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# Extension of the hierarchical model of anxiety and depression to the personality domain

Roman I. Kotov  
*University of Iowa*

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EXTENSION OF THE HIERARCHICAL MODEL OF ANXIETY AND DEPRESSION  
TO THE PERSONALITY DOMAIN

by  
Roman I Kotov

An Abstract

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

July 2006

Thesis Supervisor: Professor David Watson

## ABSTRACT

Research on the empirical structure of distress (mood and anxiety) disorders has yielded many valuable insights. These efforts have culminated in the integrative hierarchical model (Mineka, Watson, & Clark, 1998), which specified general, specific, and unique components of distress disorders. However, some components have not yet been identified, and the model cannot account for temporal relations among the syndromes. Clark, Watson, and Mineka (1994) suggested that personality traits may help us fill these gaps.

Accordingly, I proposed a hierarchical-vulnerability model of distress disorders, which posits that psychiatric syndromes are products of interactions between personality traits and environmental stressors. This model is patterned after the integrative hierarchical model, as it specifies various levels of generality among personality-psychopathology links. The aim of this study was to develop the personality component of the model by identifying traits relevant to four target syndromes: major depression, panic disorder, social phobia, and OCD. Building on previous research, I hypothesized several trait contributors for each of the disorders.

I administered an extensive personality battery and an interview measure of the target syndromes to two samples: 385 undergraduates and 188 psychiatric patients. First, I evaluated the associations among the personality measures. Next, I tested study hypotheses using correlational and multiple regression analyses. I also examined the robustness of results across samples.

The results confirmed the central role of negative emotionality as the shared trait vulnerability. I also identified two specific trait contributors (linked to two disorders each), and seven unique contributors. Notably, all unique associations involved either depression or social anxiety. The model was able to explain roughly half of variance in these two syndromes but only approximately a quarter of the variance in panic and OCD.

On the other hand, the traits consistently accounted for 75% of the covariance among the syndromes.

In sum, the hierarchical-vulnerability model offers a useful approach to conceptualizing personality-psychopathology relations. However, the stress component of the model is yet to be developed. Furthermore, the present findings need to be replicated in new samples and evaluated in longitudinal studies. Finally, the model needs to be extended to include other disorders and traits.

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

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Thesis Supervisor: Professor David Watson

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

Roman I Kotov

has been approved by the Examining Committee  
for the thesis requirement for the Doctor of Philosophy  
degree in Psychology at the July 2006 graduation.

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

\_\_\_\_\_  
Donald Black

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

\_\_\_\_\_  
James Marchman

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

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problems and was deeply appreciated. More importantly, Jim contributed tremendously to my clinical training, and this knowledge continues to inform and influence my research in many important ways. I very much appreciated Don's consultation on this and several other studies. I am still amazed at the attention and interest he gave me (a first year graduate student) the first time I showed-up in his office with a far-fetched idea of an epidemiologic study in Russia.

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## ABSTRACT

Research on the empirical structure of distress (mood and anxiety) disorders has yielded many valuable insights. These efforts have culminated in the integrative hierarchical model (Mineka, Watson, & Clark, 1998), which specified general, specific, and unique components of distress disorders. However, some components have not yet been identified, and the model cannot account for temporal relations among the syndromes. Clark, Watson, and Mineka (1994) suggested that personality traits may help us fill these gaps.

Accordingly, I proposed a hierarchical-vulnerability model of distress disorders, which posits that psychiatric syndromes are products of interactions between personality traits and environmental stressors. This model is patterned after the integrative hierarchical model, as it specifies various levels of generality among personality-psychopathology links. The aim of this study was to develop the personality component of the model by identifying traits relevant to four target syndromes: major depression, panic disorder, social phobia, and OCD. Building on previous research, I hypothesized several trait contributors for each of the disorders.

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In sum, the hierarchical-vulnerability model offers a useful approach to conceptualizing personality-psychopathology relations. However, the stress component of the model is yet to be developed. Furthermore, the present findings need to be replicated in new samples and evaluated in longitudinal studies. Finally, the model needs to be extended to include other disorders and traits.

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## INTRODUCTION

The anxiety disorders and unipolar depression—jointly referred to as the distress disorders (e.g., Clark, Watson, & Mineka, 1994; Watson, 2000)—are very prevalent and debilitating conditions. The National Comorbidity Survey (NCS) found the lifetime prevalences of anxiety disorders and unipolar depression to be 24.9% and 17.1%, respectively (Kessler et al., 1994). These disorders pose considerable societal costs. The annual toll of depression on U.S. businesses is \$70 billion in medical expenditures and lost productivity, which is second only to the cost of cancer (Greenberg, Leong, Birnbaum, & Robinson, 2003); the cost of anxiety disorders is almost as great (Greenberg et al., 1999). Moreover, unipolar depression was found to be the fourth leading cause of disability worldwide (Murray & Lopez, 1996). Given the enormous toll that the distress disorders place on society and individual sufferers, accurate diagnosis and description of these disorders is extremely important, especially since a diagnostic system is an indispensable guide for treatment and research.

The most widely used taxonomy of the distress disorders is described in the Diagnostic and Statistical Manual of Mental Disorders 4<sup>th</sup> edition (*DSM-IV*; APA, 1994). However, the validity of this system has been questioned by many researchers (e.g., Carson, 1991; Grumet, 1995; Sarbin, 1997). A central concern raised by the critics of *DSM-IV* is that the system is not based on an adequate empirical foundation and, as a result, suffers from many shortcomings (e.g., Carson, 1991; Clark, Watson, & Reynolds, 1995; Nathan & Langenbucher, 1999). Two deficiencies of the current taxonomy appear to be particularly problematic. First, many *DSM* disorders are heterogeneous; that is, criterion sets that define these disorders include symptoms that are largely uncorrelated (e.g., avoidance of thoughts associated with trauma and markedly diminished interest in activities are grouped under the same label, Criterion C of Posttraumatic Stress Disorder). As a result many *DSM* entities are not unidimensional (e.g., Clark & Watson, 1999;

Pancheri, Picardi, Pasquini, Gaetano, & Biondi, 2002; Simms, Watson, & Doebbell, 2002; Summerfeldt, Richter, Antony, & Swinson, 1999) and reliable assessment of these disorders is difficult (Clark, Livesley, & Morey, 1997; Clark et al., 1995).

Second, many *DSM* disorders are highly comorbid, that is, they tend to covary not only in patient samples but also in the general population (e.g., Clark & Watson, 1999; Clark et al., 1995; Kessler, 1997; Mineka, Watson, & Clark, 1998). This pattern not only complicates research on individual disorders—as researchers have to make decisions of whether to include or exclude comorbid cases—but also suggests conceptual problems with the taxonomy. Specifically, high comorbidity is often interpreted as evidence that *DSM-IV* arbitrarily splits unitary psychopathological phenomena into multiple diagnoses (Nathan & Langenbucher, 1999). The problem of comorbidity is particularly salient among the distress disorders. Lifetime comorbidity of unipolar depression with any anxiety disorder is estimated to be approximately 57% (Clark, 1989; Kessler et al., 1996), which indicates a substantial association between these conditions (odds ratio = 4.2; Kessler et al., 1996). In fact, given such high co-occurrence of these disorders, it seems appropriate to group them under one label. A number of proposals have been made, but none of them is widely accepted, so I chose the label of distress disorders (Watson, 2000) and will use it throughout this manuscript.

Heterogeneity, comorbidity, and other problems of the current nosology have inspired a plethora of studies on the structure of anxiety and depression. A major goal of this literature is to recast the distress disorders in terms of empirically sound constructs that can be assessed reliably and perhaps be related to basic psychological processes (e.g., affective systems). Below I provide a brief summary of advancements in this field.

### Structural Models of Anxiety and Depression

This literature was been reviewed exhaustively by Mineka, Watson, and Clark (1998); hence I will summarize the previously reviewed research only briefly and update



their conclusions in light of recent developments. The structure of the distress disorders has been approached from two different perspectives and I will consider each in turn.

### Broad Dimensions Approach

The broad dimensions approach was inspired by structural studies of mood and specifically by the finding that the universe of affective terms can be defined with two broad and largely uncorrelated dimensions of Negative Affect and Positive Affect (Watson & Tellegen, 1985). Negative Affect (NA) corresponds to the experience of subjective distress and includes such negative mood states as fear, anger, disgust, and sadness, whereas Positive Affect (PA) reflects positive engagement with the environment and includes such states as joy, enthusiasm, alertness, and confidence. Almost from the start there was an interest in describing the distress disorders in terms of these basic dimensions. Early investigations established that anxiety is characterized by high NA, whereas depression is associated with both high NA and low PA (Tellegen, 1985; Watson, Clark, & Carey 1988; Watson & Tellegen, 1985). In other words, NA is a shared feature of the distress disorders and (low) PA is specific to depression. The next question was whether anxiety has any unique features. Clark and Watson (1991) tried to address this issue by performing factor analyses of clinical measures of anxiety and depression. They were able to isolate a dimension labeled Physiological Hyperarousal or Anxious Arousal, which appears to be fairly specific to anxiety. This finding led Clark and Watson (1991) to propose their influential tripartite model.

### Tripartite Model

According to the model, symptoms of anxiety disorders and unipolar depression can be organized in three groups: general distress, anhedonia, and anxious arousal. General distress is a cluster of non-specific symptoms, such as sadness, nervousness, insomnia, and diminished concentration that are common to both anxiety and depressive disorders. Anhedonia includes features that are specific to unipolar depression, for

instance, loss of interest, lack of enjoyment, and social withdrawal. Finally, symptoms of anxious arousal, such as racing heart, shortness of breath, and dizziness, are unique to anxiety disorders. It is important to note that although the tripartite model was inspired by the structure of normal mood, it focuses on clinical symptoms and hence does not correspond perfectly to the layout of affective dimensions. It is well-accepted that NA is the core of general distress and (low) PA is strongly related to anhedonia, but the content of the symptom clusters includes more than just affective states. Moreover, the construct of anxious arousal does not have a direct parallel in the mood literature; so far it has been identified only in factor analyses of clinical instruments.

On the other hand, Barlow and colleagues proposed a three-factor model that is very similar to the tripartite model and supports the broader significance of these factors (Barlow, Chorpita, & Turovsky, 1996). Specifically, the model ties distress symptoms to three basic emotions: anxiety, which manifests as general distress; depression, which manifests as anhedonia; and fear, which manifests as anxious arousal. Barlow appears to treat Anxiety and Fear as equally general factors, but self-report data suggest that fear—and hence presumably anxious arousal—is a facet of NA (Watson, 2000). In fact, structural analyses of comorbidities between common mental disorders in large epidemiological samples have revealed the presence of two latent dimensions that underlie the distress disorders, namely Fear, defined by panic disorder and the phobias, and Misery, defined by Generalized Anxiety Disorder and unipolar depression; these factors, in turn, were found to be facets of a general Internalizing construct (Krueger, 1999a; Krueger, McGue, & Iacono, 2001; Vollebergh et al., 2001). The Internalizing dimension bears a striking resemblance to the NA factor of the tripartite model, and the Fear construct appears to map onto anxious arousal, thus supporting the hierarchical organization of these factors.

The validity of the anxious arousal construct was further strengthened by a recent study that replicated the existence of an anxious arousal factor in four large samples

(including patients, airforce cadets, and undergraduates), and provided some additional evidence of its construct validity (Joiner et al., 1999). Nevertheless, the nature of anxious arousal is still poorly understood and the structural robustness of this dimension needs further investigation.

