk and if so, a psychiatrist at the University of Iowa Hospitals and Clinics was consulted. If it was determined that the participant needed to be hospitalized, transportation was arranged through the local police department. Only one participant necessitated an in-person consultation; s/he was currently under the care of several mental health professionals and it was determined that s/he was not currently at risk of suicide.

The student sample included 161 women and 58 men. Age ranged from 18 to 30 and the mean age was 19. The sample included 201 Whites (91.8%), 11 Asian Americans (5.0%), 4 African Americans (1.8%), and 3 multiracial participants (1.4%).

*Psychiatric patient sample.* 200 psychiatric patients were recruited from November 2009 to December 2009 and they were paid \$40 at the completion of the study. The inclusion criteria were that they were 18 or older, currently receiving treatment for mental health or substance abuse issues and sufficiently fluent in English to give consent. Participants were recruited using ads on public transportation and the University of Iowa Hospitals and Clinics newsletter. In addition, fliers were posted on the University of Iowa campus, University of Iowa Student Counseling, Seashore Psychology Clinic, Community Mental Health, University of Iowa Hospitals and Clinics Psychiatry outpatient, University of Iowa Chemical Dependency Program (IOP), Mid-Eastern Council on Chemical Abuse, and private mental health practices. Finally, a mass e-mail was distributed to graduate students, faculty and staff at the University of Iowa advertising the research study.

Potential participants contacted our lab by phone or e-mail after reading advertisements or fliers. They were given a description of the study and if interested, set up an appointment to come into the lab. To help participants remember their times correctly, they were sent email reminders (or reminders by mail if they did not have e-mail) after they set up the appointment. They also received reminder phone calls the day before their scheduled session. If patients missed their session, they were called to see if they would like to reschedule. When they arrived for their appointment, they were consented by study proctors and completed questionnaires and interviews. As in the student sample, the interviews were taped for training and interrater reliability analyses. The suicidality protocol was identical to the protocol described previously.

The patient sample consisted of 150 women and 50 men. Age ranged from 18 to 67 and the mean age was 36 years. The sample included 178 Whites (89.0%), 8

multiracial participants (4.0%), 8 African Americans (4.0%), 5 Asians (2.5%), and 1 American Indian/Alaska Native (0.5%).

*Interview training.* To complete the interview training, research assistants attended training sessions for several weeks prior to interviewing and received approximately 40 hours of training. They were required to pass a written exam (score of 90% or higher) to demonstrate that they understood the domains that were assessed in the interview and to ensure that they understood the protocol (including the informed consent and suicidality protocols). In addition, they were required to conduct and score a mock interview successfully prior to conducting independent interviews. Each interviewer received feedback on their initial interview, and random interviews were selected for each interviewer throughout the study to provide continued feedback. All research assistants attended a weekly meeting to discuss problems related to the study.

*Data cleaning.* For both student and patient samples, conditional mean substitution was used for participants who were missing a small number of items on the questionnaires (e.g., 5 items or less). Scale-level imputation using SAS's PROC MISSING (average of 11 iterations) was used for participants who were missing a larger number of items on the questionnaires. Scale-level imputation was not necessary for the ISDI. The majority of participants was missing 10% or less of the data. One psychiatric patient was missing 30% of the data. Conditional mean substitution and imputation were not used for interview data; three psychiatric patients were missing interview data on the IDAS-CR and PCCP, and thus the analyses in the following sections that include these interviews are restricted to the 197 participants who had complete data.

#### Questionnaire Measures: Sleep

*ISDI.* Participants completed the ISDI (Koffel & Watson, in press), a true/false measure with 11 scales representing specific sleep dimensions, including the following scales: a 12-item measure of Nightmares; an 11-item measure of Initial Insomnia; a 10-

item measure of Fatigue; a 9-item measure of Fragmented Sleep; an 8-item measure of Nonrestorative Sleep; a 7-item measure of Anxiety at Night; 6-item measures of Light Sleep, Movement at Night, Sensations at Night, and Excessive Sleep; and a 5-item measure of Irregular Schedule. The ISDI also includes one broad scale of Daytime Disturbances. The Daytime Disturbances scale is the sum of the Nonrestorative Sleep and Fatigue scales. Participants also completed preliminary ISDI scales designed to measure more unusual sleep experiences, including Sleep Hallucinations, Cataplexy, Sleep Paralysis, Vivid Dreams, and Behaviors During the Night (these scales will be described in further detail in the following sections). The instrument with the standard and preliminary scales consisted of 147 items. The coefficient alphas for the standard ISDI scales were all above .78 in the student sample and .79 in the patient sample.

*ISES.* The ISES (Watson, 2001) was completed by all participants to obtain a measure of unusual cognitive and perceptual experiences at night. The ISES is a factor analytically created instrument that consists of a 15-item General Sleep Experiences scale (e.g., sleep-related hallucinations, vivid dreams) and a 3-item Lucid Dreaming scale (e.g., being able to direct the content of dreams). Participants are asked to rate the frequency of these sleep related experiences using a 7-point scale (1 = *never*, 2 = *less than once a year*, 3 = *once or twice a year*, 4 = *several times a year*, 5 = *once or twice a month*, 6 = *several times a month*, 7 = *several times a week*). Coefficient alphas for the General Sleep Experiences scale were .85 and .87 in the students and patients, respectively. Coefficient alphas for the Lucid Dreaming scale were .75 and .83 in the students and patients, respectively.

*PSQI.* The PSQI (Buysse et al., 1989) was used to obtain information about both nighttime and daytime complaints over the past month. The PSQI has seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The PSQI total scores had a coefficient alpha of .73 and .70 in the students and patients, respectively.

### Questionnaire Measures: Psychopathology

*IDAS*. Participants completed the IDAS, a multi-dimensional measure of depression and anxiety that contains 10 specific symptom scales, including the 8-item Well-Being and Panic scales, the 6-item Lassitude and Insomnia scales, the 5-item Social Anxiety and Ill Temper scales, the 4-item Traumatic Intrusions scale, and the 3-item Appetite Loss and Appetite Gain scales. The IDAS also includes 2 broad scales of General Depression (20 items) and Dysphoria (10 items) (Watson et al., 2007). These scales were created using structural analyses and represent distinct symptom dimensions of depression and anxiety. Participants choose a response that reflects the way they have been feeling during the past 2 weeks, rated on a five-point scale, ranging from 1 (*not at all*) to 5 (*extremely*). The Dysphoria scale was used as a general measure of depression in this study because it does not contain items about sleep problems or fatigue. Similarly, I calculated the score on the Traumatic Intrusions scale after removing an item related to nightmares to avoid inflating the correlation between the daytime and nighttime symptom scales.

I used an expanded version of the IDAS that contains 110 items; this version includes the 12 standard IDAS scales, plus several preliminary scales measuring symptoms of OCD, PTSD, and mania. These preliminary scales include a 5-item Mania scale (e.g., “I felt like my mind was moving a mile a minute”), a 5-item Euphoria scale (e.g., “I had much more energy than usual”), a 4-item Traumatic Avoidance scale (e.g., “I tried to ignore upsetting memories”), a 3-item Checking scale (e.g., “I checked things over and over again”), a 5-item Ordering scale (e.g., “I rearranged things so they were in a certain order”), a 7-item Cleaning scale (e.g., “I worried a lot about germs”), and a 5-item Agoraphobia scale (e.g., “I avoided tight, enclosed spaces”).

The coefficient alphas for the standard and experimental IDAS scales were .70 or above in the student sample, with the exception of Suicidality (coefficient alpha was .51 in students due to low variance in the items). As a result of this low coefficient alpha, the

Suicidality scale will not be included in the subsequent student analyses. The coefficient alphas for the standard and experimental IDAS scales were .72 or above in the patient sample.

*Schedule of Obsessions, Compulsions, and Pathological Impulses (SCOPI).*

To obtain measures of OCD symptoms, participants completed the SCOPI (Watson & Wu, 2005), a 47-item measure of OCD symptom dimensions. The scales, created through structural analyses, include the 14-item Obsessive Checking scale, the 12-item Obsessive Cleanliness scale, the 8-item Compulsive Rituals scale, the 5-item Hoarding scale, and the 8-item Pathological Impulses scale. Participants rated their responses to each item on a 5-point scale, ranging from *strongly disagree* to *strongly agree*.

Coefficient alphas were .80 or above in the student sample and .84 or above in the patient sample.

*PTSD Checklist-Civilian Version (PCL-C).* To obtain a measure of PTSD symptom dimensions, participants completed the PCL-C (Weathers, Litz, Herman, Huska, & Keane, 1993). This instrument measures the 17 symptoms included in the *DSM-IV* diagnostic criteria for PTSD. Participants are asked to choose a response on a 5-point scale ranging from *not at all* to *extremely* that best describes how much they have been bothered by each symptom in the past month. Although this instrument provides an overall score, it can be analyzed based on the underlying symptom dimensions of Dysphoria (8 items), Hyperarousal (2 items), Intrusions (2 items), and Avoidance (5 items) (Simms et al., 2002). In this study, the scores for Intrusions and Dysphoria were calculated after removing items related to nightmares and insomnia.

The total score had a coefficient alpha of .90 in students and .89 in patients. The dimensional scores had coefficient alphas of .81 and above and .78 and above in students and patients, respectively, with the exception of Hyperarousal, which had a coefficient alpha of .64 in students and .69 in patients. The smaller coefficient alpha for Hyperarousal is most likely due to the small number of items (2) in this scale.



*Dissociative Processes Scale (DPS)*. All participants completed the DPS (Harrison & Watson, 1992), a 33-item questionnaire designed to measure dissociative tendencies in non-clinical samples. Respondents rate each statement on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). Three factor-analytically derived subscales include a 14-item Obliviousness scale, a 6-item Detachment scale and a 7-item Imagination scale. The DPS total score had a coefficient alpha of .95 in students and the subscales had coefficient alphas of .84 or above. In patients, the DPS total score had a coefficient alpha of .93 and the subscales had coefficient alphas of .82 or above.

*Schizotypal Personality Questionnaire (SPQ)*. To obtain a measure of schizotypy, participants completed the SPQ (Raine, 1991), a 74-item true/false questionnaire that was constructed around the *Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R)* (American Psychiatric Association, 1987) criteria for STPD. The questionnaire has nine subscales, one for each of the diagnostic criteria of STPD: a 9-item Ideas of Reference scale, an 8-item Excessive Social Anxiety scale, a 7-item Odd Beliefs or Magical Thinking scale, a 9-item Unusual Perceptual Experiences scale, a 7-item Odd or Eccentric Behavior scale, a 9-item No Close Friends scale, a 9-item Odd Speech scale, an 8-item Constricted Affect scale, and an 8-item Suspiciousness scale. However, it also can be scored based on five underlying symptom dimensions, including Unusual Beliefs/Experience (sum of the Odd Beliefs and Unusual Perceptual Experiences scales), Mistrust (sum of the Ideas of Reference and Suspiciousness scales), Social Anhedonia (sum of the No Close Friends and Constricted Affect scales), Social Anxiety (the Excessive Social Anxiety scale), and Eccentricity/Oddity (sum of the Odd or Eccentric Behavior and Odd Speech scales). Computing the dimensions in this manner provides a close approximation to the five item-level factors reported by Chmielewski and Watson (2008). The subscales had coefficient alphas of .66 or higher in students and .67 or higher in patients. The dimensional scores had coefficient alphas of .78 or higher in

students and .76 or higher in patients. The dimensional scores are used in the following analyses.

*The Drug Abuse Screening Test (DAST).* Participants completed the DAST (Skinner, 1982), a 20-item screening questionnaire that assesses drug use over the past 12 months using a true/false response format. Coefficient alphas were .77 and .91 in students and patients, respectively.

*Michigan Alcohol Screening Test (MAST).* The MAST (Selzer, 1971) is a 25-item questionnaire with a true/false response format that assesses alcohol use. It had a coefficient alpha of .64 and .88 in students and patients, respectively. The low coefficient alpha in students was due to low variance in the items.

#### Interview Measures: Sleep

*ISDI-CR.* The ISDI-CR is an interview consisting of a series of items that represent the 11 nonoverlapping ISDI scales, plus additional questions about sleep paralysis, cataplexy, sleep hallucinations, vivid dreams, and unusual behaviors during the night. The ratings are made on a 3-point scale (*absent, subthreshold, present*). Interviewers begin by asking a standard question for each symptom and continue asking standard and non-standard follow-up questions until they think they can make an accurate rating. For example, the symptom of nightmares is assessed by the initial question “Do you have frequent nightmares?” and can be followed by the questions “Do you have recurring bad dreams?” or “Do nightmares make it hard to fall asleep?” In addition, prior to making a rating, the interviewers determined if the sleep-related symptoms were (a) noticeable to others or (b) affected functioning (i.e., day-to-day activity and behavior) and ensured that they did not occur solely under the influence of drugs or alcohol. The interviews were audiotaped to assess interrater reliability. A total of 51 student (23% of the sample) and 50 patient interviews (25% of the sample) were randomly selected and scored by a second interviewer. In the student sample, the symptom dimensions had

intraclass correlations ranging from .65 (Vivid Dreams) to .96 (Behaviors at Night), with a median value of .81 and a mean value of .83 (see Table 2). In the patient sample, the symptom dimensions had intraclass correlations ranging from .60 (Excessive Sleep) to .92 (Light Sleep), with a median value .87 of and a mean value of .85 (see Table 2). Intraclass correlations in this range indicate good to excellent interrater reliability (Cicchetti, 1994).

#### Interview Measures: Psychopathology

*Clinician Rating version of the IDAS (IDAS-CR).* Participants also interviewed using the IDAS-CR (Watson, O'Hara et al., 2008). The IDAS-CR consists of a series of ratings representing each of the 11 standard IDAS scales, although in this study the ratings for Insomnia and Lassitude were omitted because these sleep disturbances already were measured in the ISDI-CR interview. Additional interview items were added to reflect the preliminary IDAS scales of Traumatic Avoidance, Mania, and Euphoria. Finally, an item measuring Hyperarousal was also added in order to have an interview measure of this PTSD symptom, although there is not a corresponding IDAS scale. Ratings are made on a 3-point scale (*absent, subthreshold, present*) and are based on a standard initial probe question and follow up questions for each symptom. In addition, interviewers can ask additional (i.e., non-standard) questions before making their final rating. Prior to making a rating, interviewers also determine whether the symptoms have been present more days than not in the last 2 weeks and whether they have been (a) noticeable to others or (b) affected functioning (i.e., day to day activity and behavior).

As already noted, the interviews were audiotaped to assess interrater reliability. In the student sample, 12 symptom dimensions had intraclass correlations ranging from .51 (Well-Being) to 1.00 (Appetite Loss), with a median value of .85 and a mean value of .87 (see Table 3). Intraclass correlations in this range indicate fair to excellent interrater reliability (Cicchetti, 1994). The interrater reliability for Traumatic Hyperarousal was

unacceptably low (-.03) and accordingly this interview scale was dropped from further consideration in the student sample. In the patient sample, the symptom dimensions had intraclass correlations ranging from .83 (Well-Being) to .96 (Traumatic Intrusions), with a median value .88 and a mean value of .90 (see Table 3). Intraclass correlations in this range indicate excellent interrater reliability (Cicchetti, 1994).

*Personality, Cognitions, Consciousness, and Perceptions Interview (PCCP).*

Participants were also interviewed using the PCCP, which includes items referring to the symptom dimensions of OCD (Checking/Doubting, Cleaning/Washing, Intrusive Thoughts/Obsessions, Ordering/Rituals, Hoarding), dissociation (Obliviousness/Amnesia, Depersonalization/Derealization, Imagination/Absorption), and schizotypy (Social Anhedonia, Supernatural Beliefs of Magical Ideation, Paranoia, Hallucinations, Eccentricity/Oddity) (Chmielewski & Watson, 2007, October). As in the other interviews, ratings are made on a 3-point scale (*absent, subthreshold, present*) based on a standard initial probe question, as well as several standard follow up questions, for each symptom. In addition, prior to making ratings, the interviewers determined if the symptoms were (a) noticeable to others or (b) affected functioning (i.e., day to day activity and behavior) and ensured that they did not occur solely under the influence of drugs or alcohol. With some symptom dimensions, the interviewer also ensured that they did not occur in the context of sleep (e.g., hallucinations).

As noted, the interviews were audiotaped to assess interrater reliability. Due to audiotape problems in the student sample, some reliability ratings are only based on one or fewer interviews. In the student sample, 10 symptom dimensions had intraclass correlations ranging from .47 (Social Anhedonia) to .84 (Ordering/Rituals), with a median value of .63 and a mean value of .65 (see Table 4). Intraclass correlations in this range indicate fair to excellent interrater reliability (Cicchetti, 1994). The interrater reliabilities for Paranoia (.24) and Intrusive Thoughts/Obsessions (.19) were unacceptably low and accordingly these interview scales were dropped from further

consideration in the student sample. In addition, the interrater reliability for the Hallucinations scale could not be calculated due to lack of variability, and therefore this scale will not be used in the subsequent analyses with student data. In the patient sample, the symptom dimensions had intraclass correlations ranging from .61 (Eccentricity/Oddity) to .96 (Hoarding), with both a median and mean value of .82 (see Table 4). Intraclass correlations in this range indicate good to excellent interrater reliability (Cicchetti, 1994).

## RESULTS

### Finalizing the Preliminary ISDI Scales

#### Narcolepsy Scales

Three of the experimental ISDI scales—Sleep Paralysis, Cataplexy, and Sleep Hallucinations—were developed using a previously published dataset. This dataset was collected as part of a study designed to develop and validate the ISDI (Koffel & Watson, in press). These scales were developed in three separate samples: (a) 374 college students enrolled in an introductory psychology course, (b) 188 psychiatric patients recruited from local mental health centers, and (c) 205 patients who had been diagnosed with sleep disorders at the University of Iowa Hospitals and Clinics. Along with the standard ISDI, participants completed items referring to narcolepsy symptoms, including cataplexy, sleep paralysis, and sleep hallucinations. These additional items were selected based on an extensive literature review of previous sleep questionnaires, a review of the sleep disturbances listed in the *DSM-IV-TR* and the *International Classification of Sleep Disorders (ICSD-2; American Academy of Sleep Medicine, 2005)*, and a sleep item bank from the University of Pittsburgh containing nearly 3,000 items (Buysse et al., 2010). The response format was identical to the other ISDI items.

As mentioned previously, items originally were arranged into rational HICs in order to ensure proper coverage of each narcolepsy symptom (Sleep Paralysis HIC with 7 items, Cataplexy HIC with 5 items, and a Sleep Hallucinations HIC with 5 items). All items were submitted to principal factor analysis in each of the samples in order to select items for the scales. The prior communality estimates were calculated using squared multiple correlations (SMCs). I rotated all factors using both varimax (which constrains the factors to be orthogonal) and promax (which allows the factors to be correlated). The varimax rotation was used to identify problematic items that “split” between two or more factors. The goal in these analyses was to extract the greatest number of factors that were

interpretable and distinct from one another and to create scales based on these factors. When selecting items for the scales, I followed several guidelines to ensure that the items would be maximally informative and distinct: (1) items that loaded too strongly on a factor (i.e., .90 or above) were considered redundant and removed; (2) items that loaded below .40 were considered weak markers of a dimension and were removed; (3) items that loaded strongly onto more than one factor were considered a threat to the discriminant validity of the scales and were removed. I was able to extract three interpretable factors in each sample; three scales therefore were created based on these analyses: a 5-item measure of Cataplexy (e.g., “I sometimes feel weak when I laugh”), a 4-item measure of Sleep Paralysis (e.g., “I sometimes find that I can’t move my body when I wake up), and a 5-item measure of Sleep Hallucinations (e.g., “I sometimes see or hear things that are not real when falling asleep or waking up”).

Next I calculated coefficient alphas and average interitem correlations (AICs) for these scales in the three scale development samples (i.e., students, psychiatric patients, and sleep disorder patients from the previous study), as well as in two additional scale validation samples (i.e. students and psychiatric patients from the current study). The Cataplexy scale had unacceptably low internal consistencies in several samples, including the students from the previous study (.62), and the students and patients in the current study (.55 and .66, respectively). As a result, this scale was dropped from further consideration (the corresponding interview rating scale was dropped as well). Table 5 reports the reliabilities of the remaining two narcolepsy scales (Sleep Paralysis, Sleep Hallucinations). Both scales show evidence of good internal consistency, with coefficient alphas of .70 and above in all samples, with the exception of Sleep Hallucinations which had a coefficient alpha of .68 in two of the samples (however, the mean coefficient alpha across samples for this scale was .71). AICs provide a measure of internal consistency that is not affected by the number of items in a scale. AICs should fall in the range of .15 (broad constructs) to .50 (narrow constructs) (Clark & Watson,

1995). The scales have AICs that tend to fall within the upper limits of this range, suggesting that these scales are measuring relatively narrow and specific dimensions of sleep disturbances, in particular the Sleep Paralysis scale.

#### Vivid Dreams and Behaviors at Night scales

The two remaining experimental ISDI scales, Vivid Dreams and Behaviors at Night, were developed using three samples: (a) 374 college students from the previous study, (b) 219 college students from the current study, and (c) 200 psychiatric patients from the current study. Along with the standard ISDI, participants completed items referring to vivid dreams and automatic behaviors performed at night. As with the narcolepsy items, these additional items were selected based on an extensive literature review of previous sleep questionnaires, diagnostic manuals, and the Pittsburgh sleep item bank. The response format was identical to the other ISDI items.

Items were arranged into rational HICs to ensure proper coverage of each sleep dimension (Vivid Dreams HIC with 23 items and Behaviors at Night HIC with 13 items). All items were submitted to principal factor analysis in each of the samples in order to select items for the scales. The same guidelines that were used for selecting the narcolepsy items were used for these scales. I was able to extract two interpretable factors in each sample, and two scales were created based on these analyses: a 9-item measure of Vivid Dreams (e.g., “I often have nights full of vivid and intense dreams”) and a 6-item measure of Behaviors at Night (e.g., “I tend to walk around during the night”).

Coefficient alphas and AICs for these scales were calculated in all three scale development samples (i.e., two student samples and one psychiatric patient sample). The Behaviors at Night scale had unacceptably low internal consistencies in the student samples (.61 from the students in the previous study and .63 from the students in the current study). As a result, this scale was dropped from further consideration (as was the



corresponding interview scale). Table 5 reports the reliabilities for the Vivid Dreams scale. This scale shows evidence of good internal consistency, with coefficient alphas of .72 and above in all samples. This scale had AICs falling within the lower limits of the acceptable range, suggesting that it measures a relatively broad dimension of sleep.

### Finalizing the ISDI-CR

#### Student Sample

A multitrait-multimethod matrix consisting of ISDI and ISDI-CR ratings was created to assess convergent and discriminant validity (Campbell & Fiske, 1959). As noted earlier, I examined this matrix prior to examining the relations between daytime and nighttime symptoms to ensure that the ISDI-CR did not have problems with validity. Table 6 presents the heteromethod block of these correlations in the student sample. In terms of convergent validity, the questionnaire and interview measures of sleep symptoms were very strongly related, with correlations ranging from .51 (Vivid Dreams) to .78 (Irregular Schedule). After transforming the correlations to Fisher's  $z$  to correct for non-normal distribution (Fisher, 1921), the mean convergent correlation was .67. The mean discriminant correlation was .14.

To establish discriminant validity, the convergent correlations should be higher than the other correlations within the same row and column of the heteromethod block (Campbell & Fiske, 1959). Although an examination of Table 6 shows that this is the case, I tested the discriminant validity more formally by comparing the convergent correlations with the 26 discriminant correlations for each scale (a total of 364 comparisons overall), using the Williams modification of the Hotelling test for dependent correlations (Kenny, 1987). All of these comparisons were significant at the  $p < .05$  level, one-tailed. At the  $p < .01$  level, 363 of 364 comparisons were significant and at the  $p < .001$  level, 360 of 364 comparisons were significant.

### Patient Sample

I conducted the same analyses using the patient data. Table 7 presents the heteromethod block of these correlations in the patient sample. Convergent correlations ranged from .52 (Vivid Dreams) to .79 (Light Sleep). The mean convergent correlation was .68. The mean discriminant correlation was .10. To examine the discriminant validity of these measures, I once again compared the convergent correlations with the 26 discriminant correlations for each scale. Of the 364 comparisons, 362 were significant at the  $p < .05$  level, one-tailed. At this significance level, the convergent correlation for Vivid Dreams was not significantly higher than the discriminant correlation of the ISDI-CR Nightmares rating and the ISDI Vivid Dreams scale ( $z = 1.5$ ) and the convergent correlation for Anxiety at Night was not significantly higher than the discriminant correlation for the ISDI-CR Anxiety at Night and the ISDI Initial Insomnia scale ( $z = 1.5$ ). At the  $p < .01$  level, 359 of 364 comparisons were significant and at the  $p < .001$  level, 357 of 364 comparisons were significant.

### Summary

These analyses clearly demonstrate strong convergent and discriminant validity of the ISDI and ISDI-CR in the student and patient data. The convergent correlations were consistently high (mean  $r_s = .67$  and  $.68$  in the students and patients, respectively) and the discriminant correlations were consistently low (mean  $r_s = .14$  and  $.10$  in the students and patients, respectively). Of the 728 comparisons of the convergent and discriminant correlations at  $p < .05$ , 726 were significant (99.7%). The questionnaire and interview measures of these 14 sleep symptoms appear to be in agreement (i.e., measures of the same symptoms are more highly correlated than measures of different symptoms across the two methods). Based on these analyses, I concluded that the ISDI-CR shows promise as a valid measure of sleep disturbances and conducted the following analyses using both the ISDI and ISDI-CR.

## Descriptive Statistics

### Means and Standard Deviations

Prior to examining the structure of sleep complaints and their relation to daytime symptoms, I calculated the means and standard deviations for all questionnaire and interview measures. These descriptive statistics are listed in Table 8. As would be expected, psychiatric patients showed consistently higher scores on measures of sleep complaints and daytime symptoms. I calculated independent-samples *t*-tests to examine the differences between the two samples. Psychiatric patients had significantly higher scores on 9 out of 14 ISDI scales and 10 out of 14 ISDI-CR scales. Patients and students did not have significantly different scores on Movement at Night, Irregular Schedule, Sleep Hallucinations, and Excessive Sleep. Previous research has shown that the Movement at Night and Excessive Sleep scales do not differentiate patients and non-patients, suggesting that these sleep experiences are more common in the general population (Koffel & Watson, in press). Patients had significantly higher scores on other sleep measures, including the ISES General Sleep Experiences scale and the PSQI.

On the IDAS, patients had significantly higher scores on 11 out of 17 scales and significantly lower scores on measures of positive affect, including Well-Being and Euphoria. Students and patients did not have significantly different scores on Appetite Loss, Cleaning, Checking, and Ordering. These results were paralleled with the IDAS-CR, with patients showing significantly higher scores on 9 scales and lower scores on the Well-Being scale. Euphoria and Appetite Loss were not significantly different across groups. On the SCOPI, patients had significantly higher scores on only two scales, Pathological Impulses and Hoarding. Patients had significantly higher scores on all the PCLC scales, 2 out of 3 DPS scales (with the exception of Imagination, which is thought to be a nonpathological dimension of dissociation), and all the SPQ scales. On the PCCP, patients scored significantly higher on 6 out of 10 scales, with the exceptions being

measures of OCD and imagination. Finally, patients had significantly higher scores on the MAST and DAST. It is important to note that most scales measuring OCD in this study were not significantly different among patients and students, and the psychiatric patients in this study had lower average scores on the SCOPI scales compared to previously reported samples of psychiatric outpatients and OCD patients (Watson & Wu, 2005). Taken together, these results suggest that the patients in this sample were not elevated on these symptom dimensions.

Next I calculated effect sizes using Cohen's  $d$  (Cohen, 1988) to further quantify these differences. The results indicated large effect sizes for one measure of sleep disturbances, the PSQI ( $d = .90$ ). There were also large effect sizes ( $d = |.82|$  to  $|.96|$ ) for daytime symptom measures, including IDAS-CR Dysphoria, PCLC Dysphoria, IDAS Dysphoria, IDAS-CR Well-Being, and IDAS Well-Being. There were medium effect sizes for a number of sleep scales ( $d = |.57|$  to  $|.69|$ ), including ISDI Nightmares, ISDI-CR Fatigue, ISDI-CR Fragmented Sleep, ISDI Fatigue, ISDI Fragmented Sleep, ISDI-CR Nightmares, ISDI-CR Anxiety at Night, and IDAS Lassitude and Insomnia. There were also medium effect sizes for daytime symptom scales ( $d = |.71|$  to  $|.50|$ ), including IDAS-CR Suicidality, IDAS-CR Social Anxiety, SPQ Social Anhedonia, IDAS Panic, IDAS-CR Panic, PCCP Social Anhedonia, IDAS Traumatic Intrusions, IDAS-CR Ill Temper, IDAS Social Anxiety, IDAS Ill Temper, PCLC Intrusions, SPQ Eccentricity/Oddity, SPQ Social Anxiety, IDAS-CR Traumatic Intrusions, and PCCP Hoarding.

Overall, the data indicate that the patients in this study were exhibiting a fair amount of psychological distress. The patients' mean scores on the IDAS were similar to those previously reported in samples of psychiatric outpatients (Watson et al., 2007). For example, the previously reported mean for IDAS Dysphoria was 28.8, compared to the mean of 26.7 reported in this study. In addition, comparisons of the student and patient data in this study revealed large effect sizes for questionnaire and interview measures of both dysphoria and well-being.

## Convergent and Discriminant Validity of Daytime

### Symptom Measures

Next I examined the convergent and discriminant validity of the questionnaire and interview measures of daytime symptoms. As with the earlier analyses with the ISDI and ISDI-CR, I used multitrait-multimethod matrices. These analyses were necessary to ensure that the IDAS-CR and PCCP did not have problems with validity. Table 9 presents the heteromethod block of the correlations between the IDAS-CR items and the corresponding questionnaire scales in students. In terms of convergent validity, the questionnaire and interview measures of the same symptom dimensions were significantly related, with correlations ranging from .26 (Panic) to .67 (Appetite Loss). The mean convergent correlation was .52 and the mean discriminant correlation was .15. Although these results are not as impressive as the sleep data, they still reflect a strong level of convergent validity. Out of the 11 scales, Panic showed the weakest evidence of convergent validity. Once again, I examined discriminant validity by comparing the convergent correlations with the 20 discriminant correlations for each scale (a total of 220 comparisons overall). Overall, 205 of these comparisons were significant at the  $p < .05$  level, one-tailed (93.2%); the exceptions involved the Panic and Well-Being scales. The convergent correlation for Well-Being ( $r = .43$ ) was not significantly higher than the discriminant correlation of IDAS Well-Being and IDAS-CR Dsyphoria ( $r = -.42$ ) ( $z = .14$ , *ns*). Due to its low convergent correlation, only 6 of the 20 comparisons for Panic were significant. At the  $p < .01$  level, 180 of 205 comparisons were significant and at the  $p < .001$  level, 162 of 205 comparisons were significant.

Table 10 presents the heteromethod block of the correlations between the IDAS-CR and corresponding questionnaire scales in patients. Once again, the questionnaire and interview measures of the same symptom dimensions were significantly related, with convergent correlations ranging from .30 (Hyperarousal) to .68 (Suicidality). The mean convergent correlation was .54, which again establishes a strong level of convergent

validity. The mean discriminant correlation was .14. Of the 312 comparisons of convergent and discriminant correlations, 301 were significant at the  $p < .05$  level, one-tailed (96.5%); the exceptions involved Euphoria and Hyperarousal. The convergent correlation for Euphoria ( $r = .44$ ) was not significantly higher than the discriminant correlation of IDAS Euphoria and IDAS-CR Mania ( $r = .33$ ) ( $z = 1.25, ns$ ). Due to its low convergent correlation, only 14 of the 24 comparisons were significant for Hyperarousal. At the  $p < .01$  level, 293 of 312 comparisons were significant and at the  $p < .001$  level, 276 of 312 comparisons were significant.

Table 11 presents the heteromethod block for the correlations between the PCCP items and the corresponding questionnaire measures in students. In terms of convergent validity, all correlations were significant, ranging from .21 (Detachment) to .65 (Ordering), with a mean convergent correlation of .48. The mean discriminant correlation was .12. Of the 180 comparisons of convergent and discriminant correlations, 169 were significant at the  $p < .05$  level, one-tailed (93.9%). Due to their relatively low convergent correlations, Obliviousness and Detachment did not fully pass this test of discriminant validity. The convergent correlation for Obliviousness was higher in 15 out of 18 comparisons and the convergent correlation for Detachment was higher in 10 out of 18 comparisons. At the  $p < .01$  level, 158 of 180 comparisons were significant and at the  $p < .001$  level, 136 of 180 comparisons were significant.

Finally, Table 12 presents the correlations between the PCCP items and corresponding questionnaire scales in patients. Convergent correlations ranged from .46 (Obliviousness) to .69 (Cleaning), with a mean correlation of .58. The mean discriminant correlation was .15. Of the 220 comparisons, 216 were significant at the  $p < .05$  level, one-tailed (98.1%). Once again, two symptom dimensions did not fully pass this test of discriminant validity due to their relatively low convergent correlations. Only 18 out of 20 comparisons were significant for both Eccentricity/Oddity and Obliviousness. At the

$p < .01$  level, 208 of 216 comparisons were significant and at the  $p < .001$  level, 190 of 216 comparisons were significant.

### Relations of Daytime Symptoms

Prior to examining the structure of sleep complaints, I examined the relations of daytime symptom dimensions. Using the questionnaire data, I correlated the symptom dimensions within each domain: depression, bipolar disorder, social anxiety, OCD, PTSD, dissociation, schizotypy, and drug/alcohol use. Panic and agoraphobia were not included in these analyses since there was a single measure of each of these domains. Since dysphoria is a nonspecific symptom of both depression and anxiety, it was not combined with the other symptoms of depression. Table 13 reports the correlations among the symptoms of depression (in bold) in students, as well as the correlations of depression symptoms with other daytime symptoms. Table 14 reports these analyses in patients. It is notable that most of the correlations among depression symptoms were quite low, with none exceeding  $|.32|$ . Although these symptoms are within the same hypothetical domain, they appear to be fairly distinct and unrelated.

Table 15 reports the correlations among symptom dimensions of OCD (in bold) in students, as well as the correlations of OCD symptoms with other daytime symptoms. Table 16 reports these analyses in patients. The correlations among OCD symptoms were moderate to high, with the exception of SCOPI Pathological Impulses; this scale showed generally lower correlations with the other OCD scales. Table 17 shows the correlations among symptom dimensions of PTSD (in bold) in students, as well as the correlations of PTSD symptoms with other daytime symptoms. Table 18 reports these analyses in patients. With the exception of PCLC Hyperarousal, the PTSD scales are highly correlated at  $.58$  and above. Table 19 shows the relation among dimensions of dissociation (in bold) in students, as well as the correlations of dissociative symptoms with other daytime symptoms. Table 20 reports these analyses in patients. Tables 21 and

22 show the relations among dimensions of schizotypy (in bold) in students and patients, respectively, as well as the correlation of schizotypy symptoms with other daytime symptoms. Correlations among dissociative and schizotypal symptoms ranged from moderate to high.

The two symptom dimensions of bipolar disorder that were included in this study, IDAS Mania and Euphoria, were moderately correlated at .38 and .46 in students and patients, respectively. Similarly, the two symptom dimensions of drug/alcohol use, the MAST and the DAST, were moderately correlated at .32 and .49 in students and patients, respectively. The two measures of dysphoria, IDAS Dysphoria and PCLC Dysphoria, were strongly correlated at .69 and .73 in students and patients, respectively. Finally, the two measures of social anxiety, IDAS Social Anxiety and SPQ Social Anxiety, were strongly correlated at .66 and .68 in students and patients, respectively. Overall, with the exception of depression, the symptom dimensions within each disorder were moderately to strongly correlated. In addition, multiple measures of the same symptom dimensions were strongly correlated.

I repeated these analyses using the interview data. In general, these correlations tended to be lower than those found with the questionnaire data. Table 23 shows the relations among interview measures of depression symptoms (in bold) in students, as well as the relation of depression symptoms with other daytime symptoms. These analyses in patients are reported in Table 24. As in the questionnaire data, all of the correlations among depression symptoms were quite low, with none exceeding  $|\cdot 29|$ . Table 25 and 26 show the relations among interview measures of OCD symptoms (in bold) in students and patients, respectively, all of which were low to moderate in magnitude ( $r$ s ranged from .10 to .28 in students and from .07 to .48 in patients). Tables 27 and 28 show the relations among interview measures of PTSD symptoms (in bold) in students and patients, respectively. These correlations ranged from .51 to .57. Tables 29 and 30 show the relations among dissociative symptoms (in bold) in students and patients,



respectively. Tables 31 and 32 show the relations among schizotypal symptoms (in bold) in students and patients, respectively. Again, these correlations tended to be quite low ( $r$ s ranged from .04 to .31 across the two samples for the two domains). The two symptom dimensions of bipolar disorder, IDAS-CR Mania and Euphoria, were unrelated in students ( $r = .10$ ) and patients ( $r = .03$ ).