The tripartite model has stimulated a great deal of research. The structure has been replicated in adult (D. A. Clark, Beck, & Stewart, 1990; D. A. Clark, Steer, & Beck, 1994; Jolly & Dykman, 1994; Jolly & Karmer, 1994; Steer, D. A. Clark, Beck, & Ranieri, 1995; Steer, D. A. Clark, Ranieri, 1994) and child populations (Chorpita, 2002; Chorpita, Albano, & Barlow, 1998; Chorpita, Plumer, & Moffitt, 2000; Joiner, Catanzaro, & Laurent, 1996; Joiner & Lonigan, 2000; Lonigan, Hoe, David, & Kistner, 1999; Muris, Schmidt, Merckelbach, & Schouten, 2001). However, the model often was difficult to operationalize because existing measures of anxiety and depression are laden with general distress items, which complicates the identification of clear anhedonia and anxious arousal factors without prestructuring the measures (Mineka et al., 1998). Moreover, studies frequently found that the three symptom factors are highly correlated (D. A. Clark et al., 1994; Chorpita et al., 1998; Steer et al., 1995), which is somewhat at odds with the mood literature and appears to be due to the limitations of the available item pool (Mineka et al., 1998).

#### The Mood and Anxiety Symptom Questionnaire

To avoid these problems and perform a definitive test of the model, Watson and Clark (1991) created the Mood and Anxiety Symptom Questionnaire (MASQ), a comprehensive measure of anxious and depressive symptoms. The MASQ was based on the *DSM-III-R* (APA, 1987) criteria for the anxiety and mood disorders. It has five rationally constructed subscales, three of which measure general distress, one taps anxious arousal (AA), and the last one assesses anhedonic depression (AD). The three general distress scales are organized with respect to the nosological origin of the items;

that is, whether they reflect recognized symptoms of anxiety disorders (GD: Anxiety scale), mood disorders (GD: Depression scale), or those that appear in both diagnostic classes (GD: Mixed scale). Watson et al. (1995b) tested key predictions of the tripartite model and, in fact, found that the anxious arousal and anhedonic depression scales provide excellent discrimination of the constructs, while the general distress scales are strongly correlated. In a companion article Watson et al. (1995a) tested the tripartite model using exploratory factor analysis and found a robust three-factor structure that corresponds closely to the model.

The GD: Mixed scale was found to be of limited interest, because of its low discriminant validity. GD: Anxiety and GD: Depression also have weak discriminant validity, but they are somewhat more distinct and in combination with AA and AD, respectively, allow for modeling of the general constructs of anxiety and depression (e.g., Burns & Eidelson, 1998). Hence, a short version of the MASQ was constructed by dropping the mixed items. This version of MASQ was used in several studies (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Keogh & Reidy, 2000; Marshall, Sherbourne, Meredith, Camp, & Hays, 2003; Reidy & Keogh, 1997). These investigations generally replicated the initial findings, although two anomalies are notable. First, the anxious arousal factor appears to be broader than expected and often subsumes somatic symptoms that are not related to autonomic arousal (e.g., upset stomach, nausea; Keogh & Reidy, 2000; Marshall, Sherbourne, Meredith, Camp, & Hays, 2003; Watson et al., 1995a). Second, some of the low PA items tend to load on the general distress factor, so that the resulting anhedonic depression factor essentially narrows to high PA (reversed keyed) items (Keogh & Reidy, 2000). The significance of these anomalies is still not well understood.

The tripartite model had a major impact on the field because it linked symptoms of the distress disorders to basic dimensions of mood and gained extensive empirical

support. However, another approach to these structural issues had been unfolding almost in parallel with it.

### Hierarchical Approach

The tripartite model treats anxiety as a construct that can be decomposed into two dimensions but otherwise is homogeneous. Barlow and colleagues, however, observed considerable heterogeneity among symptoms of anxiety and proposed a more differentiated model (Barlow, 1991; Brown & Barlow, 1992). It differs from the tripartite model in two respects. First, Barlow's model is more specific as it attempts to explain relations among individual anxiety disorders, instead of evaluating the general construct of anxiety. Second, it has a hierarchical organization. According to Barlow's model, all anxiety disorders have a component of general distress or "anxious apprehension," a higher order factor that binds them together; each anxiety disorder also has a unique component that distinguishes it from the rest. Depression is also hypothesized to have a substantial general distress component. In sum, in this model general distress is a superordinate construct, a higher order factor, while the mood and anxiety disorders are narrower constructs that are saturated by general distress to various degrees.

Two salient studies have provided empirical support for the model in adults (Zinbarg & Barlow, 1996) and in children (Spence, 1997). However, the most important test of the model was performed by Brown, Chorpita, and Barlow (1998) who modeled relationships between components of the tripartite model and five distress disorders (generalized anxiety disorder, panic disorder, obsessive-compulsive disorder, social phobia, and major depressive disorder) in a large patient sample. The most significant findings of the study were that (a) anxious arousal is specific to Panic Disorder, except for a weak negative association with Generalized Anxiety Disorder (GAD), (b) Social Phobia has a considerable low PA component, (c) GAD is highly saturated with NA, and

(d) Obsessive-Compulsive Disorder (OCD) has the most unique variance, that is, its symptoms are not very well explained by the tripartite model.

This study was extremely influential; however, it had substantial limitations. First, two dimensions of the tripartite model were not operationalized as symptom clusters, but simply as PA and NA scales. Associations between the distress disorders and basic dimensions of mood are interesting in their own right. However, general distress and anhedonic depression would probably show a somewhat different pattern of relations with the distress disorders; for instance one could expect these associations to be stronger. Second, the disorders were not operationalized as diagnoses or clinical syndromes, but were dimensions derived from a factor analysis of several self-report and interview measures of symptoms. In fact, factor loadings for the interview variables were generally weak, which indicates that the psychopathological dimensions were primarily defined by self-report data. Hence, it is unclear to what extent these findings would generalize to *DSM* diagnoses.

The findings of Brown et al. (1998) were replicated in two studies in the child population (Chorpita, 2002; Chorpita et al., 2000). Some discrepancies were found, but they were minor (e.g., anxious arousal was positively associated with GAD), and may reflect a differential manifestation of psychopathology in children versus adults. Barlow's model and the research it has generated have led to a more sophisticated understanding of the distress disorders. It also drew attention to limitations of the tripartite model, which led to the proposal of a new expanded model.

#### Integrative Hierarchical Model

The integrative hierarchical model combines elements of the tripartite model and Barlow's model (Mineka et al., 1998). It includes four basic propositions. First, general distress is a nonspecific component that is shared by all distress disorders and is primarily responsible for the comorbidity between them. Second, the size of the shared component

differs across disorders, which explains differential levels of comorbidity. GAD and Major Depressive Disorder (MDD), for instance, both have large shared components and hence are very highly comorbid (Kessler et al., 1996), whereas OCD and specific phobia are much less laden with general distress and hence have lower comorbidity (Hembree, Foa, & Kozak, 1994). Third, each distress disorder, with the possible exception of GAD, has specific features; however, the specificity of these features may vary. For example, low PA is an important component of both MDD and social phobia (Brown et al., 1998; Clark et al., 1989). On the other hand, it is not present in all distress disorders; hence, low PA can be considered a specific feature of MDD, but it is not unique to MDD. The integrative model allows for multiple levels of specificity, but does not detail how many levels there are and what disorders have overlapping specific features. One important difference between the integrative and the tripartite model is that anxious arousal is now considered to be unique to panic disorder, rather than being shared by all anxiety disorders. Finally, the integrative model posits that general distress is not confined to anxiety and depression, but defines a wide range of syndromes, including personality disorders, substance use disorders, eating disorders, schizophrenia, and others (Mineka et al., 1998); thus, application of the model may be extended beyond the distress disorders.

#### Limitations of current models

In the last fifteen years, the field made great strides toward understanding the structural organization of the distress disorders. For instance, depression and anxiety are no longer considered to be homogeneous, unifactorial entities. However, many critical questions still remain unanswered. One notable limitation of the aforementioned models is that they posit the existence of specific components associated with individual disorders but do not identify them—with the exception of anxious arousal and PA. This is a major limitation because the unique components of the disorders tend to be quite large.

For instance, Brown et al. (1998) found that between 33 and 81 percent of the reliable variance in the five disorders examined was unexplained by their model.

Another issue is that the existing models are formulated in state terms, that is, current symptom presentation, and do not address the temporal component of comorbidity. There is abundant evidence that temporal relations exist and appear to be meaningful. For instance, it is commonly found that symptoms of anxiety tend to precede symptoms of depression (e.g., Alloy, Kelly, Mineka, & Clements, 1990; Kessler, Zhao, Blazer, & Swartz, 1997; Schneier, Johnson, Hornig, & Liebowitz, 1992). Thus examination of current comorbidity may underestimate the true magnitude of the overlap. In fact, comorbidity rates are found to be much lower for current than lifetime diagnoses (Moras et al., 1996). Also, a vast literature indicates that comorbidity is associated with greater impairment and chronicity (e.g., Andrews, Sanderson & Beard, 1998; Kessler et al., 1994; Sherbourne & Wells, 1997; Stein et al., 2001; Wittchen, 2002). Existing structural models do not explicate why comorbidity and severity are linked, although one can probably deduce an explanation from the premises of the model. The association with poor prognosis, however, cannot be explained in the framework of the models, since they only consider the current state. In sum, structural models of the distress disorders are far from complete and many questions need to be addressed. I propose that we turn to the personality literature for some of these answers.

### Structural Models and Personality Traits

Turning from structural models of psychopathology to trait research may be somewhat of a surprising step, but this approach may be less perplexing if one notes that the existing models frequently make use of personality data. Even the initial two-factor model partially grew out of research on affective traits (Tellegen, 1985), and the most recent hierarchical model uses personality data as well. For instance, Mineka et al. invoke established associations between Neuroticism and various psychiatric disorders to justify



the broad applicability of their model (1998, p. 398). Besides this history, there are several reasons why the personality literature is relevant to the distress disorders.

### Reasons for Relevance of Personality Traits

#### Mood and Affective Traits

One reason why personality traits are relevant to the distress disorders is that NA and PA, the core of constructs specified by the hierarchical model, have strong links to temperament traits. Specifically, NA is related to a trait called by different researchers Negative Affectivity, Neuroticism, or Negative Emotionality (NEM); PA is associated with Positive Affectivity, Extraversion, or Positive Emotionality (PEM; Watson & Clark, 1984; Watson, Clark, & Harkness, 1994). Evidence supporting these associations has been comprehensively reviewed by Watson (2000), so I will only mention his key conclusions. Perhaps the most important finding is that levels of NA and PA are predictable from one week to another. In fact, there is notable stability even in daily mood ratings. This effect allows daily moods to be aggregated over periods of time, thus producing reliable measures of affective dispositions often referred to as Negative Affectivity and Positive Affectivity. These traits also can be assessed using mood instruments with global instructions, that is, by asking participants to rate their average affect. The measures showed considerable stability over short retest intervals (e.g., two months) and were found to be fairly stable even over a span of several years. Moreover, there is reasonable self-other agreement in rating these constructs. Also, affective traits are robustly associated with measures of current mood. For instance, PA and NA during the past week correlate approximately .50 with corresponding dispositional measures (Watson, 2005a). Finally, affective traits show meaningful associations among themselves and with other personality traits. Specifically, the traits are essentially uncorrelated, and show clear convergent and discriminant correlations with Neuroticism and Extraversion, which led Tellegen (1985) to argue that Neuroticism and Extraversion

should be renamed as NEM and PEM because of their core affective components. I will use Tellegen's labels for these constructs throughout the manuscript.

The link between anxious arousal and personality is less clear, but Clark, Watson and Mineka (1994) suggested that anxious arousal may map onto anxiety sensitivity, that is, a fear of arousal symptoms. This proposal has not been tested sufficiently yet, although there is evidence that anxiety sensitivity can be conceptualized as a lower order facet of NEM (L. A. Clark et al., 1994), which parallels the association between anxious arousal and general distress delineated in a previous section. In sum, given the established relations between affective states and certain personality traits, one can expect the distress disorders to be associated with personality traits.

#### Stability of the Distress Disorders

Relations between personality traits and the distress disorders also can be expected because many distress disorders themselves show certain trait-like characteristics. It has been recognized increasingly that these disorders tend to run a chronic course (e.g., Angst & Vollrath, 1991; APA, 1994; Mattanah et al., 1995) and, for the majority of the distress disorders, sufficient evidence has accumulated to conclude that they are stable over short- and long-time intervals in patient and non-patient populations (e.g., Kessler, Keller & Wittchen, 2001; Klein et al, 1998; Merikangas, Avenevoli, Acharyya, Zhang & Angst, 2002). For instance, the diagnostic stability of social phobia was found to range between odds ratios (ORs) of 5.8 and 20.9 across different time intervals (Merikangas et al., 2002). Test-retest correlations for OCD symptoms were found to range between .57 and .86 for different symptom dimensions and follow-up periods (Mataix-Cols et al., 2002).

GAD and dysthymia are particularly chronic conditions (Kessler et al., 2001; Klein et al., 1998) and are notorious for their resistance to treatment (e.g., Woodman, Noyes, Black, Schlosser & Yagla, 1999). MDD, on the other hand, tends to run an

episodic course and often remits, at least partially, after several months (APA, 1994). However, depression is very likely to reoccur and with time the episodes tend to become more frequent and prolonged (Post, 1994). In fact, up to 70% of individuals who have experienced one major depressive episode are expected to have at least one more episode in their lifetime (Birmaher, Arbelaez & Brent, 2002). Anxiety disorders also show considerable remission rates, but the majority of remitted individuals experience relapses. For example, an 8-year observational study of 558 adults with Panic Disorder, Agoraphobia, Social Phobia, or Generalized Anxiety Disorder found remission rates that ranged from .31 to .76, and relapse rates that ranged from .21 to .64 (Yonkers, Bruce, Dyck, & Keller, 2003).

Finally, the latent dimensions that were identified in analyses of common distress disorders (Krueger, 1999a; Krueger et al., 2001; Vollebergh et al., 2001)—namely Internalizing with its subcomponents of Fear and Misery—show notable stability over one-year (latent correlations of .85-.89; Vollebergh et al., 2001) and three-year (latent correlations of .69-.86; Krueger, Caspi, Moffitt, & Silva, 1998) intervals. In fact, the authors even conceptualized these constructs as individual differences dimensions. Moreover, Internalizing shows convergence with Negative Emotionality (Krueger et al., 2001)

### Genetic links

Another reason why personality traits are relevant to the distress disorders is that there is an established genetic association between them. Numerous studies have examined this issue and there is wide consensus that correlations between anxiety and depression are largely due to a common genetic component that also is shared with Neuroticism (e.g., Jardine, Martin, & Henderson, 1984; Kendler, Heath, Martin & Eaves, 1987; Kendler, Neale, Kessler, Heath & Eaves, 1993; Mineka et al., 1998). The importance of this genetic factor varies between the disorders. It has the greatest

influence on MDD and GAD, is associated more modestly with panic disorder, and has the weakest relation to the phobias (Kendler et al., 1993; Kendler et al., 1995; Mineka et al., 1998). Despite this variability, the existence of a genetic link highlights the importance of considering personality traits in structural models.

In sum, there are many indications that personality plays a significant role in the distress disorders, but what exactly is the nature of this relation? Four major models have been proposed in the literature (Bienvenue & Stein, 2003; Clark, Watson, & Mineka, 1994; Klein, Wonderlich, & Shea, 1993) and are outlined below.

### Models of the Association Between Personality and Psychopathology

First, the vulnerability model posits that traits play a causal role in the development of mental disorders. The most popular version of this approach is the diathesis-stress model that considers personality a diathesis, that is, a predisposition to exhibit psychological symptoms in stressful situations. In other words, symptoms of a mental disorder are believed to emerge as a result of the interaction of personality and life stressors. Second, according to the pathoplasty model, traits do not have an etiological role, but influence the expression of the disease process and contribute to the maintenance of a disorder. Third, according to the scar (or complication) model, personality does not have any influence on mental disorders; rather, disorders modify levels of the traits. In other words, after the onset of a disorder, an individual's personality takes on more maladaptive characteristics. Finally, the continuity (or spectrum) model posits that there are no direct relations between traits and disorders—all of them are manifestations of a common underlying process. In other words, there is a third variable that influences both classes of phenomena and gives rise to the observed associations.

Only a few studies have tested the validity of these models so far. However, in the domain of distress disorders all four models have received some empirical support (L. A. Clark et al., 1994; Enns & Cox, 1997; Kendler et al., 1993; Watson & Clark, 1995; Widiger & Trull, 1992). Existing data suggest that relations of the distress disorders and personality traits are complex and multidirectional, and each model adds something to our understanding of the big picture. It is possible that some approaches to conceptualizing these associations are more useful than others, but extant data are not sufficient to make such a decision on empirical grounds.

Conceptually, the vulnerability model appears to offer the greatest contribution to structural models of the distress disorders. The addition of a vulnerability component to the integrative hierarchical model can allow one to explain temporal patterns of comorbidity among the distress disorders, as well as the association of comorbidity with severity and chronicity. In the following section I describe this new model and attempt to demonstrate its advantages. I should note that the idea of combining personality-psychopathology models with structural models of the distress disorders is not new. For example, in their paper that articulated the tripartite model Clark and Watson (1991) acknowledged that NEM has an important role in the expression and course of the distress disorders. However, the existing models have not fully integrated personality factors, and my goal in proposing the new model is to develop this aspect in more detail.

### The Hierarchical-Vulnerability Model

*The first premise* of the model is that there is one primary shared personality predisposition to the distress disorders—multiple pieces of evidence implicate NEM in this role (e.g., L. A. Clark et al., 1994)—and that individuals who are elevated on this trait tend to exhibit distress symptoms when faced with challenging circumstances. Most diathesis-stress models posit the existence of a threshold on the joint liability of dispositional and environmental factors and propose that when liability exceeds the

threshold an individual begins to experience symptoms (Fowles, 1992). The notion of a liability threshold undoubtedly applies to the hierarchical-vulnerability model. However, there are insufficient data to make specific proposals about the positioning of these thresholds; hence I will not consider this issue in detail.

*The second premise* of the model is that although manifestations of the underlying pathology invariably include some symptoms of general distress, the exact symptom picture depends on other characteristics of the individual (e.g., other personality traits) and on the type of stressor encountered. Later I review the literature that indicates that several personality traits contribute to the distress disorders independently of NEM. There is also a growing literature on differential associations between the distress disorders and various types of stressors (e.g., Eley & Stevenson, 2000; Surtees, 1997), but the stress component of the model is not the focus of this study. In keeping with the integrative hierarchical model, the new model permits the existence of varying levels of specificity for these additional factors, which include both secondary risk factors (personality traits other than NEM) and stressors. Hence, the new model acknowledges a common finding that many traits are associated with multiple distress disorders (e.g., Bienvenu et al., 2001; Krueger et al., 1996; Trull & Sher, 1994).

*The third premise* of the model mirrors the assumption of the hierarchical model that the importance of specific factors (vulnerabilities) relative to the significance of the common factor (vulnerability) varies among the distress disorders. As a result, the disorders show differential levels of association with NEM (evidence is reviewed in the next section) and with each other (comorbidity). Concurrent comorbidity patterns can, in principle, be adequately explained by existing models, and the new model does not differ from them in its treatment of these relations. It only adds the observation that correlations between different symptom dimensions generally mirror relations between corresponding personality traits. For instance, measures of Anxiety Sensitivity are strongly correlated with measures of NEM but not PEM (e.g., Kotov, Watson, Preston & Schmidt, 2005;

Norton, Cox, Hewitt, & McLeod, 1997), and analogously MASQ AA is strongly related to MASQ GD but not MASQ AD (Watson et al., 1995b). The hierarchical-vulnerability model attributes this parallelism to trait-state links discussed in the *Mood and Affective Traits* section and to the causal role of traits.

In addition, the new model potentially can explain patterns of temporal comorbidity. Existing evidence indicates that an individual who has a history of a distress disorder is likely to experience the same disorder again and is also at an increased risk for other distress disorders, although the likelihood of reoccurrence of the same disorder is higher than the probability of occurrence of another distress disorder (e.g., Birmaher et al., 2002; Cole & Dendukuri, 2003; Pine, Cohen & Brook, 2001; Schneier, Johnson, Hornig, Liebowitz & Weissman, 1992; Yonkers et al., 2003). In other words, there is both a certain continuity and a certain variability in symptom presentation over time. The hierarchical-vulnerability model can account for both effects. Traits remain relatively stable over time (e.g., Costa & McCrae, 1997), which contributes to the reoccurrence of the same disorder, or a set of closely linked disorders. Life stress, on the other hand, is more variable. At different times the person may be exposed to different types of stressors, and the severity of this exposure may differ as well, which is the primary reason for changes in symptom presentation.

*The fourth premise* of the hierarchical-vulnerability model is that the degree of stability versus change in symptom presentation for a distress disorder reflects the relative contribution of traits and stressors to that disorder. This postulate also helps to account for the association between comorbidity and chronicity. According to the model, the level of comorbidity that a person exhibits reflects his or her standing on relevant personality predispositions. Consider that if two individuals are placed in equally stressful environments the more vulnerable person probably will exhibit more symptoms and hence is likely to qualify for more diagnoses. In other words, comorbidity and poor prognosis are correlated because both reflect the degree of vulnerability. Incidentally, this

reasoning explains the association between comorbidity and severity, since comorbidity is associated with risk factors, which, in turn, influence the extent of symptom presentation. This reasoning is consistent with the approach taken in recent studies of the underlying structure of comorbidity that connected the number of comorbid mental disorders a person has with his or her standing on latent vulnerability dimensions (Krueger, 1999a; Vollebergh et al., 2001).

There is also the issue of the particular sequential relations between distress disorders, such as the finding that the onset of anxiety disorders often precedes the onset of depression (Mineka et al., 1998). The four premises outlined above do not immediately explain this pattern and additional premises are necessary to account for these data. However, given the somewhat preliminary nature of this study, I intend to keep the proposed model relatively simple and will not attempt to account for all available data, including sequential relations. For the same reason, I do not consider the stress component of the model, which I began developing elsewhere (Zvolensky, Kotov, Antipova, & Schmidt, in press). Instead, I want to focus on specifying the second and third premises in greater detail. Specifically, I intend to evaluate the degree of association between NEM and four selected distress disorders (MDD, Social Phobia, Panic Disorder, and OCD). Furthermore, I will attempt to identify secondary personality predispositions and evaluate the level of specificity that they exhibit.

#### Limitations of Existing Literature and the Proposed Study

A prospective design is the strongest approach to exploring these issues, as it potentially can isolate vulnerability-type relations from other personality-  
psychopathology associations (e.g., pathoplasmy, complication, etc). However, prospective studies are very time-consuming and labor intensive, and perhaps are not necessary at this stage of the model's development.



Only a handful of studies (either prospective or cross-sectional) have employed a multi-trait multi-disorder design, which is necessary for evaluating unique factors. Moreover, these investigations were not concerned explicitly with teasing apart the contributions of primary versus secondary predispositions and hence did not explore this issue in full. Another limitation of existing research is that almost all studies either relied on self-report measures of symptomatology (Gershuny & Sher, 1998; Jorm, 2000), thus introducing shared method variance in personality-psychopathology correlations, or defined psychopathology as dichotomous diagnostic variables (Bienvenu et al., 2001; Trull & Sher, 1994), which creates a base rate problem. The low base rate of a disorder may be a significant problem for this research as the magnitude of the association between personality and rarely diagnosed forms of psychopathology may be distorted. For this reason, some studies have examined only general classes of psychopathology, such as “any anxiety disorder” (Krueger et al., 1996; Krueger, 1999b), and ignored the considerable heterogeneity observed within these classes. Finally, many existing studies relied on the lifetime assessment of psychopathology (Bienvenu et al., 2001; Trull & Sher, 1994) and required retrospective recall, which may distort the reports substantially (Kahneman, 1999; Nelson & Rice, 1997; Schwarz & Strack, 1999).

The current study seeks to advance the literature by providing more comprehensive assessment of potential trait vulnerabilities, employing an interview measure of current symptoms, operationalizing the distress disorders as dimensions, and utilizing a broader range of modeling techniques (e.g., hierarchical regression analyses). The current design is cross-sectional and this limits the scope of questions that the study can address. However, this design allows for the recruitment of a large sample and is appropriate for the goals of the study, which are to identify potential secondary risk factors and to evaluate the relative contributions of primary and secondary vulnerabilities. In fact, greater specification of the model, which is likely to result from this study, may facilitate the design of future prospective studies.