To further examine the relations among daytime symptoms, I submitted both questionnaire and interview measures to separate factor analyses in students and patients. I used principal factor analysis with both promax and varimax rotations (both rotations led to highly similar factors). I report on the promax rotations in the following analyses. In the student sample, when examining the eigenvalues (the eigenvalues of the first five unrotated factors were 12.58, 3.69, 2.71, 2.59 and 1.65), the scree plot leveled off after the third factor, suggesting that three factors are the minimum number of factors to retain. Parallel analysis indicated that the maximum number of factors to retain was four. In the patient sample, when examining the eigenvalues (the eigenvalues of the first five unrotated factors were 12.17, 4.52, 3.25, 2.46, and 2.13), the scree plot leveled off after the fourth factor, suggesting that four factors are the minimum number of factors to retain. Parallel analysis indicated that the maximum number of factors to retain was six. However, when a fifth factor was extracted, it was defined by a subset of depression and OCD measures (e.g., appetite gain, hoarding), and half of these variables had loadings above .30 on other factors. Given that the five-factor model involved considerable overlap among the factors and was not readily interpretable, I report results on the four-factor model. In both samples, I was able to extract up to four factors representing OCD, PTSD, Depression/Anxiety, and Dissociation/Schizotypy. Table 33 reports this factor structure in students and patients. To compare the factor structure across samples, I computed congruence coefficients based on the variables that overlapped across the two samples (Gorsuch, 1983; O'Connor, 2002). Congruence coefficients were used in these analyses since the variables differed slightly across samples (i.e., several measures were

not analyzed in the student sample due to low reliability); this made it impossible to use comparability coefficients to compare the factor structure. Congruence coefficients are computed by summing the product of the factor loadings on factors from two different samples. This number is divided by the square root of the product of the sums of the squared factor loadings within each sample. Coefficients greater than .90 indicate that the factor replicates across samples. I obtained congruence coefficients of .99 for OCD, .96 for PTSD, .95 for Depression/Anxiety, and .95 for Dissociation/Schizotypy. These analyses establish that the same basic dimensions of psychopathology are observed in students and patients.

Overall, these findings suggest that symptoms of OCD and PTSD form distinct domains, as was suggested by the earlier correlational analyses. Symptoms of dissociation and schizotypy appear to be closely related as has been suggested by previous research (Koffel & Watson, 2009b). Symptoms of depression and anxiety are also closely related, which also replicates earlier findings (Watson et al., 2007). It is important to note, however, that not all of these disorders had equivalent coverage in this study. For example, there were two separate questionnaire measures of OCD and PTSD with multiple scales each, whereas there was only one questionnaire measure for depression, dissociation, and schizotypy, respectively. It is possible that separate factors for depression, anxiety, dissociation, and schizotypy would have emerged if there had been more coverage of these domains. In the following analyses, my primary focus is on the relation of sleep complaints with individual daytime symptoms. However, I also examine the relation of sleep complaints with broader domains (e.g., PTSD, OCD).

#### Structure of Sleep Complaints

To determine the structure of sleep complaints in each sample, the questionnaire (ISDI, PSQI, ISES, IDAS Lassitude and Insomnia scales) and interview (ISDI-CR) sleep measures were submitted to principal factor analysis with both promax and varimax

rotations. I report on the promax rotations in the following analyses in order to examine the correlations among the factors. In the student sample, when examining the eigenvalues (the eigenvalues of the first five unrotated factors were 7.58, 2.67, 2.37, and 1.62), the scree plot leveled off after the second factor, suggesting that two factors are the minimum number of factors to retain. Parallel analysis indicated that the maximum number of factors to retain was four. In the patient sample, when examining the eigenvalues (the eigenvalues of the first five unrotated factors were 6.48, 3.36, 3.11, 1.77), the scree plot leveled off after the second factor, suggesting that two factors are the minimum number of factors to retain. Parallel analysis indicated that the maximum number of factors to retain was four.

My analyses initially revealed the presence of a large and relatively broad factor of sleep complaints, which was defined by the majority of scales (26 out of the 33 scales loaded onto this factor at .30 or greater in students and 25 out of the 33 scales loaded onto this factor at .30 or greater in patients); it accounted for 39% of the common variance in students and 31% of the common variance in patients. The factor loadings for both samples are listed in Table 34.

In the next step, I extracted two factors representing Insomnia and Unusual Sleep Experiences/Lassitude in students (items defining narcolepsy symptoms and lassitude loaded onto the same factor). These two factors jointly accounted for 52% of the common variance and were only moderately correlated at .42. In patients, the two factors were Insomnia/Lassitude (items defining insomnia and lassitude loaded onto the same factor) and Unusual Sleep Experiences. These two factors accounted for 48% of the common variance and were weakly correlated at .25. The factor loadings are listed in Table 35.

When three factors were extracted, they represented Insomnia, Lassitude, and Unusual Sleep Experiences in both samples. These three factors accounted for 64% of the common variance in students and 63% of the common variance in patients. These

three factors were weakly to moderately correlated (correlations ranging from .34 to .40 in students and .18 to .24 in patients), suggesting that they are distinct dimensions of sleep disturbances. The factor loadings are listed in Table 36.

When a fourth factor was extracted in students, it was defined by ISDI and ISDI-CR Movements. The ISDI Sensations at Night scale was evenly split between the third (Unusual Sleep Experiences) and fourth factors. The ISDI-CR Sensations at Night scale did not load above .20 on any of the factors. Although this factor appears to represent symptoms of restless legs syndrome, it is not well-defined in these analyses. In patients, the fourth factor was clearly a restless legs syndrome factor and was defined by the ISDI and ISDI-CR Movements and Sensations at Night scales. The factor loadings for both students and patients are reported in Table 37. However, since this factor structure did not replicate across samples, I will focus on the three factor solution.

As mentioned earlier, Table 36 reports the factor loadings from the three-factor solution in the students and patients. Insomnia was represented by interview and questionnaire measures of long sleep latency and nighttime awakenings, including the ISDI and ISDI-CR Initial Insomnia, ISDI Fragmented Sleep, the PSQI, and IDAS Insomnia. Lassitude was represented by interview and questionnaire measures of fatigue and sleepiness, including ISDI Fatigue, IDAS Lassitude, ISDI Nonrestorative Sleep and ISDI and ISDI-CR Excessive Sleep. Unusual Sleep Experiences was represented by interview and questionnaire measures of dreaming and narcolepsy symptoms, including ISES General Sleep Experiences scale, ISDI Vivid Dreams, ISDI Sleep Paralysis, ISDI Sleep Hallucinations, and ISDI Nightmares. The ISDI and ISDI-CR Movement at Night and ISDI-CR Sensations at Night did not load strongly onto any factors in both samples. The ISDI Sensations at Night scale did not load strongly onto any factors in the patient sample.

It is important to note that the three-factor structure is clear and well-defined, with very few cross-loadings and shows the same basic structure across the two samples.

Specifically, 10 measures loaded primarily on Insomnia at  $|\geq .30|$  or greater in both samples, 8 loaded primarily on Lassitude at  $|\geq .30|$  and greater in both samples, and 10 loaded primarily on Unusual Sleep Experiences at  $|\geq .30|$  and greater in both samples. The five remaining measures (ISDI and ISDI-CR Movement at Night, ISDI and ISDI-CR Sensations at Night, and the ISDI Excessive Sleep) tended to split across the factors or had weak loadings on all three factors.

I computed comparability coefficients to examine the degree of similarity for the regression-based factor scores in the student and psychiatric patient samples for the one-factor, two-factor, three-factor and four-factor solutions (Everett & Entekin, 1980). I generated a set of regression-based factor scoring weights for the promax-rotated solution in each sample. The scoring weights from each sample were then applied to the scale scores/interview ratings for the student sample and the psychiatric patient sample. The two solutions then were compared in each sample. If the solutions are similar (e.g., Insomnia weights from the student data vs. the parallel weights from the psychiatric patient data), then the corresponding weights for each factor will produce highly correlated scores. The correlations for each solution are listed in Table 38. The six correlations for the three-factor solution ranged from .97 to .99, which exceeds the benchmark of .90 for establishing factor similarity (Everett, 1983). These correlations are higher than those for the two-factor solution (the four correlations ranged from .92 to .99) and the four-factor solution (the eight correlations ranged from .89 to .99). These data establish that the three-factor structure replicated quite well compared to the other models; furthermore, they strongly suggest that although the sleep complaints of non-patients versus patients do differ quantitatively (i.e., patients had higher mean levels of sleep disturbances), they do not differ qualitatively from one another.

### Relation of Sleep Complaints Across Daytime Symptoms

#### Higher Order Sleep Factors in Students and Correlations with Questionnaire Measures of Daytime Symptoms

Next I examined the relations between these three higher order sleep factors (i.e., Insomnia, Lassitude, and Unusual Sleep Experiences) and daytime symptom dimensions in the student sample. As mentioned previously, the IDAS Suicide scale was not included due to problems with internal consistency. I used regression-based factor scores obtained from the three factor solution (with promax rotation) to calculate correlations with questionnaire measures of mood disorders (e.g., depression, bipolar disorder), anxiety disorders (e.g., panic, social anxiety, agoraphobia, PTSD, OCD), dissociation, schizotypy, and drug and alcohol use. Table 39 lists these correlations. As hypothesized, Lassitude showed the highest correlation with measures of dysphoria, with  $r$ s ranging from .51 to .54. It had weaker correlations with other symptom dimensions, with no correlations exceeding  $|.39|$ . To further quantify this specificity, I compared the highest correlation of Lassitude (i.e., IDAS Dysphoria,  $r = .54$ ) to its correlations with the other daytime symptom dimensions using the Williams modification of the Hotelling test for dependent correlations (Kenny, 1987), for a total of 32 comparisons. PCLC Dysphoria was not included in these analyses due to redundancy with IDAS Dysphoria. In this analysis and in the following analyses, I report the findings at three significance levels ( $p < .05$ ,  $.01$  and  $.001$ , one-tailed) in order to demonstrate that the specificity findings replicate even when stringent cut-offs are used to control Type II error. The correlation of Lassitude and IDAS Dysphoria was significantly stronger than the coefficients for the other 32 symptom dimensions at  $p < .05$  and at  $p < .01$ . This correlation was significantly stronger than the coefficients for 25 of the 32 symptoms at  $p < .001$ .

Moving on to Insomnia, the highest correlations were with measures of dysphoria, as was predicted ( $r$ s ranging from .47 to .49). Insomnia correlated .20 to .30 with most

other symptom dimensions. Once again I compared the highest correlation (i.e., PCLC Dysphoria,  $r = .49$ ) to the other 32 symptom dimensions. The correlation of Insomnia and PCLC Dysphoria was significantly stronger than the coefficients for the 32 other symptom dimensions at  $p < .05$ . This correlation was significantly stronger in 30 of 32 comparisons at  $p < .01$  and 25 of 32 comparisons at  $p < .001$ .

The Unusual Sleep Experiences factor showed more complex relations with daytime symptom dimensions than Insomnia and Lassitude. Earlier, I hypothesized that unusual sleep experiences, schizotypy, and dissociation form a common domain (see Koffel & Watson, 2009b). As such, I expected the Unusual Sleep Experiences factor to show specificity to dissociation (particularly the imagination/absorption dimension) and schizotypy (particularly the unusual beliefs/experiences dimension). I also hypothesized that the Unusual Sleep Experiences factor would show specificity to PTSD (particularly the symptom of traumatic intrusions) and OCD (particularly the symptom of obsessive checking). An examination of Table 39 shows that most of these predictions were supported. Unusual Sleep Experiences had the highest correlations with the traumatic intrusions dimension of PTSD ( $r$ s ranging from .54 to .57), the unusual beliefs/experiences dimension of schizotypy ( $r = .57$ ), and the obliviousness dimension of dissociation ( $r = .56$ ) compared to other symptom dimensions. There was no evidence that Unusual Sleep Experiences is specific to dimensions of OCD, however ( $r$ s ranged from only .13 to .38).

Once again, I quantified this specificity using the significance test for dependent correlations. I compared the highest correlation of Unusual Sleep Experiences and traumatic intrusions (i.e., IDAS Traumatic Intrusions,  $r = .57$ ) to the other coefficients, for a total of 32 comparisons. PCLC Intrusions was not included in these analyses due to redundancy with IDAS Traumatic Intrusions. Unusual Sleep Experiences was more highly correlated with IDAS Traumatic Intrusions than the other symptom dimensions at  $p < .05$  in 29 of 32 comparisons. The exceptions were symptoms of dissociation and

schizotypy (i.e., DPS Imagination, DPS Obliviousness and SPQ Unusual Beliefs/Experience). In addition, this correlation was significantly stronger in 23 of 32 comparisons at  $p < .01$  and 17 of 32 comparisons at  $p < .001$ .

In the next set of analyses, I compared the correlation of Unusual Sleep Experiences and SPQ Unusual Beliefs and Experiences ( $r = .57$ ) with the 33 other symptom dimensions. This correlation was higher in 27 out of 33 comparisons at  $p < .05$ . The exceptions were symptoms of panic, PTSD, and dissociation (i.e., IDAS Panic, IDAS Traumatic Intrusions, PCLC Intrusions, IDAS Traumatic Avoidance, DPS Imagination, DPS Obliviousness). In addition, this correlation was higher in 22 out of 33 comparisons at  $p < .01$  and 17 out of 33 comparisons at  $p < .001$ .

Finally, I compared the correlation of Unusual Sleep Experiences and DPS Obliviousness ( $r = .56$ ) with the 33 other symptom dimensions. This correlation was higher than the other coefficients in 26 out of 33 comparisons at  $p < .05$ . The exceptions were measures of panic, PTSD, schizotypy, and other symptoms of dissociation (i.e., IDAS Panic, IDAS Traumatic Intrusions, PCLC Intrusions, IDAS Traumatic Avoidance, PCLC Avoidance, DPS Imagination, and SPQ Unusual Beliefs and Experiences). In addition, this correlation was significantly higher in 22 out of 33 comparisons at  $p < .01$  and in 17 out of 33 comparisons at  $p < .001$ . Although I had predicted that Unusual Sleep Experiences would show specificity to DPS Imagination, this was not strongly supported in the data (only 19 out of 33 comparisons were significant at  $p < .05$ , 16 out of 33 comparisons were significant at  $p < .01$ , and 11 out of 33 comparisons were significant at  $p < .001$ ). I also predicted that Unusual Sleep Experiences would show specificity to the checking component of OCD, but the highest correlation with checking (i.e., SCOPI Obsessive Checking,  $r = .37$ ) was only significantly higher than the other coefficients in 11 of the 32 comparisons at  $p < .05$ , 8 of the 32 comparisons at  $p < .01$ , and 3 of the 32 comparisons at  $p < .001$  (IDAS Checking was excluded due to redundancy).



Overall, it appears that Lassitude is specific to dysphoria. Previous findings have shown that Insomnia has much weaker specificity to dysphoria compared to Lassitude. However, this was not supported in the student data; Insomnia showed a strong degree of specificity to dysphoria in this sample. Unusual Sleep Experiences was specific to symptoms of PTSD (particularly traumatic intrusions), dissociation (particularly obliviousness), and schizotypy (particularly unusual beliefs/experiences). Together these unusual perceptual experiences at night and during the day appear to form a common domain. The exception to this pattern was the moderate correlation of Unusual Sleep Experiences with IDAS Panic ( $r = .48$ ); this correlation was not significantly different from the correlation of Unusual Sleep Experiences with measures of PTSD, dissociation and schizotypy. I have found in previous studies that measures of panic are related to the ISDI Sensations at Night scale (Koffel & Watson, in press). The ISDI Sensations at Night scale weakly loads on the Unusual Sleep Experiences factor in students and is most likely responsible for this correlation. It is unclear if the other scales that make up the Unusual Sleep Experiences factor are specific to panic.

In addition to examining the specificity of the sleep factors across daytime symptoms (i.e., specificity within columns), I examined the specificity of daytime symptoms with the three sleep factors (i.e., specificity within rows). This issue is examined in more detail later with the individual ISDI scales, but here I briefly summarize the findings with the sleep factors. I conducted significance tests for dependent correlations; the superscripts in Table 39 indicate which correlations within a row differ significantly from one another at  $p < .05$ , one-tailed. The most robust evidence of specificity involved the Unusual Sleep Experiences factor. Multiple symptoms, including symptoms of OCD, PTSD, dissociation, and schizotypy, showed significantly stronger correlations with Unusual Sleep Experiences compared to Insomnia and Lassitude. In particular, IDAS Traumatic Intrusions, DPS Detachment, and SPQ Unusual Beliefs/Experiences were specific to Unusual Sleep Experiences compared to the other

sleep factors at  $p < .001$ . This provides additional support for the theory that Unusual Sleep Experiences, dissociation, and schizotypy form a common domain. In contrast, no symptoms were correlated more strongly with Insomnia compared to Lassitude and Unusual Sleep Experiences.

Table 40 presents the average correlations between the higher order sleep factors and various daytime domains. After transforming the correlations to Fisher's  $z$ , the correlations between sleep and daytime symptoms within a particular domain were averaged together (e.g., IDAS Traumatic Intrusions, PCLC Intrusions, IDAS Traumatic Avoidance, PCLC Avoidance, and PCLC Hyperarousal were averaged for PTSD). Since dysphoria is a nonspecific symptom of both depression and anxiety, it was not combined with the other symptoms of depression; instead I averaged the correlations between the sleep factors and the two measures of dysphoria. The additional symptoms of depression were not averaged together since earlier analyses indicated that they were very weakly correlated (i.e., Well-Being, Ill Temper, Appetite Loss, Appetite Gain). It is clear from Table 40 that Lassitude is specific to dysphoria ( $r = .53$ ). Insomnia also shows evidence of specificity with dysphoria ( $r = .48$ ). Unusual Sleep Experiences shows specificity to PTSD, dissociation, and schizotypy ( $r$ s ranging from .41 to .51). Unusual Sleep Experiences also shows some specificity with panic ( $r = .48$ ), as was discussed earlier, and with dysphoria ( $r = .45$ ). Conversely, however, dysphoria shows a lack of specificity with regard to the higher order sleep factors, as it correlated moderately and roughly equally with all three factors.

#### Higher Order Sleep Factors in Students and Correlations with Interview Measures of Daytime Symptoms

I repeated the analyses described above using the interview data for the 22 daytime symptom dimensions listed in Table 41. As mentioned previously, I excluded IDAS-CR Traumatic Hyperarousal and PCCP Hallucinations, Paranoia, and Intrusive

Thoughts/Obsessions due to reliability issues. As in the analyses with questionnaire data, Lassitude showed the highest correlation with the interview measure of dysphoria ( $r = .36$ ) and weaker correlations with other symptom dimensions. The correlation of Lassitude and IDAS-CR Dysphoria was significantly stronger than the coefficients for 16 of the 21 other symptom dimensions at  $p < .05$ . The exceptions were IDAS-CR Well-Being, PCCP Hoarding, IDAS-CR Traumatic Intrusions, IDAS-CR Traumatic Avoidance, and PCCP Obliviousness/Amnesia. In addition, this correlation was significantly higher in 6 of 21 comparisons at  $p < .01$  and 2 of 21 comparisons at  $p < .001$ .

Compared to Lassitude, Insomnia had much weaker and more non-specific relations with the other symptom dimensions. Although Insomnia had its highest correlation with measures of dysphoria in the questionnaire data, this was not the case in the interview data. Insomnia showed the highest correlation with IDAS Mania ( $r = .30$ ). This correlation was significantly higher than 10 of the 21 coefficients for the other symptom dimensions at  $p < .05$ . It was also higher in 7 of 21 comparisons at  $p < .01$  and one comparison at  $p < .001$ . Replicating earlier analyses, I compared the correlation of Insomnia and IDAS-CR Dysphoria ( $r = .24$ ) with the other symptom dimensions and found that it was significantly higher than only 6 of the 21 coefficients at  $p < .05$ , 3 of the 21 coefficients at  $p < .01$  and one of the 21 coefficients at  $p < .001$ . In summary, Insomnia does not show the same specificity as Lassitude; moreover, the daytime symptoms to which it is most highly correlated are inconsistent across methods.

Regarding Unusual Sleep Experiences, this factor showed the strongest correlations with IDAS-CR Traumatic Intrusions ( $r = .40$ ) and PCCP Obliviousness/Amnesia ( $r = .37$ ), which parallels the questionnaire data. Unusual Sleep Experiences had stronger correlations with IDAS-CR Traumatic Intrusions in 19 of the 21 comparisons at  $p < .05$ , with the exceptions being other symptoms of PTSD and dissociation (i.e., IDAS-CR Traumatic Avoidance and PCCP Obliviousness/Amnesia).

In addition, this correlation was significantly stronger in 17 of 21 comparisons at  $p < .01$  and 7 of 21 comparisons at  $p < .001$ . Unusual Sleep Experiences had stronger correlations with PCCP Obliviousness/Amnesia in 18 of the 21 comparisons at  $p < .05$ , with the exceptions being symptoms of PTSD and other symptoms of dissociation (i.e., IDAS-CR Traumatic Intrusions, IDAS-CR Traumatic Avoidance, and PCCP Depersonalization/Derealization). This correlation was significantly higher in 13 of 21 comparisons at  $p < .01$  and 5 of 21 comparisons at  $p < .001$ .

Once again, I did not find evidence that Unusual Sleep Experiences was specific to symptoms of OCD ( $r$ s ranged from only .02 to .19). The correlation with PCCP Checking/Doubting ( $r = .19$ ), which was the symptom dimension I expected to show specificity, was only stronger in 2 of 21 comparisons at  $p < .05$  (none of the comparisons were significant at the more stringent cut-offs). I also did not find strong evidence that Unusual Sleep Experiences was specific to the dissociative dimension of imagination/absorption, as I had predicted. The correlation with PCCP Imagination/Absorption ( $r = .20$ ) was only stronger in 2 of 21 comparisons at  $p < .05$  (none of the comparisons were significant at the more stringent cut-offs). Finally, contrary to my predictions and unlike my findings with the questionnaire data, Unusual Sleep Experiences did not show specificity with the unusual beliefs/experiences dimension of schizotypy (the correlation of .19 with PCCP Supernatural Beliefs was significantly higher than the other coefficients in 2 out of 21 comparisons at  $p < .05$  and none of the comparisons were significant at the more stringent cut-offs).

As with the questionnaire data, I briefly examined specificity within a row. Very few daytime symptoms showed specificity with the three sleep factors, most likely due to the generally low correlations of the sleep factors and daytime symptoms. IDAS-CR Dysphoria was specific to Lassitude and PCCP Obliviousness/Amnesia was specific to Unusual Sleep Experiences at  $p < .05$  (but not at  $p < .01$ ), which parallel the specificity findings within a column.

Overall, the findings with the interview data are similar to but weaker than the findings with the questionnaire data, with Lassitude showing specificity to dysphoria and Insomnia showing more nonspecific relations with a variety of symptom dimensions. Together, the questionnaire and interview data offer clear evidence that Unusual Sleep Experiences is specific to PTSD (particularly traumatic intrusions) and dissociation (particularly obliviousness/amnesia), with partial support for specificity with schizotypy (particularly unusual beliefs/experiences). The average correlations between the sleep factors and daytime dimensions are listed in Table 42. Lassitude shows some specificity to dysphoria ( $r = .36$ ), whereas insomnia has weaker, nonspecific relations with most dimensions. Unusual Sleep Experiences shows some specificity to PTSD ( $r = .36$ ) and dissociation ( $r = .28$ ).

#### Higher Order Sleep Factors in Patients and Correlations with Questionnaire Measures of Daytime Symptoms

I repeated the analyses above using the patient data. Table 43 lists these correlations using the questionnaire measures. Once again, Lassitude showed the highest correlation with measures of dysphoria, with  $r$ s ranging from .48 to .56. It had weaker correlations with other symptom dimensions, with no correlations exceeding  $|.39|$ . The strongest correlation between Lassitude and dysphoria (i.e., IDAS Dysphoria,  $r = .56$ ) was compared to the coefficients for the other 33 symptom dimensions (as with the student analyses, PCLC Dysphoria was not included in these analyses due to redundancy with IDAS Dysphoria). This correlation was significantly stronger than the coefficients for the other 33 symptom dimensions at  $p < .05$  and at  $p < .01$ . It was significantly stronger in 32 of 33 comparisons at  $p < .001$ .

Conversely, Insomnia was much more nonspecific, with correlations for most symptom dimensions ranging from .20 to .30. The highest correlation was with IDAS Appetite Loss ( $r = .38$ ); this was significantly stronger than the coefficients for 24 out of

the 34 other symptom dimensions at  $p < .05$ . It was also stronger in 17 out of 34 comparisons at  $p < .01$  and 2 out of 34 comparisons at  $p < .001$ . Because I had hypothesized that Insomnia would show weak specificity to dysphoria, I also compared the correlation of Insomnia and IDAS Dysphoria ( $r = .30$ ) with the other symptom dimensions and found that this coefficient was significantly stronger in 16 out of 33 comparisons at  $p < .05$  and one out of 33 comparisons at  $p < .01$  and  $p < .001$  (as in previous analyses, I excluded PCLC Dysphoria due to redundancy with IDAS Dysphoria). Although Insomnia is showing some specificity to symptom dimensions, it is much weaker and more inconsistent than that seen with Lassitude.

Unusual Sleep Experiences showed the highest correlation with PCLC Intrusions ( $r = .45$ ), followed by DPS Imagination ( $r = .44$ ). It did not have particularly strong correlations with the symptom dimensions of schizotypy and OCD (e.g., none of these correlations was above .36). In significance testing, Unusual Sleep Experiences was more highly correlated with PCLC Intrusions in 27 of the 33 comparisons at  $p < .05$  (these analyses excluded IDAS Traumatic Intrusions due to redundancy with PCLC Intrusions). The exceptions to this specificity were other symptoms of PTSD (i.e., IDAS Traumatic Avoidance), symptoms of OCD (i.e., SCOPI Pathological Impulses), symptoms of dissociation (i.e., DPS Imagination, Detachment, and Obliviousness) and schizotypy (i.e., SPQ Unusual Beliefs/Experiences). In addition, this correlation was significantly higher in 25 of 33 comparisons at  $p < .01$  and 18 of 33 comparisons at  $p < .001$ . Unusual Sleep Experiences was more highly correlated with DPS Imagination in 26 of the 34 comparisons at  $p < .05$ . Again, the exceptions were symptoms of OCD (i.e., SCOPI Pathological Impulses), PTSD (i.e., IDAS Traumatic Intrusions, PCLC Intrusions, IDAS Traumatic Avoidance, PCLC Avoidance), other symptoms of dissociation (i.e., DPS Detachment and Obliviousness) and symptoms of schizotypy (i.e., SPQ Unusual Beliefs/Experiences). In addition, this correlation was significantly higher in 23 of 34 comparisons at  $p < .01$  and 15 of 34 comparisons at  $p < .001$ .

Although I had predicted that Unusual Sleep Experiences would be specific to the OCD symptom of checking and the unusual beliefs/experiences dimension of schizotypy, I did not find evidence of this in these analyses. The highest correlation between the Unusual Sleep Experiences and OCD checking was the correlation with SCOPI Obsessive Checking ( $r = .28$ ), which was significantly greater than the other coefficients in 11 of 33 comparisons at  $p < .05$ , 8 of 33 comparisons at  $p < .01$ , and one comparison at  $p < .001$  (IDAS Checking was excluded due to redundancy). The correlation between Unusual Sleep Experiences and SPQ Unusual Beliefs/Experiences ( $r = .33$ ) was significantly greater than the other coefficients in 16 out of 34 comparisons at  $p < .05$ , 10 out of 34 comparisons at  $p < .01$ , and 5 out of 34 comparisons at  $p < .001$ . One unexpected finding was the moderate correlation between Unusual Sleep Experiences and SCOPI Pathological Impulses ( $r = .36$ ); this coefficient was not significantly different from the correlation between this sleep factor and measures of PTSD and dissociation. This finding was not replicated in any of the other analyses, but does suggest that Unusual Sleep Experiences may show weak specificity to pathological impulses.

I also compared the correlations within a row to see if the symptom dimensions showed specificity to the three sleep factors. These analyses are shown in Table 43, where significantly different correlations at  $p < .05$  have different superscripts. Paralleling the specificity findings within the columns, IDAS Dysphoria and PCLC Dysphoria showed significantly stronger correlations with Lassitude than with Insomnia and Unusual Sleep Experiences (these results were significant at  $p < .001$ ). Similarly, PCLC Intrusions, DPS Imagination, and SPQ Unusual Beliefs/Experiences showed significantly stronger correlations with Unusual Sleep Experiences compared to Insomnia and Lassitude. Of these comparisons, only DPS Imagination showed specificity with Unusual Sleep Experiences at  $p < .01$ .

In general, these analyses with the patient questionnaire data parallel my findings with the student data. Lassitude is specific to dysphoria, and Insomnia shows inconsistent evidence of weak specificity (i.e., its strongest correlation varies across analyses and samples and is generally weaker than the correlations between Lassitude and daytime symptoms). Unusual Sleep Experiences continues to show specificity to PTSD (particularly the symptom of traumatic intrusions). Unusual Sleep Experiences is also specific to dissociation, but the particular symptom dimension varies by analyses. In the patient analyses, I did not find evidence that Unusual Sleep Experiences is specific to the unusual beliefs/experiences dimension of schizotypy. Finally, there is no evidence that Unusual Sleep Experiences shows strong specificity to symptoms of OCD. Table 44 shows the average correlation of the sleep factors with daytime domains using the patient questionnaire data. Lassitude is strongly correlated with Dysphoria ( $r = .52$ ) and Unusual Sleep Experiences has the highest correlations with PTSD and dissociation (both  $r_s = .37$ ).

#### Higher Order Sleep Factors in Patients and Correlations with Interview Measures of Daytime Symptoms

Using the patient interview data on 26 symptom dimensions, I once again examined which daytime symptoms showed specificity to the higher order sleep factors; these correlations are listed in Table 45. Lassitude had its highest correlation with IDAS-CR Dysphoria ( $r = .39$ ), with the majority of other correlations falling below  $|.30|$ . In the 25 comparisons, this correlation was significantly higher than 22 other coefficients at  $p < .05$  (the exceptions involved IDAS-CR Suicidality, Panic and Social Anxiety). In addition, this coefficient was significantly higher in 19 of 25 comparisons at  $p < .01$  and 10 of 25 comparisons at  $p < .001$ .

Insomnia was once again more nonspecific with daytime symptoms. It had its highest correlation with IDAS-CR Wellbeing ( $r = -.25$ ) and this correlation was



significantly higher in 10 of the 25 comparisons at  $p < .05$  and 2 of 25 comparisons at  $p < .01$  (none of the comparisons were significant at  $p < .001$ ). Although I predicted that Insomnia would show some specificity with dysphoria, it had a very weak correlation with IDAS-CR Dysphoria ( $r = .15$ ) in this sample. This correlation was significantly higher than only 2 of the 25 other coefficients at  $p < .05$  (none of the comparisons were significant at the more stringent cut-offs).

Unusual Sleep Experiences had its highest correlations with measures of PTSD and dissociation. Within the PTSD domain, Unusual Sleep Experiences was closely related to IDAS-CR Traumatic Avoidance ( $r = .29$ ) and IDAS-CR Traumatic Intrusions ( $r = .27$ ). The correlation with IDAS-CR Traumatic Avoidance was significantly higher in 13 of the 25 comparisons at  $p < .05$  (it was significantly higher in 8 of 25 comparisons at  $p < .01$  and no comparisons were significant at  $p < .001$ ) and the correlation with IDAS-CR Traumatic Intrusions was significantly higher in 11 of the 25 comparisons at  $p < .05$  (it was significantly higher in 6 of 25 comparisons at  $p < .01$  and no comparisons were significant at  $p < .001$ ). The exceptions in both these cases tended to be other symptoms of PTSD, symptoms of panic (e.g., IDAS-CR panic), OCD (e.g., PCCP Intrusive Thoughts/Obsessions), symptoms of dissociation (e.g., PCCP Depersonalization/Derealization), and symptoms of schizotypy (e.g., PCCP Hallucinations and Eccentricity/Oddity). Within the dissociation domain, Unusual Sleep Experiences was particularly related to PCCP Depersonalization/Derealization ( $r = .29$ ), followed by PCCP Imagination/Absorption ( $r = .27$ ). These correlations were higher in 13 and 11 comparisons, respectively, out of 25 at  $p < .05$ . These correlations were also higher in 8 and 6 comparisons, respectively, out of 25 at  $p < .01$ . No comparisons were significant at  $p < .001$ . Again, the exceptions tended to be other symptoms of dissociation, symptoms of panic, OCD, PTSD, and schizotypy.

It is interesting to note that in these analyses, as in some previous analyses, Unusual Sleep Experiences tends to show specificity with panic ( $r = .21$ ). In addition,

Unusual Sleep Experiences showed weak specificity with symptoms of OCD. It is important to keep in mind, however, that Unusual Sleep Experiences did not show strong relations with OCD symptoms ( $r$ s ranging from only .13 to .18). Although I predicted it would be specific to obsessive checking, Unusual Sleep Experiences only correlated .13 with PCCP Checking/Doubting, which was not significantly higher than any of the other 25 coefficients at  $p < .05$ . I also predicted the Unusual Sleep Experiences would be specific to the unusual beliefs/experiences dimension of schizotypy, but Unusual Sleep Experiences correlated only .12 with PCCP Supernatural Beliefs (not significantly higher than the other 25 coefficients at  $p < .05$ ). Within the domain of schizotypy, Unusual Sleep Experiences had moderate correlations with PCCP Eccentricity/Oddity at  $r = .25$  (significantly higher in 8 out of 25 comparisons at  $p < .05$ ) and PCCP Hallucinations at  $r = .21$  (significantly higher in 5 out of 25 comparisons at  $p < .05$ ), but even these symptom dimensions did not show strong evidence of specificity.

Table 45 also shows which correlations within a row are significantly different from one another at  $p < .05$ . Of note, IDAS-CR Dysphoria had a stronger correlation with Lassitude compared to Insomnia and Unusual Sleep Experiences (this remained significant at  $p < .01$ ), whereas IDAS-CR Traumatic Intrusions and PCCP Hallucinations had significantly stronger correlations with Unusual Sleep Experiences (these were not significant at more stringent cut-offs). No symptom dimension showed specificity with Insomnia compared to the other two sleep factors.

Overall, Lassitude shows specificity to dysphoria in the patient interview data, whereas Insomnia is more nonspecific. Unusual Sleep Experiences shows strong evidence of specificity to PTSD (both symptoms of traumatic intrusions and traumatic avoidance) and dissociation (both the imagination/absorption and depersonalization/derealization dimensions). Finally, Unusual Sleep Experiences shows much weaker evidence of specificity with schizotypy and minimal evidence of specificity with OCD. Table 46 lists the average correlations using the patient interview data.

Lassitude correlates most strongly with Dysphoria,  $r = .39$ . Unusual Sleep Experiences correlates most strongly with PTSD and dissociation, with  $r$ s ranging from .22 to .27. There is also some evidence of specificity with panic in the interview data.

#### Summary of Higher Order Sleep Factors and Their Relation to Daytime Dimensions

I examined the pattern of relations of the three higher order sleep factors with daytime symptom dimensions using two samples (i.e., student and patient) and two methods (i.e., questionnaire and interview). In general, the patterns of correlations replicated very well across samples and methods. The strongest finding was the specificity of Lassitude to measures of dysphoria. In 103 out of 111 significance tests at  $p < .05$ , Lassitude had a stronger correlation with dysphoria than other daytime symptom dimensions (92.8%). In 90 out of 111 significance tests at  $p < .01$ , Lassitude had a stronger correlation with dysphoria (81.1%). In 69 out of 111 significance tests at  $p < .001$ , Lassitude had a stronger correlation with dysphoria (62.2%). I had predicted that Insomnia would show weaker specificity with dysphoria; in 56 out of 111 comparisons at  $p < .05$ , the correlation of Insomnia and dysphoria was higher than the correlation of Insomnia with other daytime symptoms (50.5%). Insomnia had a stronger correlation with dysphoria in 34 out of 111 tests at  $p < .01$  (30.6%) and in 27 out of 111 significance tests at  $p < .001$  (24.3%). Lassitude consistently had the strongest correlation with dysphoria, whereas Insomnia had its strongest correlation with a variety of symptom dimensions across analyses (e.g., dysphoria, mania, appetite loss, well-being).

I had predicted that Unusual Sleep Experiences would be specific to PTSD, dissociation, schizotypy, and OCD. The strongest evidence for specificity for this sleep factor was for PTSD—in particular traumatic intrusions. Unusual Sleep Experiences had significantly stronger correlations with this symptom dimension in 86 out of 111 comparisons at  $p < .05$  (77.5%), 71 out of 111 comparisons at  $p < .01$  (63.9%), and 42

out of 111 comparisons at  $p < .001$  (37.8%). However, it is also important to note that Unusual Sleep Experiences showed relatively high correlations with the other symptom dimensions of PTSD, in particular traumatic avoidance. Unusual Sleep Experiences also showed specificity to dissociation, although the particular symptom dimension tended to fluctuate across analyses. In the student analyses, Unusual Sleep Experiences was most highly correlated with obliviousness/amnesia, whereas in the patient analyses it was most highly correlated with imagination/absorption and depersonalization/derealization. I had predicted that imagination/absorption would show the strongest evidence of specificity, and this was true in 58 out of 113 comparisons at  $p < .05$  (51.3%), 45 out of 113 comparisons at  $p < .01$  (39.8%) and 26 out of 113 comparisons at  $p < .001$  (23.0%). It is clear that unlike PTSD, there is not a particular symptom dimension of dissociation with which Unusual Sleep Experiences shows consistently strong evidence of specificity.

Contrary to my predictions, Unusual Sleep Experiences did not show strong evidence of specificity with OCD. The OCD symptom of checking was stronger in only 24 of 111 comparisons at  $p < .05$  (21.6%), 16 of 111 comparisons at  $p < .01$  (14.4%) and 4 of 111 comparisons at  $p < .001$  (3.6%). Similarly, schizotypy did not show strong evidence of specificity. The unusual beliefs/experiences dimension was significantly stronger in only 45 of 113 comparisons at  $p < .05$  (39.8%), 32 of 113 comparisons at  $p < .01$  (28.3%) and 22 of 113 comparisons at  $p < .001$  (19.5%). It is important to note that Unusual Sleep Experiences did show moderate correlations with this symptom dimension in the questionnaire data (significantly higher in 43 of 67 comparisons at  $p < .05$ , 64.2%). Finally, I found that Unusual Sleep Experiences showed weak specificity to panic and OCD symptoms (e.g., intrusive thoughts/obsessions, pathological impulses); in several analyses, these correlations were not significantly different from the correlations of Unusual Sleep Experiences with symptoms of PTSD and dissociation/schizotypy. However, these findings are not consistent across these analyses and would need to be replicated in future studies.

Before moving on to the lower order sleep facets, I examined the relation between the higher order sleep factors and the daytime symptom factors obtained from the factor analyses described earlier (i.e., Depression/Anxiety, OCD, PTSD, Dissociation/Schizotypy). These relations are shown in Table 47 in students and patients. In the students, Lassitude showed its highest correlation with Depression/Anxiety ( $r = .51$ ), which was significantly higher than the correlations of Lassitude with OCD and Dissociation/Schizotypy at  $p < .05$  (it was significantly higher than OCD at  $p < .01$ ). Insomnia also showed its highest correlation with Depression/Anxiety ( $r = .52$ ), which was significantly higher than the coefficients for OCD, PTSD, and Dissociation/Schizotypy at  $p < .05$  (this correlation was significantly higher than OCD, PTSD, and Dissociation/Schizotypy at  $p < .01$  and OCD and Dissociation/Schizotypy at  $p < .001$ ). Finally, Unusual Sleep Experiences showed its highest correlations with PTSD ( $r = .62$ ) and Dissociation/Schizotypy ( $r = .58$ ); these coefficients were significantly higher than the coefficients for Depression/Anxiety and OCD at  $p < .05$  (these results were also significant at  $p < .001$ ). These analyses replicate earlier findings with the student data, in which Lassitude and Insomnia show specificity to dysphoria, whereas Unusual Sleep Experiences shows specificity to PTSD and symptoms of dissociation. I also examined specificity within a row and found that OCD, PTSD, and Dissociation/Schizotypy all had significantly stronger correlations with Unusual Sleep Experiences compared to Lassitude and Insomnia (these results were also significant at  $p < .01$ ). Conversely, Depression/Anxiety correlated significantly more strongly with Lassitude and Insomnia than with Unusual Sleep Experiences (these results were also significant at  $p < .01$ ).

In the patients, Lassitude showed its strongest correlation with Depression/Anxiety ( $r = .53$ ), which was significantly stronger than all other coefficients at  $p < .05$  (these results were also significant at  $p < .001$ ). Insomnia showed its strongest correlation with PTSD ( $r = .39$ ). This correlation was significantly stronger than the

coefficients for OCD and Dissociation/Schizotypy at  $p < .05$  (and was significantly stronger than the coefficients for Dissociation/Schizotypy at  $p < .01$ ). As mentioned previously, Insomnia shows inconsistent evidence of specificity across analyses and across samples. Unusual Sleep experiences had its strongest correlations with PTSD and Dissociation/Schizotypy ( $r = .41$ ). These correlations were significantly stronger than the coefficients for Depression/Anxiety and OCD at  $p < .05$  (and significantly stronger than Depression/Anxiety at  $p < .001$ ). In examining specificity within a row, Depression/Anxiety was significantly more strongly related to Lassitude than to Insomnia and Unusual Sleep Experiences at  $p < .05$  (these results were also significant at  $p < .001$ ). The other symptom factors showed less robust evidence of specificity across sleep factors in the patients.

#### Lower Order Sleep Facets in Students and Correlations with Questionnaire and Interview Measures of Daytime Symptoms

In addition to examining the relations between the sleep factors and daytime symptoms, I examined the relations of the individual ISDI scales across daytime symptoms. This allowed me to determine if lower order sleep facets showed specificity to daytime symptom dimensions. For example, I hypothesized that the ISDI Nightmares scale would show specificity to the PTSD symptom dimension of traumatic intrusions and to symptom dimensions of schizotypy/dissociation. I also hypothesized that the ISDI Fatigue scale would be specific to dysphoria. I more tentatively hypothesized that the ISDI Sensations at Night scale would be specific to panic and that the ISDI Sleep Hallucinations scale would be specific to schizotypy (in particular the unusual beliefs/experiences dimension). I expected the ISDI Initial Insomnia and Sleep Paralysis scales to show low, nonspecific correlations with all the daytime symptom dimensions.

These analyses also allowed me to determine whether there was continuity between daytime and nighttime symptoms. I hypothesized that unusual perceptual experiences during the daytime (e.g., traumatic intrusions, imagination/absorption, unusual beliefs/experience) would show specificity to unusual perceptual experiences at night (e.g., nightmares, vivid dreams, sleep hallucinations).

First, I examined the ISDI and ISDI-CR scales in relation to daytime symptom dimensions in both students and patients and found that most scales had low, nonspecific relations with daytime symptoms (see Tables 48 to 51). For example, Initial Insomnia tended to have correlations ranging from .10 to .20 with daytime symptom dimensions, with no correlations above .33. In this regard, it is important to note that the ISDI and ISDI-CR Sensations at Night scales, despite my predictions, did not show consistent evidence of specificity with any daytime symptom dimension and, therefore, the scales are not included in the following analyses. Several correlations of daytime and nighttime symptoms in these analyses were the highest in both row and column and thus show some specificity, however, the relations remain weak overall.

In contrast, five scales tended to have stronger correlations with daytime symptoms (i.e., .40 or above) and showed more evidence of specificity; these scales were Fatigue, Nightmares, Sleep Hallucinations, Vivid Dreams, and Sleep Paralysis. Tables 47 through 50 show the relation of these sleep scales with daytime symptom dimensions, both within and across methods, using the student data. Tables 52 and 53 show the correlations of the ISDI and ISDI-CR with questionnaire measures of daytime symptoms. Tables 54 and 55 show the correlations of the ISDI and ISDI-CR with interview measures of daytime symptoms. I was most interested in patterns of correlations that replicated across these four tables since this would indicate robust specificity of sleep symptoms with daytime symptoms.

Beginning with the Fatigue scale, both interview and questionnaire measures showed the strongest relations with measures of dysphoria ( $r$ s ranging from .37 to .54), as

I had hypothesized. Fatigue tended to show smaller correlations with the remaining symptom dimensions (i.e., below .30). Using the Williams modification of the Hotelling test for dependent correlations (Kenny, 1987), I found that Fatigue had significantly higher correlations with dysphoria than with other symptom dimensions in 81 of 84 comparisons (96.4%) at  $p < .05$ . The Fatigue scale had significantly higher correlations with dysphoria in 61 of 84 comparisons (72.6%) at  $p < .01$  and 39 of 84 comparisons (46.4%) at  $p < .001$ . In Table 52 and Table 53, the Fatigue scale had moderate correlations with several other symptoms (including well-being, ill temper, panic, social anxiety), but these findings did not replicate in the other tables.

The questionnaire and interview measures of the Nightmares scale tended to show specificity to the PTSD symptoms of traumatic intrusions and traumatic avoidance, which again matches my hypotheses. In Tables 54 and 55, Nightmares had its strongest correlations with these PTSD symptoms ( $r$ s ranging from .27 to .34). In the remaining Tables 52 and 53, Nightmares had its strongest relation with traumatic intrusions ( $r$ s ranging from .37 to .45). The correlation of Nightmares with other symptom dimensions tended to be below .30; there were some exceptions in Tables 52 and 53, where Nightmares had moderate relations with other daytime symptom dimensions (including ill temper, social anxiety), but these findings did not replicate in the other analyses. In significance testing, Nightmares showed a significantly stronger correlation with traumatic intrusions in 63 of 84 comparisons (75.0%) at  $p < .05$ , in 40 of 84 comparisons (47.6%) at  $p < .01$ , and in 22 of 84 comparisons (26.2%) at  $p < .001$ . Nightmares showed a significantly stronger correlation with traumatic avoidance in 42 of 84 comparisons (50.0%) at  $p < .05$ , 29 of 84 comparisons (34.5%) at  $p < .01$ , and 15 of 84 comparisons (17.9%) at  $p < .001$ .

The measures of Sleep Hallucinations consistently showed strong relations to measures of dissociation in all analyses. In Tables 52 and 53, Sleep Hallucinations had correlations ranging from .40 to .44 with all three symptom dimensions of dissociation.



These analyses also revealed moderate relations with symptoms of schizotypy, but these findings did not replicate in the other tables. In Tables 54 and 55, the Sleep Hallucinations scales were most strongly related to the obliviousness/amnesia dimension of dissociation ( $r = .32$ ). Sleep Hallucinations showed a significantly stronger correlation with obliviousness/amnesia in 70 of 84 comparisons (83.3%) at  $p < .05$ , 41 of 84 comparisons (48.8%) at  $p < .01$ , and 13 of 84 comparisons (15.5%) at  $p < .001$ . Sleep Hallucinations had a significantly stronger correlation with imagination/absorption in 30 of 84 comparisons (35.7%) at  $p < .05$ , in 18 of 84 comparisons (21.4%) at  $p < .01$  and 10 of 84 comparisons (11.9%) at  $p < .001$ . Sleep Hallucinations had significantly stronger correlation with depersonalization/derealization in 28 of 84 comparisons (33.3%) at  $p < .05$ , in 16 of 84 comparisons (19.0%) at  $p < .01$ , and in 9 of 84 comparisons (10.7%) at  $p < .001$ .

The Vivid Dreams scales tended to show weaker, more non-specific relations with daytime symptom dimensions. In Tables 54 and 55, Vivid Dreams did not correlate at .30 or above with any daytime symptom. In Table 53, Vivid Dreams had its strongest correlation with IDAS Traumatic Intrusions ( $r = .32$ ), which was significantly stronger in 7 of 21 comparisons (33.3%) at  $p < .05$ . In Table 52, Vivid Dreams had its strongest correlation with SPQ Unusual Beliefs/Experience ( $r = .42$ ), which was significantly stronger in 15 of 21 comparisons (71.4%) at  $p < .05$ , followed by symptoms of dissociation and PTSD. Thus, there is some evidence that vivid dreams are related to symptoms of dissociation, schizotypy, and PTSD, but these findings are much weaker and more inconsistent than the findings for other sleep dimensions.

Finally, the ISDI and ISDI-CR Sleep Paralysis scales tended to have weaker and more inconsistent relations with daytime symptoms compared to other sleep dimensions, as was predicted. Sleep Paralysis had its strongest relation with traumatic intrusions in Table 52 ( $r = .40$ ) and Table 54 ( $r = .31$ ); these correlations were significantly stronger in 18 of 21 (85.7%) and 17 of 21 (81.0%) comparisons at  $p < .05$ , respectively. Sleep

Paralysis did not correlate at .30 or above with any daytime symptom dimension in the remaining tables. Thus, much like vivid dreams, sleep paralysis shows only weak evidence of specificity to PTSD symptoms.

Regarding symptom continuity, there is some evidence that unusual perceptual experiences at night show specificity to unusual perceptual experiences during the day. For example, people who report having nightmares also report having traumatic intrusions during the day. Similarly, people who report having hallucinations at night also report having an active fantasy life/vivid daydreams and unusual visual experiences during the day, including seeing things that other people cannot see. These findings offer further support for a common domain of unusual perceptual experiences both during the day and at night, which encompasses symptoms of schizotypy, dissociation, PTSD, nightmares and narcolepsy.

#### Lower Order Sleep Facets in Patients and Correlations with Questionnaire and Interview Measures of Daytime Symptoms

I replicated the analyses described above using the patient data, which are shown in Tables 56 through 59. Tables 56 and 57 show the relation of the ISDI and ISDI-CR with questionnaire measures, whereas Tables 58 and 59 show the relation of the ISDI and ISDI-CR with interview measures. As in the student data, the Fatigue scale showed its strongest relation with measures of dysphoria ( $r$ s ranging from .33 to .51), and had smaller correlations with other symptom measures. Using the Williams modification of the Hotelling test for dependent correlations (Kenny, 1987), I found that Fatigue had significantly higher correlations with Dysphoria than with other symptom dimensions in 85 of 94 comparisons (90.4%) at  $p < .05$ , in 68 of 94 comparisons (72.3%) at  $p < .01$ , and in 38 of 94 comparisons (40.4%) at  $p < .001$ . In Table 56, Fatigue had moderate

correlations with several other symptoms (including well-being, panic, social anxiety, obliviousness), but these findings did not replicate in the other tables.

In every table, Nightmares had its strongest relations with symptoms of PTSD, including traumatic intrusions and avoidance ( $r$ s ranging from .31 to .45), which parallels the findings with the student data and offers support for the symptom continuity hypothesis (i.e., people who experience frightening dreams at night also tend to have flashbacks during the day). Nightmares had significantly stronger correlations with Traumatic Intrusions in 81 of 94 comparisons (86.2%) at  $p < .05$ , in 62 of 94 comparisons (66.0%) at  $p < .01$ , and in 30 of 94 comparisons (31.9%) at  $p < .001$ . Nightmares had significantly stronger relations with Traumatic Avoidance in 84 of 94 comparisons (89.4%) at  $p < .05$ , in 66 of 94 comparisons (70.2%) at  $p < .01$ , and in 29 of 94 comparisons (30.9%) at  $p < .001$ . In Table 56, Nightmares also had a moderate correlation with Imagination ( $r = .37$ ), but this finding did not replicate in the other tables.

Replicating the student findings, Sleep Hallucinations consistently showed strong relations to symptoms of dissociation, including the dimensions of imagination/absorption ( $r = .33$  in Table 56 and  $.30$  in Table 58) and depersonalization/derealization ( $r = .38$  in Table 56,  $r = .30$  in Table 57, and  $r = .33$  in Table 59). Sleep Hallucinations had significantly stronger correlations with imagination/absorption in 59 of 94 comparisons (62.8%) at  $p < .05$ , in 33 of 94 comparisons (35.1%) at  $p < .01$ , and in 8 of 94 comparisons (8.5%) at  $p < .001$ . Sleep Hallucinations had significantly stronger correlations with depersonalization/derealization in 60 of 94 comparisons (63.8%) at  $p < .05$ , in 47 of 94 comparisons (50.0%) at  $p < .01$ , and in 16 of 94 comparisons (17.0%) at  $p < .001$ . This also supports the symptom continuity hypothesis given that people who have unusual dreams at night also tend to have an active imagination/fantasy life during the day. Sleep

hallucinations were also related to unusual beliefs/experiences in Table 56 ( $r = .30$ ), but this finding did not replicate in the other tables.

As in the student data, Sleep Paralysis and Vivid Dreams tended to have weak, nonspecific relations with daytime symptoms. The Sleep Paralysis scales did not correlate at .30 or above in any of the tables. In most analyses, Vivid Dreams did not correlate at .30 or above with any symptom dimension. The one exception is in Table 56, where ISDI Vivid Dreams correlated .38 with DPS Imagination. This correlation was significantly stronger in 21 of 22 comparisons (95.5%) at  $p < .05$ .

#### Summary of Lower Order Sleep Facets and Their Correlations with Questionnaire and Interview Measures of Daytime Symptoms

These analyses revealed that the individual ISDI scales contained within the three higher order sleep factors have differential relations to daytime symptom dimensions (e.g., although the Unusual Sleep Experiences factor shows specificity to PTSD, not all the scales comprising the Unusual Sleep Experiences factor show specificity to PTSD). In particular, five scales showed the most evidence of specificity, including Fatigue, Nightmares, Sleep Hallucinations, Vivid Dreams, and Sleep Paralysis. Of these scales, only Fatigue, Nightmares, and Sleep Hallucinations showed replicable patterns of correlations with daytime symptoms.

Fatigue showed specificity to dysphoria compared to other symptom dimensions and had a significantly higher correlation with dysphoria in 166 of 178 comparisons (93.3%) at  $p < .05$ , in 129 of 178 comparisons (72.5%) at  $p < .01$ , and 77 of 178 comparisons (43.3%) at  $p < .001$ . This suggests that this component of Lassitude is most relevant when examining the relation between sleep complaints and depression. Fatigue appears to be a hallmark of dysphoria whereas other dimensions of Lassitude, such as excessive sleep and irregular schedule, represent more nonspecific sleep complaints.

Nightmares showed specificity to symptoms of PTSD, in particular, traumatic intrusions and avoidance. Nightmares had a significantly stronger correlation with Traumatic Intrusions in 144 of 178 comparisons (80.9%) at  $p < .05$ , in 102 of 178 comparisons (57.3%) at  $p < .01$ , and 52 of 178 comparisons (29.2%) at  $p < .001$ . Nightmares had significantly stronger correlations with Traumatic Avoidance in 126 of 178 comparisons (70.8%) at  $p < .05$ , 95 of 178 comparisons (53.4%) at  $p < .01$ , and 44 of 178 comparisons (24.7%) at  $p < .001$ . Sleep Hallucinations showed specificity to dissociation, in particular, imagination/absorption and depersonalization/derealization. Sleep Hallucinations had a significantly stronger correlation with imagination/absorption in 89 of 198 comparisons (44.9%) at  $p < .05$ , in 51 of 198 comparisons (25.8%) at  $p < .01$ , and 18 of 198 comparisons (9.1%) at  $p < .001$ . Sleep Hallucinations had a significantly stronger correlation with depersonalization/derealization in 88 of 198 comparisons (44.4%) at  $p < .05$ , in 63 of 198 comparisons (31.8%) at  $p < .01$ , and in 25 of 198 comparisons (12.6%) at  $p < .001$ . Once again, this suggests that the Nightmares and Sleep Hallucinations facets of Unusual Sleep Experiences are more informative than other sleep dimensions within this factor; nightmares appear primarily in conjunction with PTSD, whereas hallucinations at night appear in conjunction with dissociation. Conversely, vivid dreams and sleep paralysis are more likely to appear in conjunction with a variety of daytime symptoms and these are less informative sleep complaints, at least in terms of their specificity.

#### Relation of Daytime Symptoms Across Sleep Complaints

In addition to examining the same sleep disturbance across daytime symptoms, I compared the same daytime symptom dimension across different sleep complaints. This allowed me to determine if certain sleep complaints are more relevant than others in the context of the daytime symptom dimensions. For example, although both nightmares and

insomnia are included in the diagnosis for PTSD, it is unclear if both sleep disturbances are strongly related to daytime symptoms of PTSD.

As mentioned earlier, I hypothesized that depression would be more strongly related to measures of lassitude than insomnia and that anxiety, including panic and social anxiety, would show similar relations to both lassitude and insomnia. Finally, I hypothesized that PTSD would show stronger relations to measures of nightmares than measures of insomnia and lassitude. I did not make specific hypotheses about symptoms of dissociation and schizotypy, but given that these domains were strongly related to sleep complaints within the Unusual Sleep Experiences factor, I assumed that they would be more strongly related to the scales within the Unusual Sleep Experiences factor than to measures of lassitude and insomnia.

These analyses were conducted using the questionnaire data because they provided a more complete data set than the interview data (i.e., several patients had missing interview data and several student interview scales were dropped due to problems with reliability). These analyses included the daytime symptoms of depression, anxiety, dissociation and schizotypy. For nighttime symptoms, I included ISDI Initial Insomnia as a measure of insomnia because this scale loaded strongly on the Insomnia factor in both samples. I included ISDI Fatigue as a measure of lassitude given that this scale loaded strongly on the Lassitude factor in both samples. I also included several scales within the Unusual Sleep Experiences factor that had strong relations with daytime symptoms, including Nightmares, Sleep Hallucinations, Vivid Dreams, and Sleep Paralysis. Table 60 shows these analyses in students, whereas Table 61 shows these analyses in patients.

To examine specificity, I selected the highest correlation of each daytime symptom scale with the ISDI scales, which are indicated in bold in the tables. This correlation was compared to all other ISDI scale correlations within a row using the Williams modification of the Hotelling test for dependent correlations (Kenny, 1987). As

is indicated in the tables, this correlation is significantly stronger than the correlations with different superscripts within a row at  $p < .05$ , one-tailed. In both students and patients, the correlation of IDAS Dysphoria with ISDI Fatigue was significantly stronger than the correlation of IDAS Dysphoria with all other sleep complaints (these comparisons were significant at  $p < .001$  in students and patients, with the exception of the comparison with ISDI Initial Insomnia, which was significant at  $p < .01$ ). As predicted, dysphoria shows specificity to measures of lassitude in 10 out of 10 comparisons at  $p < .01$ . IDAS Panic and Social Anxiety showed some evidence of specificity with Fatigue in students and in patients; however, these anxiety symptoms tended to show weaker, nonspecific relations with a variety of sleep complaints. Panic was only specific to Fatigue in 2 out of 10 comparisons at  $p < .05$ . Social Anxiety was specific to Fatigue in 7 out of 10 comparisons at  $p < .05$ .

The PTSD symptoms of traumatic intrusions and avoidance showed specificity to ISDI Nightmares. In patients, these PTSD symptoms had a significantly higher correlation with Nightmares than all other sleep complaints at  $p < .05$  (these comparisons were also significant at  $p < .01$ ). In students, the PTSD symptom of traumatic intrusions had a higher correlation with ISDI Nightmares than the corresponding coefficients, with the exceptions of ISDI Sleep Paralysis and Vivid Dreams, at  $p < .05$  (these findings were not significant at more stringent cut-offs). Overall, therefore, IDAS Traumatic Intrusions had a significantly higher correlation with ISDI Nightmares in 8 of 10 comparisons at  $p < .05$ .

The findings of specificity with measures of dissociation and schizotypy were more mixed. In students, the DPS scales had significantly higher correlations with ISDI Sleep-Related Hallucinations compared to the other sleep scales, with the exception of ISDI Vivid Dreams, at  $p < .05$  (these findings were not significant at more stringent cut-offs). In patients, the DPS scale of Detachment had a significantly higher correlation with ISDI Sleep Hallucinations compared to all other ISDI scales at  $p < .05$  (these

comparisons were also significant at  $p < .01$ ). This suggests that symptoms of dissociation, in particular the dimension of depersonalization/derealization, may show specificity to sleep hallucinations compared to measures of insomnia, lassitude and other scales within the factor of Unusual Sleep Experiences. The measures of schizotypy did not show strong, consistent evidence of specificity with any of the ISDI sleep scales in the two samples, suggesting that symptoms of schizotypy show weak, nonspecific relations with a variety of sleep complaints.

In summary, dysphoria shows specificity to lassitude/fatigue, whereas anxiety symptoms and schizotypy show nonspecific relations with a variety of sleep complaints. PTSD is specific to nightmares compared to other sleep complaints, suggesting that this is the most informative sleep complaint to examine within the context of PTSD symptoms. Dissociation shows some evidence of specificity with sleep hallucinations, but these findings were not as robust as the findings with the other daytime symptom dimensions and will need to be replicated.



## DISCUSSION

### Overview

The primary goal of the current study was to move beyond broad associations of nighttime and daytime symptoms and to determine which sleep disturbances show specificity to daytime symptoms. Although a great deal of research has established that sleep complaints are related to a variety of daytime symptoms, very few studies have focused on identifying which sleep disturbances show evidence of specificity. I examined specificity at both higher order (i.e., broad sleep factors) and lower order (i.e., specific sleep facets) levels by comparing the same sleep disturbance across daytime symptoms. As Watson (2009) discusses, these types of analyses have important taxonomic implications. By identifying and focusing on symptoms that show specificity, we can improve differential diagnosis and reduce comorbidity among disorders. For example, ensuring that the sleep disturbances included in a particular diagnosis are specific to that diagnosis/symptom cluster would reduce the overlap among disorders.

I also examined specificity by examining the same daytime symptom across different sleep complaints. Since many diagnoses contain multiple sleep complaints (e.g., nightmares and insomnia in PTSD), I was interested in whether certain sleep disturbances were more strongly related to the daytime symptoms within a particular domain. I assumed that in most cases this type of specificity would parallel the specificity described earlier. That is, it is likely that sleep disturbances would show specificity with a particular symptom dimension compared to both daytime and nighttime symptoms. For example, I hypothesized that nightmares are strongly related to PTSD symptoms compared to other daytime symptoms (e.g., social anxiety) and other sleep disturbances (e.g., lassitude). This would suggest that nightmares are a very specific and informative symptom.

In addition to focusing on specificity, this study addressed several limitations of previous research. First, this study utilized continuous symptom-based measures of sleep and psychopathology. These types of measures prevent the problem of low-base rates because symptoms of psychopathology and sleep disorders are more common than diagnoses in the general population. In addition, the symptoms within psychological disorders tend to be quite heterogeneous; symptom-based analyses allowed me to investigate the differential relations of sleep disturbances with these heterogeneous symptoms. The assessment battery included both interview and questionnaire measures of sleep and daytime symptoms, which reduced monomethod bias and allowed me to prove that associations between daytime and nighttime symptoms were robust and replicable. I also utilized a comprehensive assessment battery that included a wide range of sleep complaints and daytime symptoms. This allowed me to examine the specificity of sleep disturbances that are commonly associated with psychopathology (e.g., insomnia, lassitude) as well as the specificity of sleep disturbances that have been studied less frequently (e.g., nightmares, narcolepsy symptoms). Finally, I examined these relations in both college students and psychiatric patients, which allowed me to identify consistent relations that are robust across non-clinical and clinical samples.

#### Assessment of Sleep Complaints: ISDI and ISDI-CR

Before examining the specificity of sleep disturbances, I finalized two comprehensive sleep instruments: an expanded version of the ISDI (including new Sleep Hallucinations, Sleep Paralysis, and Vivid Dreams scales) and the ISDI-CR. The Sleep Hallucinations and Sleep Paralysis scales were developed using samples of students, psychiatric patients, and sleep disorder patients from a previously published dataset. These scales were then validated using the student and patient samples from the current study. The Vivid Dreams scale was developed using a student sample from a previous study and the samples from the current study. All of the new ISDI scales showed good

psychometric properties in terms of internal reliability, with the majority of coefficient alphas at .70 and above in students and psychiatric patients (see Table 5). In addition, the expanded ISDI showed strong evidence of convergent and discriminant validity with the corresponding interview ratings on the ISDI-CR (see Tables 6 and 7). The mean convergent correlation was .67 in students and .68 in patients. Of the 728 comparisons of the convergent and discriminant correlations, 726 were significant (99.7%). These analyses establish that the 14 sleep dimensions measured by the expanded ISDI can be differentiated from one another.

#### Assessment of Daytime Symptoms

The current study included questionnaire and interview measures of symptoms of depression, bipolar disorder, panic, social anxiety, agoraphobia, OCD, PTSD, dissociation, schizotypy, and drug/alcohol use. Prior to examining the relation of sleep complaints with these symptoms, I calculated the means and standard deviations for these symptom measures, the relations between questionnaire and interview measures, and the relations among the symptoms within a particular disorder. Regarding the mean scores on these measures, the patients exhibited more severe psychopathology (both in terms of sleep disturbances and daytime symptoms) compared to the students (see Table 8). For example, there were large effect sizes for interview and questionnaire measures of dysphoria and well-being. In addition, the patients' mean scores on the IDAS scales were similar to those previously reported in samples of psychiatric outpatients.

I then examined the convergent and discriminant validity of daytime symptom measures by correlating the IDAS-CR and PCCP items with the corresponding questionnaire scales (see Tables 9-11). Although the convergent and discriminant validity results with these interviews were not as strong as those found with the ISDI-CR, they were still encouraging and suggested that these interviews were valid measures of daytime symptoms. The mean convergent correlations for the IDAS-CR and

corresponding questionnaire measures were .52 and .54 in students and patients, respectively. Of a total of 532 comparisons of convergent and discriminant correlations in students and patients, 506 were significant (95.1%). The PCCP also showed good evidence of convergent validity with questionnaire measures. The mean convergent correlations were .48 and .58 in students and patients, respectively. Of a total of 400 comparisons of convergent and discriminant correlations, 385 were significant (96.3%).

Finally, I investigated the relations among daytime symptoms by 1) examining the correlations among the symptoms within a given disorder (see Tables 13-32) and 2) submitting the symptom measures to factor analysis (see Table 33). The symptoms of depression, including well-being, appetite loss, appetite gain, suicidality, and ill-temper, tended to be very weakly correlated on both questionnaire and interview measures. In contrast, the symptoms of bipolar disorder, OCD, PTSD, dissociation, schizotypy, and drug/alcohol use had moderate to strong correlations with one another, particularly in the questionnaire data. Using factor analysis, I was able to model four distinct factors in patients and students representing OCD, PTSD, Dissociation/Schizotypy, and Depression/Anxiety. Together, these results suggest that OCD and PTSD symptoms represent two distinct domains. Symptoms of depression and anxiety were closely related, as were symptoms of dissociation and schizotypy. These four disorders did not emerge as distinct factors in this study, although it is possible that they would form distinct factors with additional coverage. On the basis of these analyses, I primarily examined the relation of sleep complaints with individual symptom dimensions instead of disorders. It is clear that some disorders, in particular depression, consist of very heterogeneous symptoms that may show differential relations with sleep complaints.

### Structure of Sleep Complaints: Factor Analyses with Questionnaire and Interview Measures

I used the structure of sleep complaints as an organizing framework to examine the relation of sleep and psychopathology at both a higher order (i.e., sleep factor) and lower order (i.e. sleep scale) levels. Previous research has shown that the ISDI scales can be organized using a two-factor structure of sleep complaints, consisting of Insomnia and Lassitude. This two-factor structure is robust and was replicated in samples of students and psychiatric patients (Koffel & Watson, 2009a, in press). However, I hypothesized that I would obtain additional sleep factors in this study given that my assessment battery contained a broader variety of sleep disturbances than those found on the standard ISDI.

After submitting both questionnaire and interview measures of sleep disturbances to factor analyses, I found a robust and replicable three-factor structure consisting of Insomnia, Lassitude, and Unusual Sleep Experiences (see Table 36). This structure was clear and well defined, with very few cross-loadings. The factor loadings were similar in both students and psychiatric patients, with comparability coefficients ranging from .97 to .99 (see Table 38). The comparability coefficients were higher for the three-factor structure than for the two-factor and four-factor models, suggesting that this is the best fitting model. Insomnia included measures of long sleep latency and nighttime awakenings. Lassitude was represented by measures of fatigue, sleepiness, excessive sleep and irregular sleep-wake schedules. Unusual Sleep Experiences was represented by measures of vivid dreams, nightmares, and narcolepsy symptoms.

It is important to note that measures of restless legs syndrome, including movements and sensations at night, did not load strongly on these factors and may represent an additional factor. However, I was unable to extract additional factors beyond Insomnia, Lassitude, and Unusual Sleep Experiences that replicated in both students and patients. Additional measures of restless legs syndrome would need to be included in future analyses to further explore the possible existence of this factor.

Finally, the replicability of the three-factor structure in students and patients confirms previous findings showing that psychiatric patients and students have quantitatively—but not qualitatively—different sleep (Koffel & Watson, 2009a).

### Specificity I: Comparing Sleep Complaints Across Daytime

#### Symptoms

I examined the relation of sleep complaints with various daytime symptoms. These relations were examined in both patients and students using interview and questionnaire measures of daytime symptoms to ensure that findings replicated across samples and methods. The first set of analyses took place at a higher order level with the three sleep factors, followed by analyses at the lower order level with individual ISDI scales.

I had predicted that the Lassitude factor would be specific to measures of dysphoria. Indeed, the most robust evidence of specificity was the relation of Lassitude with dysphoria; Lassitude had a significantly stronger correlation with dysphoria than other daytime symptoms in 103 of 111 comparisons (92.8%) at  $p < .05$ . In 90 out of 111 significance tests at  $p < .01$ , Lassitude had a stronger correlation with dysphoria (81.1%). In 69 out of 111 significance tests at  $p < .001$ , Lassitude had a stronger correlation with dysphoria (62.2%). These comparisons included both questionnaire and interview measures in two separate samples of patients and students, which makes this finding remarkably robust (see Tables 39, 41, 43 and 45). This specificity appears to be mainly driven by measures of fatigue within the Lassitude factor. The ISDI Fatigue scale showed the most evidence of specificity with dysphoria, whereas the other ISDI scales within the Lassitude factor had weak, nonspecific relations with daytime symptoms. For example, Fatigue had a significantly higher correlation with dysphoria in 166 of 178 comparisons (93.3%) at  $p < .05$  (see Tables 52-59). Fatigue had significantly higher correlations with dysphoria in 129 of 178 comparisons (72.5%) at  $p < .01$ , and 77 of 178

comparisons (43.3%) at  $p < .001$ . This provides evidence that Lassitude, and in particular the lower order facet of fatigue, is a hallmark of dysphoria.

In contrast to Lassitude, the Insomnia factor showed more nonspecific relations with daytime symptoms. I had predicted that Insomnia would show weak specificity with dysphoria. Although Insomnia showed strong specificity with dysphoria in the student questionnaire data, these results did not replicate in the other analyses. Instead, Insomnia showed inconsistent evidence of specificity; that is, the daytime symptom that showed the highest correlation with Insomnia changed across analyses (e.g., dysphoria, mania, appetite loss, well-being). Overall, Insomnia was specific to dysphoria in only 56 of 111 comparisons (50.5%) at  $p < .05$  (see Tables 39, 41, 43 and 45). As would be expected, the ISDI scales contained within the Insomnia factor, including Initial Insomnia and Fragmented Sleep, showed nonspecific relations with daytime symptoms.

Regarding Unusual Sleep Experiences, I had hypothesized that this sleep factor would be specific to PTSD (in particular, traumatic intrusions), dissociation (in particular, imagination/absorption), schizotypy (in particular, unusual beliefs/experiences) and OCD (in particular, obsessive checking). Although Unusual Sleep Experiences showed moderate to high correlations with all the symptom dimensions of PTSD, the strongest evidence for specificity was with traumatic intrusions. Unusual Sleep Experiences had a significantly stronger correlation with traumatic intrusions in 86 of 111 comparisons (77.5%) at  $p < .05$ , 71 out of 111 comparisons at  $p < .01$  (63.9%), and 42 out of 111 comparisons at  $p < .001$  (37.8%) (see Tables 39, 41, 43 and 45). Unusual Sleep Experiences also showed some specificity to symptoms of dissociation, although these results were less robust than those seen with PTSD. For example, Unusual Sleep Experiences was most highly correlated with obliviousness/amnesia in the student sample and with imagination/absorption and depersonalization/derealization in the patient sample. Although I had hypothesized that Unusual Sleep Experiences would be specific to imagination/absorption, this was true in only 58 out of 113 comparisons (51.3%) at  $p <$

.05, 45 out of 113 comparisons at  $p < .01$  (39.8%) and 26 out of 113 comparisons at  $p < .001$  (23.0%) (see Tables 39, 41, 43 and 45).

Contrary to my predictions, Unusual Sleep Experiences did not show consistent evidence of specificity with symptoms of schizotypy and OCD (see Tables 39, 41, 43 and 45). For example, Unusual Sleep Experiences had significantly stronger relations with obsessive checking in only 24 of 111 comparisons (21.6%) at  $p < .05$ . Similarly, Unusual Sleep Experiences had significantly stronger relations with unusual beliefs/experiences in only 45 of 113 comparisons (39.8%) at  $p < .05$ . Overall, there is evidence that Unusual Sleep Experiences, PTSD and, to some extent, dissociation form a common domain; there is less support for the inclusion of schizotypy and OCD.