Moreover, such data can inform the integrative hierarchical model by providing additional specification of the unique components. First, given the stability of the distress disorders and substantial correlations between personality traits and disorders, it appears likely that some traits contribute directly to the definition of certain distress disorders and can be incorporated explicitly in the integrative hierarchical model. For instance, Panic Disorder perhaps can be defined as a combination of high NA and elevated Anxiety Sensitivity. Second, the identification of traits that are significantly associated with a disorder can guide the search for unique symptomatic components by considering the state correlates of these traits. For instance, it has been proposed that the trait of self-criticism is associated with feelings of guilt, thoughts of worthlessness, and social withdrawal (Blatt, 1974). Hence, if self-criticism is found to contribute to depression above and beyond NEM and PEM, these data may be used as indirect evidence for the existence of a distinct self-critical dimension of depressive symptomatology defined by worthlessness, guilt, and social withdrawal.

So far, this discussion of the hierarchical-vulnerability model has been laid out in general terms. I mentioned that the available evidence implicates NEM as the primary vulnerability factor, but I did not identify secondary risk factors and did not connect them to particular distress disorders. I attempt to do this in the next section by reviewing existing research on associations between the distress disorders and personality traits. From this review I derive hypotheses about the identities of the secondary vulnerabilities and their connections to the four selected distress disorders. However, before starting the review I need to provide a brief overview of the personality traits that have been considered in personality-psychopathology research.

Review of Empirical Relations Between Personality Traits  
and Distress Disorders

Brief Review of Relevant Personality Traits

The Five Factor Model (FFM) of personality was derived in factor analyses of trait terms recorded in English language dictionaries (Digman, 1990). The FFM has received wide support as a consensual personality structure at the highest order of generality. The robustness of this structure has been confirmed in diverse populations, using peer ratings as well as self-report data, and it has been replicated in many languages (for a review, see Watson, Clark, & Harkness, 1994). The five traits, often referred to as the Big Five, are Neuroticism, Extraversion, Conscientiousness, Agreeableness, and Openness. Descriptions of these traits are given in Table A1 (also see Costa & McCrae, 1992).

The Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark, 1993; Clark, Simms, Wu, & Casillas, in press) is an omnibus measure of maladaptive personality traits. It includes 15 personality scales: three scales measure the core of general personality dimensions known as the Big Three, while others assess more specific traits that play an important role in psychopathology. The Negative Temperament and the Positive Temperament scales measure the core of NEM and PEM, respectively. The third big trait, Disinhibition is a general construct that is not part of the FFM, but it correlates negatively with both Conscientiousness and Agreeableness (Clark, 1993; Clark et al., in press; Watson et al., 1994). In other words, Disinhibition is a combination of low Conscientiousness and low Agreeableness. Other traits assessed by the SNAP are facets of these three general dimensions; they are described in Table A1 (also see Clark, 1993; Clark et al., in press).

Other faceted instruments, such as the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992) and the Multidimensional Personality Questionnaire

(MPQ; Tellegen, in press) assess somewhat different sets of traits, but the majority of these facets map onto SNAP scales (Clark, 1993; Clark et al., in press; Reynolds & Clark, 2001). Hence, the SNAP can serve as a framework for organizing investigations that use diverse instruments. I summarize the results of studies that related the SNAP to the MPQ or to the NEO-PI-R (Clark et al., in press; Reynolds & Clark, 2001) in Table A2. In the following literature review, I will use this trait mapping to convert findings based on the MPQ or the NEO-PI-R to the framework of the SNAP.

Conversion from the MPQ to the SNAP is straightforward, as the two instruments assess very similar sets of constructs and show almost one-to-one correspondence, partially due to some shared items. Facets of the NEO-PI-R do not map on the SNAP as clearly. Forward multiple regression analyses in a sample of 94 psychiatric patients revealed that the NEO-PI-R facets explain a substantial proportion of variance in most SNAP scales, but more than one facet contributed significantly to explaining variance in scales other than Mistrust (Reynolds & Clark, 2001). A few of these relations were inconsistent with conceptualizations of the constructs (e.g., NEO Fantasy predicted SNAP Manipulativeness) and thus were not included in Table A2. All excluded associations involved facets that were entered in later steps of forward regression analyses (usually step three or four).

Finally, a number of unique constructs have been proposed in the clinical literature as predictors of certain distress disorders. Some of these constructs are not labeled as personality traits, but all of them are considered to be dispositional characteristics and hence fall in the domain considered here. In fact, it appears that the distinction between these clinical traits and traditional personality constructs is historic rather than substantive; that is, clinical traits were proposed by clinical researchers, while personality traits were identified by personality psychologists.

Given that the number of constructs is fairly large, I limit the review only to traits that were found to have consistent associations with certain distress disorders in several

studies. The depression literature is particularly rich and the number of empirically supported constructs is far greater than can be examined in one study. Hence, I applied more stringent requirements in this domain and focused only on the best established constructs. Moreover, I excluded Beck's Sociotropy-Autonomy Scale (Beck, Epstein, Harrison, & Emery, 1983) from the review, because it shows notable overlap with some of the measures considered (see L. A. Clark et al., 1994; Enns & Cox, 1997). I also did not review measures of attributional style, as attributional style is heavily influenced by the current state; that is, it appears to be a correlate of distress rather than a vulnerability factor (e.g., L.A. Clark et al., 1994). Furthermore, a number of studies have related distress disorders to the Tridimensional Personality Questionnaire (Cloninger, 1987). However, this measure does not map clearly onto the other personality instruments considered; moreover, the construct validity of the Tridimensional Personality Questionnaire is problematic (see Cannon, Clark, Leeka, & Keefe, 1993; Waller, Lilienfeld, Tellegen, & Lykken, 1991; Watson et al., 1994). Hence, I excluded this measure from the review.

In sum, the review identified eight potential clinical trait vulnerabilities: self-criticism (Blatt, 1974, Blatt, 1991), ruminative response style (Nolen-Hoeksema, 1991), perfectionism (Frost, Marten, Lahart, & Rosenblate, 1990), anxiety sensitivity (Reiss, 1991; Taylor, 1999), fear of negative evaluation (Reiss, 1991; Leary, 1983), public self-consciousness (Fenigstein, Scheier, & Buss, 1975), thought suppression (Wegner & Zanakos, 1994), and dissociation-proneness (Watson, 2001). The definitions of self-criticism and perfectionism appear to be rather similar; however, they are moderately distinct constructs. Correlations between measures of self-criticism and perfectionism range from .50 to .60 (e.g., Enns & Cox, 1999; Frost et al., 1990). I now review studies that examined relations between these traits and distress disorders individually. I consider each disorder in turn, starting with MDD.

## Major Depressive Disorder

### Previous Literature Reviews

Two reviews have examined associations between personality traits and unipolar depression (L. A. Clark et al., 1994; Enns & Cox, 1997). I start my review by summarizing their conclusions. The reviews are in agreement that (a) NEM and PEM show strong links to depression cross-sectionally, and (b) prospective studies support a vulnerability view of NEM, whereas the data on PEM are insufficient. The reviews also concluded that Dependency is associated with depression, but this relationship is not unique; that is, Dependency is related to other distress disorders as well. Self-criticism, on the other hand, shows more specificity to depression, although there is emerging evidence that self-criticism is also associated with Social Phobia (Enns & Cox, 1997). Furthermore, Enns and Cox (1997) suggested that Perfectionism is linked to depression, albeit this relationship appears to be somewhat nonspecific and the data are still very limited. Finally, Enns and Cox (1997) considered the role of obsessional traits (e.g., conscientiousness, rigidity) in depression, but concluded that the findings are too mixed to permit any firm conclusion.

Next, I review recent empirical studies that were published since these reviews and mention some earlier influential work. In evaluating this literature, it is important to consider three issues. First, the vast majority of studies use a cross-sectional design, which may suggest vulnerability relations but does not establish them. Hence, studies that test the vulnerability model directly (e.g., prospective research) should receive special consideration. Second, NEM was found repeatedly to show strong concurrent and predictive associations with the distress disorders, and thus it is necessary to determine if a particular trait contributes to a disorder independently of NEM. This is the question of specificity or incremental validity that was emphasized in previous sections. Finally, the distress disorders are highly overlapping, and it is possible for a trait to contribute to

multiple disorders; therefore, it is important to consider evidence of diagnostic specificity.

### Prospective Relations

Since the publication of these reviews, three large studies have used prospective designs to identify personality vulnerabilities to depression. Krueger (1999) examined an epidemiological sample of 961 New Zealanders who were assessed at the age of 18 with the MPQ and a diagnostic interview, using a past-year timeframe. The participants were also reassessed when they were 21 with the same diagnostic interview. Depression was operationalized either as a continuous variable (the sum of relevant symptoms) or dichotomous membership in a group diagnosed with a major depressive episode, or dysthymia, or both. Presence of depression at 18 was controlled. On the higher order level, NEM (Stress Reaction) and PEM (Well Being) both predicted depression, defined either as a continuous or a dichotomous variable (NEM:  $r = .12$  and  $OR = 1.52$ , PEM:  $r = -.08$  and  $OR = .80$ ). On the lower order level, Mistrust (Alienation)—a facet of NEM—showed a significant relation, but it only predicted continuous depression ( $r = .09$ ). Although Disinhibition (low Constraint) did not show a significant association, one component of this factor, Harm Avoidance, consistently predicted depression ( $r = -0.09$  and  $OR = .82$ ).

Two other studies examined both prospective and concurrent relations. Gershuny and Sher (1998) assessed 466 students—half of whom had a father with an alcohol use disorder—on the Big Three traits at the age of 18. Depression was operationalized with a brief self-report measure of depressed mood over the past week, which was administered when the participants were 18 and 21 years old. Concurrent analyses revealed associations with NEM ( $beta = .42$ ) and Disinhibition (Psychoticism;  $beta = .17$ ), but the correlation with PEM was not significant. Prospective analyses were performed while controlling for Time 1 depression. They did not reveal a significant contribution from any

of the traits; however, the interaction of NEM and PEM predicted future depression ( $\beta = -.15$ ). Jorm et al. (2000) tried to replicate these findings in a sample of 2,725 community dwellers (concurrent relationships) and in a sample of 441 older adults (predictive relations after a 3.6 year delay). They related the Big Three traits to a brief self-report measure of depressed mood over the past month. Both concurrent and predictive analyses only identified NEM as a significant predictor ( $\beta = .55$  and  $.21$ , respectively); neither the main effect for PEM nor the interaction between NEM and PEM were significant.

In sum, these two studies reaffirm the role of NEM as a vulnerability to depression. Unfortunately, no firm conclusions can be drawn about other traits, both in terms of main and interactive effects, because of the conflicting findings and measurement problems—most notably, it is likely that the outcome measures were saturated with NA and failed to assess properly the anhedonic component of depression. Finally, a study by Krueger (1999) supported the risk factor view of NEM, PEM, and several lower order factors; unfortunately, the incremental validity and the diagnostic specificity of these traits was not examined.

### Concurrent Relations

Many more recent studies have examined concurrent associations. Two of these investigations assessed personality with the SNAP. Gamez, Simms, and Watson (2005) administered a diagnostic measure to 569 Gulf War veterans, 52 of whom qualified for the diagnosis of MDD. Diagnostic membership (“MDD” versus “No MDD”) showed several correlations with SNAP scales. To test the incremental validity of the scales, the authors partialled out variance associated with NEM. Several traits still correlated significantly with the diagnostic membership after Negative Temperament was controlled. Specifically, MDD correlated with Mistrust ( $r = .12$ ), Self-Harm ( $r = .26$ ), PEM ( $r = -.16$ ) and Detachment ( $r = .10$ ). Clark, Vittengl, Kraft, and Jarrett (2003)



administered the SNAP to 108 patients with MDD before and after a 13-week course of cognitive therapy. Personality traits were related to composite indexes of depression severity aggregated over several different measures and assessments. Of many possible sets of relations between traits and symptoms, the concurrent correlations with SNAP scores at the end of treatment—the range of depression severity at the beginning of treatment was restricted—are most pertinent here. Six SNAP scales showed robust correlations: NEM ( $r = .57$ ), Mistrust ( $r = .39$ ), Self-Harm ( $r = .54$ ), Dependency ( $r = .39$ ), PEM ( $r = -.43$ ), and Detachment ( $r = .40$ ).