Within the Unusual Sleep Experiences factor, ISDI Nightmares showed specificity to symptoms of PTSD (in particular, traumatic intrusions and avoidance), as was predicted. Nightmares had a significantly stronger correlation with traumatic intrusions in 144 of 178 comparisons (80.9%) and with traumatic avoidance in 126 of 178 comparisons (70.8%) at  $p < .05$  (see Tables 52-59). Nightmares had a significantly stronger correlation with traumatic intrusions in 102 of 178 comparisons (57.3%) at  $p < .01$  and 52 of 178 comparisons (29.25%) at  $p < .001$ . Nightmares had significantly stronger correlations with traumatic avoidance in 95 of 178 comparisons (53.4%) at  $p < .01$  and 44 of 178 comparisons (24.7%) at  $p < .001$ . The other scale in the Unusual Sleep Experiences factor that showed specificity with daytime symptoms was ISDI Sleep Hallucinations. This scale was strongly related to symptoms of dissociation. In particular, it had significantly stronger correlations with imagination/absorption in 89 of 198 comparisons (44.9%) and with depersonalization/derealization in 88 of 198 comparisons (44.4%) at  $p < .05$  (see Tables 52-59). Sleep Hallucinations had a significantly stronger correlation with imagination/absorption in 51 of 198 comparisons (25.8%) at  $p < .01$ , and 18 of 198 comparisons (9.1%) at  $p < .001$ . Sleep Hallucinations had a significantly stronger correlation with depersonalization/derealization in 63 of 198



comparisons (31.8%) at  $p < .01$  and in 25 of 198 comparisons (12.6%) at  $p < .001$ . It appears that Nightmares and Sleep Hallucinations are the most informative facets of Unusual Sleep Experiences. Two other ISDI scales within Unusual Sleep Experiences, Vivid Dreams and Sleep Paralysis, tended to show moderate relations with daytime symptoms but did not show specificity. The remaining scales within Unusual Sleep Experiences were weakly related to daytime symptoms.

The analyses involving the individual ISDI scales also helped address the symptom continuity hypothesis. I wanted to examine whether unusual perceptual experiences during the day (e.g., traumatic intrusions, imagination/absorption, unusual beliefs/experiences) would show specificity to unusual perceptual experiences at night (e.g., nightmares, vivid dreams, sleep hallucinations). In this study, people who report having nightmares also report having traumatic intrusions during the day, as evidenced by the specificity of ISDI Nightmares with measures of traumatic intrusions. Similarly, people who report having hallucinations at night also report an active fantasy life and vivid daydreams, as evidenced by the specificity of ISDI Sleep Hallucinations with measures of imagination/absorption.

Several mechanisms have been proposed to explain the overlap of these unusual sleep experiences and daytime symptoms, including abnormalities of the sleep-wake cycle, stress and trauma, and underlying personality traits (Koffel & Watson, 2009b). For example, the tendency to experience intrusions of sleep states during wakefulness and vice versa would lead to sleep hallucinations, daydreams, and flashbacks (Mahowald & Schenck, 2001). The blurring of sleep-wake boundaries may be due to environmental stress or biological factors. For example, traumatic events often precede both unusual perceptual experiences during the day (e.g., flashbacks, dissociative episodes) and at night (e.g., nightmares, hallucinations) (Gershuny & Thayer, 1999; Harvey, Jones, & Schmidt, 2003). Additionally, the higher order personality trait of Oddity may account for unusual cognitions and perceptions during the day and at night (Watson, Clark et al.,

2008). It has been suggested that people who are high on this trait experience a thin boundary between sleeping and waking states and may easily pass from one to another (Watson, 2001).

### Specificity II: Comparing Daytime Symptoms Across Sleep

#### Complaints

Although it was not the primary focus of this study, I examined how the same daytime symptom dimension related to various sleep complaints. This allowed me to determine if particular sleep complaints are more relevant than others in the context of daytime symptoms. I conducted these analyses using both sleep factors and individual ISDI scales. At the higher order level, daytime symptoms showed the most specificity to Lassitude and Unusual Sleep Experiences (see Tables 39, 41, 43 and 45). Very few symptoms showed specificity to Insomnia in the student and patient samples. In the student interview data and the patient interview and questionnaire data, measures of dysphoria showed specificity with Lassitude compared to Insomnia and Unusual Sleep Experiences. In both samples, symptoms of PTSD, dissociation, and schizotypy showed significantly stronger correlations with the Unusual Sleep Experiences factor compared to Insomnia and Lassitude, although the particular symptom within each domain tended to vary across analyses. In general, these specificity analyses within a row paralleled the specificity analyses within a column. That is, Lassitude is specific to dysphoria compared to other sleep factors and other daytime symptoms. Similarly, Unusual Sleep Experiences shows specificity with PTSD and dissociation (and to a lesser extent, schizotypy) compared to other sleep factors and other daytime symptoms.

Next I examined the specificity of daytime symptoms with individual ISDI scales using the questionnaire data (see Tables 60 and 61). In both students and patients, IDAS Dysphoria showed specificity to ISDI Fatigue compared to other sleep complaints. Combining these analyses with the earlier specificity findings, it appears that fatigue is

specific to dysphoria compared to other daytime and nighttime symptoms. IDAS Traumatic Intrusions had significantly higher correlations with ISDI Nightmares in both students and patients. Thus, nightmares are specific to traumatic intrusions compared to other daytime and nighttime symptoms. Finally, the DPS scale of Detachment had a significantly higher correlation with ISDI Sleep Hallucinations compared to other ISDI scales in both students and patients. Combining these findings with earlier analyses provides evidence that sleep hallucinations are specific to depersonalization/derealization compared to other daytime and nighttime symptoms.

#### Implications of Specificity Findings

The findings in this study have important diagnostic, assessment, and taxonomic implications. Although a variety of sleep disturbances have been linked to psychopathology both in the research literature and in diagnostic criteria, the current study suggests that many of these relations are relatively weak and nonspecific. For example, the Insomnia factor and corresponding facets did not show strong, consistent evidence of specificity with any daytime symptoms. This is particularly concerning since insomnia is part of the diagnostic criteria of several disorders, including depression, PTSD, and GAD. Despite its inclusion in the diagnostic criteria of these disorders, insomnia is not more strongly related to symptoms of anxiety or depression compared to other sleep complaints or other daytime symptoms (e.g., dissociation, schizotypy). These findings suggest that including insomnia in the diagnostic criteria for depression and anxiety disorders hinders differential diagnosis and contributes to the high rate of comorbidity between these disorders.

The Lassitude and Unusual Sleep Experiences factors did show specificity to daytime symptoms, suggesting that these sleep experiences are diagnostically informative, particularly in the context of depression, PTSD, and dissociation. However, most of the scales that make up the Lassitude and Unusual Sleep Experiences factors

were relatively nonspecific. Within the Lassitude factor, only fatigue shows consistent evidence of specificity with dysphoria. Within the Unusual Sleep Experiences factor, only nightmares and sleep hallucinations show specificity with PTSD and dissociation, respectively. These analyses support the inclusion of fatigue in the diagnostic criteria of depression and the inclusion of nightmares in the criteria for PTSD. In addition, they suggest that sleep hallucinations are specific to dissociation and may be an informative symptom in the context of dissociative disorders.

In terms of assessment implications, this study suggests that sleep instruments need to 1) provide separate scores for the various dimensions of sleep disturbances and 2) include a broader range of sleep phenomena. This study provides support for a three-factor structure of sleep disturbances, in which lower order facets are grouped under the higher order factors of Lassitude, Insomnia, and Unusual Sleep Experiences.

Unfortunately many of the existing sleep instruments are not based on these underlying dimensions, which may result in a loss of information. For example, several widely used instruments simply collapse insomnia and lassitude items in a total score despite the fact that insomnia and lassitude can be modeled as separate dimensions that are only moderately correlated and that show differential relations with daytime symptoms. In addition to providing scores for the higher order factors, it would be advantageous if sleep instruments also provided information on lower order sleep facets. This study has demonstrated that lower order facets show varying degrees of specificity; for example, the fatigue facet of Lassitude is more informative in the context of depression than the Irregular Schedule facet. Finally, many existing sleep instruments do not provide scores for more unusual sleep phenomena, including symptoms of narcolepsy and nightmares. However, these sleep experiences (in particular, sleep hallucinations) show impressive specificity with daytime symptoms.

This study also has important taxonomic implications, both in terms of the arrangement of sleep disorders in the *DSM-IV-TR* and their placement in general models

of psychopathology. In the current arrangement of the *DSM-IV-TR*, sleep disorders are organized into four major sections: primary sleep disorders, sleep disorder related to another mental disorder, sleep disorder due to a general medical condition, and substance-induced sleep disorder. Each grouping contains a diverse array of sleep complaints. For example, the primary sleep disorders grouping includes insomnia, hypersomnia, narcolepsy, breathing-related sleep disorder, circadian rhythm sleep disorder, and dyssomnia not otherwise specified. The sleep disorder related to another mental disorder includes insomnia and hypersomnia. The structural analyses conducted in this study have illustrated that these groups contain both distinct (e.g., insomnia and hypersomnia) and closely related (e.g., hypersomnia and circadian rhythm sleep disorder) sleep disturbances. It may be more informative for both research and clinical purposes to organize these complaints according to underlying structural models (e.g., Insomnia, Lassitude, and Unusual Sleep Experiences).

This study also provides some guidance as to where sleep disturbances should be located in general models of psychopathology. For example, one widely supported model of psychopathology consists of an Externalizing dimension (alcohol dependence, drug dependence, antisocial personality disorder) and an Internalizing/Emotional Disorders dimension. This dimension can be further divided into Anxious Misery/Distress Disorders (major depression, dysthymia, GAD, PTSD), Fear/Fear Disorders (panic disorder, agoraphobic, social phobia, specific phobia), and Bipolar Disorders (bipolar I disorder, bipolar II disorder, cyclothymia) (Krueger, 1999; Watson, 2005). Lassitude and to some extent, Insomnia, would most likely fall within the Anxious Misery/Distress Disorders dimension based on their relations with dysphoria. Unusual Sleep Experiences is not as easily classified, however, given its relations with both the Anxious Misery/Distress Disorders dimension (PTSD) and with disorders that are not currently included in these models (dissociation). It is clear that more work needs

to be done in order to locate Unusual Sleep Experiences within general structural models of psychopathology.

Watson (2009) has advocated supplementing disorder-based structural analyses, such as those described above, with symptom-based analyses. In this approach, depression and anxiety symptoms would be classified based on two quantitative dimensions: 1) the level of specificity with traditional indicators of depression and anxiety and 2) the magnitude of general distress variance (i.e., relation with Neuroticism/Negative Emotionality). In this scheme, differential diagnosis is improved by focusing on both high and low distress symptoms that show greater specificity. High distress symptoms with limited specificity are important clinically, but offer more of a challenge for differential diagnosis. Conversely, low distress symptoms with limited specificity are less valuable in both a clinical and a diagnostic context. Given that this study focused on the first dimension (i.e., specificity of sleep disturbances with symptoms of anxiety/depression), additional research is needed to explicate the role of the second dimension (i.e., the relation of higher order and lower order sleep complaints with general distress).

I have demonstrated that several sleep disturbances—such as fatigue and nightmares—show a high degree of specificity with symptoms of anxiety and depression. These sleep disturbances are thus important for differential diagnosis. However, many other sleep complaints showed limited specificity; it remains to be determined if they are high distress symptoms that have clinical importance or low distress symptoms that offer little information both clinically and diagnostically. In previous research, I have found that lassitude is highly correlated with Neuroticism/Negative Emotionality, whereas insomnia has weaker correlations with general distress (Koffel & Watson, 2009a). This suggests that lassitude is a more important symptom both in terms of clinical significance and diagnostic specificity compared to insomnia. Similar studies will need to be conducted on a wider range of sleep disturbances.

### Limitations and Future Directions

Although this study has improved on previous research both in terms of a comprehensive assessment battery and symptom-based analyses, there are several limitations that should be addressed in future research. First, this study was based only on samples of students and psychiatric patients. It will be important to examine the structure and specificity of sleep complaints in additional populations with sleep disturbances, including older adults, sleep disorder patients, and medical patients. It is possible that factors such as age and patient status could influence the number of sleep dimensions that can be identified in structural analyses; this may result in different models across different populations (O'Connor, 2002).

In my previous work I have found that sleep disorder patients, psychiatric patients, and older adults have quantitatively but not qualitatively different sleep complaints compared to younger non-patients, which leads to structural invariance across samples. The two-factor structure of Insomnia and Lassitude has shown to be quite robust across populations, including younger and older adults and sleep disorder patients (Koffel & Watson, 2009a, in press). However, the three-factor structure presented in this paper, consisting of Insomnia, Lassitude, and Unusual Sleep Experiences, is quite preliminary. Very few studies include measures of sleep disturbances that define the Unusual Sleep Experiences factor (e.g., narcolepsy symptoms, vivid dreams). I was able to demonstrate that the three-factor structure replicated quite well across students and patients, with high comparability coefficients. However, the three-factor model will need to be replicated in additional samples, particularly those with an elevated risk of sleep problems.

Future research will need to determine if additional factors beyond Insomnia, Lassitude, and Unusual Sleep Experiences can be identified. In particular, it appears that measures of restless legs syndrome (e.g., movements and sensations at night) tend to cohere together when a fourth factor is extracted, although this fourth factor was unstable

and under-defined in the current study. For example, in students this fourth factor was defined by ISDI and ISDI-CR Movements at Night. In patients, this fourth factor was defined by ISDI and ISDI-CR Movements at Night, as well as by ISDI and ISDI-CR Sensations at Night. It is possible that this fourth factor is exclusive to patient populations. However, the findings in this study regarding this factor are not conclusive, in part because very few measures of restless legs syndrome were included. Including additional measures of restless legs syndrome beyond the ISDI and ISDI-CR will be necessary to determine the nature of this fourth factor and whether it shows specificity to daytime symptoms.

The current study was primarily limited to measures of internalizing disorders and dissociation/schizotypy. It will be necessary to expand this work to include a broader range of externalizing symptoms (e.g., conduct disorder, antisocial personality disorder). The questionnaire measures of drug and alcohol use included in this study did not show strong relations with sleep complaints, suggesting that sleep disturbances are primarily linked to internalizing symptoms and dissociation/schizotypy, although further work needs to be done to confirm this finding. Further research is also needed to examine how sleep disturbances relate to broader domains of psychological disorders. For example, this study examined the relation of higher order sleep disturbances and lower order sleep facets with specific symptom dimensions. However, preliminary analyses suggest that these symptom dimensions can be grouped under higher order factors of PTSD, OCD, Dissociation/Schizotypy, and Depression/Anxiety. Lassitude appears to be specific to the Depression/Anxiety factor, whereas Unusual Sleep Experiences appears to be specific to PTSD and Dissociation/Schizotypy. Although this four-factor model of daytime symptoms needs to be replicated and possibly expanded to include externalizing symptoms, it will be interesting to continue examining the relation of sleep complaints with these broader domains.



Another limitation of the current study is its cross-sectional design. Longitudinal research is necessary to examine how the relations between sleep complaints and daytime symptoms develop and change over time. For example, the research reviewed earlier suggests that people with insomnia and hypersomnia are at greater risk for developing depression than those without sleep disturbances, even when controlling for previous diagnoses. Similarly, there is some indication that sleep deprivation increases dissociative tendencies (Giesbrecht, Smeets, Leppink, Jelicic, & Merckelbach, 2007). Longitudinal studies can also address the question of whether treatment of sleep disturbances leads to improvement of daytime symptoms. Although very few studies have been done in this area, there is some indication that treatment of sleep disturbances reduces symptoms of depression (Manber et al., 2008). Finally, longitudinal studies would be valuable in examining the chronology of daytime and nighttime symptoms following a trauma to determine if environmental stress represents a common mechanism.

Future research is also needed to examine the relation of sleep complaints with temperament and personality dimensions to help account for the overlap of sleep and psychopathology. There is some evidence that Insomnia and Lassitude are linked to the temperament dimensions of Neuroticism/Negative Emotionality and Extraversion/Positive Emotionality (Koffel & Watson, 2009a). These relations can help account for the specificity (or nonspecific relations) of these sleep disturbances with daytime symptoms. For example, depression and anxiety disorders share a component of general distress represented by high levels of Neuroticism/Negative Emotionality (Watson, Clark, & Carey, 1988). In addition, low levels of Extraversion/Positive Emotionality are specific to depression and distinguish it from the anxiety disorders. This model has received strong support in a number of studies; most notably, indicators of low Extraversion/Positive Emotionality are more strongly related to depression than to the anxiety disorders, with the exception of social anxiety (see Clark, Watson, & Mineka,

1994; Mineka, Watson, & Clark, 1998; Watson, 2005; Watson et al., 1988). Sleep complaints that are exclusively related to Neuroticism/Negative Emotionality can be considered nonspecific symptoms of anxiety and depression, whereas sleep complaints that are also related to Extraversion/Positive Emotionality can be considered specific to depression.

I have found that lassitude is highly correlated with Negative Emotionality/Neuroticism and (low) Extraversion/Positive Emotionality; consequently, lassitude is specific to depression (Koffel & Watson, 2009a). Conversely, insomnia has weaker relations with these temperament dimensions and is nonspecific across measures of depression and anxiety. It is unclear how the Unusual Sleep Experiences factor relates to various temperament/personality dimensions, although there is some indication that both unusual Sleep Experiences and dissociation are linked to the higher order personality dimensions of Oddity that was discussed earlier. It is likely that explicating these relations will help account for the specificity of Unusual Sleep Experiences with select symptoms of PTSD and dissociation.

It is clear that sleep disturbances are prominent in psychopathology and the current study suggests that several sleep disturbances show impressive diagnostic specificity. At the same time, many sleep disturbances are not very informative in the context of psychological disorders, despite their inclusion in diagnostic criteria and their emphasis in the research literature. It is my hope that the current study helps to highlight the importance of identifying sleep symptoms that show evidence of specificity. Focusing on these symptoms will ultimately improve differential diagnosis, assessment, and treatment of psychopathology.

## APPENDIX

## TABLES

Table 1. Correlations Between Higher Order Sleep Factors and Inventory of Depression and Anxiety Symptoms (IDAS) in Psychiatric/Sleep Disorder Patients (Standardized Combined Sample)

IDAS scale	Lassitude	Insomnia
Dysphoria	.49	.41
Panic	.37	.43
Social Anxiety	.34	.32
Well-Being	-.33	-.20
Ill Temper	.27	.33
Appetite Loss	.25	.23
Traumatic Intrusions •	.23	.33
Appetite Gain	.23	.18
Suicidality	.21	.31

*Note.*  $N = 393$ . All correlations significant at  $p < .01$ . • sleep-related item removed.

Table 2. Intraclass Correlations for the Iowa Sleep Disturbances Inventory Clinician Rating Scale (ISDI-CR)

ISDI-CR scale	Intraclass $r$	
	Student	Psychiatric patient
Nightmares	.67	.89
Movement at Night	.85	.89
Sensations at Night	.79	.85
Light Sleep	.92	.92
Excessive Sleep	.87	.60
Irregular Schedule	.85	.92
Fatigue	.85	.80
Nonrestorative Sleep	.73	.81
Initial Insomnia	.81	.87
Fragmented Sleep	.74	.90
Anxiety at Night	.81	.86
Sleep Paralysis	.89	.89
Cataplexy	.77	.88
Sleep Hallucinations	.73	.80
Vivid Dreams	.65	.83
Behaviors During the Night	.96	.74

*Note.*  $n = 51$  (students),  $n = 50$  (patients).

Table 3. Intraclass Correlations for the Clinician Rating Version of the Inventory of Depression and Anxiety Symptoms (IDAS-CR)

IDAS-CR scale	Intraclass $r$	
	Student	Psychiatric patient
Dysphoria	.88	.93
Ill Temper	.89	.88
Well-Being	.51	.83
Appetite Loss	1.00	.87
Appetite Gain	.86	.87
Suicidality	.70	.88
Traumatic Intrusions	.81	.96
Traumatic Avoidance	.97	.88
Traumatic Hyperarousal	-.03	.88
Social Anxiety	.78	.92
Panic	.89	.95
Mania	.83	.92
Euphoria	.79	.90

*Note.*  $n = 51$  (students),  $n = 50$  (patients).

Table 4. Intraclass Correlations for the Personality, Cognitions, Consciousness, and Perceptions Interview (PCCP)

PCCP scale	Intraclass $r$	
	Student	Psychiatric patient
Checking/Doubting	.57	.71
Cleaning/Washing	.68	.83
Intrusive Thoughts/Obsessions	.19	.77
Ordering/Rituals	.84	.81
Hoarding	.54	.96
Obliviousness/Amnesia	.59	.88
Depersonalization/Derealization	.70	.82
Imagination/Absorption	.49	.76
Social Anhedonia	.47	.82
Supernatural Beliefs	.77	.87
Paranoia	.24	.72
Hallucinations	—	.85
Eccentricity/Oddity	.67	.61

*Note.*  $n = 51$  (students),  $n = 50$  (patients).

Table 5. Internal Consistency Reliabilities (Coefficient Alphas) and Average Interitem Correlations (AICs) of the Expanded Iowa Sleep Disturbances Inventory (ISDI) Scales

ISDI scale (# of items)	Previous study						Current study			
	Student		Psychiatric patient		Sleep disorder patient		Student		Psychiatric patient	
	$\alpha$	AIC	$\alpha$	AIC	$\alpha$	AIC	$\alpha$	AIC	$\alpha$	AIC
Sleep Hallucinations (5)	.68	.30	.68	.30	.76	.39	.71	.33	.70	.32
Sleep Paralysis (4)	.74	.42	.82	.53	.85	.59	.79	.48	.78	.47
Vivid Dreams (9)	.72	.22					.72	.22	.77	.27
<i>Mean values</i>	.71	.32	.76	.42	.81	.50	.74	.35	.75	.36

*Note.*  $n = 374$  (students, previous study), 188 (psychiatric patients, previous study), 205 (sleep disorder patients, previous study), 219 (students, current study), and 200 (psychiatric patients, current study).

Table 6. Correlations Between the Iowa Sleep Disturbances Inventory (ISDI) and the Iowa Sleep Disturbances Inventory Clinician Rating Scale (ISDI-CR) in Student Sample

ISDI scale	ISDI-CR item													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Irregular Schedule	<b>.78</b>	.03	.31	.31	.12	.03	.32	.11	.16	.12	.16	.11	.16	.05
2. Light Sleep	.05	<b>.77</b>	.26	.25	.06	-.04	.05	.18	.15	.11	.08	.21	.24	.03
3. Initial Insomnia	.28	.35	<b>.73</b>	.25	-.02	.02	.26	.07	<u>.43</u>	.06	.14	.15	<u>.49</u>	.04
4. Fatigue	.30	.18	.27	<b>.71</b>	.33	.05	<u>.47</u>	.10	.27	.05	.24	.27	.29	.17
5. Excessive Sleep	.16	-.10	-.02	.31	<b>.70</b>	-.02	.16	.08	-.12	.07	.11	.01	-.02	.09
6. Movement at Night	-.02	-.08	.00	.02	-.12	<b>.70</b>	.16	.00	.10	.11	.09	.01	.01	.14
7. Nonrestorative Sleep	.34	.18	.33	<u>.41</u>	.20	.10	<b>.68</b>	.06	.22	.07	.20	.13	.19	.09
8. Sleep Paralysis	.06	.11	.16	.20	.11	.07	.12	<b>.67</b>	.00	.19	.31	.22	.10	.22
9. Fragmented Sleep	.13	.25	.38	.25	.02	.09	.07	.09	<b>.62</b>	.03	.22	.20	.34	.13
10. Sensations at Night	.04	.07	.05	.15	-.02	.25	.12	.23	.09	<b>.60</b>	.10	.12	.05	.15
11. Sleep Hallucinations	.12	.08	.15	.16	-.03	.11	.19	.18	.21	.05	<b>.59</b>	.22	.09	.26
12. Nightmares	.10	.17	.20	.29	.06	.05	.17	.26	.27	.06	.26	<b>.59</b>	.26	.32
13. Anxiety at Night	.07	.22	<u>.42</u>	.14	-.06	.03	.09	.04	.37	.06	.11	.19	<b>.58</b>	.12
14. Vivid Dreams	.08	.01	.13	.11	.05	.01	.12	.24	.05	-.02	.22	.31	.08	<b>.51</b>



Table 6. (cont.)

*Note.*  $n = 219$ . Convergent correlations are in bold along the diagonal. Discriminant correlations of  $|.40|$  and greater are underlined. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 7. Correlations Between the Iowa Sleep Disturbances Inventory (ISDI) and the Iowa Sleep Disturbances Inventory Clinician Rating Scale ( ISDI-CR) in Psychiatric Patient Sample

ISDI scale	ISDI-CR item													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Light Sleep	<b>.79</b>	.05	.00	.39	.10	-.08	.23	-.10	.01	-.14	-.03	.24	.09	.01
2. Irregular Schedule	-.01	<b>.76</b>	.23	.00	.01	.00	.22	.27	.00	.02	.20	.27	.02	-.04
3. Fatigue	.01	.26	<b>.73</b>	.17	.08	.08	.09	.38	.04	.05	.30	.13	.05	.00
4. Fragmented Sleep	<u>.41</u>	.14	.07	<b>.73</b>	.27	.09	.33	-.04	.02	.00	-.01	.36	.07	.17
5. Nightmares	.13	.01	.09	.20	<b>.72</b>	.13	.12	.11	.00	.10	.11	.18	.32	<u>.42</u>
6. Movement at Night	-.09	-.12	-.02	.12	.12	<b>.72</b>	.00	.06	.12	.06	.06	-.03	-.02	.11
7. Initial Insomnia	.24	.33	.06	.29	.11	.04	<b>.70</b>	-.01	.10	.06	.23	<u>.52</u>	.08	.01
8. Excessive Sleep	-.08	.12	.28	-.04	.21	.05	-.09	<b>.70</b>	-.07	.06	.15	.01	.04	.14
9. Sensations at Night	.04	.01	-.13	.08	.08	.27	.14	-.05	<b>.68</b>	.04	.12	.03	.09	.04
10. Sleep Paralysis	-.00	.02	.14	.05	.16	.03	.02	.07	.04	<b>.66</b>	.02	.03	.24	.12
11. Nonrestorative Sleep	.09	.28	.39	.10	.03	.03	.22	.16	.06	-.01	<b>.64</b>	.18	-.01	-.02
12. Anxiety at Night	.18	.21	.05	.31	.35	.07	<u>.47</u>	.12	.06	.09	.09	<b>.60</b>	.07	.10
13. Sleep Hallucinations	.05	.10	.02	.18	.37	.03	.22	.02	.07	.28	.03	.13	<b>.54</b>	<u>.41</u>
14. Vivid Dreams	.05	.01	.03	.13	<u>.41</u>	-.04	.06	.04	.08	.23	-.03	.07	.26	<b>.52</b>

Table 7. (cont.)

*Note.*  $n = 200$ . Convergent correlations are in bold along the diagonal. Discriminant correlations of  $|.40|$  and greater are underlined. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 8. Descriptive Statistics for Questionnaire and Interview Measures

Instrument and scale	Psychiatric patient		Student		Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
<b>ISDI</b>					
Nightmares	4.00	3.90	1.68	2.33	.69**
Fatigue	6.53	3.40	4.18	3.34	.66**
Fragmented Sleep	3.90	3.29	2.03	2.26	.63**
Vivid Dreams	4.49	2.60	3.26	2.26	.49**
Anxiety at Night	5.00	2.25	3.87	2.45	.47**
Initial Insomnia	6.19	4.39	4.36	3.96	.43**
Nonrestorative Sleep	5.61	2.56	4.54	2.85	.39**
Sensations at Night	1.35	1.87	.88	1.47	.28**
Light Sleep	3.21	2.50	2.58	2.40	.26**
Movement at Night	1.96	1.95	2.34	2.12	-.19
Irregular Schedule	2.22	1.98	1.88	1.91	.18
Sleep Hallucinations	1.05	1.36	.83	1.27	.16
Sleep Paralysis	.41	.94	.30	.83	.12
Excessive Sleep	2.25	2.01	2.21	2.05	.02
<b>ISDI-CR</b>					
Fatigue	2.28	.76	1.74	.73	.68**
Fragmented Sleep	1.98	.84	1.43	.67	.67**
Nightmares	1.69	.75	1.27	.50	.62**
Anxiety at Night	1.96	.78	1.52	.67	.57**
Nonrestorative Sleep	2.21	.77	1.83	.77	.48**
Initial Insomnia	1.90	.82	1.57	.72	.42**
Vivid Dreams	2.00	.80	1.71	.73	.37**
Sensations at Night	1.29	.62	1.10	.38	.36**

Table 8. (cont.)

Light Sleep	1.80	.86	1.55	.80	.29**
Sleep Paralysis	1.17	.47	1.09	.34	.20*
Irregular Schedule	1.89	.85	1.75	.83	.16
Movement at Night	1.85	.87	1.92	.91	-.09
Sleep Hallucinations	1.37	.65	1.32	.62	.07
Excessive Sleep	1.66	.75	1.63	.74	.05
ISES					
GSE	40.68	14.62	34.53	12.13	.45**
Lucid Dreaming	8.16	4.45	8.00	4.38	.04
PSQI	8.58	3.96	5.00	3.15	.90**
IDAS					
Dysphoria	26.65	8.72	19.03	7.15	.87**
Well-Being	20.20	7.16	26.06	5.96	-.82**
Panic	13.47	5.02	10.58	3.49	.64**
Traumatic Intrusions •	6.19	3.18	4.41	2.22	.62**
Social Anxiety	10.63	4.74	8.05	3.83	.57**
Lassitude	17.62	5.96	14.34	5.05	.57**
Insomnia	14.50	6.14	11.29	4.68	.57**
Ill Temper	9.38	4.36	7.22	2.78	.57**
Appetite Gain	7.42	3.24	6.12	2.62	.43**
Traumatic Avoidance	8.30	4.24	6.60	3.57	.43**
Mania	9.62	4.59	8.39	4.02	.28**
Euphoria	6.98	2.76	7.75	2.91	-.27**
Agoraphobia	6.84	3.53	6.02	2.54	.27**
Appetite Loss	6.02	3.38	5.47	2.71	.18
Cleaning	9.97	4.76	10.75	5.13	-.16
Checking	5.39	2.92	5.75	2.81	-.13
Ordering	8.11	4.27	8.50	3.81	-.10
Suicidality	8.37	3.79			

Table 8. (cont.)

## IDAS-CR

Dysphoria	2.29	.68	1.57	.63	.96**
Well-Being	1.92	.60	2.48	.58	-.87**
Suicidality	1.34	.58	1.02	.15	.71**
Social Anxiety	1.77	.71	1.30	.55	.71**
Panic	1.43	.67	1.09	.30	.64**
Ill Temper	1.79	.63	1.42	.55	.60**
Traumatic Intrusions	1.63	.73	1.29	.52	.53**
Mania	1.60	.73	1.29	.55	.47**
Traumatic Avoidance	1.56	.73	1.26	.54	.46**
Appetite Gain	1.51	.76	1.24	.53	.40**
Appetite Loss	1.44	.76	1.36	.67	.12
Euphoria	1.13	.35	1.16	.41	-.07
Traumatic Hyperarousal	1.30	.60			

## SCOPI

Pathological Impulses	12.88	5.77	11.21	4.41	.32**
Hoarding	11.27	5.78	9.71	4.52	.30**
Obsessive Cleanliness	25.73	9.14	27.18	8.33	-.17
Compulsive Rituals	15.08	7.59	16.04	7.87	-.12
Obsessive Checking	30.68	12.21	29.37	11.89	.11

## PCLC

Dysphoria •	15.68	5.59	10.61	4.03	.93**
Intrusions •	8.27	4.17	6.13	2.98	.57**
Hyperarousal	3.71	1.94	2.90	1.38	.47**
Avoidance	4.21	2.31	3.45	1.95	.35**

## DPS

Detachment	9.87	4.76	8.11	3.49	.41**
Obliviousness	36.89	11.76	32.11	12.55	.38**
Imagination	17.98	6.50	17.07	6.27	.14

Table 8. (cont.)

SPQ					
Social Anhedonia	5.24	4.23	2.70	3.06	.66**
Eccentricity/Oddity	6.04	4.01	3.84	3.75	.55**
Social Anxiety	4.11	2.65	2.72	2.31	.54**
Unusual Beliefs/Experiences	2.76	2.87	2.06	2.43	.26**
Mistrust	5.61	4.58	4.69	3.94	.21*
PCCP					
Social Anhedonia	1.53	.74	1.16	.40	.62**
Hoarding	1.49	.70	1.20	.42	.50**
Depersonalization/Derealization	1.22	.52	1.03	.20	.48**
Eccentricity/Oddity	1.29	.52	1.10	.34	.45**
Supernatural Beliefs	1.41	.68	1.17	.43	.42**
Obliviousness/Amnesia	1.39	.59	1.18	.41	.40**
Ordering/Rituals	1.39	.66	1.29	.54	.16
Checking/Doubting	1.43	.59	1.35	.56	.15
Imagination/Absorption	1.56	.69	1.47	.65	.14
Cleaning/Washing	1.25	.55	1.20	.49	.09
Hallucinations	1.10	.35			
Paranoia	1.35	.54			
Intrusive Thoughts/Obsessions	1.27	.59			
MAST	8.11	10.61	4.16	4.09	.49**
DAST	2.25	3.69	.85	1.67	.48**

*Note.*  $n = 219$  (students), 197 (psychiatric patients, IDAS-CR and PCCP), 200 (psychiatric patients, all other measures). \*  $p < .05$ ; \*\*  $p < .01$ . ISDI = Iowa Sleep Disturbances Inventory. ISDI-CR = ISDI Clinician Rating Scale. ISES = Iowa Sleep Experiences Survey. GSE = General Sleep Experiences scale. PSQI = Pittsburgh Sleep Quality Index. IDAS = Iowa Depression and Anxiety Scales. IDAS-CR = Clinician Rating version of the IDAS. SCOPI = Schedule of Compulsions, Obsessions, and Pathological Impulses. PCLC = PTSD Checklist, Civilian Version. DPS = Dissociative Processes Scales. SPQ = Schizotypal Personality Questionnaire. PCCP = Personality, Cognitions, Consciousness and Perceptions interview. MAST = Michigan Alcohol Screening Test. DAST = Drug Abuse Screening Test. • sleep-related items removed.

Table 9. Correlations Between the Inventory of Depression and Anxiety Symptoms (IDAS) and the Clinician Rating Version of the IDAS (IDAS-CR) in Student Sample

IDAS scale	IDAS-CR item										
	1	2	3	4	5	6	7	8	9	10	11
1. Appetite Loss	<b>.67</b>	.25	.20	.19	.22	.03	.21	-.09	-.09	.03	.14
2. Traumatic Intrusions •	.11	<b>.65</b>	.13	.26	<u>.49</u>	.23	.20	-.04	.07	-.10	.24
3. Social Anxiety	.14	.24	<b>.64</b>	.29	.21	.15	.21	-.14	.16	-.08	.13
4. Dysphoria	.24	.34	.35	<b>.59</b>	.25	.18	<u>.40</u>	-.26	.19	-.02	.30
5. Traumatic Avoidance	.05	<u>.46</u>	.21	.21	<b>.59</b>	.22	.18	-.02	.05	.03	.21
6. Ill Temper	.08	.33	.22	.35	.30	<b>.54</b>	.18	-.09	.15	.03	.19
7. Mania	.12	.18	.14	.30	.12	.13	<b>.53</b>	-.09	.17	.05	.22
8. Well-Being	-.17	-.05	-.26	<u>-.42</u>	-.11	-.03	-.17	<b>.43</b>	-.03	.14	-.21
9. Appetite Gain	-.10	.13	.19	.19	.09	.09	.08	-.02	<b>.43</b>	.03	.05
10. Euphoria	.08	.12	.02	.03	.08	.11	.16	.13	-.04	<b>.31</b>	-.08
11. Panic	.28	.35	.30	.37	.30	.14	.24	-.17	.11	.02	<b>.26</b>

*Note.*  $n = 219$ . Convergent correlations are in bold along the diagonal. Discriminant correlations of  $|.40|$  and greater are underlined. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. • sleep-related items removed



Table 10. Correlations Between Questionnaire Measures and the Clinician Rating Version of the IDAS (IDAS-CR) in Patient Sample

Scale	IDAS-CR item												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1. IDAS Suicidality	<b>.68</b>	.20	.32	.24	.20	.07	.18	.24	-.30	.04	.33	-.06	.13
2. IDAS Appetite Loss	.12	<b>.66</b>	.17	.14	.22	.15	.23	.09	-.16	-.23	.32	.07	.25
3. IDAS Dysphoria	.35	.14	<b>.63</b>	.20	.26	.34	.28	.32	<u>-.41</u>	.10	.31	-.10	.19
4. IDAS Traumatic Intrusions •	.23	.22	.21	<b>.62</b>	.18	.11	<u>.47</u>	.18	-.13	.06	.17	.02	<u>.41</u>
5. IDAS Ill Temper	.19	.16	.29	.12	<b>.60</b>	.17	.21	.20	-.16	.11	.27	-.09	.18
6. IDAS Mania	.13	.07	.23	.00	.11	<b>.59</b>	.22	.06	-.12	.00	.18	.08	.07
7. IDAS Traumatic Avoidance	.29	.20	.25	.41	.15	.15	<b>.58</b>	.16	-.15	.05	.24	.02	.33
8. IDAS Social Anxiety	.21	.08	.28	.04	.15	.13	.16	<b>.56</b>	-.23	.01	.21	.00	.07
9. IDAS Well-Being	-.23	-.16	<u>-.42</u>	-.03	-.10	-.05	-.14	-.15	<b>.55</b>	-.06	-.19	.27	-.13
10. IDAS Appetite Gain	.06	-.32	.15	.06	.09	.01	.04	.01	-.03	<b>.53</b>	.02	.05	-.07
11. IDAS Panic	.24	.29	.25	.13	.19	.21	.29	.18	-.21	.03	<b>.51</b>	.06	.21
12. IDAS Euphoria	.02	.02	.07	.00	.07	.33	.09	-.06	.16	.00	-.01	<b>.44</b>	.06
13. PCLC Hyperarousal	.04	.12	.17	.14	.28	.24	.23	.08	-.13	-.05	.22	.03	<b>.30</b>

Note.  $n = 197$ . Convergent correlations are in bold along the diagonal. Discriminant correlations of  $|.40|$  and greater are underlined. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. • sleep-related items removed

Table 11. Correlations Between Questionnaire Measures and the Personality, Cognitions, Consciousness and Perceptions Interview (PCCP) in Student Sample

Scale	PCCP item									
	1	2	3	4	5	6	7	8	9	10
1. IDAS Ordering	<b>.65</b>	.30	.13	-.01	.39	-.01	.14	.02	.10	-.01
2. IDAS Cleaning	.25	<b>.58</b>	-.02	-.07	.23	.03	.10	.06	.03	.06
3. SCOPI Hoarding	.30	.14	<b>.52</b>	.11	.09	.09	.25	.03	.12	.12
4. SPQ Eccentricity/Oddity	.24	.05	.15	<b>.51</b>	.16	.17	.31	.17	.29	-.02
5. IDAS Checking	.32	.27	.05	-.04	<b>.50</b>	.08	.17	-.07	.16	.05
6. SPQ Social Anhedonia	.11	-.01	.03	.26	.19	<b>.48</b>	.18	.00	.19	-.08
7. DPS Imagination	.22	.05	.09	.28	.25	.12	<b>.46</b>	.17	.34	.09
8. SPQ Unusual Beliefs/Experiences	.17	.02	.03	.25	.05	.06	.22	<b>.45</b>	.26	.03
9. DPS Obliviousness	.22	.09	.18	.23	.23	.14	.32	.13	<b>.40</b>	.14
10. DPS Detachment	.14	.01	-.01	.12	.11	.06	.28	.12	.31	<b>.21</b>

Note.  $n = 219$ . Convergent correlations are in bold along the diagonal. Discriminant correlations of  $|.40|$  and greater are underlined. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 12. Correlations Between Questionnaire Measures and the Personality, Cognitions, Consciousness and Perceptions Interview (PCCP) in Patient Sample

Scale	PCCP item										
	1	2	3	4	5	6	7	8	9	10	11
1. IDAS Cleaning	<b>.69</b>	.17	.24	.08	-.01	.10	.04	.19	.12	.16	.11
2. SCOPI Hoarding	.18	<b>.68</b>	.28	.02	-.02	.19	.14	.13	.19	.19	.14
3. IDAS Ordering	.14	.17	<b>.66</b>	.07	.13	.07	.08	.14	<u>.40</u>	.19	.12
4. SPQ Social Anhedonia	.09	-.01	.12	<b>.65</b>	.16	-.09	.13	.36	.07	.15	.11
5. DPS Detachment	.06	.20	.24	.02	<b>.58</b>	.22	.28	.25	.12	.25	.25
6. SPQ Unusual Beliefs/Experiences	.06	.29	.31	.11	.31	<b>.57</b>	.21	.30	.11	.38	.38
7. DPS Imagination	.07	.08	.24	-.02	.22	.04	<b>.52</b>	.13	.19	.21	.23
8. SPQ Mistrust	.10	.24	.29	.23	.17	.08	.13	<b>.52</b>	.11	.24	.14
9. IDAS Checking	.11	.14	.35	-.03	.05	-.07	-.05	.02	<b>.49</b>	.08	.08
10. SPQ Eccentricity/Oddity	.15	.20	.39	.23	.28	.19	.25	.31	.20	<b>.47</b>	.28
11. DPS Obliviousness	.03	.18	.22	.08	.29	.02	.34	.21	.24	.25	<b>.46</b>

*Note.*  $n = 197$ . Convergent correlations are in bold along the diagonal. Discriminant correlations of  $|.40|$  and greater are underlined. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 13. Correlations of Questionnaire Measures of Depression Symptoms with Other Daytime Symptoms in Student Sample

Scale	1	2	3	4
1. IDAS Well-Being	—			
2. IDAS Ill Temper	<b>-.16</b>	—		
3. IDAS Appetite Loss	<b>-.17</b>	<b>.25</b>	—	
4. IDAS Appetite Gain	<b>-.03</b>	<b>.24</b>	<b>.03</b>	—
5. IDAS Checking	-.02	.20	.15	.31
6. SCOPI Obsessive Checking	-.12	.28	.18	.29
7. IDAS Ordering	.01	.23	.18	.30
8. SCOPI Compulsive Rituals	.04	.14	.12	.19
9. IDAS Cleaning	-.02	.12	.12	.17
10. SCOPI Obsessive Cleanliness	.00	.12	.01	.14
11. SCOPI Hoarding	-.04	.18	.07	.25
12. SCOPI Pathological Impulses	-.10	.21	.19	.14
13. IDAS Traumatic Intrusions •	-.12	.43	.38	.11
14. PCLC Intrusions •	-.16	.44	.27	.12
15. IDAS Traumatic Avoidance	-.11	.40	.32	.14
16. PCLC Avoidance	-.13	.41	.25	.19
17. PCLC Hyperarousal	-.13	.33	.32	.08
18. DPS Imagination	-.05	.24	.25	.25
19. DPS Detachment	-.03	.18	.31	.10
20. DPS Obliviousness	-.12	.30	.31	.35
21. SPQ Unusual Beliefs/Experiences	-.10	.34	.24	.19
22. SPQ Mistrust	-.18	.41	.29	.23
23. SPQ Social Anhedonia	-.41	.18	.23	.10
24. SPQ Eccentricity/Oddity	-.18	.29	.17	.28

*Note.*  $n = 219$ . Convergent correlations are in bold. Correlations of  $|\cdot| \geq .14$  and greater are significant at  $p < .05$ , two-tailed.

Table 14. Correlations of Questionnaire Measures of Depression Symptoms with Other Daytime Symptoms in Patient Sample

Scale	1	2	3	4	5
1. IDAS Well-Being	—				
2. IDAS Ill Temper	<b>-.15</b>	—			
3. IDAS Appetite Loss	<b>-.11</b>	<b>.29</b>	—		
4. IDAS Appetite Gain	<b>.01</b>	<b>.20</b>	<b>-.32</b>	—	
5. IDAS Suicidality	<b>-.27</b>	<b>.30</b>	<b>.28</b>	<b>.04</b>	—
6. IDAS Checking	-.01	.15	.20	.00	.11
7. SCOPI Obsessive Checking	-.11	.26	.16	.08	.22
8. IDAS Ordering	.13	.23	.12	.11	.06
9. SCOPI Compulsive Rituals	.05	.16	.00	.15	.04
10. IDAS Cleaning	.03	.13	.08	.05	.11
11. SCOPI Obsessive Cleanliness	.03	.18	.08	.04	.08
12. SCOPI Hoarding	-.08	.16	-.04	.10	.09
13. SCOPI Pathological Impulses	-.10	.35	.17	.09	.34
14. IDAS Traumatic Intrusions •	-.10	.35	.31	.11	.44
15. PCLC Intrusions •	-.02	.35	.36	.07	.38
16. IDAS Traumatic Avoidance	-.13	.30	.35	.07	.44
17. PCLC Avoidance	-.21	.31	.39	-.03	.45
18. PCLC Hyperarousal	-.03	.45	.32	.03	.18
19. DPS Imagination	.05	.27	.19	.03	.27
20. DPS Detachment	-.10	.23	.26	.00	.32
21. DPS Obliviousness	-.18	.28	.19	.11	.27
22. SPQ Unusual Beliefs/Experiences	.07	.20	.15	.10	.07
23. SPQ Mistrust	-.10	.33	.11	.18	.33
24. SPQ Social Anhedonia	-.34	.26	.19	.13	.36
25. SPQ Eccentricity/Oddity	-.12	.30	.10	.14	.36

*Note.*  $n = 200$ . Convergent correlations are in bold. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 15. Correlations of Questionnaire Measures of Obsessive Compulsive Disorder (OCD) Symptoms with Other Daytime Symptoms in Student Sample

Scale	1	2	3	4	5	6	7	8
1. IDAS Checking	.__							
2. SCOPI Obsessive Checking	<b>.70</b>	.__						
3. IDAS Ordering	<b>.64</b>	<b>.56</b>	.__					
4. SCOPI Compulsive Rituals	<b>.48</b>	<b>.64</b>	<b>.77</b>	.__				
5. IDAS Cleaning	<b>.37</b>	<b>.44</b>	<b>.45</b>	<b>.46</b>	.__			
6. SCOPI Obsessive Cleanliness	<b>.36</b>	<b>.53</b>	<b>.40</b>	<b>.55</b>	<b>.73</b>	.__		
7. SCOPI Hoarding	<b>.29</b>	<b>.59</b>	<b>.33</b>	<b>.45</b>	<b>.21</b>	<b>.26</b>	.__	
8. SCOPI Pathological Impulses	<b>.14</b>	<b>.38</b>	<b>.21</b>	<b>.21</b>	<b>.05</b>	<b>.07</b>	<b>.38</b>	.__
9. IDAS Well-Being	-.02	-.11	.01	.04	-.20	.00	-.04	-.10
10. IDAS Ill Temper	.20	.28	.24	.14	.12	-.16	.18	.21
11. IDAS Appetite Loss	.15	.18	.18	.12	.12	-.17	.01	.19
12. IDAS Appetite Gain	-.31	.29	.30	.19	.17	.14	.25	.14
13. IDAS Traumatic Intrusions •	.24	.29	.23	.09	.07	.09	.11	.24
14. PCLC Intrusions •	.29	.43	.23	.22	.12	.20	.24	.27
15. IDAS Traumatic Avoidance	.34	.38	.21	.13	.08	.16	.17	.23
16. PCLC Avoidance	.26	.42	.18	.16	.09	.18	.24	.31

Table 15. (cont.)

17. PCLC Hyperarousal	.28	.47	.31	.30	.25	.25	.32	.37
18. DPS Imagination	.36	.53	.31	.34	.16	.18	.44	.53
19. DPS Detachment	.20	.34	.22	.21	.08	.10	.20	.35
20. DPS Obliviousness	.32	.55	.32	.32	.19	.20	.47	.44
21. SPQ Unusual Beliefs/Experiences	.20	.34	.28	.25	.12	.14	.30	.51
22. SPQ Mistrust	.27	.50	.31	.35	.23	.28	.37	.32
23. SPQ Social Anhedonia	.16	.29	.12	.05	.13	.06	.12	.21
24. SPQ Eccentricity/Oddity	.21	.44	.34	.28	.12	.09	.37	.48

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*Note.*  $n = 219$ . Convergent correlations are in bold. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 16. Correlations of Questionnaire Measures of Obsessive Compulsive Disorder (OCD) Symptoms with Other Daytime Symptoms in Patient Sample

Scale	1	2	3	4	5	6	7	8
1. IDAS Checking	.__							
2. SCOPI Obsessive Checking	<b>.64</b>	.__						
3. IDAS Ordering	<b>.59</b>	<b>.48</b>	.__					
4. SCOPI Compulsive Rituals	<b>.46</b>	<b>.57</b>	<b>.77</b>	.__				
5. IDAS Cleaning	<b>.16</b>	<b>.30</b>	<b>.29</b>	<b>.35</b>	.__			
6. SCOPI Obsessive Cleanliness	<b>.16</b>	<b>.42</b>	<b>.26</b>	<b>.41</b>	<b>.81</b>	.__		
7. SCOPI Hoarding	<b>.23</b>	<b>.49</b>	<b>.24</b>	<b>.38</b>	<b>.25</b>	<b>.34</b>	.__	
8. SCOPI Pathological Impulses	<b>.15</b>	<b>.37</b>	<b>.21</b>	<b>.25</b>	<b>.16</b>	<b>.13</b>	<b>.22</b>	.__
9. IDAS Well-Being	-.01	-.11	.13	.05	.03	.03	-.08	-.10
10. IDAS Ill Temper	.15	.26	.23	.16	.13	.18	.16	.35
11. IDAS Appetite Loss	.20	.16	.12	.00	.08	.08	-.04	.17
12. IDAS Appetite Gain	.00	.08	.11	.15	.05	.04	.10	.09
13. IDAS Suicidality	.12	.22	.06	.04	.11	.08	.09	.34
14. IDAS Traumatic Intrusions •	.17	.28	.11	-.04	.08	.12	.23	.17
15. PCLC Intrusions •	.24	.32	.21	.08	.13	.17	.03	.16
16. IDAS Traumatic Avoidance	.19	.28	.21	.08	.20	.18	.09	.23
17. PCLC Avoidance	.16	.21	.11	.04	.08	.09	.09	.21



Table 16. (cont.)

18. PCLC Hyperarousal	.31	.38	.35	.27	.18	.23	.14	.26
19. DPS Imagination	.13	.35	.19	.17	.16	.13	.14	.48
20. DPS Detachment	.17	.32	.25	.23	.16	.09	.21	.53
21. DPS Obliviousness	.22	.46	.21	.20	.11	.10	.25	.44
22. SPQ Unusual Beliefs/Experiences	.14	.29	.27	.23	.19	.17	.28	.37
23. SPQ Mistrust	.26	.38	.36	.35	.30	.30	.27	.38
24. SPQ Social Anhedonia	.08	.20	.12	.16	.14	.13	.01	.26
25. SPQ Eccentricity/Oddity	.14	.36	.34	.33	.28	.21	.32	.45

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*Note.*  $n = 200$ . Convergent correlations are in bold. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 17. Correlations of Questionnaire Measures of Posttraumatic Stress Disorder (PTSD) Symptoms with Other Daytime Symptoms in Student Sample

Scale	1	2	3	4	5
1. IDAS Traumatic Intrusions •	.—				
2. PCLC Intrusions •	<b>.61</b>	.—			
3. IDAS Traumatic Avoidance	<b>.67</b>	<b>.69</b>	.—		
4. PCLC Avoidance	<b>.58</b>	<b>.75</b>	<b>.76</b>	.—	
5. PCLC Hyperarousal	<b>.36</b>	<b>.40</b>	<b>.34</b>	<b>.37</b>	.—
6. IDAS Well-Being	-.12	-.16	-.11	-.13	-.13
7. IDAS Ill Temper	.43	.44	.40	.41	.33
8. IDAS Appetite Loss	.38	.27	.32	.25	.32
9. IDAS Appetite Gain	.11	.12	.14	.19	.08
10. IDAS Checking	.24	.28	.34	.26	.28
11. SCOPI Obsessive Checking	.29	.43	.38	.42	.47
12. IDAS Ordering	.23	.23	.21	.18	.31
13. SCOPI Compulsive Rituals	.01	.22	.13	.16	.30
14. IDAS Cleaning	.07	.12	.08	.10	.25
15. SCOPI Obsessive Cleanliness	.08	.20	.16	.18	.24
16. SCOPI Hoarding	.11	.24	.17	.24	.32
17. SCOPI Pathological Impulses	.24	.27	.23	.31	.37
18. DPS Imagination	.34	.35	.31	.32	.43
19. DPS Detachment	.33	.33	.27	.26	.39
20. DPS Obliviousness	.37	.33	.33	.32	.41
21. SPQ Unusual Beliefs/Experiences	.37	.42	.32	.39	.48
22. SPQ Mistrust	.32	.47	.36	.43	.55
23. SPQ Social Anhedonia	.19	.27	.26	.36	.30
24. SPQ Eccentricity/Oddity	.29	.30	.21	.27	.46

*Note.*  $n = 219$ . Convergent correlations are in bold. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed. • = sleep-related items removed.

Table 18. Correlations of Questionnaire Measures of Posttraumatic Stress Disorder (PTSD) Symptoms with Other Daytime Symptoms in Patient Sample

Scale	1	2	3	4	5
1. IDAS Traumatic Intrusions •	.—				
2. PCLC Intrusions •	<b>.78</b>	.—			
3. IDAS Traumatic Avoidance	<b>.72</b>	<b>.70</b>	.—		
4. PCLC Avoidance	<b>.60</b>	<b>.78</b>	<b>.77</b>	.—	
5. PCLC Hyperarousal	<b>.34</b>	<b>.43</b>	<b>.34</b>	<b>.36</b>	.—
6. IDAS Well-Being	-.10	-.02	-.13	-.21	-.03
7. IDAS Ill Temper	.35	.36	.30	.31	.45
8. IDAS Appetite Loss	.31	.36	.35	.39	.32
9. IDAS Appetite Gain	.11	.07	.07	-.03	.03
10. IDAS Suicidality	.44	.38	.44	.45	.18
11. IDAS Checking	.17	.24	.19	.16	.31
12. SCOPI Obsessive Checking	.28	.32	.28	.21	.38
13. IDAS Ordering	.11	.22	.21	.11	.35
14. SCOPI Compulsive Rituals	-.04	.08	.08	.04	.27
15. IDAS Cleaning	.08	.13	.20	.08	.18
16. SCOPI Obsessive Cleanliness	.12	.17	.18	.09	.23
17. SCOPI Hoarding	.03	.09	.09	.07	.14
18. SCOPI Pathological Impulses	.17	.16	.23	.21	.26
19. DPS Imagination	.29	.25	.25	.25	.24
20. DPS Detachment	.23	.24	.21	.25	.32
21. DPS Obliviousness	.30	.24	.25	.27	.27
22. SPQ Unusual Beliefs/Experiences	.23	.31	.23	.26	.25
23. SPQ Mistrust	.27	.33	.36	.35	.43
24. SPQ Social Anhedonia	.19	.18	.31	.35	.19
25. SPQ Eccentricity/Oddity	.19	.19	.23	.22	.35

Note.  $n = 200$ . Convergent correlations are in bold. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. • = sleep-related items removed

Table 19. Correlations of Questionnaire Measures of Dissociative Symptoms with Other Daytime Symptoms in Student Sample

Scale	1	2	3
1. DPS Imagination	—		
2. DPS Detachment	<b>.57</b>	—	
3. DPS Obliviousness	<b>.71</b>	<b>.59</b>	—
4. IDAS Well-Being	-.05	-.03	-.12
5. IDAS Ill Temper	.23	.18	.30
6. IDAS Appetite Loss	.25	.31	.31
7. IDAS Appetite Gain	.25	.10	.35
8. IDAS Checking	.36	.20	.32
9. SCOPI Obsessive Checking	.53	.34	.54
10. IDAS Ordering	.31	.22	.32
11. SCOPI Compulsive Rituals	.34	.21	.32
12. IDAS Cleaning	.16	.08	.19
13. SCOPI Obsessive Cleanliness	.18	.10	.20
14. SCOPI Hoarding	.44	.20	.47
15. SCOPI Pathological Impulses	.53	.35	.43
16. IDAS Traumatic Intrusions •	.34	.33	.37
17. PCLC Intrusions •	.35	.33	.33
18. IDAS Traumatic Avoidance	.31	.27	.33
19. PCLC Avoidance	.32	.26	.33
20. PCLC Hyperarousal	.43	.39	.41
21. SPQ Unusual Beliefs/Experiences	.50	.47	.52
22. SPQ Mistrust	.42	.31	.46
23. SPQ Social Anhedonia	.27	.18	.33
24. SPQ Eccentricity/Oddity	.57	.38	.58

*Note.*  $n = 219$ . Convergent correlations are in bold. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 20. Correlations of Questionnaire Measures of Dissociative Symptoms with Other Daytime Symptoms in Patient Sample

Scale	1	2	3
1. DPS Imagination	.—		
2. DPS Detachment	<b>.43</b>	.—	
3. DPS Obliviousness	<b>.48</b>	<b>.52</b>	.—
4. IDAS Well-Being	.05	-.10	-.18
5. IDAS Ill Temper	.27	.23	.28
6. IDAS Appetite Loss	.19	.26	.20
7. IDAS Appetite Gain	.03	.00	.11
8. IDAS Suicidality	.27	.32	.27
9. IDAS Checking	.13	.17	.21
10. SCOPI Obsessive Checking	.35	.32	.46
11. IDAS Ordering	.19	.25	.21
12. SCOPI Compulsive Rituals	.17	.23	.20
13. IDAS Cleaning	.16	.16	.11
14. SCOPI Obsessive Cleanliness	.13	.09	.10
15. SCOPI Hoarding	.14	.21	.25
16. SCOPI Pathological Impulses	.48	.53	.44
17. IDAS Traumatic Intrusions •	.29	.23	.30
18. PCLC Intrusions •	.25	.24	.24
19. IDAS Traumatic Avoidance	.25	.21	.25
20. PCLC Avoidance	.25	.26	.27
21. PCLC Hyperarousal	.24	.32	.27
22. SPQ Unusual Beliefs/Experiences	.34	.49	.37
23. SPQ Mistrust	.32	.40	.42
24. SPQ Social Anhedonia	.04	.21	.31
25. SPQ Eccentricity/Oddity	.38	.40	.42

*Note.*  $n = 200$ . Convergent correlations are in bold. Correlations of  $|\cdot| \geq .14$  and greater are significant at  $p < .05$ , two-tailed.

Table 21. Correlations of Questionnaire Measures of Schizotypal Symptoms with Other Daytime Symptom in Student Sample

Scale	1	2	3	4
1. SPQ Unusual Beliefs/Experiences	.__			
2. SPQ Mistrust	<b>.54</b>	.__		
3. SPQ Social Anhedonia	<b>.24</b>	<b>.45</b>	.__	
4. SPQ Eccentricity/Oddity	<b>.53</b>	<b>.52</b>	<b>.41</b>	.__
5. IDAS Well-Being	-.11	-.18	-.41	-.18
6. IDAS Ill Temper	.34	.41	.18	.29
7. IDAS Appetite Loss	.24	.29	.23	.17
8. IDAS Appetite Gain	.19	.23	.10	.28
9. IDAS Checking	.20	.27	.16	.21
10. SCOPI Obsessive Checking	.34	.50	.29	.44
11. IDAS Ordering	.28	.31	.12	.33
12. SCOPI Compulsive Rituals	.25	.34	.05	.28
13. IDAS Cleaning	.12	.23	.13	.12
14. SCOPI Obsessive Cleanliness	.14	.28	.07	.09
15. SCOPI Hoarding	.30	.37	.12	.37
16. SCOPI Pathological Impulses	.51	.32	.21	.48
17. IDAS Traumatic Intrusions •	.37	.32	.19	.29
18. PCLC Intrusions •	.42	.47	.27	.30
19. IDAS Traumatic Avoidance	.32	.36	.26	.21
20. PCLC Avoidance	.39	.43	.36	.27
21. PCLC Hyperarousal	.48	.55	.30	.46
22. DPS Imagination	.50	.42	.27	.57
23. DPS Detachment	.47	.31	.18	.39
24. DPS Obliviousness	.52	.47	.33	.58

Note.  $n = 219$ . Convergent correlations are in bold. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 22. Correlations of Questionnaire Measures of Schizotypal Symptoms with Other Daytime Symptom in Patient Sample

Scale	1	2	3	4
1. SPQ Unusual Beliefs/Experiences	._			
2. SPQ Mistrust	<b>.47</b>	._		
3. SPQ Social Anhedonia	<b>.12</b>	<b>.43</b>	._	
4. SPQ Eccentricity/Oddity	<b>.46</b>	<b>.56</b>	<b>.45</b>	._
5. IDAS Well-Being	.07	-.10	-.34	-.12
6. IDAS Ill Temper	.20	.34	.26	.30
7. IDAS Appetite Loss	.16	.11	.19	.10
8. IDAS Appetite Gain	.10	.18	.13	.14
9. IDAS Suicidality	.07	.33	.36	.36
10. IDAS Checking	.14	.26	.08	.14
11. SCOPI Obsessive Checking	.29	.38	.20	.36
12. IDAS Ordering	.27	.36	.12	.34
13. SCOPI Compulsive Rituals	.23	.35	.16	.33
14. IDAS Cleaning	.19	.30	.31	.28
15. SCOPI Obsessive Cleanliness	.17	.30	.13	.21
16. SCOPI Hoarding	.28	.27	.01	.32
17. SCOPI Pathological Impulses	.37	.38	.26	.45
18. IDAS Traumatic Intrusions •	.23	.27	.19	.19
19. PCLC Intrusions •	.31	.33	.18	.19
20. IDAS Traumatic Avoidance	.23	.36	.31	.23
21. PCLC Avoidance	.26	.35	.35	.22
22. PCLC Hyperarousal	.25	.43	.19	.35
23. DPS Imagination	.34	.32	.04	.38
24. DPS Detachment	.49	.40	.21	.40
25. DPS Obliviousness	.37	.42	.31	.42

*Note.*  $n = 200$ . Convergent correlations are in bold. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 23. Correlations of Interview Measures of Depression Symptoms with Other Daytime Symptoms in Student Sample

Item	1	2	3	4	5
1. IDAS-CR Well-Being	.__				
2. IDAS-CR Ill Temper	<b>.00</b>	.__			
3. IDAS-CR Appetite Loss	<b>-.09</b>	<b>.00</b>	.__		
4. IDAS-CR Appetite Gain	<b>-.07</b>	<b>.04</b>	<b>-.09</b>	.__	
5. IDAS-CR Suicidality	<b>-.13</b>	<b>-.12</b>	<b>.15</b>	<b>.05</b>	.__
6. PCCP Checking/Doubting	-.05	.10	-.05	.24	.12
7. PCCP Ordering/Rituals	.02	.18	.03	.08	.03
8. PCCP Cleaning/Washing	-.05	.14	.10	.04	-.06
9. PCCP Hoarding	.00	.09	.01	-.03	.07
10. IDAS-CR Traumatic Intrusions	.05	.16	.10	.13	.09
11. IDAS-CR Traumatic Avoidance	-.02	.22	.19	.03	.04
12. PCCP Imagination/Absorption	-.13	.03	.21	.03	.22
13. PCCP Depersonalization/Derealization	.10	.13	.15	.10	-.02
14. PCCP Obliviousness/Amnesia	-.07	.12	.15	.24	.16
15. PCCP Supernatural Beliefs	-.13	.06	.00	.04	.15
16. PCCP Social Anhedonia	-.11	.07	.10	.02	.09
17. PCCP Eccentricity/Oddity	-.15	.13	-.05	-.03	.23

*Note.*  $n = 219$ . Convergent correlations are in bold. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed.



Table 24. Correlations of Interview Measures of Depression Symptoms with Other Daytime Symptoms in Patient Sample

Item	1	2	3	4	5
1. IDAS-CR Well-Being	.__				
2. IDAS-CR Ill Temper	<b>-.15</b>	.__			
3. IDAS-CR Appetite Loss	<b>-.20</b>	<b>.13</b>	.__		
4. IDAS-CR Appetite Gain	<b>-.12</b>	<b>.13</b>	<b>-.29</b>	.__	
5. IDAS-CR Suicidality	<b>-.24</b>	<b>.22</b>	<b>.19</b>	<b>.10</b>	.__
6. PCCP Checking/Doubting	-.12	.13	.02	.06	.02
7. PCCP Intrusive Thoughts/Obsessions	-.02	.14	.05	-.04	.27
8. PCCP Ordering/Rituals	-.08	.14	-.06	.09	.07
9. PCCP Cleaning/Washing	-.05	.02	-.02	.09	.11
10. PCCP Hoarding	.00	.15	-.08	.15	.13
11. IDAS-CR Traumatic Intrusions	-.10	.17	.17	.02	.23
12. IDAS-CR Traumatic Avoidance	-.20	.13	.16	.04	.15
13. IDAS-CR Traumatic Hyperarousal	-.12	.20	.22	-.04	.25
14. PCCP Imagination/Absorption	-.00	.00	.04	.10	.16
15. PCCP Depersonalization/Derealization	-.12	.06	.29	-.02	.21
16. PCCP Obliviousness/Amnesia	.03	.04	.06	.07	.05
17. PCCP Supernatural Beliefs	.00	.04	-.06	.07	.10
18. PCCP Hallucinations	.06	.05	.10	.00	.11
19. PCCP Paranoia	-.13	.23	.13	.04	.28
20. PCCP Social Anhedonia	-.28	.15	.00	.21	.12
21. PCCP Eccentricity/Oddity	-.15	.11	.13	-.06	.10

*Note.*  $n = 197$ . Convergent correlations are in bold. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 25. Correlations of Interview Measures of Obsessive Compulsive Disorder (OCD) Symptoms with Other Daytime Symptoms in Student Sample

Item	1	2	3	4
1. PCCP Checking/Doubting	.—			
2. PCCP Ordering/Rituals	<b>.34</b>	.—		
3. PCCP Cleaning/Washing	<b>.31</b>	<b>.28</b>	.—	
4. PCCP Hoarding	<b>.10</b>	<b>.28</b>	<b>.14</b>	.—
5. IDAS-CR Well-Being	-.05	.02	-.05	.00
6. IDAS-CR Ill Temper	.10	.18	.14	.09
7. IDAS-CR Appetite Loss	-.05	.03	.10	.01
8. IDAS-CR Appetite Gain	.24	.08	.04	-.03
9. IDAS-CR Suicidality	.12	.03	-.06	.07
10. IDAS-CR Traumatic Intrusions	.08	.19	.09	.26
11. IDAS-CR Traumatic Avoidance	-.03	.10	.07	.21
12. PCCP Imagination/Absorption	.17	.31	.13	.25
13. PCCP Depersonalization/Derealization	.06	.08	.21	.14
14. PCCP Obliviousness/Amnesia	.18	.22	.04	.00
15. PCCP Supernatural Beliefs	-.09	.03	.03	-.05
16. PCCP Social Anhedonia	.02	-.02	-.07	.06
17. PCCP Eccentricity/Oddity	-.06	.10	-.03	.16

*Note.*  $n = 219$ . Convergent correlations are in bold. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 26. Correlations of Interview Measures of Obsessive Compulsive Disorder (OCD) Symptoms with Other Daytime Symptoms in Patient Sample

Item	1	2	3	4	5
1. PCCP Checking/Doubting	.__				
2. PCCP Intrusive Thoughts/Obsessions	<b>.21</b>	.__			
3. PCCP Ordering/Rituals	<b>.48</b>	<b>.24</b>	.__		
4. PCCP Cleaning/Washing	<b>.25</b>	<b>.07</b>	<b>.26</b>	.__	
5. PCCP Hoarding	<b>.16</b>	<b>.37</b>	<b>.29</b>	<b>.18</b>	.__
6. IDAS-CR Well-Being	-.12	-.02	-.07	-.05	.00
7. IDAS-CR Ill Temper	.13	.14	.14	.02	.15
8. IDAS-CR Appetite Loss	.01	.05	-.06	-.02	-.07
9. IDAS-CR Appetite Gain	.07	-.04	.09	.09	.15
10. IDAS-CR Suicidality	.02	.27	.07	.10	.13
11. IDAS-CR Traumatic Intrusions	.01	.14	-.02	.01	.08
12. IDAS-CR Traumatic Avoidance	.04	.15	.07	.00	.00
13. IDAS-CR Traumatic Hyperarousal	-.04	.11	.02	-.03	.04
14. PCCP Imagination/Absorption	-.02	.22	.16	.03	.07
15. PCCP Depersonalization/Derealization	.08	.17	.20	-.02	.00
16. PCCP Obliviousness/Amnesia	.16	.10	.19	.15	.28
17. PCCP Supernatural Beliefs	-.02	.15	.15	.03	.24
18. PCCP Hallucinations	.03	.13	.12	.05	.23
19. PCCP Paranoia	.12	.11	.16	.13	.20
20. PCCP Social Anhedonia	.03	.10	.12	.12	.14
21. PCCP Eccentricity/Oddity	.13	.30	.26	.08	.16

*Note.*  $n = 197$ . Convergent correlations are in bold. Correlations of  $|\cdot| \geq .14$  and greater are significant at  $p < .05$ , two-tailed.

Table 27. Correlations of Interview Measures of Posttraumatic Stress Disorder (PTSD) Symptoms with Other Daytime Symptoms in Student Sample

Item	1	2
1. IDAS-CR Traumatic Intrusions	—	
2. IDAS-CR Traumatic Avoidance	<b>.57</b>	—
3. IDAS-CR Well-Being	.04	-.02
4. IDAS-CR Ill Temper	.16	.22
5. IDAS-CR Appetite Loss	.09	.19
6. IDAS-CR Appetite Gain	.13	.03
7. IDAS-CR Suicidality	.09	.04
8. PCCP Checking/Doubting	.08	-.03
9. PCCP Ordering/Rituals	.19	.10
10. PCCP Cleaning/Washing	.09	.07
11. PCCP Hoarding	.26	.21
12. PCCP Imagination/Absorption	.12	.23
13. PCCP Depersonalization/Derealization	.26	.22
14. PCCP Obliviousness/Amnesia	.09	.15
15. PCCP Supernatural Beliefs	.11	.10
16. PCCP Social Anhedonia	.09	.15
17. PCCP Eccentricity/Oddity	.07	.16

*Note.*  $n = 219$ . Convergent correlations are in bold. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 28. Correlations of Interview Measures of Posttraumatic Stress Disorder (PTSD) Symptoms with Other Daytime Symptoms in Patient Sample

Item	1	2	3
1. IDAS-CR Traumatic Intrusions	—		
2. IDAS-CR Traumatic Avoidance	<b>.54</b>	—	
3. IDAS-CR Traumatic Hyperarousal	<b>.55</b>	<b>.51</b>	—
4. IDAS-CR Well-Being	-.10	-.20	-.12
5. IDAS-CR Ill Temper	.17	.13	.20
6. IDAS-CR Appetite Loss	.17	.16	.22
7. IDAS-CR Appetite Gain	.02	.04	-.04
8. IDAS-CR Suicidality	.23	.14	.25
9. PCCP Checking/Doubting	.01	.01	-.05
10. PCCP Intrusive Thoughts/Obsessions	.15	.10	.11
11. PCCP Ordering/Rituals	-.02	.07	.02
12. PCCP Cleaning/Washing	.01	.00	-.03
13. PCCP Hoarding	.08	.00	.05
14. PCCP Imagination/Absorption	.20	.22	.03
15. PCCP Depersonalization/Derealization	.18	.29	.32
16. PCCP Obliviousness/Amnesia	.07	.17	.12
17. PCCP Supernatural Beliefs	.05	.08	.18
18. PCCP Hallucinations	.15	.17	.22
19. PCCP Paranoia	.26	.31	.22
20. PCCP Social Anhedonia	.00	.10	.05
21. PCCP Eccentricity/Oddity	.10	.22	.22

*Note.*  $n = 197$ . Convergent correlations are in bold. Correlations of  $|\cdot| \geq .14$  and greater are significant at  $p < .05$ , two-tailed.