One study assessed personality with the MPQ. Krueger et al. (1996) used the same sample as Krueger (1999), but they compared concurrent MPQ scores of participants who qualified for a depression diagnosis (major depressive episode or dysthymia in the past year;  $N = 163$ ) to scores of participants who were free from all common disorders ( $N = 501$ ), including anxiety disorders and substance use disorders. Both the MPQ and the diagnostic measure were administered when participants were 18 years old. All Big Three traits were linked to membership in the depressed group, with NEM showing the strongest association ( $d = 1.3$ ), PEM being somewhat weaker ( $d = -.5$ ), and Disinhibition having the least robust relation ( $d = .3$ ). On the lower order level, several scales were significantly elevated: Mistrust (Alienation;  $d = .7$ ), Aggression (Aggression;  $d = .3$ ), Detachment (low Social Closeness;  $d = .4$ ), Impulsivity (low Control;  $d = .4$ ), and Propriety (Traditionalism;  $d = .3$ ).

Two studies have used the NEO-PI-R. Bienvenue et al. (2001) administered a diagnostic interview to a sample of 333 community volunteers who showed evidence of a possible distress disorder or alcohol use disorder diagnosis. Sixty participants met criteria for lifetime MDD. Their personality scores were compared to the instrument's norms. On the higher order level, only NEM was elevated ( $d = .5$ ). On the lower order level, a number of facets showed significant effects, suggesting elevated Manipulativeness, Self-Harm, Aggression, and Dependency. Rector, Hood, Richter, and Bagby (2002) compared

98 outpatients with a current diagnosis of MDD to the norms. On the higher order level, NEM was highly elevated ( $d = 2.2$ ), Extraversion and Conscientiousness were low ( $d = -1.4$  each), and Agreeableness scores were slightly lower than in normals ( $d = -0.5$ ). Facet-level results suggested that high Mistrust, Manipulativeness, Aggression, Self-Harm, Dependency, and Detachment, and low Exhibitionism are associated with MDD.

In addition, one study used the NEO-PI (Costa & McCrae, 1989), which is an earlier version of the NEO-PI-R and does not have facets for Conscientiousness and Agreeableness. Harkness, Bagby, Joffe, and Levitt (2002) assessed 32 patients with MDD, who responded to a 3-month course of pharmacotherapy, at the beginning and at the end of treatment. The scores were compared to the norms. At time 1, significant differences were found on NEM ( $d = 1.6$ ), Extraversion ( $d = -1.0$ ), and Conscientiousness ( $d = -.8$ ). Evaluation of the facets suggests elevations on Self-Harm, Dependency, and Detachment, as well as lower levels of Exhibitionism. At time 2, the differences were still observed on NEM ( $d = .9$ ), Extraversion ( $d = -0.6$ ), and Conscientiousness ( $d = -0.6$ ). For the lower order traits the pattern remained largely the same.

Three other studies assessed personality with measures of the Big Five or Big Three. Trull and Sher (1994) administered a Big Five measure and a diagnostic interview to 468 college students, half of whom had a father with an alcohol use disorder. Thirty eight participants qualified for a life time diagnosis of MDD and their scores were compared to the instrument's norms. There were significant differences on NEM ( $d = 1.0$ ), Extraversion ( $d = -1.0$ ), Conscientiousness ( $d = -.7$ ), and Openness ( $d = .5$ ). Petersen, Bottonari, Alpert, Fava, and Nierenberg (2001) compared Big Five scores of 76 outpatients with current MDD to the norms. The authors found significant differences on NEM ( $d = 1.5$ ), Extraversion ( $d = -1.5$ ), and Conscientiousness ( $d = -1.3$ ). Pickering et al. (2003) compared scores of 108 patients with current MDD to scores of 105 never depressed controls on a Big Three measure. Significant differences were found on each trait: NEM ( $d = 2.5$ ), PEM ( $d = -1.1$ ), and Disinhibition ( $d = .4$ ).

In sum, recent data have identified many robust concurrent relations between personality and depression. On the higher order level, NEM showed the strongest association (sample size-weighted average  $d = 1.6$ ), PEM/Extraversion related strongly as well ( $d = -.9$ ), while Conscientiousness was a close third ( $d = -.8$ ), Agreeableness showed a very weak link ( $d = -.2$ ), and Openness was completely unrelated ( $d = 0.0$ ). The magnitude of the effect sizes may be somewhat inflated in the studies of currently depressed participants—presumably because personality ratings also are influenced by current mood. In fact, weighted effect sizes for NEM, PEM/Extraversion, and Conscientiousness in investigations with currently depressed participants were 2.1, -1.3, and -1.3, respectively, while the values were much lower for studies that relied on lifetime diagnoses: 0.7 for NEM, -0.5 for PEM/Extraversion, and -0.4 for Conscientiousness. Nevertheless, the effects were moderate to large even in the latter studies. Also, it is important to consider that the retrospective nature of lifetime diagnoses appears to decrease their reliability (e.g., Nelson & Rice, 1997) and thus may attenuate the magnitude of the relations. On the level of narrow traits, three constructs emerged as likely contributors to depression: Mistrust, Self-Harm, and Detachment. In fact, there is some indication that these traits contribute to depression independently of NEM (Gamez et al., 2005). Some studies also linked MDD to Manipulativeness, Aggression, Dependency, and (low) Exhibitionism, but the evidence is weaker and the specificity of these traits was not examined.

### Relations with Clinical Traits

*Ruminative Response Style* was proposed originally as a moderator of depression course (pathoplasty relationship), but there is emerging evidence that the trait is also a predisposition to the development of depression. The Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Marrow, 1991) is the best-established measure of Ruminative Response Style. Earlier studies established that the RSQ predicts the severity of

depressed mood (e.g., Nolen-Hoeksema & Morrow, 1993; Nolen-Hoeksema, Morrow, & Fredrickson, 1993) and that instructions to ruminate following negative mood induction in a laboratory prolong dysphoric mood (e.g., Morrow & Nolen-Hoeksema, 1990). Also, ruminative responses in the 10 days following a natural disaster predicted a high level of depression seven weeks later (Nolen-Hoeksema & Marrow, 1991). More recently, Just and Alloy (1997) demonstrated that the RSQ administered to non-depressed participants predicted onset of depressive episodes—defined as a 2-week period of elevated scores on the Beck Depression Inventory (BDI, Beck, Rush, Shaw, & Emery, 1979)—over an 18-month period. Enns, Cox, and Borger (2001) administered several vulnerability measures to 148 dysphoric undergraduates and 161 patients with MDD. They found that the RSQ predicted BDI scores in both samples even after NEM and PEM (assessed with the NEO Five Factor Inventory; Costa & McCrae, 1992) were controlled, while other purported vulnerability measures did not. Furthermore, Nolan, Roberts, and Gotlib (1998) demonstrated the incremental validity of RRS for predicting depression after a nine-week delay in a sample 135 undergraduates. Depression was assessed with a self-report diagnostic measure both at Time 1 and Time 2. RSQ predicted Time 2 depression in addition to Time 1 depression, whereas NEM did not. Together these studies suggest that Ruminative Response Style is a vulnerability factor for depression, and it contributes to depression beyond NEM, although little is known about the diagnostic specificity of the construct.

*Anxiety Sensitivity* is an established risk factor for panic attacks and panic disorder (e.g., McNally, 2002; Taylor, 1999). However, recently there has been considerable interest in relating Anxiety Sensitivity to depression. Anxiety Sensitivity is usually assessed with the Anxiety Sensitivity Index (ASI; Peterson and Reiss, 1992). The instrument has a three-factor structure, which includes Physical (e.g., “It scares me when I am short of breath”), Psychological (e.g., “When I am nervous, I worry that I might be mentally ill”), and Social (e.g., “It is important to me not to appear nervous”) subscales.

Taylor, Koch, Woody, and McLean (1996) examined the construct validity of these factors in a sample of 135 patients with current MDD, Panic Disorder, or both. The authors found that only the Physical subscale correlated significantly with the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988;  $r = .43$ ), a measure of agoraphobia ( $r = .32$ ), and diagnosis of panic disorder ( $r = .32$ ). On the other hand, only the Psychological subscale correlated with the BDI ( $r = .49$ ) and diagnosis of MDD ( $r = .37$ ). Schmidt, Lerew, and Joiner (1998) examined the predictive validity of the subscales in a sample of 1401 cadets who were given the ASI and a battery of psychopathology measures at the beginning of basic training and were readministered the measures of psychopathology at the end of basic training (five weeks later). The authors found that only the Psychological subscale predicted Time 2 scores on the BDI and on a measure of hopelessness after several Time 1 and Time 2 psychopathology measures were controlled. Zinbarg, Brown, Barlow, and Rapee (2001) reanalyzed the reactions of 198 outpatients with anxiety disorders and 25 controls to physiological challenges that may trigger a panic attack. After general anxiety was controlled, only the Physical scale predicted fearful reactions to challenges and only the Psychological subscale correlated with a self-report measure of depression. Finally, Otto, Pollack, Fava, Uccello, and Rosenbaum (1995) compared ASI scores of 63 patients with MDD to general population norms. The patients were highly elevated on the total ASI ( $d = 0.8$ ). Elevations on the subscales, unfortunately, were not examined.

These studies consistently indicate that at least one component of Anxiety Sensitivity is linked to depression. The next question is whether Anxiety Sensitivity can contribute to depression independently of NEM. Three studies are pertinent to this issue. Kotov and Watson (2005) administered a battery of potential risk factors to 63 undergraduates and assessed their mood with the MASQ two months later. They performed a hierarchical forward regression with NEM being force-entered at the first step. Scores on the GD: Depression scale were predicted by NEM (28% of the variance

accounted for), the psychological concerns component of Anxiety Sensitivity (12%), and (low) Agreeableness (7%). Scores of Anhedonic Depression were predicted by NEM (13%), PEM (22%), and (low) Agreeableness (5%). Cox, Enns, and Taylor (2001) tested the specificity of the relationship between Anxiety Sensitivity and depression severity, operationalized with the BDI, in a sample of 142 outpatients with MDD. They found that the Psychological but not the Physical subscale of the ASI predicted the BDI after NEM was controlled. On the other hand, when the RSQ was added, the ASI was no longer a significant predictor. Furthermore, Cox, Enns, Walker, Kjernisted, and Pidlubny (2001) administered the ASI and the RSQ to a mixed sample of 38 patients with MDD and 38 patients with panic disorder and found that both measures distinguished the groups. However, the MDD group scored higher on the RSQ, while the panic disorder group scored higher on the ASI. In sum, the psychological concerns component of Anxiety Sensitivity appears to contribute to depression independently of NEM, but it is unclear whether it is unique to depression and if it has incremental validity relative to Ruminative Response Style.

*Self-Criticism* and Dependency are two trait vulnerabilities to depression posited by Blatt's (1974; 1991) theory of depression. Blatt's Dependency appears to converge well with the SNAP Dependency scale; the primary focus of this section will be on Self-Criticism, as SNAP Dependency was discussed earlier. Blatt's Self-Criticism and Dependency are usually measured by the Depressive Experiences Questionnaire (DEQ; Bagby, Parker, Joffe, & Buis, 1994; Blatt, D'Afflitti, & Quinlan, 1976). The DEQ is a well-established risk factor for depression and has been included in many studies; hence, rather than reviewing this entire literature I will only mention a few key findings (for reviews, see Nietzel & Harris, 1990; Enns & Cox, 1997).