Table 29. Correlations of Interview Measures of Dissociative Symptoms with Other Daytime Symptoms in Student Sample

Item	1	2	3
1. PCCP Imagination/Absorption	__		
2. PCCP Depersonalization/Derealization	<b>.10</b>	__	.
3. PCCP Obliviousness/Amnesia	<b>.31</b>	<b>.04</b>	__
4. IDAS-CR Well-Being	-.13	.10	-.07
5. IDAS-CR Ill Temper	.03	.13	.12
6. IDAS-CR Appetite Loss	.21	.15	.15
7. IDAS-CR Appetite Gain	.03	.10	.24
8. IDAS-CR Suicidality	.22	-.02	.16
9. PCCP Checking/Doubting	.17	.06	.18
10. PCCP Ordering/Rituals	.31	.08	.22
11. PCCP Cleaning/Washing	.13	.21	.04
12. PCCP Hoarding	.25	.14	.00
13. IDAS-CR Traumatic Intrusions	.23	.26	.09
14. IDAS-CR Traumatic Avoidance	.12	.22	.15
15. PCCP Supernatural Beliefs	.16	.00	.03
16. PCCP Social Anhedonia	.09	.00	.19
17. PCCP Eccentricity/Oddity	.25	.05	.17

*Note.*  $n = 219$ . Convergent correlations are in bold. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 30. Correlations of Interview Measures of Dissociative Symptoms with Other Daytime Symptoms in Patient Sample

Item	1	2	3
1. PCCP Imagination/Absorption	.__		
2. PCCP Depersonalization/Derealization	<b>.18</b>	.__	.
3. PCCP Obliviousness/Amnesia	<b>.16</b>	<b>.23</b>	.__
4. IDAS-CR Well-Being	.00	-.12	.03
5. IDAS-CR Ill Temper	-.01	.07	.04
6. IDAS-CR Appetite Loss	.04	.29	.06
7. IDAS-CR Appetite Gain	.10	-.02	.07
8. IDAS-CR Suicidality	.16	.21	.05
9. PCCP Checking/Doubting	-.02	.08	.16
10. PCCP Intrusive Thoughts/Obsessions	.22	.17	.10
11. PCCP Ordering/Rituals	.16	.20	.19
12. PCCP Cleaning/Washing	.03	-.02	.16
13. PCCP Hoarding	.08	.00	.28
14. IDAS-CR Traumatic Intrusions	.20	.17	.07
15. IDAS-CR Traumatic Avoidance	.22	.29	.17
16. IDAS-CR Traumatic Hyperarousal	.03	.32	.12
17. PCCP Supernatural Beliefs	.07	.23	.26
18. PCCP Hallucinations	.10	.30	.13
19. PCCP Paranoia	.04	.16	.19
20. PCCP Social Anhedonia	.09	.03	.09
21. PCCP Eccentricity/Oddity	.13	.29	.29

*Note.*  $n=197$ . Convergent correlations are in bold. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 31. Correlations of Interview Measures of Schizotypal Symptoms with Other Daytime Symptoms in Students

Item	1	2	3
1. PCCP Supernatural Beliefs	.__		
2. PCCP Social Anhedonia	<b>-.07</b>	.__	
3. PCCP Eccentricity/Oddity	<b>.23</b>	<b>.16</b>	.__
4. IDAS-CR Well-Being	-.13	-.11	-.15
5. IDAS-CR Ill Temper	.06	.07	.13
6. IDAS-CR Appetite Loss	.00	.10	-.05
7. IDAS-CR Appetite Gain	.04	.02	-.03
8. IDAS-CR Suicidality	.15	.10	.23
9. PCCP Checking/Doubting	-.09	.02	-.05
10. PCCP Ordering/Rituals	.03	-.02	.10
11. PCCP Cleaning/Washing	.03	-.07	-.03
12. PCCP Hoarding	-.06	.06	.16
13. IDAS-CR Traumatic Intrusions	.12	.09	.07
14. IDAS-CR Traumatic Avoidance	.10	.15	.16
15. PCCP Imagination/Absorption	.16	.09	.25
16. PCCP Depersonalization/Derealization	.00	.00	-.06
17. PCCP Obliviousness/Amnesia	.03	.19	.17

*Note.*  $n = 200$ . Convergent correlations are in bold. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. .



Table 32. Correlations of Interview Measures of Schizotypal Symptoms with Other Daytime Symptoms in Patients

Item	1	2	3	4	5
1. PCCP Supernatural Beliefs	.__				
2. PCCP Hallucinations	<b>.17</b>	.__			
3. PCCP Paranoia	<b>.08</b>	<b>.11</b>	.__		
4. PCCP Social Anhedonia	<b>.02</b>	<b>.01</b>	<b>.16</b>	.__	
5. PCCP Eccentricity/Oddity	<b>.31</b>	<b>.26</b>	<b>.21</b>	<b>.12</b>	.__
6. IDAS-CR Well-Being	.00	.06	-.13	-.28	-.15
7. IDAS-CR Ill Temper	.05	.05	.23	.15	.10
8. IDAS-CR Appetite Loss	-.06	.10	.13	.00	.13
9. IDAS-CR Appetite Gain	.07	.00	.04	.22	-.06
10. IDAS-CR Suicidality	.10	.11	.28	.12	.09
11. PCCP Checking/Doubting	-.02	.03	.12	.03	.13
12. PCCP Intrusive Thoughts/Obsessions	.15	.14	.11	.10	.30
13. PCCP Ordering/Rituals	.15	.12	.16	.12	.26
14. PCCP Cleaning/Washing	.03	-.05	.14	.12	.08
15. PCCP Hoarding	.24	.23	.19	.14	.16
16. IDAS-CR Traumatic Intrusions	.05	.15	.26	.00	.10
17. IDAS-CR Traumatic Avoidance	.08	.17	.31	.10	.22
18. IDAS-CR Traumatic Hyperarousal	.18	.22	.22	.05	.22
19. PCCP Imagination/Absorption	.07	.10	.04	.08	.13
20. PCCP Depersonalization/Derealization	.23	.30	.16	.03	.29
21. PCCP Obliviousness/Amnesia	.26	.13	.19	.09	.29

*Note.*  $n = 197$ . Convergent correlations are in bold. Correlations of  $|\cdot| \geq .14$  and greater are significant at  $p < .05$ , two-tailed.

Table 33. Factor Structure of the Daytime Symptom Measures

	Student				Psychiatric patient			
	I	II	III	IV	I	II	III	IV
SCOPI Compulsive Rituals	<b>.84</b>	-.10	-.21	.16	-.18	.06	<b>.77</b>	.03
IDAS Ordering	<b>.82</b>	-.03	-.04	.04	.04	.03	<b>.75</b>	.00
SCOPI Obsessive Cleanliness	<b>.77</b>	.01	-.13	-.13	.08	-.11	<b>.69</b>	-.10
IDAS Cleaning	<b>.72</b>	-.08	.14	-.05	.07	-.11	<b>.63</b>	.00
IDAS Checking	<b>.69</b>	.05	.05	-.05	.12	-.02	<b>.71</b>	-.22
SCOPI Obsessive Checking	<b>.69</b>	.02	.06	.24	.04	.13	<b>.70</b>	.03
IDAS-CR Cleaning	<b>.65</b>	.05	-.09	-.24	-.11	-.02	<b>.50</b>	-.05
IDAS-CR Ordering	<b>.58</b>	.01	-.02	.04	-.27	.09	<b>.57</b>	.21
IDAS-CR Checking	<b>.51</b>	-.07	.22	-.13	-.13	.13	<b>.55</b>	-.08
SCOPI Hoarding	<b>.38</b>	-.02	-.05	<b>.38</b>	-.17	.00	<b>.40</b>	<b>.30</b>
IDAS Mania	<b>.37</b>	.20	.12	.18	.19	.04	<b>.32</b>	.24
IDAS Appetite Gain	.23	.01	.21	.04	-.24	<b>.31</b>	.03	.08
PCCP Hoarding	.15	.07	.04	.07	-.16	-.04	.28	<b>.37</b>
IDAS Traumatic Avoidance	.01	<b>.80</b>	.02	.03	<b>.76</b>	.05	.09	-.05
IDAS Traumatic Intrusions•	-.07	<b>.79</b>	.03	.01	<b>.79</b>	.00	.02	.00
IDAS-CR Traumatic Intrusions	-.05	<b>.75</b>	-.10	-.01	<b>.62</b>	-.07	-.06	.01
PCLC Avoidance	.02	<b>.73</b>	.06	.03	<b>.73</b>	.13	.00	-.02
PCLC Intrusions•	.06	<b>.72</b>	.03	.06	<b>.84</b>	-.11	.13	-.02
IDAS-CR Traumatic Avoidance	-.14	<b>.70</b>	-.04	.03	<b>.63</b>	.01	-.04	.07
IDAS Ill Temper	.08	<b>.54</b>	.14	-.04	.25	<b>.34</b>	.15	.05
PCCP Depersonalization/Derealization	.05	<b>.44</b>	-.22	-.05	.20	.08	-.22	<b>.49</b>
IDAS-CR Panic	.07	<b>.38</b>	.12	-.07	<b>.30</b>	.27	-.16	.12
IDAS Panic	.13	<b>.37</b>	<b>.35</b>	.06	<b>.37</b>	.18	.00	.21
IDAS-CR Ill Temper	.04	<b>.36</b>	-.05	.03	.16	.22	.13	-.02
IDAS Appetite Loss	.07	<b>.34</b>	.22	.10	<b>.62</b>	-.07	.02	.03

Table 33. (cont.)

MAST	-.10	<b>.32</b>	-.19	.19	.02	-.10	.03	<b>.32</b>
IDAS-CR Mania	.15	.18	.10	.15	.11	.11	.27	.19
IDAS Social Anxiety	.16	.08	<b>.73</b>	-.04	.08	<b>.63</b>	.22	-.08
SPQ Social Anhedonia	-.19	-.13	<b>.72</b>	.11	-.03	<b>.77</b>	-.02	-.03
SPQ Social Anxiety	.24	-.16	<b>.61</b>	.02	.01	<b>.60</b>	.23	-.09
IDAS Dysphoria	.03	<b>.36</b>	<b>.61</b>	-.03	<b>.33</b>	<b>.59</b>	.09	-.07
IDAS-CR Social Anxiety	.09	-.14	<b>.60</b>	.12	.03	<b>.47</b>	.10	-.07
PCLC Dysphoria•	.06	.28	<b>.53</b>	.18	<b>.33</b>	<b>.59</b>	-.01	.07
IDAS Agoraphobia	.19	.08	<b>.52</b>	-.13	.26	-.05	<b>.40</b>	.03
PCCP Social Anhedonia	-.09	.03	<b>.46</b>	-.02	-.15	<b>.55</b>	.00	.00
IDAS-CR Dysphoria	-.03	.25	<b>.43</b>	-.11	.09	<b>.53</b>	.01	.00
IDAS-CR Appetite Loss	-.11	.14	.21	.08	<b>.48</b>	.02	-.14	-.03
IDAS-CR Appetite Gain	.10	.04	.13	-.05	-.22	.29	-.04	.03
IDAS-CR Well-Being	.15	.07	<b>-.45</b>	.01	-.06	<b>-.59</b>	.13	.13
IDAS Well-Being	.13	.05	<b>-.70</b>	.14	.03	<b>-.68</b>	.21	.14
DPS Imagination	.12	.01	.02	<b>.72</b>	.10	.03	.09	<b>.47</b>
SCOPI Pathological Impulses	-.08	.03	-.03	<b>.70</b>	-.10	.28	.05	<b>.53</b>
SPQ Unusual Beliefs/Experiences	-.04	.17	-.06	<b>.68</b>	.05	-.12	.05	<b>.76</b>
SPQ Eccentricity/Oddity	.04	-.10	.27	<b>.65</b>	-.12	<b>.37</b>	.18	<b>.48</b>
DPS Obliviousness	.14	.13	.01	<b>.63</b>	-.02	<b>.31</b>	.07	<b>.45</b>
DPS Detachment	-.03	.14	-.10	<b>.63</b>	.07	.11	-.04	<b>.66</b>
IDAS Euphoria	.15	.10	<b>-.43</b>	<b>.53</b>	.16	<b>-.38</b>	<b>.37</b>	<b>.37</b>
PCCP Eccentricity/Oddity	-.25	-.17	.25	<b>.48</b>	.12	-.07	.07	<b>.48</b>
PCCP Imagination/Absorption	.09	-.10	.06	<b>.47</b>	-.08	.17	-.12	<b>.45</b>
DAST	<b>-.35</b>	.14	-.03	<b>.38</b>	.03	.07	-.08	<b>.49</b>
PCCP Supernatural Beliefs	-.14	-.06	.01	<b>.38</b>	-.02	-.22	-.11	<b>.59</b>
PCLC Hyperarousal	.15	.21	.13	<b>.36</b>	<b>.41</b>	.02	<b>.35</b>	.03
SPQ Mistrust	.18	.13	.26	<b>.35</b>	.04	<b>.33</b>	.28	.28
IDAS-CR Suicidality	-.19	-.22	<b>.31</b>	<b>.33</b>	.11	<b>.43</b>	-.13	.16
PCCP Obliviousness/Amnesia	-.01	.06	.16	<b>.30</b>	.01	-.03	.03	<b>.46</b>

Table 33. (cont.)

IDAS-CR Euphoria	-.01	-.04	-.14	.28	.05	<b>-.33</b>	.00	<b>.34</b>
IDAS-CR Traumatic Hyperarousal	._	._	._	._	<b>.56</b>	-.06	-.12	.11
IDAS Suicidality	._	._	._	._	.11	<b>.49</b>	-.14	.16
PCCP Paranoia	._	._	._	._	.10	.26	.04	.20
PCCP Hallucinations	._	._	._	._	.12	-.19	-.08	<b>.46</b>
PCCP Intrusive Thoughts/Obsessions	._	._	._	._	.00	.01	.17	.29

*Note.*  $n = 219$  (students), 197 (patients). Factor loadings of  $|\geq .30|$  and higher are in bold. SCOPI = Schedule of Compulsions, Obsessions, and Pathological Impulses. IDAS = Inventory of Depression and Anxiety Symptoms. IDAS-CR = Clinician Rating version of the IDAS. PCCP = Personality, Cognitions, Consciousness, and Perceptions Interview. PCLC = PTSD Checklist, Civilian Version. MAST = Michigan Alcohol Screening Test. SPQ = Schizotypal Personality Questionnaire. DPS = Dissociative Processes Scales. DAST = Drug Abuse Screening Test. • sleep-related items removed

Table 34. One-Factor Structure of the Sleep Measures

Sleep measure	Student	Psychiatric patient
	General Sleep Factor	General Sleep Factor
IDAS Insomnia	<b>.78</b>	<b>.76</b>
PSQI	<b>.74</b>	<b>.70</b>
ISDI Fatigue	<b>.66</b>	<b>.44</b>
IDAS Lassitude	<b>.64</b>	<b>.52</b>
ISDI Initial Insomnia	<b>.63</b>	<b>.65</b>
ISDI-CR Initial Insomnia	<b>.62</b>	<b>.60</b>
ISES General Sleep Experiences	<b>.62</b>	<b>.58</b>
ISDI-CR Fatigue	<b>.58</b>	<b>.35</b>
ISDI Nonrestorative Sleep	<b>.58</b>	<b>.47</b>
ISDI Fragmented Sleep	<b>.56</b>	<b>.60</b>
ISDI Nightmares	<b>.55</b>	<b>.54</b>
ISDI Sleep Hallucinations	<b>.51</b>	<b>.48</b>
ISDI-CR Anxiety at Night	<b>.50</b>	<b>.56</b>
ISDI-CR Fragmented Sleep	<b>.49</b>	<b>.52</b>
ISDI Irregular Schedule	<b>.49</b>	<b>.39</b>
ISDI-CR Nightmares	<b>.48</b>	<b>.54</b>
ISDI-CR Nonrestorative Sleep	<b>.48</b>	<b>.32</b>
ISDI-CR Sleep Hallucinations	<b>.46</b>	<b>.32</b>
ISDI-CR Irregular Schedule	<b>.44</b>	<b>.42</b>
ISDI Anxiety at Night	<b>.42</b>	<b>.56</b>
ISDI Vivid Dreams	<b>.40</b>	<b>.39</b>
ISDI Sleep Paralysis	<b>.40</b>	.21
ISDI-CR Light Sleep	<b>.39</b>	<b>.38</b>
ISDI Light Sleep	<b>.37</b>	<b>.35</b>
ISDI-CR Vivid Dreams	<b>.37</b>	<b>.36</b>
ISDI-CR Sleep Paralysis	<b>.31</b>	.18

Table 34. (cont.)

ISDI Sensations at Night	.27	.18
ISDI Excessive Sleep	.23	.19
ISDI-CR Excessive Sleep	.23	.24
ISDI-CR Sensations at Night	.19	.15
ISDI-CR Movements at Night	.17	.10
ISES Lucid Dreaming	.17	<b>.31</b>
ISDI Movements at Night	.13	.11

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*Note.*  $n = 219$  (students), 200 (psychiatric patients). Factor loadings of  $|\geq .30|$  and higher are in bold. IDAS = Inventory of Depression and Anxiety Symptoms. PSQI = Pittsburgh Sleep Quality Index. ISDI = Iowa Sleep Disturbances Inventory. ISDI-CR = ISDI Clinician Rating Scale. ISES = Iowa Sleep Experiences Survey.

Table 35. Two-Factor Structure of the Sleep Measures

Sleep measure	Student		Psychiatric patient	
	Insomnia	Unusual/Lassitude	Insomnia/Lassitude	Unusual
ISDI Initial Insomnia	<b>.86</b>	-.18	<b>.80</b>	-.11
PSQI	<b>.78</b>	.06	<b>.82</b>	-.06
ISDI-CR Initial Insomnia	<b>.75</b>	-.06	<b>.69</b>	-.04
IDAS Insomnia	<b>.70</b>	.19	<b>.79</b>	.06
ISDI-CR Fragmented Sleep	<b>.66</b>	-.12	<b>.50</b>	.11
ISDI Fragmented Sleep	<b>.65</b>	-.03	<b>.64</b>	.03
ISDI-CR Anxiety at Night	<b>.62</b>	-.06	<b>.60</b>	.03
ISDI Anxiety at Night	<b>.58</b>	-.12	<b>.57</b>	.07
ISDI Light Sleep	<b>.53</b>	-.12	<b>.52</b>	-.19
ISDI-CR Light Sleep	<b>.52</b>	-.09	<b>.47</b>	-.07
ISDI Nonrestorative Sleep	<b>.38</b>	<b>.31</b>	<b>.49</b>	.05
ISDI Irregular Schedule	<b>.34</b>	.24	<b>.45</b>	-.04
ISDI-CR Irregular Schedule	<b>.33</b>	.18	<b>.52</b>	-.07
ISES General Sleep Experiences	.03	<b>.74</b>	.04	<b>.85</b>
ISDI Sleep Paralysis	-.13	<b>.66</b>	-.05	<b>.40</b>
ISDI Vivid Dreams	-.10	<b>.63</b>	-.08	<b>.73</b>
ISDI Sleep Hallucinations	.06	<b>.58</b>	.04	<b>.69</b>
IDAS Lassitude	.24	<b>.53</b>	<b>.42</b>	.21
ISDI Excessive Sleep	-.21	<b>.53</b>	-.05	<b>.37</b>
ISDI Nightmares	.17	<b>.50</b>	.08	<b>.73</b>
ISDI-CR Vivid Dreams	-.02	<b>.48</b>	-.03	<b>.60</b>
ISDI-CR Sleep Hallucinations	.11	<b>.45</b>	.04	<b>.43</b>
ISDI-CR Sleep Paralysis	-.04	<b>.44</b>	-.07	<b>.37</b>
ISDI Fatigue	<b>.39</b>	<b>.40</b>	<b>.35</b>	.18
ISDI-CR Nightmares	.22	<b>.37</b>	.15	<b>.64</b>
ISDI Sensations at Night	-.03	<b>.37</b>	.15	.07

Table 35. (cont.)

ISDI-CR Fatigue	<b>.33</b>	<b>.36</b>	.28	.14
ISDI-CR Excessive Sleep	-.06	<b>.36</b>	.08	.27
ISES Lucid dreaming	-.13	<b>.35</b>	.03	<b>.45</b>
ISDI-CR Nonrestorative Sleep	.24	<b>.33</b>	<b>.32</b>	.05
ISDI-CR Movements at Night	.00	.21	.02	.13
ISDI-CR Sensations at Night	.02	.21	.10	.09
ISDI Movements at Night	-.04	.21	-.04	.23

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*Note.*  $n = 219$  (students), 200 (psychiatric patients). Factor loadings of  $|\geq .30|$  and higher are in bold. Unusual = Unusual Sleep Experiences. ISDI = Iowa Sleep Disturbances Inventory. PSQI = Pittsburgh Sleep Quality Index. ISDI-CR = ISDI Clinician Rating scale. IDAS = Inventory of Depression and Anxiety Symptoms. ISES = Iowa Sleep Experiences Survey.



Table 36. Three-Factor Structure of the Sleep Measures

Sleep measure	Student			Psychiatric patient		
	Insomnia	Lassitude	Unusual	Insomnia	Unusual	Lassitude
ISDI Initial Insomnia	<b>.81</b>	.09	-.14	<b>.74</b>	-.10	.19
ISDI-CR Initial Insomnia	<b>.69</b>	.11	-.04	<b>.65</b>	-.02	.12
ISDI Fragmented Sleep	<b>.66</b>	-.06	.09	<b>.75</b>	.11	-.12
PSQI	<b>.66</b>	.28	-.02	<b>.75</b>	-.05	.21
IDAS Insomnia	<b>.65</b>	.12	.22	<b>.79</b>	.10	.09
ISDI-CR Fragmented Sleep	<b>.65</b>	-.04	-.02	<b>.59</b>	.17	-.09
ISDI Anxiety at Night	<b>.62</b>	-.13	.03	<b>.55</b>	.09	.10
ISDI-CR Anxiety at Night	<b>.60</b>	.00	.01	<b>.55</b>	.04	.14
ISDI-CR Light Sleep	<b>.55</b>	-.12	.05	<b>.58</b>	.00	.16
ISDI Light Sleep	<b>.54</b>	-.07	-.02	<b>.67</b>	-.10	-.23
ISDI Fatigue	.13	<b>.73</b>	.01	-.04	.04	<b>.75</b>
IDAS Lassitude	-.01	<b>.72</b>	.13	.01	.06	<b>.79</b>
ISDI Nonrestorative Sleep	.13	<b>.69</b>	-.07	.14	-.06	<b>.66</b>
ISDI Excessive Sleep	<b>-.44</b>	<b>.68</b>	.10	<b>-.34</b>	.25	<b>.54</b>
ISDI-CR Excessive Sleep	-.28	<b>.63</b>	-.03	-.21	.15	<b>.56</b>
ISDI-CR Irregular Schedule	.11	<b>.61</b>	-.16	.26	-.15	<b>.51</b>
ISDI-CR Nonrestorative Sleep	.02	<b>.61</b>	-.01	.05	-.05	<b>.52</b>
ISDI-CR Fatigue	.12	<b>.60</b>	.05	-.08	.01	<b>.68</b>
ISDI Irregular Schedule	.14	<b>.55</b>	-.06	.15	-.14	<b>.57</b>
ISES General Sleep Experiences	.03	.08	<b>.76</b>	.02	<b>.83</b>	.10
ISDI Vivid Dreams	-.07	-.03	<b>.68</b>	-.03	<b>.74</b>	-.05
ISDI Sleep Paralysis	-.12	.04	<b>.67</b>	-.08	<b>.38</b>	.08
ISDI Sleep Hallucinations	.07	.03	<b>.62</b>	.09	<b>.70</b>	-.04
ISDI Nightmares	.20	-.02	<b>.58</b>	.09	<b>.73</b>	.03
ISDI-CR Sleep Paralysis	-.01	-.05	<b>.51</b>	-.08	<b>.36</b>	.05
ISDI-CR Vivid Dreams	-.01	.03	<b>.50</b>	.04	<b>.63</b>	-.09

Table 36. (cont.)

ISDI-CR Sleep Hallucinations	.10	.07	<b>.46</b>	.09	<b>.45</b>	-.03
ISDI-CR Nightmares	.24	-.03	<b>.44</b>	.19	<b>.65</b>	-.02
ISDI Sensations at Night	.01	-.07	<b>.44</b>	.21	.10	-.08
ISES Lucid Dreaming	-.09	-.05	<b>.40</b>	.08	<b>.47</b>	-.05
ISDI-CR Movement at Night	.03	-.05	.27	.01	.13	.02
ISDI Movement at Night	-.02	-.03	.24	-.04	.23	.01
ISDI-CR Sensations at Night	.02	.04	.21	.12	.10	-.01

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*Note.*  $n = 219$  (students), 200 (psychiatric patients). Factor loadings of  $|\geq .30|$  and higher are in bold. Unusual = Unusual Sleep Experiences. ISDI = Iowa Sleep Disturbances Inventory. ISDI-CR = ISDI Clinician Rating scale. PSQI = Pittsburgh Sleep Quality Index. IDAS = Inventory of Depression and Anxiety Symptoms. ISES = Iowa Sleep Experiences Survey.

Table 37. Four-Factor Structure of the Sleep Measures

Sleep measure	Student				Psychiatric patient			
	Insomnia	Lassitude	Unusual	RLS	Insomnia	Unusual	Lassitude	RLS
ISDI Initial Insomnia	<b>.80</b>	.11	-.15	-.01	<b>.72</b>	-.12	.17	.16
ISDI-CR Initial Insomnia	<b>.69</b>	.12	-.04	-.02	<b>.64</b>	-.02	.11	.08
PSQI	<b>.66</b>	.29	-.01	-.04	<b>.74</b>	-.06	.19	.16
IDAS Insomnia	<b>.65</b>	.13	.20	.07	<b>.80</b>	.11	.08	.00
ISDI Fragmented Sleep	<b>.65</b>	-.04	.06	.08	<b>.75</b>	.12	-.13	-.03
ISDI-CR Fragmented Sleep	<b>.64</b>	-.02	-.07	.16	<b>.58</b>	.17	-.10	.02
ISDI Anxiety at Night	<b>.61</b>	-.12	.01	.02	<b>.55</b>	.08	.09	.04
ISDI-CR Anxiety at Night	<b>.61</b>	.01	.02	-.06	<b>.56</b>	.05	.14	-.03
ISDI-CR Light Sleep	<b>.57</b>	-.13	.13	<b>-.32</b>	<b>.61</b>	.05	-.16	-.23
ISDI Light Sleep	<b>.57</b>	-.08	.09	<b>-.39</b>	<b>.69</b>	-.06	-.23	-.20
ISDI Fatigue	.14	<b>.72</b>	.03	-.06	-.02	.03	<b>.75</b>	-.02
IDAS Lassitude	.01	<b>.71</b>	.13	.06	.04	.06	<b>.78</b>	-.01
ISDI Nonrestorative Sleep	.13	<b>.69</b>	-.09	.11	.15	-.09	<b>.65</b>	.10
ISDI Excessive Sleep	<b>-.41</b>	<b>.65</b>	.16	-.15	<b>-.31</b>	.26	<b>.54</b>	-.10
ISDI-CR Irregular Schedule	.11	<b>.61</b>	-.17	.02	.29	-.13	<b>.50</b>	-.12
ISDI-CR Nonrestorative Sleep	.02	<b>.61</b>	-.05	.19	.04	-.08	<b>.50</b>	.18
ISDI-CR Excessive Sleep	-.25	<b>.61</b>	.05	-.17	-.18	.16	<b>.56</b>	-.10
ISDI-CR Fatigue	.14	<b>.59</b>	.09	-.12	-.04	.02	<b>.69</b>	-.12
ISDI Irregular Schedule	.14	<b>.55</b>	-.08	.08	.18	-.13	<b>.57</b>	-.03
ISES General Sleep Experiences	.04	.07	<b>.76</b>	.05	.02	<b>.83</b>	.11	.00
ISDI Vivid Dreams	-.06	-.04	<b>.69</b>	.03	-.03	<b>.75</b>	-.04	-.04
ISDI Sleep Paralysis	-.11	.03	<b>.69</b>	-.01	-.09	<b>.38</b>	.08	.01
ISDI Sleep Hallucinations	.07	.03	<b>.58</b>	.03	.08	<b>.70</b>	-.03	.05
ISDI Nightmares	.20	-.02	<b>.58</b>	.03	.08	<b>.72</b>	.04	.07

Table 37. (cont.)

ISDI-CR Sleep Paralysis	.01	-.06	<b>.55</b>	-.11	-.10	<b>.34</b>	.05	.10
ISDI-CR Vivid Dreams	-.01	.03	<b>.48</b>	.13	.03	<b>.63</b>	-.09	.02
ISDI-CR Nightmares	.25	-.03	<b>.46</b>	-.04	.18	<b>.65</b>	-.02	.05
ISDI-CR Sleep Hallucinations	.10	.07	<b>.43</b>	.13	.09	<b>.45</b>	-.02	-.03
ISES Lucid Dreaming	-.09	-.06	<b>.42</b>	-.03	.09	<b>.49</b>	-.04	-.08
ISDI Movement at Night	-.08	.00	.03	<b>.74</b>	-.14	.11	-.01	<b>.67</b>
ISDI-CR Movement at Night	-.02	-.02	.08	<b>.69</b>	-.09	.01	-.01	<b>.65</b>
ISDI Sensations at Night	.00	-.06	<b>.35</b>	<b>.35</b>	.10	-.02	-.12	<b>.69</b>
ISDI-CR Sensations at Night	.00	.04	.15	.20	.04	.01	-.04	<b>.52</b>

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*Note.*  $n = 219$  (students), 200 (psychiatric patients). Factor loadings of  $|\geq .30|$  and higher are in bold. Unusual = Unusual Sleep Experiences. RLS = Restless Legs Syndrome. ISDI = Iowa Sleep Disturbances Inventory. ISDI-CR = ISDI Clinician Rating scale. PSQI = Pittsburgh Sleep Quality Index. IDAS = Inventory of Depression and Anxiety Symptoms. ISES = Iowa Sleep Experiences Survey.

Table 38. Factor Similarity Between Student and Patient Samples Across Multiple Solutions

	Number of factors extracted							
	1		2		3		4	
Factor								
1	.99	.99	.99	.99	.99	.99	.99	.99
2			.94	.92	.99	.99	.99	.99
3					.98	.97	.97	.97
4							.89	.91

*Note.*  $n = 219$  (students), 200 (patients). Correlations are between regression-based factor scores. The first column represents the correlation of student factor scores with factor scores generated by applying scoring weights from the patient sample to the student data. The second column represents the correlation of patient factor scores with factor scores generated by applying the scoring weights from the student sample to the patient data.

Table 39. Correlations Between Higher Order Sleep Factors and Questionnaire Measures of Daytime Symptoms in Student Sample

	Lassitude	Insomnia	Unusual Sleep Experiences
Depression			
IDAS Dysphoria	<b>.54</b> <sup>a</sup>	.47 <sup>a</sup>	.44 <sup>a</sup>
PCLC Dysphoria •	.51 <sup>a</sup>	<b>.49</b> <sup>a</sup>	.46 <sup>a</sup>
IDAS Well-Being	-.36 <sup>a</sup>	-.31 <sup>a</sup>	-.09 <sup>b</sup>
IDAS Ill Temper	.37 <sup>a</sup>	.23 <sup>b</sup>	.43 <sup>a</sup>
IDAS Appetite Loss	.31 <sup>a</sup>	.23 <sup>a</sup>	.31 <sup>a</sup>
IDAS Appetite Gain	.24 <sup>a</sup>	.07 <sup>b</sup>	.19 <sup>ab</sup>
Bipolar Disorder			
IDAS Mania	.26 <sup>b</sup>	.33 <sup>ab</sup>	.40 <sup>a</sup>
IDAS Euphoria	-.01 <sup>b</sup>	-.08 <sup>b</sup>	.24 <sup>a</sup>
Panic			
IDAS Panic	.39 <sup>ab</sup>	.31 <sup>b</sup>	.48 <sup>a</sup>
Social Anxiety			
IDAS Social Anxiety	.38 <sup>a</sup>	.38 <sup>a</sup>	.36 <sup>a</sup>
SPQ Social Anxiety	.25 <sup>a</sup>	.30 <sup>a</sup>	.19 <sup>a</sup>
Agoraphobia			
IDAS Agoraphobia	.23 <sup>a</sup>	.30 <sup>a</sup>	.26 <sup>a</sup>
OCD			
IDAS Checking	.09 <sup>b</sup>	.17 <sup>b</sup>	.30 <sup>a</sup>
SCOPI Obsessive Checking	.24 <sup>b</sup>	.26 <sup>ab</sup>	<b>.37</b> <sup>a</sup>
IDAS Ordering	.09 <sup>b</sup>	.18 <sup>ab</sup>	.27 <sup>a</sup>
SCOPI Compulsive Rituals	.05 <sup>b</sup>	.06 <sup>b</sup>	.20 <sup>a</sup>
IDAS Cleaning	.05 <sup>a</sup>	.08 <sup>a</sup>	.13 <sup>a</sup>
SCOPI Obsessive Cleanliness	.07 <sup>a</sup>	.03 <sup>a</sup>	.15 <sup>a</sup>
SCOPI Hoarding	.24 <sup>a</sup>	.09 <sup>b</sup>	.22 <sup>a</sup>
SCOPI Pathological Impulses	.31 <sup>ab</sup>	.21 <sup>b</sup>	.38 <sup>a</sup>

Table 39. (cont.)

PTSD			
IDAS Traumatic Intrusions •	.36 <sup>b</sup>	.31 <sup>b</sup>	<b><u>.57</u></b> <sup>a</sup>
PCLC Intrusions •	.38 <sup>b</sup>	.28 <sup>b</sup>	.54 <sup>a</sup>
IDAS Traumatic Avoidance	.33 <sup>b</sup>	.22 <sup>b</sup>	.48 <sup>a</sup>
PCLC Avoidance	.38 <sup>a</sup>	.26 <sup>b</sup>	.46 <sup>a</sup>
PCLC Hyperarousal	.20 <sup>b</sup>	.27 <sup>ab</sup>	.35 <sup>a</sup>
Dissociation			
DPS Imagination	.29 <sup>b</sup>	.21 <sup>b</sup>	<b>.50</b> <sup>a</sup>
DPS Detachment	.21 <sup>b</sup>	.19 <sup>b</sup>	.47 <sup>a</sup>
DPS Obliviousness	.37 <sup>b</sup>	.31 <sup>b</sup>	<b>.56</b> <sup>a</sup>
Schizotypy			
SPQ Unusual Beliefs/Experiences	.22 <sup>b</sup>	.19 <sup>b</sup>	<b><u>.57</u></b> <sup>a</sup>
SPQ Mistrust	.33 <sup>b</sup>	.22 <sup>b</sup>	.41 <sup>a</sup>
SPQ Social Anhedonia	.30 <sup>ab</sup>	.40 <sup>a</sup>	.20 <sup>b</sup>
SPQ Eccentricity/Oddity	.33 <sup>b</sup>	.28 <sup>b</sup>	.44 <sup>a</sup>
Drug/Alcohol Use			
MAST	.25 <sup>a</sup>	.01 <sup>b</sup>	.16 <sup>a</sup>
DAST	.29 <sup>a</sup>	.16 <sup>b</sup>	.22 <sup>ab</sup>

*Note.*  $n = 219$ . The correlations used for testing specificity are in bold. Within a row, correlations not sharing the same superscript differ from one another at  $p < .05$ , one-tailed. Underlined correlations are the highest in both row and column. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS = Inventory of Depression and Anxiety Symptoms. PCLC = PTSD Checklist- Civilian Version. SPQ = Schizotypal Personality Questionnaire. SCOPI = Schedule of Compulsions, Obsessions, and Pathological Impulses. DPS = Dissociative Processes Scale. MAST = Michigan Alcohol Screening Test. DAST = Drug Abuse Screening Test. • = sleep-related items removed.

Table 40. Average Correlations Between Higher Order Sleep Factors and Questionnaire Measures of Daytime Symptoms in Student Sample

	Lassitude	Insomnia	Unusual Sleep Experiences
Dysphoria	<b>.53</b>	<b>.48</b>	<b>.45</b>
Bipolar Disorder	.13	.13	.32
Panic	.39	.31	<b>.48</b>
Social Anxiety	.32	.34	.28
Agoraphobia	.23	.30	.26
OCD	.14	.14	.25
PTSD	.33	.27	<b>.48</b>
Dissociation	.29	.24	<b>.51</b>
Schizotypy	.30	.27	<b>.41</b>
Drug/Alcohol Use	.27	.09	.19

*Note.*  $n = 219$ . The correlations that show evidence of specificity within a column are in bold.



Table 41. Correlations Between Higher Order Sleep Factors and Interview Measures of Daytime Symptoms in Student Sample

	Lassitude	Insomnia	Unusual Sleep Experiences
<b>Depression</b>			
IDAS-CR Dysphoria	<b>.36<sup>a</sup></b>	<b>.24<sup>b</sup></b>	.19 <sup>b</sup>
IDAS-CR Well-Being	-.24 <sup>a</sup>	-.23 <sup>a</sup>	-.12 <sup>a</sup>
IDAS-CR Ill Temper	.14 <sup>a</sup>	.09 <sup>a</sup>	.20 <sup>a</sup>
IDAS-CR Appetite Loss	.22 <sup>a</sup>	.13 <sup>a</sup>	.17 <sup>a</sup>
IDAS-CR Appetite Gain	.12 <sup>a</sup>	.07 <sup>a</sup>	.08 <sup>a</sup>
IDAS-CR Suicidality	.18 <sup>a</sup>	.19 <sup>a</sup>	.07 <sup>a</sup>
<b>Bipolar Disorder</b>			
IDAS-CR Mania	.22 <sup>ab</sup>	<b>.30<sup>a</sup></b>	.15 <sup>b</sup>
IDAS-CR Euphoria	.06 <sup>a</sup>	-.11 <sup>b</sup>	.00 <sup>ab</sup>
<b>Panic</b>			
IDAS-CR Panic	.12 <sup>a</sup>	.19 <sup>a</sup>	.14 <sup>a</sup>
<b>Social Anxiety</b>			
IDAS-CR Social Anxiety	.22 <sup>a</sup>	.26 <sup>a</sup>	.17 <sup>a</sup>
<b>OCD</b>			
PCCP Checking/Doubting	.18 <sup>a</sup>	.23 <sup>a</sup>	<b>.19<sup>a</sup></b>
PCCP Ordering/Rituals	.18 <sup>a</sup>	.22 <sup>a</sup>	.15 <sup>a</sup>
PCCP Cleaning/Washing	.07 <sup>a</sup>	.12 <sup>a</sup>	.10 <sup>a</sup>
PCCP Hoarding	.22 <sup>a</sup>	.08 <sup>b</sup>	.02 <sup>b</sup>
<b>PTSD</b>			
IDAS-CR Traumatic Intrusions	.32 <sup>ab</sup>	.22 <sup>b</sup>	<b>.40<sup>a</sup></b>
IDAS-CR Traumatic Avoidance	.25 <sup>a</sup>	.08 <sup>b</sup>	.31 <sup>a</sup>
<b>Dissociation</b>			
PCCP Imagination/Absorption	.20 <sup>a</sup>	.11 <sup>a</sup>	<b>.20<sup>a</sup></b>
PCCP Depersonalization/Derealization	.16 <sup>ab</sup>	.14 <sup>b</sup>	.27 <sup>a</sup>
PCCP Obliviousness/Amnesia	.23 <sup>b</sup>	.21 <sup>b</sup>	<b>.37<sup>a</sup></b>

Table 41. (cont.)

## Schizotypy

PCCP Supernatural Beliefs	.16 <sup>a</sup>	.01 <sup>b</sup>	<b>.19<sup>a</sup></b>
PCCP Social Anhedonia	.18 <sup>a</sup>	.17 <sup>a</sup>	.09 <sup>a</sup>
PCCP Eccentricity/Oddity	.14 <sup>b</sup>	.26 <sup>a</sup>	.13 <sup>b</sup>

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*Note.*  $n = 219$ . The correlations used for testing specificity are in bold. Within a row, correlations not sharing the same superscript differ from one another at  $p < .05$ , one-tailed. Underlined correlations are the highest in both row and column. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS-CR = Clinician Rating version of the IDAS. PCCP = Personality, Cognitions, Consciousness, and Perceptions Interview.

Table 42. Average Correlations Between Higher Order Sleep Factors and Interview Measures of Daytime Symptoms in Student Sample

	Lassitude	Insomnia	Unusual Sleep Experiences
Dysphoria	<b>.36</b>	.24	.19
Bipolar Disorder	.14	.10	.08
Panic	.12	.19	.14
Social Anxiety	.22	.26	.17
OCD	.16	.16	.12
PTSD	.29	.15	<b>.36</b>
Dissociation	.20	.15	<b>.28</b>
Schizotypy	.16	.15	.14

*Note.*  $n = 219$ . The correlations that show evidence of specificity are in bold.

Table 43. Correlations Between Higher Order Sleep Factors and Questionnaire Measures of Daytime Symptoms in Patient Sample

	Lassitude	Insomnia	Unusual Sleep Experiences
Depression			
IDAS Dysphoria	<b>.56</b> <sup>a</sup>	<b>.30</b> <sup>b</sup>	.19 <sup>b</sup>
PCLC Dysphoria •	.48 <sup>a</sup>	.30 <sup>b</sup>	.21 <sup>b</sup>
IDAS Well-Being	-.33 <sup>a</sup>	-.15 <sup>b</sup>	.00 <sup>c</sup>
IDAS Ill Temper	.31 <sup>a</sup>	.24 <sup>a</sup>	.23 <sup>a</sup>
IDAS Appetite Loss	.17 <sup>b</sup>	<b>.38</b> <sup>a</sup>	.24 <sup>b</sup>
IDAS Appetite Gain	.31 <sup>a</sup>	-.08 <sup>b</sup>	.06 <sup>b</sup>
IDAS Suicidality	.26 <sup>a</sup>	.18 <sup>a</sup>	.19 <sup>a</sup>
Bipolar Disorder			
IDAS Mania	.27 <sup>a</sup>	.37 <sup>a</sup>	.27 <sup>a</sup>
IDAS Euphoria	.03 <sup>a</sup>	.17 <sup>a</sup>	.07 <sup>a</sup>
Panic			
IDAS Panic	.39 <sup>a</sup>	.31 <sup>ab</sup>	.25 <sup>b</sup>
Social Anxiety			
IDAS Social Anxiety	.36 <sup>a</sup>	.19 <sup>b</sup>	.14 <sup>b</sup>
SPQ Social Anxiety	.22 <sup>a</sup>	.13 <sup>b</sup>	.07 <sup>b</sup>
Agoraphobia			
IDAS Agoraphobia	.06 <sup>b</sup>	.29 <sup>a</sup>	.15 <sup>ab</sup>
OCD			
IDAS Checking	.14 <sup>a</sup>	.22 <sup>a</sup>	.15 <sup>a</sup>
SCOPI Obsessive Checking	.27 <sup>a</sup>	.24 <sup>a</sup>	<b>.28</b> <sup>a</sup>
IDAS Ordering	.05 <sup>b</sup>	.11 <sup>ab</sup>	.22 <sup>a</sup>
SCOPI Compulsive Rituals	.10 <sup>a</sup>	.07 <sup>a</sup>	.12 <sup>a</sup>
IDAS Cleaning	.14 <sup>a</sup>	.13 <sup>a</sup>	.15 <sup>a</sup>
SCOPI Obsessive Cleanliness	.11 <sup>a</sup>	.20 <sup>a</sup>	.11 <sup>a</sup>
SCOPI Hoarding	.22 <sup>a</sup>	.12 <sup>a</sup>	.09 <sup>a</sup>

Table 43. (cont.)

SCOPI Pathological Impulses	.29 <sup>a</sup>	.14 <sup>b</sup>	.36 <sup>a</sup>
PTSD			
IDAS Traumatic Intrusions •	.27 <sup>b</sup>	.23 <sup>b</sup>	.41 <sup>a</sup>
PCLC Intrusions •	.21 <sup>b</sup>	.28 <sup>b</sup>	<b>.45<sup>a</sup></b>
IDAS Traumatic Avoidance	.27 <sup>a</sup>	.28 <sup>a</sup>	.38 <sup>a</sup>
PCLC Avoidance	.24 <sup>a</sup>	.29 <sup>a</sup>	.34 <sup>a</sup>
PCLC Hyperarousal	.13 <sup>b</sup>	.30 <sup>a</sup>	.25 <sup>ab</sup>
Dissociation			
DPS Imagination	.23 <sup>b</sup>	.12 <sup>b</sup>	<b>.44<sup>a</sup></b>
DPS Detachment	.25 <sup>ab</sup>	.18 <sup>b</sup>	.33 <sup>a</sup>
DPS Obliviousness	.36 <sup>a</sup>	.19 <sup>b</sup>	.34 <sup>a</sup>
Schizotypy			
SPQ Unusual Beliefs/Experiences	.16 <sup>b</sup>	.07 <sup>b</sup>	<b>.33<sup>a</sup></b>
SPQ Mistrust	.29 <sup>a</sup>	.10 <sup>b</sup>	.20 <sup>ab</sup>
SPQ Social Anhedonia	.25 <sup>a</sup>	.23 <sup>a</sup>	-.03 <sup>b</sup>
SPQ Eccentricity/Oddity	.26 <sup>a</sup>	.15 <sup>a</sup>	.20 <sup>a</sup>
Drug/Alcohol Use			
MAST	-.02 <sup>a</sup>	.11 <sup>a</sup>	.02 <sup>a</sup>
DAST	.14 <sup>a</sup>	.14 <sup>a</sup>	.07 <sup>a</sup>

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*Note.*  $n = 200$ . The correlations used for testing specificity are in bold. Within a row, correlations not sharing the same superscript differ from one another at  $p < .05$ , one-tailed. Underlined correlations are the highest in both row and column. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS = Inventory of Depression and Anxiety Symptoms. PCLC = PTSD Checklist- Civilian Version. SPQ = Schizotypal Personality Questionnaire. SCOPI = Schedule of Compulsions, Obsessions, and Pathological Impulses. DPS = Dissociative Processes Scale. MAST = Michigan Alcohol Screening Test. DAST = Drug Abuse Screening Test. • = sleep-related items removed.

Table 44. Average Correlations Between Higher Order Sleep Factors and Questionnaire Measures of Daytime Symptoms in Patient Sample

	Lassitude	Insomnia	Unusual Sleep Experiences
Dysphoria	<b>.52</b>	.30	.20
Bipolar Disorder	.15	.27	.17
Panic	.39	.31	.25
Social Anxiety	.29	.16	.11
Agoraphobia	.06	.29	.15
OCD	.17	.15	.19
PTSD	.22	.28	<b>.37</b>
Dissociation	.28	.16	<b>.37</b>
Schizotypy	.24	.14	.18
Drug/Alcohol Use	.06	.13	.05

*Note.*  $n = 200$ . The correlations that show evidence of specificity are in bold.

Table 45. Correlations Between Higher Order Sleep Factors and Interview Measures of Daytime Symptoms in Patient Sample

	Lassitude	Insomnia	Unusual Sleep Experiences
Depression			
IDAS-CR Dysphoria	<b>.39<sup>a</sup></b>	<b>.15<sup>b</sup></b>	.03 <sup>b</sup>
IDAS-CR Well-Being	-.24 <sup>a</sup>	<b>-.25<sup>a</sup></b>	-.03 <sup>b</sup>
IDAS-CR Ill Temper	.08 <sup>a</sup>	.06 <sup>a</sup>	.18 <sup>a</sup>
IDAS-CR Appetite Loss	.09 <sup>a</sup>	.20 <sup>a</sup>	.11 <sup>a</sup>
IDAS-CR Appetite Gain	.15 <sup>a</sup>	.01 <sup>a</sup>	.02 <sup>a</sup>
IDAS-CR Suicidality	.29 <sup>a</sup>	.11 <sup>b</sup>	.07 <sup>b</sup>
Bipolar Disorder			
IDAS-CR Mania	.18 <sup>a</sup>	.23 <sup>a</sup>	.11 <sup>a</sup>
IDAS-CR Euphoria	-.00 <sup>a</sup>	-.07 <sup>a</sup>	.04 <sup>a</sup>
Panic			
IDAS-CR Panic	.32 <sup>a</sup>	.22 <sup>a</sup>	.21 <sup>a</sup>
Social Anxiety			
IDAS-CR Social Anxiety	.29 <sup>a</sup>	.17 <sup>ab</sup>	.12 <sup>b</sup>
OCD			
PCCP Checking/Doubting	.12 <sup>a</sup>	.17 <sup>a</sup>	<b>.13<sup>a</sup></b>
PCCP Intrusive Thoughts/Obsessions	.11 <sup>a</sup>	.08 <sup>a</sup>	.18 <sup>a</sup>
PCCP Ordering/Rituals	.03 <sup>a</sup>	.03 <sup>a</sup>	.15 <sup>a</sup>
PCCP Cleaning/Washing	.08 <sup>a</sup>	.18 <sup>a</sup>	.15 <sup>a</sup>
PCCP Hoarding	.13 <sup>a</sup>	.12 <sup>a</sup>	.16 <sup>a</sup>
PTSD			
IDAS-CR Traumatic Intrusions	.12 <sup>b</sup>	.10 <sup>b</sup>	<b>.27<sup>a</sup></b>
IDAS-CR Traumatic Avoidance	.21 <sup>a</sup>	.23 <sup>a</sup>	<b>.29<sup>a</sup></b>
IDAS-CR Traumatic Hyperarousal	.09 <sup>a</sup>	.15 <sup>a</sup>	.11 <sup>a</sup>
Dissociation			
PCCP Imagination/Absorption	.16 <sup>ab</sup>	.02 <sup>b</sup>	<b>.27<sup>a</sup></b>

Table 45. (cont.)

PCCP Depersonalization/Derealization	.15 <sup>a</sup>	.19 <sup>a</sup>	<b><u>.29</u></b> <sup>a</sup>
PCCP Obliviousness/Amnesia	.16 <sup>ab</sup>	.04 <sup>b</sup>	.26 <sup>a</sup>
Schizotypy			
PCCP Supernatural Beliefs	.01 <sup>ab</sup>	-.03 <sup>b</sup>	<b>.12</b> <sup>a</sup>
PCCP Hallucinations	.02 <sup>b</sup>	.05 <sup>b</sup>	<b>.21</b> <sup>a</sup>
PCCP Paranoia	.23 <sup>a</sup>	.07 <sup>b</sup>	.08 <sup>b</sup>
PCCP Social Anhedonia	.15 <sup>ab</sup>	.16 <sup>a</sup>	.01 <sup>b</sup>
PCCP Eccentricity/Oddity	.13 <sup>a</sup>	.21 <sup>a</sup>	<b>.25</b> <sup>a</sup>

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*Note.*  $n = 197$ . The correlations used for testing specificity are in bold. Within a row, correlations not sharing the same superscript differ from one another at  $p < .05$ , one-tailed. Underlined correlations are the highest in both row and column. Correlations of  $|\cdot 14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS-CR = Clinician Rating version of the IDAS. PCCP = Personality, Cognitions, Consciousness, and Perceptions Interview.



Table 46. Average Correlations Between Higher Order Sleep Factors and Interview Measures of Daytime Symptoms in Patient Sample

	Lassitude	Insomnia	Unusual Sleep Experiences
Dysphoria	<b>.39</b>	.15	.03
Bipolar Disorder	.09	.08	.08
Panic	.32	.22	.21
Social Anxiety	.29	.17	.12
OCD	.09	.12	.15
PTSD	.14	.16	<b>.22</b>
Dissociation	.16	.08	<b>.27</b>
Schizotypy	.11	.09	.14

*Note.*  $n = 197$ . The correlations that show evidence of specificity are in bold.

Table 47. Correlations Between Higher Order Sleep Factors and Daytime Symptom Factors

	Students			Patients		
	Lassitude	Insomnia	Unusual	Lassitude	Insomnia	Unusual
Depression/Anxiety	<b>.51<sup>a</sup></b>	<b>.52<sup>a</sup></b>	.36 <sup>b</sup>	<b>.53<sup>a</sup></b>	.28 <sup>b</sup>	.16 <sup>b</sup>
OCD	.18 <sup>b</sup>	.21 <sup>b</sup>	.33 <sup>a</sup>	.19 <sup>a</sup>	.25 <sup>a</sup>	.26 <sup>a</sup>
PTSD	.48 <sup>b</sup>	.34 <sup>c</sup>	<b>.62<sup>a</sup></b>	.30 <sup>a</sup>	<b>.39<sup>a</sup></b>	<b>.41<sup>a</sup></b>
Dissociation/Schizotypy	.37 <sup>b</sup>	.28 <sup>b</sup>	<b>.58<sup>a</sup></b>	.28 <sup>ab</sup>	.18 <sup>b</sup>	<b>.41<sup>a</sup></b>

*Note.*  $n = 219$  (students), 197 (patients). The correlations used for testing specificity are in bold. Within a row and sample, correlations not sharing the same superscript differ from one another at  $p < .05$ , one-tailed. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed.

Table 48. Correlations Between Iowa Sleep Disturbances Inventory (ISDI) and Questionnaire Measures of Daytime Symptoms in Student Sample: Nonspecific Relations

	ISDI scale								
	Initial Insomnia	Fragmented Sleep	Anxiety at Night	Light Sleep	Nonrestorative Sleep	Excessive Sleep	Irregular Schedule	Movement at Night	Sensations at Night
IDAS scale									
Dysphoria	.33	.31	.34	.14	.40	.18	.20	.02	.15
Well-Being	-.30	-.18	-.16	-.10	-.33	-.07	-.22	-.02	.05
Ill Temper	.09	.07	.15	.11	.20	.15	.19	.04	.12
Appetite Loss	.12	.21	.10	.04	.19	.18	.19	.02	-.02
Appetite Gain	.04	-.03	.10	.00	.13	.10	.02	.02	.11
Mania	.22	.20	.23	.11	.21	.08	.08	.10	.14
Euphoria	-.11	-.09	.03	-.06	-.06	.12	-.05	.01	.19
Panic	.16	.16	.19	.13	.26	.12	.16	.07	.22
Social Anxiety	.24	.19	.24	.16	.28	.05	.16	.03	.04

Table 48. (cont.)

Agoraphobia	.21	.14	.11	.09	.20	-.03	.14	.04	-.05
Checking	.05	.14	.16	.17	.07	.05	-.05	.11	.19
Ordering	.05	.09	.16	.14	.10	.00	-.07	.05	.10
Cleaning	.00	.02	.08	.11	-.03	.05	.03	-.12	.01
Traumatic Intrusions •	.19	.23	.15	.18	.23	.14	.20	.13	.18
Traumatic Avoidance	.08	.13	.11	.08	.24	.12	.18	.19	<u>.25</u>
DPS scale									
Imagination	.10	.15	.16	.07	.15	.16	.20	.10	.17
Detachment	.09	.19	.15	.03	.09	.13	.13	.10	.20
Obliviousness	.17	.25	.21	.17	.25	.21	.22	.20	.19
SPQ scale									
Unusual Beliefs/Experiences	.11	.09	.16	.06	.16	.11	.13	.12	.19
Mistrust	.09	.11	.20	.17	.19	.19	.12	.00	.12
Social Anhedonia	.31	.25	.16	.26	.24	.01	.23	-.05	.03
Eccentricity/Oddity	.18	.18	.25	.10	.28	.04	.16	.10	.13

*Note.*  $n = 219$ . Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. Underlined correlations are the highest in both row and column and thus are weakly related to daytime symptoms but show some specificity. IDAS = Inventory of Depression and Anxiety Symptoms. DPS = Dissociative Processes Scale. SPQ = Schizotypal Personality Questionnaire. • = sleep-related items removed.

Table 49. Correlations Between Iowa Sleep Disturbances Inventory Clinician Rating Scale (ISDI-CR) and Interview Measures of Daytime Symptoms in Student Sample: Nonspecific Relations

	ISDI-CR scale								
	Initial Insomnia	Fragmented Sleep	Anxiety at Night	Light Sleep	Nonrestorative Sleep	Excessive Sleep	Irregular Schedule	Movement at Night	Sensations at Night
IDAS-CR scale									
Dysphoria	.19	.05	.33	.07	.23	.13	.13	.09	.20
Well-Being	-.18	-.13	-.14	-.13	-.15	-.02	-.22	.02	-.14
Ill Temper	.00	.13	.13	.00	.04	.03	.10	.08	.01
Appetite Loss	.16	.13	.12	.02	.07	.13	.12	.01	.07
Appetite Gain	.04	-.01	.12	.03	.07	.12	.03	.03	.08
Suicidality	.22	.18	.15	.13	.11	.12	.16	-.05	-.04
Mania	.22	.15	.32	.12	.14	-.02	.05	.10	-.03
Euphoria	-.10	.00	-.04	-.04	.04	.11	.06	.00	-.04
Panic	.09	.18	.28	.09	.06	.02	-.01	.16	.04

Table 49. (cont.)

Social Anxiety	.15	.13	.19	.29	.15	.04	.07	.01	.05
Traumatic Intrusions	.17	.04	.17	.14	.18	.09	.18	.12	.11
Traumatic Avoidance	.04	.07	.22	.04	.12	.11	.14	.10	.05
PCCP scale									
Checking/Doubting	.15	.16	.16	.19	.13	.04	.04	.12	.03
Ordering/Rituals	.10	.16	.26	.17	.11	.04	.17	.10	.04
Cleaning/Washing	.05	.04	.15	.16	.05	.01	.00	.02	-.03
Hoarding	.01	.09	.12	.09	.20	.18	.11	.03	.05
Imagination/Absorption	.08	.12	.20	.04	.14	.11	.11	.12	.10
Depersonalization/Derealization	.13	.14	.22	.06	.18	.05	.00	.16	.02
Obliviousness/Amnesia	.13	.19	.17	.10	.11	.05	.13	.11	.18
Supernatural Beliefs	.03	-.03	.06	.10	.07	.10	.14	.02	.06
Social Anhedonia	.16	.09	.04	.08	.10	.04	.21	-.05	.14
Eccentricity/Oddity	.13	.12	.20	.20	.15	-.09	.12	.04	.03

*Note.*  $n = 219$ . Correlations of  $|\underline{.14}|$  and greater are significant at  $p < .05$ , two-tailed. Underlined correlations are the highest in both row and column and thus are weakly related to daytime symptoms but show some specificity. IDAS-CR = Clinician Rating version of the Inventory of Depression and Anxiety Symptoms. PCCP = Personality, Cognitions, Consciousness, and Perceptions interview.

Table 50. Correlations Between Iowa Sleep Disturbances Inventory (ISDI) and Questionnaire Measures of Daytime Symptoms in Patient Sample: Nonspecific Relations

	ISDI scale								
	Initial Insomnia	Fragmented Sleep	Anxiety at Night	Light Sleep	Nonrestorative Sleep	Excessive Sleep	Irregular Schedule	Movement at Night	Sensations at Night
IDAS scale									
Dysphoria	.28	.22	.27	.02	<u>.37</u>	.22	.31	-.01	.01
Well-Being	-.13	-.15	-.09	-.04	-.22	-.17	-.22	-.12	-.12
Ill Temper	.13	.21	.21	.03	.20	.14	.21	.08	-.04
Appetite Loss	.24	<u>.31</u>	.28	.23	.09	.04	.07	-.10	-.04
Appetite Gain	-.01	-.02	-.05	-.13	.16	<u>.33</u>	.14	.04	.03
Suicide	.13	.18	.09	-.01	.12	.12	.18	-.08	.06
Mania	.28	.26	<u>.32</u>	.12	.16	.03	.20	.04	-.04
Euphoria	.15	.12	.06	.04	-.06	.02	.07	-.19	-.10
Panic	.26	.19	.20	.02	.19	.15	.23	.02	.04

Table 50. (cont.)

Social Anxiety	.23	.09	.22	-.02	.25	.18	.17	.06	.04
Agoraphobia	.15	.20	.16	.16	.03	.01	.13	-.06	.12
Checking	.14	.09	.22	.18	.12	.11	.06	-.13	.03
Ordering	.00	.07	.11	.09	.04	.06	-.03	-.05	.00
Cleaning	.02	.13	.10	.12	.09	.13	.08	-.09	.09
Traumatic Intrusions •	.16	.27	.08	-.04	.21	.08	.09	.01	.04
Traumatic Avoidance	.21	.26	.14	.03	.18	.12	.11	-.01	.01
DPS scale									
Imagination	.16	.07	.15	-.02	.12	.15	.18	.09	-.10
Detachment	.11	.15	.12	.06	.13	.16	.21	.03	.01
Obliviousness	.15	.20	.18	-.04	.19	.20	.24	.12	-.05
SPQ scale									
Unusual Beliefs/Experiences	.05	.05	-.01	.02	.03	.13	.10	.08	-.05
Mistrust	.06	.08	.14	.02	.10	.30	.24	.04	.00
Social Anhedonia	.20	.18	.19	.08	.12	.08	.13	-.03	.01
Eccentricity/Oddity	.13	.11	.08	.02	.14	.15	.19	.01	-.03

*Note.*  $n = 200$ . Correlations of  $|\underline{.14}|$  and greater are significant at  $p < .05$ , two-tailed. Underlined correlations are the highest in both row and column and thus are weakly related to daytime symptoms but show some specificity. IDAS = Inventory of Depression and Anxiety Symptoms. DPS = Dissociative Processes Scale. SPQ = Schizotypal Personality Questionnaire. • = sleep-related items removed.



Table 51. Correlations Between Iowa Sleep Disturbances Inventory Clinician Rating Scale (ISDI-CR) and Interview Measures of Daytime Symptoms in Patient Sample: Nonspecific Relations

	ISDI-CR scale								
	Initial Insomnia	Fragmented Sleep	Anxiety at Night	Light Sleep	Nonrestorative Sleep	Excessive Sleep	Irregular Schedule	Movement at Night	Sensations at Night
IDAS-CR scale									
Dysphoria	.13	.06	.19	.12	.08	.20	.29	-.05	-.03
Well-Being	-.21	-.16	-.12	-.07	-.14	-.05	-.21	-.04	-.09
Ill Temper	-.01	.08	.14	.03	.06	.03	-.01	.12	.08
Appetite Loss	.15	.09	.20	.16	-.05	.01	.16	.06	.07
Appetite Gain	-.01	.06	-.05	.04	.17	.07	.03	-.05	.10
Suicidality	.13	.08	.10	.05	.14	.17	<u>.31</u>	.00	.13
Mania	.17	.20	.31	.01	.07	.05	.08	.10	.03
Euphoria	.03	-.11	-.09	-.09	.05	-.06	-.04	-.08	-.02
Panic	.22	.20	<u>.34</u>	.07	.14	.17	.17	-.03	-.01

Table 51. (cont.)

Social Anxiety	.19	.05	.18	.20	.21	.21	.22	.09	-.01
Traumatic Intrusions	.08	.16	.11	.06	.04	.13	.06	.08	-.03
Traumatic Avoidance	.15	<u>.25</u>	.21	.00	.12	.07	.12	.10	.06
Traumatic Hyperarousal	.15	.10	.16	.05	-.06	.10	.14	.08	.06
PCCP scale									
Checking/Doubting	.07	.16	.20	.16	.11	.06	.05	.07	-.01
Intrusive Thoughts/Obsessions	.12	.07	.06	-.02	-.01	.05	.14	.03	-.04
Ordering/Rituals	.06	.03	.11	.03	.05	.09	.00	.05	.05
Cleaning/Washing	.08	.12	.12	<u>.20</u>	.10	.06	.08	-.07	.04
Hoarding	.06	.16	.09	.05	.08	.10	.13	.09	.11
Imagination/Absorption	.12	.03	.08	-.03	.08	.04	.13	.10	.02
Depersonalization/Derealization	<u>.23</u>	.13	.15	.10	.03	.08	.17	-.12	.13
Obliviousness/Amnesia	.03	.15	.04	-.08	.13	.06	.08	.11	.03
Supernatural Beliefs	.04	.04	-.09	-.10	-.07	.04	.07	-.01	.12
Hallucinations	.09	.06	.02	.07	.04	.02	-.06	.12	.03
Paranoia	.02	.09	.17	-.06	.04	<u>.22</u>	.21	.04	-.05
Social Anhedonia	.06	.11	.17	.04	.09	.07	.04	.03	-.07
Eccentricity/Oddity	.20	.17	.22	-.08	.14	.01	.13	.08	.06

Table 51. (cont.)

*Note.*  $n = 197$ . Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. Underlined correlations are the highest in both row and column and thus are weakly related to daytime symptoms but show some specificity. IDAS-CR = Clinician Rating version of the Inventory of Depression and Anxiety Symptoms. PCCP = Personality, Cognitions, Consciousness, and Perceptions interview.

Table 52. Correlations Between Iowa Sleep Disturbances Inventory (ISDI) and Questionnaire Measures of Daytime Symptoms in Student Sample

	ISDI scale				
	Fatigue	Nightmares	Sleep Hallucinations	Vivid Dreams	Sleep Paralysis
IDAS scale					
Dysphoria	<b>.54</b>	.26	.28	.29	.16
Well-Being	<b>-.41</b>	-.14	-.17	.05	.00
Ill Temper	<b>.36</b>	<b>.30</b>	.25	.26	.23
Appetite Loss	.25	.16	.19	.19	.23
Appetite Gain	.23	.04	.11	.14	.08
Mania	.23	.20	.29	<b>.30</b>	.14
Euphoria	-.15	.05	.13	.24	.18
Panic	<b>.36</b>	<b>.31</b>	.29	<b>.32</b>	.24
Social Anxiety	<b>.39</b>	<b>.32</b>	<b>.32</b>	.23	.06
Agoraphobia	.21	.22	.28	.11	.02
Checking	.12	.15	.23	.13	.09
Ordering	.08	.14	.12	.23	.03
Cleaning	.02	.05	.11	.06	.01
Traumatic Intrusions	.29	<b>.45</b>	<b>.31</b>	<b>.38</b>	<b>.40</b>
Traumatic Avoidance	.27	<b>.36</b>	.28	.21	<b>.35</b>
DPS scale					
Imagination	.20	.27	<b>.40</b>	<b>.32</b>	.28
Detachment	.15	.25	<b>.40</b>	<b>.30</b>	.28
Obliviousness	.29	<b>.31</b>	<b>.44</b>	<b>.39</b>	.29
SPQ scale					
Unusual Beliefs/Exp	.14	<b>.40</b>	<b>.47</b>	<b>.42</b>	<b>.36</b>
Mistrust	<b>.34</b>	.29	<b>.30</b>	.26	.18
Social Anhedonia	.29	<b>.32</b>	.29	.06	-.01

Table 52. (cont.)

Eccentricity/Oddity	<b>.32</b>	<b>.37</b>	<b>.40</b>	<b>.36</b>	.07
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*Note.*  $n = 219$ . Correlations of  $|\geq .30|$  and greater are in bold. Underlined correlations are the highest in both row and column. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS = Inventory of Depression and Anxiety Symptoms. DPS = Dissociative Processes Scale. SPQ = Schizotypal Personality Questionnaire. Unusual Beliefs/Exp = Unusual Beliefs/Experiences. • = sleep-related items removed.

Table 53. Correlations Between Iowa Sleep Disturbances Inventory Clinician Rating Scale (ISDI-CR) and Questionnaire Measures of Daytime Symptoms in Student Sample

	ISDI-CR scale				
	Fatigue	Nightmares	Sleep Hallucinations	Vivid Dreams	Sleep Paralysis
IDAS scale					
Dysphoria	<b>.47</b>	.28	.25	.29	.05
Well-Being	<b>-.31</b>	-.13	-.17	-.02	.01
Ill Temper	<b>.36</b>	<b>.35</b>	.25	.24	.15
Appetite Loss	.15	.16	.17	.16	.02
Appetite Gain	.17	.07	.05	.12	.11
Mania	.19	.25	.20	.29	-.01
Euphoria	-.13	.02	.10	.17	-.01
Panic	<b>.31</b>	.26	.24	.25	.11
Social Anxiety	<b>.30</b>	<b>.33</b>	.28	.25	.00
Agoraphobia	.10	.18	.25	.25	.02
Checking	.06	.17	.16	.19	-.01
Ordering	.05	.21	.11	.21	-.07
Cleaning	.04	.17	.08	.09	.00
Traumatic Intrusions	.26	<b>.37</b>	.27	<b>.32</b>	.20
Traumatic Avoidance	.22	.29	.27	.26	.16
DPS scale					
Imagination	.19	.20	<b>.41</b>	.24	.14
Detachment	.11	.11	<b>.41</b>	.24	.09
Obliviousness	.24	.24	<b>.40</b>	.26	.18
SPQ scale					
Unusual Beliefs/Exp	.12	.26	<b>.37</b>	.24	.23
Mistrust	.27	.25	.28	.21	.10
Social Anhedonia	.20	.17	<b>.31</b>	.01	.01

Table 53. (cont.)

Eccentricity/Oddity	.26	.24	<b>.34</b>	.23	.06
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*Note.*  $n = 219$ . Correlations of  $|\geq .30|$  and greater are in bold. Underlined correlations are the highest in both row and column. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS = Inventory of Depression and Anxiety Symptoms. DPS = Dissociative Processes Scale. SPQ = Schizotypal Personality Questionnaire. Unusual Beliefs/Exp = Unusual Beliefs/Experiences. • = sleep-related items removed.

Table 54. Correlations Between Iowa Sleep Disturbances Inventory (ISDI) and Interview Measures of Daytime Symptoms in Student Sample

	ISDI scale				
	Fatigue	Nightmares	Sleep Hallucinations	Vivid Dreams	Sleep Paralysis
IDAS-CR scale					
Dysphoria	<b><u>.37</u></b>	.12	.06	.09	.04
Well-Being	-.19	-.06	-.13	-.05	-.12
Ill Temper	.18	.24	.16	.09	.06
Appetite Loss	.18	.08	.10	.09	.14
Appetite Gain	.09	.00	.09	-.04	.05
Suicidality	.12	-.02	.17	.02	-.06
Mania	.27	.09	.09	.12	-.01
Euphoria	.04	-.04	-.02	-.02	.02
Panic	.22	.18	.00	.04	.02
Social Anxiety	.25	.18	.22	.10	-.07
Traumatic Intrusions	.24	<b><u>.34</u></b>	.14	.18	<b><u>.31</u></b>
Traumatic Avoidance	.18	<b><u>.34</u></b>	.16	.16	.21
PCCP scale					
Checking/Doubting	.22	.07	.12	.04	.03
Ordering/Rituals	.17	.09	.01	.14	.00
Cleaning/Washing	.11	.08	.02	.01	.05
Hoarding	.18	.07	-.09	.05	-.08
Imagination/Absorption	.18	.19	.08	.11	.07
Depers/Dereal	.18	.15	.13	.12	.27
Obliviousness/Amnesia	.19	.22	<b><u>.32</u></b>	.20	.26
Supernatural Beliefs	.14	.08	.11	.13	.11
Social Anhedonia	.15	.14	.15	.01	-.07
Eccentricity/Oddity	.18	.25	.20	.06	-.07



Table 54. (cont.)

*Note.*  $n = 219$ . Correlations of  $|.30|$  and greater are in bold. Underlined correlations are the highest in both row and column. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS-CR = Clinician Rating version of the Inventory of Depression and Anxiety Symptoms. PCCP = Personality, Cognitions, Consciousness, and Perceptions interview. Depers/Dereal = Depersonalization/Derealization.

Table 55. Correlations Between Iowa Sleep Disturbances Inventory Clinician Rating Scale (ISDI-CR) and Interview Measures of Daytime Symptoms in Student Sample

	ISDI-CR scale				
	Fatigue	Nightmares	Sleep Hallucinations	Vivid Dreams	Sleep Paralysis
IDAS-CR scale					
Dysphoria	<u>.37</u>	.16	.10	.15	-.02
Well-Being	-.22	-.17	-.20	.07	-.07
Ill Temper	.19	.24	.09	.20	-.05
Appetite Loss	.12	.09	.08	.10	.04
Appetite Gain	.25	.03	.11	.03	.09
Suicidality	.14	.04	.17	.06	-.04
Mania	.23	.17	.10	.17	-.09
Euphoria	-.03	-.03	.10	-.03	.00
Panic	.19	.21	.02	.18	.01
Social Anxiety	.18	.20	.25	.09	-.11
Traumatic Intrusions	.24	.27	.16	.27	.22
Traumatic Avoidance	.16	<u>.29</u>	.14	.21	.10
PCCP scale					
Checking/Doubting	.23	.18	.18	.15	-.01
Ordering/Rituals	.17	.25	.05	.14	-.09
Cleaning/Washing	.20	.18	.01	.07	.03
Hoarding	.20	.11	-.09	.16	-.12
Imagination/Absorption	.13	.25	.18	.11	-.06
Depers/Dereal	.12	.14	.06	.13	<u>.23</u>
Obliviousness/Amnesia	.22	.24	<u>.32</u>	.25	.15
Supernatural Beliefs	.10	.06	.22	.11	.12
Social Anhedonia	.11	.13	.11	.09	-.03
Eccentricity/Oddity	.14	.14	.16	.08	-.03

Table 55. (cont.)

*Note.*  $n = 219$ . Correlations of  $|.30|$  and greater are in bold. Underlined correlations are the highest in both row and column. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS-CR = Clinician Rating version of the Inventory of Depression and Anxiety Symptoms. PCCP = Personality, Cognitions, Consciousness, and Perceptions interview. Depers/Dereal = Depersonalization/Derealization.