In keeping with the diathesis-stress model, Self-Criticism was found to predict physiological and emotional responses to an induced-failure task (Gruen, Silva, Ehrlich, Schweitzer, & Friedhoff, 1997). Also both Self-Criticism and Dependency were found to

interact with negative life events to predict depressed mood (Smith, O’Keeffe, & Jenkins, 1988). Enns and Cox (1999) examined the incremental validity of Self-Criticism in a sample of 145 outpatients with MDD. They found that Self-Criticism predicted depression severity assessed with an interview and a self-report measure, even after NEM and PEM were controlled. It is well-established in the literature that Self-Criticism shows diagnostic specificity; that is, it is more elevated in patients with MDD than normal or psychiatric controls (Enns & Cox, 1997). DEQ Dependency, on the other hand, is elevated equally across different distress disorder groups (Enns & Cox, 1997). For example, Bagby et al. (1994) administered the DEQ to 113 patients with MDD, 25 patients with panic disorder, and 404 normals. They found that Self-Criticism was elevated both in the MDD group ( $d = 1.3$ ) and in the panic disorder group ( $d = .7$ ). Moreover, the MDD group was significantly more elevated than the panic disorder group. Elevations also were observed on the DEQ Dependency scale—MDD ( $d = .7$ ), Panic Disorder ( $d = .6$ )—but the groups were not different from each other. Cox et al. (2000) administered the DEQ to 26 patients with MDD and 32 patients with social phobia and found that the MDD group was elevated significantly on the DEQ Self-Criticism scale relative to the social phobia group ( $d = .6$ ) but there was no difference on the DEQ Dependency.

In sum, the findings strongly support the conceptualization of Self-Criticism as a specific vulnerability to depression. Self-Criticism appears to contribute to other disorders as well, but it is primarily associated with depression. Studies that used the DEQ did not find much support for Dependency as a specific vulnerability factor, but it is important to note that the DEQ Dependency scale maybe a less pure measure of the construct than SNAP Dependency. Specifically, correlations of the DEQ Dependency scale with NEM were reported as high as .58 (Dunkley, Blackstein, & Flett, 1997); in contrast, correlations of SNAP Dependency with NEM do not exceed .45 (Clark, 1993,

Clark et al., in press). This higher saturation with NEM may be responsible for ambiguous findings for the DEQ.

*Perfectionism* recently has been recognized as an important contributor to the distress disorders. Two multidimensional models of Perfectionism have been proposed; one views the construct as having five facets (Frost et al., 1990), whereas the other partitions it into three components (Hewitt & Flett, 1991). The models show good convergence (Frost, Heimberg, Holt, Mattia, & Neubauer, 1993), as Hewitt and Flett's scales correlated strongly ( $r = .49 - .62$ ) with one or more of the Frost's scales. Thus, I will focus on Frost's model, as it defines a more detailed structure. According to this model, dimensions of Perfectionism are Concern over Mistakes, Doubts about Actions, Parental Criticism, Parental Expectations, and Personal Standards. Frost's Multidimensional Perfectionism Scale (MPS; Frost et al., 1990) assesses each of the five facets and is becoming widely accepted as a useful measure of the construct.

Factor analyses of the Perfectionism subscales reveal two underlying dimensions of Active Perfectionism and Passive Perfectionism (Frost et al., 1993; Lynd-Stevenson & Hearne, 1999). The Passive factor is primarily defined by Concern over Mistakes and shows strong associations with psychopathology, while the Active dimension is primarily defined by Personal Standards and is largely unrelated to the distress disorders (Frost et al., 1993; Kawamura, Hunt, Frost, & DiBartolo, 2001; Lynd-Stevenson & Hearne, 1999). For instance, Lynd-Stevenson and Hearne (1999) administered the MPS and a self-report measure of depressed mood to 142 undergraduates. The depression measure correlated most strongly with the Concern over Mistakes subscale ( $r = .47$ ). In addition, the Passive factor interacted with self-report stressors to predict depressed mood, while the Active factor did not. Furthermore, Enns and Cox (1999) found that the Concern over Mistakes subscale predicted depression severity assessed with an interview and a self-report measure, even after NEM and PEM were controlled. In sum, there is emerging evidence that Perfectionism—at least the Concerns over Mistakes component—is a trait



vulnerability to depression and has incremental validity relative to NEM. However, the current data are fairly limited.

*In conclusion*, a number of general and narrow traits have been identified in the literature as specific contributors to depression. However, the amount of supporting evidence differs among the constructs and their diagnostic specificity has not been evaluated sufficiently. The present study has the potential of advancing the literature by clarifying these issues.

### Social Phobia

Relations between personality and psychopathology have received much less attention in the domain of anxiety than in the depression literature. Social Phobia appears to be the best-studied condition, but the data are limited even for this disorder. The only existing review of the topic identified NEM and PEM as potential trait vulnerabilities (L. A. Clark et al., 1994). Three studies examined personality profiles of individuals with social phobia since the review. Trull and Sher (1994) found significant differences only on NEM ( $d = .8$ ) and Extraversion ( $d = -1.0$ ). Bienvenue et al. (2001) also found differences only on NEM ( $d = .5$ ) and Extraversion ( $d = -0.8$ ). Interestingly, the patients did not differ from the norms on PEM. Facet-level comparisons suggested elevations on Mistrust, Self-Harm, Dependency, and Detachment, and lower levels of Exhibitionism. Gamez et al. (2005) found that after NEM was controlled, diagnosis of social phobia correlated with Self-Harm (.12), Eccentric Perceptions (.10), PEM (-.12), Exhibitionism (-.11), and Detachment (.12).

Three recent studies examined associations between self-report measures of social anxiety and potential trait vulnerabilities. Kotov, Watson, Preston, and Schmidt (2005) performed stepwise forward regression in a sample of 907 undergraduates using composites of several trait and symptom measures. They found that NEM was the strongest predictor of social anxiety (it accounted for 33% of the variance), PEM was

somewhat weaker (15%), and Negative Evaluation Sensitivity—a combination of Public Self-Consciousness and Fear of Negative Evaluation—contributed an additional 7% of the variance. Anxiety Sensitivity, however, did not predict social anxiety beyond the three traits. Norton, Cox, Hewitt, and McLeod (1996) also performed a stepwise forward regression with a measure of the Big Five and the ASI in a sample of 95 undergraduates. They found that NEM, (low) Extraversion, and (low) Conscientiousness were significant predictors, but the ASI was the strongest predictor. Finally, Kotov and Watson (2005) found that only NEM and PEM were able to predict social anxiety after a two-month delay; Anxiety Sensitivity, Fear of Negative Evaluation, and Public Self-Consciousness were not significant predictors after NEM was controlled, although Anxiety Sensitivity showed a positive trend. Thus, studies are mixed regarding the incremental validity of the three clinical constructs over general personality traits. A possible explanation of these inconsistencies is that the studies used self-report measures of social anxiety that are too saturated with NA to show robust specific relations.

Another issue is the specificity of the lower order traits to social anxiety versus other distress disorders. Several studies have examined this question. Taylor, Koch, and McNally (1992) compared ASI scores of 23 patients with social anxiety, 67 patients with OCD, 17 patients with GAD, and 151 patients with panic disorder to the norms. They found significant and comparable elevations for the social phobia group ( $d = .8$ ), the OCD group ( $d = .9$ ), and the GAD group ( $d = 1.0$ ), while the panic disorder group was much more elevated ( $d = 2.1$ ). Considering that Otto et al. (1995) found a  $d = 0.8$  elevation in patients with MDD, we can conclude that the ASI shows some diagnostic specificity for panic disorder. This is also consistent with Ball, Otto, Pollack, Uccello, and Rosenbaum (1995), who found 25 outpatients with panic disorder to be more elevated on the ASI than 50 patients with social phobia ( $d = .7$ ). Ball and colleagues also found the social phobia group to be more elevated than the panic disorder group on a measure of Fear of Negative Evaluation ( $d = .9$ ).

Two studies examined the diagnostic specificity of Public Self-Consciousness. Jostes, Pook, and Florin (1998) administered a measure of the construct to 23 patients with social phobia, 136 patients with panic disorder, 38 patients with OCD, and 40 controls. The social phobia group was more elevated than controls ( $d = 2.1$ ) and other psychiatric groups, while the panic disorder group and the OCD group were elevated relative to the control group ( $d = .5$  for each) but were not different from each other. Saboonchi, Lundh, and Ost (1999) administered a measure of Self-Consciousness to 52 outpatients with social phobia, 55 outpatients with panic disorder, and 113 controls and found a similar pattern. Specifically, the social phobia group was higher than the control group ( $d = 1.0$ ) and the panic disorder group, but the latter two groups were not different from each other. Elevations obtained in these studies differ considerably, but this is probably due to sample selection. Jostes et al. (1998) studied inpatients, presumably a more disordered population with more pronounced maladaptive personality characteristics.

Saboonchi et al. (1999) also compared the groups on the MPS. Significant differences were observed on three subscales, but I only review findings for the Concern over Mistakes subscale, because it shows the strongest evidence of specificity. In this investigation, the social phobia group was more elevated than either the control group ( $d = 1.0$ ) or the panic disorder group and the latter group was elevated relative to the control group ( $d = .5$ ). In a similar study Antony, Purdon, Huta, and Swinson (1998) administered the MPS to 70 patients with social phobia, 44 patients with panic disorder, 45 patients with OCD, and 49 controls. On the Concerns over Mistakes subscale the social phobia group was elevated relative to the control group ( $d = 1.5$ ) and other psychiatric groups. The panic disorder group and the OCD group were elevated relative to the control group ( $d = 1.0$  and  $.6$ , respectively), but they were not different from each other. A somewhat different pattern is suggested by analysis of combined data from two other studies (Frost & Steketee, 1997; Juster et al., 1996) reported by Frost and Steketee

(1997). In this analysis the authors compared MPS scores of 61 patients with social phobia, 14 patients with panic disorder, 35 patients with OCD, and 74 normal controls. All psychiatric groups were elevated on Concerns over Mistakes relative to the control group ( $d = .6 - .9$ ) but were not different from each other.

*In conclusion*, there is substantial evidence to suggest that NEM and Extraversion are associated with social phobia. The role of PEM, however, is less clear with studies yielding mixed results. The observation that Extraversion has a more robust link suggests that the sociability component of Extraversion is more strongly related to social phobia than PEM. Furthermore, several narrow traits were related consistently to social phobia, namely Self-Harm, Detachment, and (low) Exhibitionism. There is also some support for Mistrust, Eccentric Perceptions, and Dependency, albeit it is much weaker. Public Self-Consciousness, Perfectionism, and Fear of Negative Evaluation show some evidence of diagnostic specificity in relation to social phobia. Anxiety Sensitivity, on the other hand, appears to be specific to panic disorder. Moreover, the data are too mixed and limited to determine whether any of these constructs contribute to social anxiety independently of NEM.

### Panic Disorder

I should first note that some researchers have considered panic disorder and agoraphobia separately. However, there are only a handful of such studies and the findings appear to be very similar for the two conditions, hence I review all of these studies in the same section. A previous literature review concluded that NEM and Anxiety Sensitivity are two potential trait vulnerabilities to panic disorder (L. A. Clark et al., 1994).

Four recent studies examined the validity of this conclusion for traditional personality traits. Bienvenue et al. (2001) compared the personality profile of 27 patients with panic disorder and 25 patients with agoraphobia to general population norms. On the

higher order level, they found elevations on NEM ( $d = .7$  panic disorder,  $d = .6$  agoraphobia) and low levels of Extraversion ( $d = -0.5$  panic disorder,  $d = -0.8$  agoraphobia). Facet-level comparisons suggested elevations on Mistrust, Aggression, Self-Harm, Dependency, and Detachment. Trull and Sher (1994) also found an elevation on NEM ( $d = .8$ ) and low levels of Extraversion ( $d = -1.0$ ) for a group of 18 individuals with agoraphobia. Kanton et al. (1995) compared scores of 62 patients with panic disorder and 61 controls on a Big Five measure and found an elevation on NEM and low levels of Conscientiousness—unfortunately, it is impossible to calculate effect sizes from the data that they reported. Finally, Gamez et al. (2005) found that only Propriety related to membership in panic disorder ( $N = 12$ ) or agoraphobia ( $N = 16$ ) groups after NEM was controlled ( $r = -.08$  and  $-.10$ , respectively).