Table 56. Correlations Between Iowa Sleep Disturbances Inventory (ISDI) and Questionnaire Measures of Daytime Symptoms in Patient Sample

	ISDI scale				
	Fatigue	Nightmares	Sleep Hallucinations	Vivid Dreams	Sleep Paralysis
IDAS scale					
Dysphoria	<b><u>.51</u></b>	.14	.14	.20	.08
Well-Being	<b>-.35</b>	-.01	-.02	.01	.02
Ill Temper	.28	.17	.12	.23	.09
Appetite Loss	.17	.18	.27	.17	.20
Appetite Gain	.29	.00	-.11	.06	-.01
Suicidality	.25	.16	.14	.22	.01
Mania	.23	.20	.19	.24	.21
Euphoria	-.04	-.03	.04	.08	.09
Panic	<b>.32</b>	.22	.22	.18	.13
Social Anxiety	<b>.37</b>	.08	.14	.14	.03
Agoraphobia	.03	.13	.12	.09	.02
Checking	.09	.14	.14	.09	.07
Ordering	.01	.14	.11	.19	.08
Cleaning	.11	.13	.10	.07	.14
Traumatic Intrusions	.21	<b><u>.45</u></b>	.27	.26	.15
Traumatic Avoidance	.19	<b>.42</b>	.21	.23	.11
DPS scale					
Imagination	.15	<b>.37</b>	<b>.33</b>	<b><u>.38</u></b>	.17
Detachment	.16	.22	<b><u>.38</u></b>	.25	.18
Obliviousness	<b>.34</b>	.24	.29	.23	.22
SPQ scale					
Unusual Beliefs/Exp	.10	.19	<b>.30</b>	.20	.26
Mistrust	.22	.16	.07	.14	.14

Table 56. (cont.)

Social Anhedonia	<u>.27</u>	<u>.03</u>	<u>-.05</u>	<u>-.04</u>	<u>.01</u>
Eccentricity/Oddity	<u>.20</u>	<u>.12</u>	<u>.14</u>	<u>.21</u>	<u>.09</u>

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*Note.*  $n = 200$ . Correlations of  $|\geq .30|$  and greater are in bold. Underlined correlations are the highest in both row and column. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS = Inventory of Depression and Anxiety Symptoms. DPS = Dissociative Processes Scale. SPQ = Schizotypal Personality Questionnaire. Unusual Beliefs/Exp = Unusual Beliefs/Experiences. • = sleep-related items removed.

Table 57. Correlations Between Iowa Sleep Disturbances Inventory Clinician Rating Scale (ISDI-CR) and Questionnaire Measures of Daytime Symptoms in Patient Sample

	ISDI-CR scale				
	Fatigue	Nightmares	Sleep Hallucinations	Vivid Dreams	Sleep Paralysis
IDAS scale					
Dysphoria	<b>.34</b>	.10	-.03	.05	.02
Well-Being	-.22	.01	.04	.01	.06
Ill Temper	.22	.14	.08	.07	.19
Appetite Loss	.15	.17	.05	.07	.13
Appetite Gain	.18	-.03	.06	.05	.00
Suicidality	.10	.05	.06	.10	-.01
Mania	.23	.14	.09	.16	.18
Euphoria	.01	.04	.03	.04	.14
Panic	.27	.13	.18	.15	.13
Social Anxiety	.15	.05	.01	.00	.04
Agoraphobia	-.10	.18	.12	.11	.02
Checking	.05	.10	.06	.04	-.03
Ordering	.06	.17	.09	.08	.05
Cleaning	.10	.12	.17	.00	.12
Traumatic Intrusions	.15	<b>.33</b>	.15	.15	.15
Traumatic Avoidance	.13	<b>.36</b>	.12	.17	.07
DPS scale					
Imagination	.14	.28	.18	.19	.21
Detachment	.17	.10	<b>.30</b>	.15	.13
Obliviousness	.25	.20	.18	.15	.18
SPQ scale					
Unusual Beliefs/Exp	.17	.13	.26	.14	.22
Mistrust	.10	.17	.09	-.02	.09

Table 57. (cont.)

Social Anhedonia	<u>.19</u>	<u>.05</u>	<u>-.04</u>	<u>-.08</u>	<u>-.07</u>
Eccentricity/Oddity	<u>.15</u>	<u>.12</u>	<u>.10</u>	<u>.07</u>	<u>.12</u>

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*Note.*  $n = 200$ . Correlations of  $|\geq .30|$  and greater are in bold. Underlined correlations are the highest in both row and column. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS = Inventory of Depression and Anxiety Symptoms. DPS = Dissociative Processes Scale. SPQ = Schizotypal Personality Questionnaire. • = sleep-related items removed. Unusual Beliefs/Exp = Unusual Beliefs/Experiences.

Table 58. Correlations Between Iowa Sleep Disturbances Inventory (ISDI) and Interview Measures of Daytime Symptoms in Patient Sample

	ISDI scale				
	Fatigue	Nightmares	Sleep Hallucinations	Vivid Dreams	Sleep Paralysis
IDAS-CR scale					
Dysphoria	<b><u>.40</u></b>	-.02	.00	.04	.02
Well-Being	-.27	-.05	-.02	-.02	.07
Ill Temper	.06	.11	.08	.13	.14
Appetite Loss	.09	.09	.11	.07	.13
Appetite Gain	.19	.01	-.06	.01	-.07
Suicidality	.26	.04	.03	.10	-.02
Mania	.16	.05	.09	-.05	.15
Euphoria	-.04	.03	.07	.05	.01
Panic	<b>.31</b>	.18	.13	.10	.14
Social Anxiety	.24	.07	.09	.04	.04
Traumatic Intrusions	.07	<b>.31</b>	.07	.13	.09
Traumatic Avoidance	.18	<b><u>.32</u></b>	.15	.14	.12
Traumatic Hyperarousal	.02	.10	.05	.05	.06
PCCP scale					
Checking/Doubting	.10	.09	.06	.09	-.05
Intrusive Thoughts/Obsess	.04	.14	.07	.18	.12
Ordering/Rituals	.04	.07	.10	.15	-.01
Cleaning/Washing	.05	.15	.07	-.01	.09
Hoarding	.04	.13	.14	.09	.08
Imagination/Absorption	.18	.18	<b><u>.30</u></b>	.19	.11
Depers/Dereal	.10	.14	.16	<b><u>.26</u></b>	.18
Obliviousness/Amnesia	.12	.22	.16	.14	.12
Supernatural Beliefs	-.03	.04	.08	.09	.03



Table 58. (cont.)

Hallucinations	.01	.17	.20	.13	.10
Paranoia	.16	.10	.00	-.03	.11
Social Anhedonia	.12	.10	-.08	-.03	-.03
Eccentricity/Oddity	.01	.23	.19	.15	.12

*Note.*  $n = 197$ . Correlations of  $|\geq .30|$  and greater are in bold. Underlined correlations are the highest in both row and column. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS-CR = Clinician Rating version of the Inventory of Depression and Anxiety Symptoms. PCCP = Personality, Cognitions, Consciousness, and Perceptions interview. Intrusive Thoughts/Obsess = Intrusive Thoughts/Obsessions. Depers/Dereal = Depersonalization/Derealization.

Table 59. Correlations Between Iowa Sleep Disturbances Inventory Clinician Rating Scale (ISDI-CR) and Interview Measures of Daytime Symptoms in Patient Sample

	ISDI-CR scale				
	Fatigue	Nightmares	Sleep Hallucinations	Vivid Dreams	Sleep Paralysis
IDAS-CR scale					
Dysphoria	<b>.33</b>	.06	.02	.07	-.01
Well-Being	-.22	-.09	-.06	.00	.03
Ill Temper	.08	.12	.05	.04	.17
Appetite Loss	.13	.12	.01	.01	.07
Appetite Gain	.12	.04	.10	.09	-.05
Suicidality	.25	.00	.08	.07	.01
Mania	.19	.18	.07	.04	.22
Euphoria	.03	-.05	.11	.04	.02
Panic	.28	.22	.20	.15	.15
Social Anxiety	.23	.12	.10	.03	.01
Traumatic Intrusions	.12	<b>.39</b>	.08	.14	.14
Traumatic Avoidance	.21	<b>.36</b>	.18	.15	.16
Traumatic Hyperarousal	.12	.22	.01	.08	.10
PCCP scale					
Checking/Doubting	.12	.10	-.03	.18	-.03
Intrusive Thoughts/Obsess	.17	.14	.13	.11	.18
Ordering/Rituals	.03	.09	.10	.09	.01
Cleaning/Washing	.12	.19	.20	.17	.07
Hoarding	.12	.16	.09	.17	.07
Imagination/Absorption	.18	.21	.28	.15	.19
Depers/Dereal	.09	.20	<b>.33</b>	.21	.22
Obliviousness/Amnesia	.14	.22	.13	.22	.07
Supernatural Beliefs	.08	.03	.23	.10	.10
Hallucinations	.07	.18	.11	.13	.11

Table 59. (cont.)

Paranoia	.16	.14	.02	.00	.10
Social Anhedonia	.05	.14	.00	.00	-.05
Eccentricity/Oddity	.06	.28	.22	.20	.14

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*Note.*  $n = 197$ . Correlations of  $|\geq .30|$  and greater are in bold. Underlined correlations are the highest in both row and column. Correlations of  $|\geq .14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS-CR = Clinician Rating version of the Inventory of Depression and Anxiety Symptoms. PCCP = Personality, Cognitions, Consciousness, and Perceptions interview. Intrusive Thoughts/Obsess = Intrusive Thoughts/Obsessions. Depers/Dereal = Depersonalization/Derealization.

Table 60. Specificity of Daytime Symptoms: Correlations Between the Iowa Sleep Disturbances Inventory (ISDI) and Questionnaire Measures of Daytime Symptoms in Student Sample

	ISDI scale					
	Initial Insomnia	Fatigue	Nightmares	Sleep Hallucinations	Vivid Dreams	Sleep Paralysis
IDAS scale						
Dysphoria	.33 <sup>b</sup>	<b>.54<sup>a</sup></b>	.26 <sup>b</sup>	.28 <sup>b</sup>	.29 <sup>b</sup>	.16 <sup>b</sup>
Panic	.16 <sup>b</sup>	<b>.36<sup>a</sup></b>	.31	.29	.32	.24
Social Anxiety	.24 <sup>b</sup>	<b>.39<sup>a</sup></b>	.32	.32	.23 <sup>b</sup>	.06 <sup>b</sup>
Traumatic Intrusions •	.19 <sup>b</sup>	.29 <sup>b</sup>	<b>.45<sup>a</sup></b>	.31 <sup>b</sup>	.38	.40
Traumatic Avoidance	.08 <sup>b</sup>	.27	<b>.36<sup>a</sup></b>	.28	.21 <sup>b</sup>	.35
DPS scale						
Imagination	.10 <sup>b</sup>	.20 <sup>b</sup>	.27 <sup>b</sup>	<b>.40<sup>a</sup></b>	.32	.28 <sup>b</sup>
Detachment	.09 <sup>b</sup>	.15 <sup>b</sup>	.25 <sup>b</sup>	<b>.40<sup>a</sup></b>	.30	.28 <sup>b</sup>
Obliviousness	.17 <sup>b</sup>	.29 <sup>b</sup>	.31 <sup>b</sup>	<b>.44<sup>a</sup></b>	.39	.29 <sup>b</sup>
SPQ scale						
Unusual Beliefs/Exp	.11 <sup>b</sup>	.14 <sup>b</sup>	.40	<b>.47<sup>a</sup></b>	.42	.36 <sup>b</sup>
Mistrust	.09 <sup>b</sup>	<b>.34<sup>a</sup></b>	.29	.30	.26	.18 <sup>b</sup>
Social Anhedonia	.31	.29	<b>.32<sup>a</sup></b>	.29	.06 <sup>b</sup>	-.01 <sup>b</sup>

Table 60. (cont.)

Eccentricity/Oddity	.18 <sup>b</sup>	.32	.37	<b>.40<sup>a</sup></b>	.36	.07 <sup>b</sup>
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*Note.*  $n = 219$ . The highest correlation in each row is in bold. This correlation is significantly stronger than correlations with different superscripts within a row at  $p < .05$ , one-tailed. Underlined correlations are the highest in both row and column. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS = Inventory of Depression and Anxiety Symptoms. DPS = Dissociative Processes Scale. SPQ = Schizotypal Personality Questionnaire. Unusual Beliefs/Exp = Unusual Beliefs/Experiences. • = sleep-related items removed.

Table 61. Specificity of Daytime Symptoms: Correlations Between the Iowa Sleep Disturbances Inventory (ISDI) and Questionnaire Measures of Daytime Symptoms in Patient Sample

	ISDI scale					
	Initial Insomnia	Fatigue	Nightmares	Sleep Hallucinations	Vivid Dreams	Sleep Paralysis
IDAS scale						
Dysphoria	.27 <sup>b</sup>	<b>.51<sup>a</sup></b>	.14 <sup>b</sup>	.14 <sup>b</sup>	.20 <sup>b</sup>	.08 <sup>b</sup>
Panic	.26	<b>.32<sup>a</sup></b>	.22	.22	.18	.13 <sup>b</sup>
Social Anxiety	.23	<b>.37<sup>a</sup></b>	.08 <sup>b</sup>	.14 <sup>b</sup>	.14 <sup>b</sup>	.03 <sup>b</sup>
Traumatic Intrusions •	.16 <sup>b</sup>	.21 <sup>b</sup>	<b>.45<sup>a</sup></b>	.27 <sup>b</sup>	.26 <sup>b</sup>	.15 <sup>b</sup>
Traumatic Avoidance	.21 <sup>b</sup>	.19 <sup>b</sup>	<b>.42<sup>a</sup></b>	.21 <sup>b</sup>	.23 <sup>b</sup>	.11 <sup>b</sup>
DPS scale						
Imagination	.16 <sup>b</sup>	.15 <sup>b</sup>	.37	.33	<b>.38<sup>a</sup></b>	.17 <sup>b</sup>
Detachment	.11 <sup>b</sup>	.16 <sup>b</sup>	.22 <sup>b</sup>	<b>.38<sup>a</sup></b>	.25 <sup>b</sup>	.18 <sup>b</sup>
Obliviousness	.15 <sup>b</sup>	<b>.34<sup>a</sup></b>	.24	.29	.23	.22
SPQ scale						
Unusual Beliefs/Exp	.05 <sup>b</sup>	.10 <sup>b</sup>	.19	<b>.30<sup>a</sup></b>	.20	.26
Mistrust	.06 <sup>b</sup>	<b>.22<sup>a</sup></b>	.16	.07	.14	.14
Social Anhedonia	.20	<b>.27<sup>a</sup></b>	.03 <sup>b</sup>	-.05 <sup>b</sup>	-.04 <sup>b</sup>	.01 <sup>b</sup>

Table 61. (cont.)

Eccentricity/Oddity	.12	.20	.12	.14	<b>.21</b>	.09
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*Note.*  $n = 200$ . The highest correlation in each row is in bold. This correlation is significantly stronger than correlations with different superscripts within a row at  $p < .05$ , one-tailed. Underlined correlations are the highest in both row and column. Correlations of  $|.14|$  and greater are significant at  $p < .05$ , two-tailed. IDAS = Inventory of Depression and Anxiety Symptoms. DPS = Dissociative Processes Scale. SPQ = Schizotypal Personality Questionnaire. Unusual Beliefs/Exp = Unusual Beliefs/Experiences. • = sleep-related items removed.

## References

- Abrams, M. P., Mulligan, A. D., Carleton, R. N., & Asmundson, G. J. G. (2008). Prevalence and correlates of sleep paralysis in adults reporting childhood sexual abuse. *Journal of Anxiety Disorders, 22*, 1535-1541.
- Agargun, M. Y., Kara, H., Ozer, O. A., Kiran, U., Selvi, Y., & Kiran, S. (2002). Sleep-related violence, dissociative experiences, and childhood traumatic events. *Sleep and Hypnosis, 4*, 52-57.
- Agargun, M. Y., Kara, H., Ozer, O. A., Selvi, Y., Kiran, U., & Ozer, B. (2003). Clinical importance of nightmare disorder in patients with dissociative disorders. *Psychiatry and Clinical Neurosciences, 57*, 575-579.
- American Academy of Sleep Medicine. (2005). *The international classification of sleep disorders: Diagnostic and coding manual* (2nd ed.). Westchester, IL: Author.
- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd rev. ed.). Washington, DC: Author.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (text revision ed.). Washington, DC: Author.
- Arndt, S., Alliger, R. J., & Andreasen, N. C. (1991). The distinction of positive and negative symptoms: The failure of a two-dimensional model. *British Journal of Psychiatry, 158*, 317-322.
- Bastien, C. H., Vallieres, A., & Morin, C. M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Medicine, 2*, 297-307.
- Benca, R. M. (1996). Sleep in psychiatric disorders. *Neurologic Clinics, 14*, 739-764.
- Benca, R. M. (2005). Mood disorders. In M. H. Kryger, T. Roth & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (4th ed., pp. 1311-1325). Philadelphia, PA: Saunders.
- Benca, R. M., & Schenck, C. H. (2005). Sleep and eating disorders. In M. H. Kryger, T. Roth & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (4th ed., pp. 1337-1344). Philadelphia, PA: Saunders.
- Benson, K. L., & Zarcone Jr., V. P. (2005). Schizophrenia. In M. H. Kryger, T. Roth & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (4th ed., pp. 1327-1336). Philadelphia, PA: Saunders.
- Bergman, A. J., Harvey, P. D., Mitropoulou, V., Aronson, A., Marder, D., Silverman, J., et al. (1996). The factor structure of schizotypal symptoms in a clinical population. *Schizophrenia Bulletin, 22*, 501-509.
- Breslau, N., Roth, T., Rosenthal, L., & Andreski, P. (1996). Sleep disturbance and psychiatric disorders: A longitudinal epidemiological study of young adults. *Biological Psychiatry, 39*, 411-418.



- Buckner, J. D., Bernert, R. A., Cromer, K. R., Joiner, T. E., & Schmidt, N. B. (2008). Social anxiety and insomnia: the mediating role of depressive symptoms. *Depression and Anxiety, 25*, 124-130.
- Butler, L. D., Duran, R. E., Jasiukaitis, P., Koopman, C., & Spiegel, D. (1996). Hypnotizability and traumatic experience: A diathesis-stress model of dissociative symptomatology. *American Journal of Psychiatry, 153*, 42-63.
- Buysse, D. J., Angst, J., Gamma, A., Ajdacic, V., Eich, D., & Rossler, W. (2008). Prevalence, course, and comorbidity of insomnia and depression in young adults. *Sleep, 31*, 473-480.
- Buysse, D. J., Reynolds, C. F., 3rd, Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research, 28*, 193-213.
- Buysse, D. J., Yu, L., Moul, D. E., Germain, A., Stover, A., Dodds, N. E., et al. (2010). Development and validation of patient-reported outcome measures for sleep disturbance and sleep-related impairments. *Sleep, 33*, 781-792.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*, 81-105.
- Carlson, E. B., & Putnam, F. W. (1993). An update on the Dissociative Experiences Scale. *Dissociation: Progress in the Dissociative Disorders, 6*, 16-27.
- Chang, P. P., Ford, D. E., Mead, L. A., Cooper-Patrick, L., & Klag, M. J. (1997). Insomnia in young men and subsequent depression: The Johns Hopkins Precursors Study. *American Journal of Epidemiology, 146*, 105-114.
- Chmielewski, M., & Watson, D. (2007, October). *Oddity: The third higher order factor of psychopathology*. Poster session presented at the annual meeting of the Society for Research in Psychopathology, Iowa City, IA.
- Chmielewski, M., & Watson, D. (2008). The heterogeneous structure of schizotypal personality disorder: Item-level factors of the Schizotypal Personality Questionnaire and their associations with obsessive-compulsive disorder symptoms, dissociative tendencies, and normal personality. *Journal of Abnormal Psychology, 117*, 364-376.
- Cho, S. J., Hong, J. P., Hahm, B. J., Jeon, H. J., Chang, S. M., Cho, M. J., et al. (2009). Restless legs syndrome in a community sample of Korean adults: prevalence, impact on quality of life, and association with DSM-IV psychiatric disorders. *Sleep, 32*, 1069-1076.
- Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment, 6*, 284-290.
- Claridge, G. (1997). Theoretical background and issues. In G. Claridge (Ed.), *Schizotypy: Implications for illness and health* (pp. 3-18). Oxford: Oxford University Press.
- Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*, 309-319.

- Clark, L. A., Watson, D., & Mineka, S. (1994). Temperament, personality, and the mood and anxiety disorders. *Journal of Abnormal Psychology, 103*, 103-116.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York: Academic Press.
- Cole, J. C., Motivala, S. J., Buysse, D. J., Oxman, M. N., Levin, M. J., & Irwin, M. R. (2006). Validation of a 3-factor scoring model for the Pittsburgh Sleep Quality Index in older adults. *Sleep, 29*, 112-116.
- Cutshall, C., & Watson, D. (2004). The Phobic Stimuli Response Scales: A new self-report measure of fear. *Behaviour Research and Therapy, 42*, 1193-1201.
- Devine, E. B., Hakim, Z., & Green, J. (2005). A systematic review of patient-reported outcome instruments measuring sleep dysfunction in adults. *Pharmacoeconomics, 23*, 889-912.
- Everett, J. E. (1983). Factor comparability as a means of determining the number of factors and their rotation. *Multivariate Behavioral Research, 18*, 197-218.
- Everett, J. E., & Entekin, L. V. (1980). Factor comparability and the advantages of multiple group factor analysis. *Multivariate Behavioral Research, 2*, 165-180.
- Fassler, O., Knox, J., & Lynn, S. J. (2006). The Iowa Sleep Experiences Survey: Hypnotizability, absorption, and dissociation. *Personality and Individual Differences, 41*, 675-684.
- Fisher, R. A. (1921). On the probable error of a coefficient of correlation deduced from a small sample. *Metron, 1*, 3-32.
- Ford, D. E., & Kamerow, D. B. (1989). Epidemiologic study of sleep disturbances and psychiatric disorders. An opportunity for prevention? *JAMA, 262*, 1479-1484.
- Gershuny, B. S., & Thayer, J. F. (1999). Relations among psychological trauma, dissociative phenomena, and trauma-related distress: A review and integration. *Clinical Psychology Review, 19*, 631-657.
- Giesbrecht, T., Jongen, E. M., Smulders, F. T., & Merckelbach, H. (2006). Dissociation, resting EEG, and subjective sleep experiences in undergraduates. *Journal of Nervous and Mental Disease, 194*, 362-368.
- Giesbrecht, T., & Merckelbach, H. (2004). Subjective sleep experiences are related to dissociation. *Personality and Individual Differences, 37*, 1341-1345.
- Giesbrecht, T., & Merckelbach, H. (2006). Dreaming to reduce fantasy? Fantasy proneness, dissociation, and subjective sleep experiences. *Personality and Individual Differences, 41*, 697-706.
- Giesbrecht, T., Merckelbach, H., Kater, M., & Sluis, A. F. (2007). Why dissociation and schizotypy overlap: The joint influence of fantasy proneness, cognitive failures, and childhood trauma. *Journal of Nervous and Mental Disease, 195*, 812-818.

- Giesbrecht, T., Smeets, T., Leppink, J., Jelicic, M., & Merckelbach, H. (2007). Acute dissociation after 1 night of sleep loss. *Journal of Abnormal Psychology, 116*, 599-606.
- Gillin, J. C., Drummond, S. P., Clark, C. P., & Moore, P. (2005). Medication and substance abuse. In M. H. Kryger, T. Roth & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (4th ed., pp. 1345-1358). Philadelphia, PA: Saunders.
- Goldberg, L. R. (1999). The curious experiences survey, a revised version of the Dissociative Experiences Scale: Factor structure, reliability, and relations to demographic and personality variables. *Psychological Assessment, 11*, 134-145.
- Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Harrison, J. A., & Watson, D. (1992). *The Dissociative Processes Scale*. Unpublished manuscript. University of Iowa, Iowa City.
- Harvey, A. G., Jones, C., & Schmidt, D. A. (2003). Sleep and posttraumatic stress disorder: A review. *Clinical Psychology Review, 23*, 377-407.
- Hefez, A., Metz, L., & Lavie, P. (1987). Long-term effects of extreme situational stress on sleep and dreaming. *American Journal of Psychiatry, 144*, 344-347.
- Hogan, R. T. (1983). A socioanalytic theory of personality. In M. Page (Ed.), *1982 Nebraska Symposium on Motivation* (pp. 55-89). Lincoln: University of Nebraska Press.
- Husain, A. M., Miller, P. P., & Carwile, S. T. (2001). REM sleep behavior disorder: Potential relationship to post-traumatic stress disorder. *Journal of Clinical Neurophysiology, 18*, 148-157.
- Kenny, D. A. (1987). *Statistics for the social and behavioral sciences*. Boston: Little, Brown.
- Kihlstrom, J. F., Glisky, M. L., & Angiulo, M. J. (1994). Dissociative tendencies and dissociative disorders. *Journal of Abnormal Psychology, 103*, 117-124.
- Knox, J. A. (2008). Context effects examined: Imagination, sleep experiences, dissociation, and schizotypy. *Dissertation Abstracts International, 68*, 7B (UMI No. 3274108).
- Koffel, E., & Watson, D. (2009a). The two-factor structure of sleep complaints and its relation to depression and anxiety. *Journal of Abnormal Psychology, 118*, 183-194.
- Koffel, E., & Watson, D. (2009b). Unusual sleep experiences, dissociation, and schizotypy: Evidence for a common domain. *Clinical Psychology Review, 29*, 548-559.
- Koffel, E., & Watson, D. (in press). Development and initial validation of the Iowa Sleep Disturbances Inventory. *Assessment*.

- Krakow, B., Schrader, R., Tandberg, D., Hollifield, M., Koss, M. P., Yau, C., et al. (2002). Nightmare frequency in sexual assault survivors with PTSD. *Journal of Anxiety Disorders, 16*, 175-190.
- Krueger, R. F. (1999). The structure of common mental disorders. *Arch Gen Psychiatry, 56*, 921-926.
- Lee, H. B., Hening, W. A., Allen, R. P., Kalaydjian, A. E., Earley, C. J., Eaton, W. W., et al. (2008). Restless legs syndrome is associated with DSM-IV major depressive disorder and panic disorder in the community. *The Journal of Neuropsychiatry and Clinical Neurosciences, 20*, 101-105.
- Lenzenweger, M. F., & Dworkin, R. H. (1996). The dimensions of schizophrenia phenomenology: Not one or two, at least three, perhaps four. *British Journal of Psychiatry 168*, 432-440.
- Levin, R. (1998). Nightmares and schizotypy. *Psychiatry, 61*, 206-216.
- Levin, R., & Fireman, G. (2002). Nightmare prevalence, nightmare distress, and self-reported psychological disturbance. *Sleep, 25*, 205-212.
- Loevinger, J. (1957). Objective tests as instruments of psychological theory. *Psychological Reports, 3*, 635-694.
- Mahowald, M. W., & Schenck, C. H. (2001). Evolving concepts of human state dissociation. *Archives Italiennes de Biologie, 139*, 269-300.
- Manber, R., Edinger, J. D., Gress, J. L., San Pedro-Salcedo, M. G., Kuo, T. F., & Kalista, T. (2008). Cognitive behavioral therapy for insomnia enhances depression outcome in patients with comorbid major depressive disorder and insomnia. *Sleep, 31*, 489-495.
- Mellman, T. A. (2006). Sleep and anxiety disorders. *Psychiatric Clinics of North America, 29*, 1047-1058.
- Mellman, T. A., Kulick-Bell, R., Ashlock, L. E., & Nolan, B. (1995). Sleep events among veterans with combat-related posttraumatic stress disorder. *American Journal of Psychiatry, 152*, 110-115.
- Merckelbach, H., & Giesbrecht, T. (2006). Subclinical dissociation, schizotypy, and traumatic distress. *Personality and Individual Differences, 40*, 365-374.
- Merckelbach, H., Rassin, E., & Muris, P. (2000). Dissociation, schizotypy, and fantasy proneness in undergraduate students. *Journal of Nervous and Mental Disease, 188*, 428-431.
- Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology, 49*, 377-412.
- Morin, C. M. (1993). *Insomnia: Psychological assessment and management*. New York: Guilford Press.
- Moul, D. E., Hall, M., Pilkonis, P. A., & Buysse, D. J. (2004). Self-report measures of insomnia in adults: rationales, choices, and needs. *Sleep Med Rev, 8*, 177-198.

- Neylan, T. C., Marmar, C. R., Metzler, T. J., Weiss, D. S., Zatzick, D. F., Delucchi, K. L., et al. (1998). Sleep disturbances in the Vietnam generation: Findings from a nationally representative sample of male Vietnam veterans. *American Journal of Psychiatry*, *155*, 929-933.
- O'Connor, B. P. (2002). The search for dimensional structure differences between normality and abnormality: A statistical review of published data on personality and psychopathology. *Journal of Personality and Social Psychology*, *83*, 962-982.
- Ohayon, M. M. (2000). Prevalence of hallucinations and their pathological associations in the general population. *Psychiatry Research*, *97*, 153-164.
- Ohayon, M. M., Caulet, M., & Priest, R. G. (1997). Violent behavior during sleep. *Journal of Clinical Psychiatry*, *58*, 369-376.
- Ohayon, M. M., Priest, R. G., Caulet, M., & Guilleminault, C. (1996). Hypnagogic and hypnopompic hallucinations: Pathological phenomena? *British Journal of Psychiatry*, *169*, 459-467.
- 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.
- Papadimitriou, G. N., & Linkowski, P. (2005). Sleep disturbance in anxiety disorders. *International Review of Psychiatry*, *17*, 229-236.
- Peterson, M. J., & Benca, R. M. (2006). Sleep in mood disorders. *Psychiatric Clinics of North America*, *29*, 1009-1032.
- Pope, C. A., & Kwapil, T. R. (2000). Dissociative experiences in hypothetically psychosis-prone college students. *Journal of Nervous and Mental Disease*, *188*, 530-536.
- Raine, A. (1991). The SPQ: a scale for the assessment of schizotypal personality based on DSM-III-R criteria. *Schizophrenia Bulletin*, *17*, 555-564.
- Raine, A., Reynolds, C., Lencz, T., Scerbo, A., Triphon, N., & Kim, D. (1994). Cognitive-perceptual, interpersonal, and disorganized features of schizotypal personality. *Schizophrenia Bulletin*, *20*, 191-201.
- Ross, C. A., Ellason, J. W., & Anderson, G. (1995). A factor analysis of the Dissociative Experiences Scale (DES) in dissociative identity disorder. *Dissociation: Progress in the Dissociative Disorders*, *8*, 229-235.
- Roth, T., Jaeger, S., Jin, R., Kalsekar, A., Stang, P. E., & Kessler, R. C. (2006). Sleep Problems, Comorbid Mental Disorders, and Role Functioning in the National Comorbidity Survey Replication (NCS-R). *Biological Psychiatry*, *60*, 1364-1371.
- Sateia, M. J., Doghramji, K., Hauri, P. J., & Morin, C. M. (2000). Evaluation of chronic insomnia: An American Academy of Sleep Medicine review. *Sleep*, *23*, 243-308.
- Savard, M. H., Savard, J., Simard, S., & Ivers, H. (2005). Empirical validation of the Insomnia Severity Index in cancer patients. *Psychooncology*, *14*, 429-441.

- Schramm, E., Hohagen, F., Grasshoff, U., Riemann, D., Hajak, G., Wees, H. G., et al. (1993). Test-retest reliability and validity of the Structured Interview for Sleep Disorders According to DSM-III--R. *American Journal of Psychiatry*, *150*, 867-872.
- Selzer, M. L. (1971). The Michigan Alcoholism Screening Test: The quest for a new diagnostic instrument. *American Journal of Psychiatry*, *127*, 1653-1658.
- Simms, L. J., Watson, D., & Doebbeling, B. N. (2002). Confirmatory factor analyses of posttraumatic stress symptoms in deployed and nondeployed veterans of the Gulf War. *Journal of Abnormal Psychology*, *111*, 637-647.
- Skinner, H. A. (1982). The Drug Abuse Screening Test. *Addictive Behaviors*, *7*, 363-371.
- Smith, G. T., McCarthy, D. M., & Zapolski, T. C. (2009). On the value of homogeneous constructs for construct validation, theory testing, and the description of psychopathology. *Psychological Assessment*, *21*, 272-284.
- Sours, J. A. (1963). Narcolepsy and other disturbances in the sleep-waking rhythm: A study of 115 cases with review of the literature. *Journal of Nervous and Mental Disease* *137*, 525-542.
- Spanos, N. P., McNulty, S. A., DuBreuil, S. C., & Pires, M. (1995). The frequency and correlates of sleep paralysis in a university sample. *Journal of Research in Personality*, *29*, 285-305.
- Spoormaker, V. I., Verbeek, I., van den Bout, J., & Klip, E. C. (2005). Initial Validation of the SLEEP-50 Questionnaire. *Behavioral Sleep Medicine*, *3*, 227-246.
- Stein, M. B., Chartier, M., & Walker, J. R. (1993). Sleep in nondepressed patients with panic disorder: I. Systematic assessment of subjective sleep quality and sleep disturbance. *Sleep*, *16*, 724-726.
- Stein, M. B., Kroft, C. D., & Walker, J. R. (1993). Sleep impairment in patients with social phobia. *Psychiatry Research*, *49*, 251-256.
- Stein, M. B., & Mellman, T. A. (2005). Anxiety disorders. In M. H. Kryger, T. Roth & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (4th ed., pp. 1297-1310). Philadelphia, PA: Saunders.
- Szklo-Coxe, M., Young, T., Peppard, P. E., Finn, L. A., & Benca, R. M. (2010). Prospective associations of insomnia markers and symptoms with depression. *American Journal of Epidemiology*, *171*, 709-720.
- van der Kolk, B., Blitz, R., Burr, W., Sherry, S., & Hartmann, E. (1984). Nightmares and trauma: A comparison of nightmares after combat with lifelong nightmares in veterans. *American Journal of Psychiatry*, *141*, 187-190.
- van Ijzendoorn, M. H., & Schuengel, C. (1996). The measurement of dissociation in normal and clinical populations: Meta-analytic validation of the Dissociative Experiences Scale (DES). *Clinical Psychology Review*, *16*, 365-382.

- Watson, D. (2001). Dissociations of the night: Individual differences in sleep-related experiences and their relation to dissociation and schizotypy. *Journal of Abnormal Psychology, 110*, 526-535.
- Watson, D. (2003). To dream, perchance to remember: Individual differences in dream recall. *Personality and Individual Differences, 34*, 1271-1286.
- Watson, D. (2005). Rethinking the mood and anxiety disorders: A quantitative hierarchical model for DSM-V. *Journal of Abnormal Psychology, 114*, 522-536.
- Watson, D. (2009). Differentiating the mood and anxiety disorders: A quadripartite model. *Annual Review of Clinical Psychology, 5*, 221-247.
- Watson, D., Clark, L. A., & Carey, G. (1988). Positive and negative affectivity and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology, 97*, 346-353.
- Watson, D., Clark, L. A., & Chmielewski, M. (2008). Structures of personality and their relevance to psychopathology: II. Further articulation of a comprehensive unified trait structure. *Journal of Personality, 76*, 1545-1586.
- Watson, D., O'Hara, M. W., Chmielewski, M., McDade-Montez, E. A., Koffel, E., Naragon, K., et al. (2008). Further validation of the IDAS: Evidence of convergent, discriminant, criterion, and incremental validity. *Psychological Assessment, 20*, 248-259.
- Watson, D., O'Hara, M. W., Simms, L. J., Kotov, R., Chmielewski, M., McDade-Montez, E. A., et al. (2007). Development and validation of the Inventory of Depression and Anxiety Symptoms (IDAS). *Psychological Assessment, 19*, 253-268.
- Watson, D., & Wu, K. D. (2005). Development and validation of the Schedule of Compulsions, Obsessions, and Pathological Impulses (SCOPI). *Assessment, 12*, 50-65.
- Watson, D., Wu, K. D., & Cutshall, C. (2004). Symptom subtypes of obsessive-compulsive disorder and their relation to dissociation. *Journal of Anxiety Disorders, 18*, 435-458.
- Weathers, F. W., Litz, B. T., Herman, D. S., Huska, J. A., & Keane, T. M. (1993, October). *The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility*. Paper presented at the annual meeting of the International Society for Traumatic Stress Studies, San Antonio, TX.
- Weissman, M. M., Greenwald, S., Nino-Murcia, G., & Dement, W. C. (1997). The morbidity of insomnia uncomplicated by psychiatric disorders. *General Hospital Psychiatry, 19*, 245-250.
- Widiger, T. A., & Samuel, D. B. (2005). Diagnostic Categories or Dimensions? A Question for the Diagnostic and Statistical Manual of Mental Disorders--Fifth Edition. *Journal of Abnormal Psychology, 114*, 494-504.
- Wilcox, J. (1985). Psychopathology and narcolepsy. *Neuropsychobiology, 14*, 170-172.

Winkelmann, J., Prager, M., Lieb, R., Pfister, H., Spiegel, B., Wittchen, H. U., et al. (2005). "Anxietas tibiaram": Depression and anxiety disorders in patients with restless legs syndrome. *Journal of Neurology*, 252, 67-71.