Anxiety Sensitivity is an established risk factor for panic attacks and panic disorder. This claim is supported by a number of prospective and laboratory studies that I do not discuss here (for a review, see McNally, 2002; Taylor, 1999). The diagnostic specificity of Anxiety Sensitivity to panic disorder is also established, as was described in the previous section. Moreover, a number of studies found that Anxiety Sensitivity is distinct from trait anxiety, a construct that is very similar to NEM, and predicts panic and panic disorder independently of this trait (McNally, 2002; Taylor, 1999). Moreover, Kotov et al. (2005) found that both NEM and Anxiety Sensitivity predicted panic symptoms (accounting for 35% and an additional 17% of the variance, respectively). Kotov and Watson (2005) also showed that these two constructs predicted scores on the MASQ Anxious Arousal scale and a measure of panic symptoms after a two-month delay—the percent of variance accounted for ranged from 9 to 18. It is important to note that in these two studies other trait vulnerabilities did not contribute to the prediction of panic symptoms.

In sum, the link between panic disorder and NEM is well-established, and there is emerging evidence that panic disorder is also associated with low PEM/Extraversion. The

support is much more limited for narrow traits, with Mistrust, Aggression, Self-Harm, Dependency, Detachment, and Propriety being potential candidates. On the other hand, extensive data support the role of Anxiety Sensitivity as a specific vulnerability to panic disorder. Anxiety Sensitivity may be related to other disorders as well, but not nearly as strongly.

### Obsessive-Compulsive Disorder

Little is known about relations between personality and OCD. The previous literature review concluded that only NEM is a likely risk factor (L. A. Clark et al., 1994). Three studies have examined the issue since then. Samuels et al. (2000) compared NEO-PI-R scores of 65 individuals with lifetime OCD diagnoses to the instrument's norms. The OCD group was elevated on NEM ( $d = 1.4$ ) and scored low on Conscientiousness ( $d = -0.7$ ). Facet-level comparisons suggested elevations on Aggression, Self-Harm, and Dependency. Rector, Hod, Richter, and Bagby (2002) replicated this study in a sample of 98 patients with current OCD. They found an elevation on NEM ( $d = 2.0$ ), as well as low levels of Extraversion ( $d = -1.0$ ) and Conscientiousness ( $d = -0.9$ ). The pattern of facet scores suggested elevations on Mistrust, Manipulativeness, Aggression, Self-Harm, Dependency, and Detachment, and low scores on Exhibitionism. The authors also compared the OCD group to 98 patients with current MDD, and found no evidence of specificity. In other words, the MDD group showed deviations that were at least as large as those of the OCD group on all traits. Wu (2005) observed a similar pattern. He compared SNAP profiles of 51 patients with OCD and 88 general outpatients (the vast majority of whom had the primary diagnosis of a mood disorder). Relative to the general population norms, the OCD group was significantly elevated on NEM ( $d = 1.0$ ), Self-Harm ( $d = 1.0$ ), Dependency ( $d = 1.0$ ), and Detachment ( $d = .6$ ), and was lower on PEM ( $d = -0.9$ ). However, the OCD group did not differ from the general outpatient group on any of these traits. In fact, the only significant

difference between the two psychiatric groups was on Entitlement, with the OCD group scoring lower but still within the normal range.

Thus, existing research indicates that several traditional higher- and lower-order traits are associated with OCD, but they seem to lack diagnostic specificity, at least when OCD is compared to MDD. Moreover, it is virtually unknown whether any of these traits contribute to OCD independently of NEM. Only Wu (2005) performed an indirect evaluation of this issue. He correlated SNAP scales with two self-report measures of OCD, while controlling for General Distress (measured with the MASQ). Analyses were conducted independently in a patient (N = 137) and in an undergraduate (N = 411) sample. Overall, four traits showed consistent associations with OCD symptoms: NEM, Eccentric Perceptions, Propriety, and Workaholism. Three other traits also related to OCD scores: Mistrust, Dependency, and Detachment, albeit the pattern was less consistent. Unfortunately, these data are too limited and indirect to permit definite conclusions.

Relations between OCD and clinical traits have not been studied extensively either. As discussed in previous sections the majority of clinical traits appear to lack diagnostic specificity. Also, Kotov et al. (2005) found that only NEM predicted self-report symptoms of OCD (accounting for 17% of variance) and other traits did not show incremental validity.

However, there is emerging evidence that Thought Suppression is a contributor to OCD. Laboratory work has shown that thought suppression can produce a rebound effect; that is, it can intensify thoughts that a person is trying to suppress (e.g., Wegner, 1989, 1992). Analogously, thought suppression was found to amplify unwanted emotions. This led Wegner and Zanakos (1994) to propose that the Thought Suppression trait is associated with obsessional thinking, as well as depression and anxiety. The authors constructed the White Bear Suppression Inventory (WBSI) to measure Thought Suppression and found that the WBSI correlates with self-report measures of anxiety,

depression, and OCD. The magnitudes of these correlations were approximately equal ( $r = .38 - .53$ ) suggesting a lack of diagnostic specificity. On the other hand, in a sample of 82 OCD patients the WBSI showed a strong association with an interview index of obsessions ( $r = .43$ ) but not an index of compulsions (Wegner & Zanakos, 1994). Moreover, the WBSI was shown to interact with uncontrollable life events to predict OCD symptoms in a sample of undergraduates ( $N = 269$ ) and patients with anxiety disorders, mostly OCD ( $N = 91$ ; McLaren & Crowe, 2003).

Knowledge of the construct validity of the WBSI is still limited but growing. The measure was found to predict frequency of intrusive thinking in laboratory experiments (Muris, Merckelbach, & Horselenberg, 1996), but its incremental validity relative to NEM has not been examined and the diagnostic specificity of the WBSI has been evaluated only indirectly. Another concern with the WBSI is that the measure includes some content pertaining to intrusive thoughts rather than thought suppression per se (consider a WBSI item “There are images that come to my mind that I cannot erase”). This overlap with OCD symptomatology, as obsessions are essentially intrusive thoughts, is potentially problematic, and it can inflate associations between the WBSI and measures of OCD. Muris et al. (1996) addressed this issue by dropping five WBSI items that tap intrusions and evaluating properties of this revised WBSI. The authors identified the intrusion items using content analysis, but a factor-analytic study of the WBSI also placed these five items on the Intrusions factor (Blumberg, 2000). Muris et al. (1996) found almost no change in the psychometric characteristics of the measure after the five intrusion items were dropped (Cronbach’s alpha changed from .89 to .84, 12-week retest stability remained  $r = .80$ ) and the change in the strength of association with a self-report measure of OCD symptoms was minor ( $r = .30$  instead of .35). It appears that inclusion of intrusion items does not inflate the relation between Thought Suppression and OCD very much; nevertheless, the Revised WBSI will be used in the proposed study.



There also is emerging evidence that Dissociation-Proneness is strongly associated with at least some symptoms of OCD (Watson, Wu, & Cutshall, 2004). Dissociation-proneness is a multidimensional phenomenon and two facets of the construct, Obliviousness and Depersonalization, appear to be particularly relevant to OCD. Obliviousness is a tendency to engage in mindless, automatic behaviors, and to enter into naturally occurring trance states. Depersonalization is a propensity to experience disconnection from one's body, such as out-of-body experiences, or spells of perceiving the surrounding as not real.

There is a conceptual relation between OCD and Obliviousness. Specifically, checking compulsions and obsessions of doubt imply a certain degree of Obliviousness, as they apparently involve a failure to remember clearly that an activity was performed. The connection with Depersonalization is less obvious but is empirically robust. Watson et al. (2004) related a self-report measure of Dissociation-Proneness to two self-report measures of OCD symptoms in two undergraduate samples ( $N = 1,132$  and  $465$ ) and found that obsessions and checking compulsions were linked consistently to Obliviousness and Depersonalization even after NEM was controlled ( $r = .37 - .50$ ). In this study, Dissociation-Proneness also related to other types of OCD symptoms but not as strongly ( $r_s < .25$  after controlling for NEM).

### Current Study

As mentioned earlier the two main goals of the current study were: (1) to assess the contribution of the shared vulnerability factor (NEM) to the four selected distress disorders and (2) to identify potential secondary risk factors to these disorders. The cross-sectional design of the study did not permit examination of actual vulnerability relations, but it allowed identification of candidate risk factors. This approach is based on the assumption that most trait vulnerabilities should show cross-sectional associations with the symptoms that they predispose individuals for. This assumption is consistent with the

hierarchical-vulnerability model. Consider that a significant portion of the population experiences distress disorders at any given point of time—for instance, the point-prevalence of MDD is 3% (Joyce, 1994)—and, according to the model, the majority of individuals with these disorders are elevated on the corresponding risk factors. Thus, current symptoms should be associated with trait vulnerabilities in the general population at any given point of time.

To address these goals, I examined relations between candidate trait vulnerabilities and symptoms of the four selected distress disorders—MDD, Social Phobia, Panic Disorder, and OCD—in a sample of University of Iowa undergraduates and in a sample of local psychiatric patients. Utilization of two samples allowed me to test the generalizability of personality-psychopathology links. The hierarchical-vulnerability model does not specify any variability in associations across populations, and hence I expected to see essentially the same pattern in these two samples. My review of the literature suggested a number of potential relations, and they are outlined in the following section.

### Hypotheses

The literature review indicated that NEM has the strongest contribution to MDD (average  $d = 1.6$ ); its contribution to OCD is slightly weaker (average  $d = 1.4$ ), and its contributions to Social Phobia and Panic Disorder are equally weak (average  $d = .7$ ). I expected to find the same rank-order of associations with NEM in this study.

The review also suggested that a number of personality traits contribute to the four selected distress disorders above and beyond NEM. The summary of these findings is presented in Table A3. I took a conservative approach to hypothesis generation and included a relation on the list only if the evidence for it was consistent and fairly direct. However, even this approach may somewhat overestimate the numbers of associations, as the majority of existing personality-psychopathology studies did not control for NEM.

The incremental validity evidence was taken into account whenever possible, but it was not always available. In sum, MDD was hypothesized to relate to PEM, Disinhibition, Mistrust, Self-Harm, Dependency, Detachment, Self-Criticism, Ruminative Response Style, Anxiety Sensitivity, and Perfectionism; Social Phobia to PEM, Self-Harm, Dependency, Exhibitionism, Detachment, Self-Criticism, Anxiety Sensitivity, Perfectionism, Fear of Negative Evaluation, and Public Self-Consciousness; Panic Disorder to PEM, Dependency, Propriety, Self-Criticism, Anxiety Sensitivity, and Perfectionism; and OCD to PEM, Disinhibition, Mistrust, Self-Harm, Eccentric Perceptions, Dependency, Detachment, Propriety, Workaholism, Anxiety Sensitivity, Perfectionism, Thought Suppression, and Dissociation-Proneness.

It is important to consider that although many traits may contribute to a disorder in addition to NEM, only a few constructs can be expected to have incremental validity relative to all other traits. This issue has not received much attention in the literature, but a few hypotheses can be derived based on how strong and consistent a psychopathology-personality relation is. Specifically, it appears that MDD has the most robust links to Ruminative Response Style, PEM, and Self-Harm; Social Phobia to PEM, Exhibitionism, and Perfectionism; Panic Disorder to Anxiety Sensitivity; and OCD to Dissociation-Proneness. In Table A3 these traits are marked as the main contributors.

Table A3 is organized around traits rather than disorders, because the issue of diagnostic specificity of the traits is one of the central questions of the study. The proposed associations are grouped according to their expected magnitude into primary, secondary, and tertiary categories, and the composition of these categories reflects the expected diagnostic specificity of a trait. Assignment to the categories was done on the basis of effect sizes and correlations reported in the literature. For example, effect sizes (*ds* reflecting the difference between a diagnostic group and the norms) on Anxiety Sensitivity were found to be 2.1 for Panic Disorder, 0.9 for Social Phobia, 0.9 for OCD, and 0.8 for MDD; hence, Panic Disorder was assigned to the primary group and other

disorders were placed in the secondary group. When too little data were available to allow for this quantitative approach, the assignment was done according to the strength of supporting evidence. For instance, Mistrust showed approximately equal associations with MDD and OCD, but Mistrust was related to OCD only in one study, whereas the link with MDD was established in several investigations.

Diagnostic specificity can be hypothesized if a trait has only one primary association. Thus the following traits are expected to show diagnostic specificity: Ruminative Response Style to MDD, Self-Harm to MDD, Mistrust to MDD, Self-Criticism to MDD, Exhibitionism to Social Phobia, Perfectionism to Social Phobia, Fear of Negative Evaluation to Social Phobia, Public Self-Consciousness to Social Phobia, Anxiety Sensitivity to Panic Disorder, Dissociation-Proneness to OCD, Eccentric Perceptions to OCD, Workaholism to OCD, and Thought Suppression to OCD.

## METHODS

### Participants

The data collection was performed in two phases: a pilot study and the main study. For the pilot study, I recruited a sample of 89 University of Iowa undergraduates and a sample of 38 outpatients treated at the Community Mental Health Center for Mid-Eastern Iowa. Students completed both the questionnaires and the interview, while the patients completed only the interview due to logistical constraints. This pilot study allowed me to test out the procedures and examine psychometric characteristics of the interview items. Specifically, I examined the ability of interview questions to discriminate between students and patients (by comparing means and *SDs* of items across samples) and evaluated the strength of the item-total correlations. Forty two items were replaced or revised because of poor psychometric characteristics, which resulted in the final 242-item interview measure.

Participants in the main study were sampled from two populations: (1) undergraduates at the University of Iowa ( $N = 385$ ) and (2) psychiatric patients at local mental health clinics ( $N = 188$ ). Undergraduates were recruited from the Elementary Psychology course during the spring 2004, fall 2004, and spring 2005 semesters using a voluntary internet-based sign-up system. The students were offered two credit hours for their participation as partial fulfillment of a required research exposure component of the course. Psychiatric patients were recruited from the Community Mental Health Center for Mid-Eastern Iowa, the Adult Psychiatry Clinic at the University of Iowa Hospitals and Clinics, the Inpatient Psychiatric Clinic at the University of Iowa Hospitals and Clinics, and the Carl E. Seashore Psychology Clinic. Patients were approached in the waiting room of a clinic and given a flier inviting them to participate in the study. If a patient expressed an interest in the study, the recruiter obtained his or her contact information.

Patients were scheduled over the phone to come to the lab. They were offered \$40 for their participation.

The student sample was predominantly female (73%) and Caucasian (92%). Student ages ranged from 18 to 40 (Mean = 19.00,  $SD = 2.04$ ), and 84% of participants were 18 or 19 years old. The patient sample was largely female (69%) and Caucasian (92%). Patient ages ranged from 18 to 77 (Mean = 40.57,  $SD = 12.66$ ). Psychiatric records of participants were not available, but all participants were asked during the interview about their psychiatric history. All patients reported a lifetime history of mental health treatment and 89% were in treatment at the time of the assessment. Thirty two percent of students reported a lifetime history of treatment and 6% were in treatment at the time of the assessment. Participants reporting a history of contact with mental health professionals were asked about problems that occasioned treatment and about their diagnoses. I used these data to estimate the diagnostic composition of the sample. Summary results are presented in Table A4. Participants reported a range of problems but the most frequent were unipolar depression (122 patients and 51 students) and anxiety (89 patients and 23 students).

A number of cases had missing data (44 in the patient sample and 71 in the student sample). Missing values were filled in if less than 15% of responses on a scale were missing. In the interview data, missing values were replaced with the median of the three or five highest correlates (the number of items depended on the strength of correlations). Personality scales were prorated for missing responses. The resulting sample size was 180 for patients and 367 for students.

### Trait Measures

The entire personality battery included 561 items. Almost all measures of personality traits were discussed in the previous sections, so here I only provide a brief summary.

*SNAP*. The Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark, 1993; Clark et al., in press) is a 390-item true-false self-report questionnaire measuring 15 personality traits and 12 dimensional operationalizations of *DSM* personality disorders. Given that focus of the present study is on personality traits rather than personality disorders the latter scales were not used in the analyses. The instrument has been developed using a variety of empirical methods, including content analysis and factor analysis. Although the measure was developed using a “bottom up” approach, that is, focusing on lower order traits rather than general dimensions, factor analyses of the SNAP scales revealed a three-factor structure that clearly is interpretable as the Big Three. A substantial body of evidence supports the reliability and construct validity of the SNAP scales (Clark, 1993; Clark et al., in press). For instance, the scales are internally consistent (alphas of the trait scales range .76-.93 across patient and nonpatient samples) and stable over moderate intervals (median retest  $r = .85$  for a four-month interval).

*BFI*. The Big Five Inventory (BFI; John & Srivastava, 1999) is a widely used 44-item measure of the dimensions of the FFM of personality. The items are rated on a five-point Likert scale (0 = strongly disagree, 4 = strongly agree); they begin with the stem “*I see myself as someone who...*” and tap Neuroticism (e.g., *Is depressed, blue*), Extraversion (e.g., *Is full of energy*), Conscientiousness (e.g., *Does a thorough job*), Agreeableness (e.g., *Is helpful and unselfish with others*), and Openness (e.g., *Is original, comes up with new ideas*). The BFI scales show good internal consistency (mean alpha = .83; John & Srivastava, 1999) and demonstrate good convergent and discriminant validity with other measures of the Big Five and with the SNAP (Clark, 1993; Clark et al., in press)

*DEQ*. The Depressive Experiences Questionnaire (DEQ; Blatt et al., 1976) is a measure of personality predisposition to depression. The original DEQ included 66 items and responses on these items were used to compute scores on three factors: Self-Criticism, Dependency and Self-Efficacy. Although factor analysis was used to develop

this scoring scheme, the instrument itself was rationally constructed and one-third of the items do not load significantly on either factor (Blatt et al., 1976). Bagby et al. (1994) performed a series of exploratory and confirmatory factor analyses of the DEQ to create the Reconstructed DEQ. The revision produced considerable item-savings and improved the measure's stability (four-week test-retest  $r = .75 - .83$ ), internal consistency ( $\alpha = .69 - .80$ ), and ability to discriminate between psychiatric groups (Bagby et al., 1994). Only the 9-item Self-Criticism scale of the Reconstructed DEQ was used in the study. The items are rated on a 5-point Likert scale (0 = strongly disagree, 4 = strongly agree).

*RSQ.* The Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991) measures individual tendencies in reaction to depression. The instrument is multifaceted but only the 22-item Rumination subscale is relevant to this study, as it is the best established measure of Ruminative Response Style. The participants are asked to indicate how often they think or do each of the listed items (e.g., "think about how alone you feel") when they are depressed. The items are rated on a 4-point frequency scale (0 = almost never, 3 = almost always). The reliability of the RSQ ( $\alpha = .89$ , five-month test-retest  $r = .80$ ) and its utility for predicting future depression have been established in several studies that were reviewed in the previous section.

*ASI.* The Anxiety Sensitivity Index (ASI; Peterson and Reiss, 1992) is a widely used 16-item measure of Anxiety Sensitivity. The items are rated on a 5-point Likert scale (0 = very little, 4 = very much) and assess fears of anxiety symptoms (e.g., "It scares me when I feel faint"). The reliability of the ASI ( $\alpha = .82$ , 10-month test-retest  $r = .72$ ) and its utility for predicting future panic attacks are well established (for a review, see McNally, 2002; Taylor, 1999). The instrument has a three-factor structure, which includes Physical Concerns, Psychological Concerns, and Social Concerns factors.

*ACQ.* The Agoraphobic Cognitions Questionnaire (ACQ; Chambless, Caputo, Bright, & Gallagher, 1984) is another measure of Anxiety Sensitivity. Participants rate the frequency of 14 negative cognitions concerning the perceived consequences of



anxiety experienced while they are anxious (e.g., “I will have a heart attack”). The items are rated on a 5-point Likert scale (0 = never, 4 = always). The scale showed adequate internal consistency ( $\alpha = .80$ ) and stability (31-day test-retest  $r = .86$ ) in previous research (Chambless et al., 1984). The validity of the ACQ as a risk factor for panic-related psychopathology was established in several studies with concurrent and prospective designs (Ahmad, Wardle, & Hayward, 1992; Arrindell, 1993; Chambless et al., 1984; Chambless & Gracely 1989). As mentioned previously, Kotov and Watson (2005) found that the ACQ accounted for 12% of the variance in the MASQ GD: Depression scale after a two-month delay and after controlling for NEM.

*MPS.* The Multidimensional Perfectionism Scale (MPS; Frost et al., 1990) is an established measure of perfectionism. The MPS is a multifaceted measure, and studies reviewed in previous sections indicate that the Concern over Mistakes subscale of the MPS shows the strongest associations with the distress disorders. Hence, only this scale was used in the study. The Concern over Mistakes scale includes nine items (e.g., “I should be upset if I make a mistake”) rated on a 5-point Likert scale (0 = strongly disagree, 4 = strongly agree) and have shown adequate internal consistency ( $\alpha = .88$ ).

*FNE.* The Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969) is a 30-item True/False measure of apprehension at the prospect of being negatively evaluated. Leary (1983) revised the instrument by converting it to a 5-point Likert scale (0 = very little, 4 = very much) and shortening the measure to 12 items (e.g., “I am afraid that people will find fault with me”). The revised instrument is comparable in its psychometric properties to the original ( $\alpha = .90$ , four-week test-retest  $r = .75$ ; Leary, 1983) and almost all recent studies, including those reviewed above, utilized the brief version. Hence, the Brief FNE was used in this study.

*PSC.* The Self-Consciousness Scale (Fenigstein, Scheier, & Buss, 1975) is a widely used measure of dispositional self-awareness. The reliability of the PSC ( $\alpha = .79$ , two-week test-retest  $r = .84$ ) and its utility for predicting social anxiety have been

established in many studies (for a review, see Fenigstein, 1987). The measure includes Private and Public Self-Consciousness subscales. The literature reviewed earlier indicates that only the Public Self-Consciousness subscale (PSC) is clearly relevant to the distress disorders. Thus, only this scale was used in the study. The PSC is a 7-item measure of consciousness of one's appearance to others (e.g., "I'm self-conscious about the way I look"). The items are rated on a 5-point Likert scale (0 = extremely uncharacteristic, 4 = extremely characteristic).

*WBSI*. The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) is a 15-item measure of thought suppression (e.g., "I always try to put problems out of my mind"). The items are rated on a 5-point Likert scale (0 = strongly disagree, 4 = strongly agree). There is accumulating evidence of the reliability of the instrument ( $\alpha = .84$ ; 12-week test-retest  $r = .80$ ; Muris et al., 1996). Studies supporting the validity of the measure were reviewed in previous sections. As mentioned before, there is a concern that the WBSI includes a few intrusion items, which may distort estimates of personality-psychopathology relations. To avoid these problems the 10-item Revised WBSI (Muris et al., 1996) was used in this study.

*DPS*. The Dissociative Processes Scale (DPS; Harrison & Watson, 1992) is a 33-item factor-analytically derived measure of normal-range individual differences in dissociative tendencies. The items are rated on a 5-point Likert scale (0 = strongly disagree, 4 = strongly agree). There is emerging evidence that the DPS is a valid and internally consistent ( $\alpha = .84 - .86$ ) measure of dissociation-proneness (e.g., Watson, 2005b). The DPS has three subscales: Obliviousness, Detachment, and Imagination. Only the 6-item Detachment scale, which measures depersonalization (e.g., "At times I have felt disconnected from my body"), and the 14-item Obliviousness scale (e.g., "When I am doing a routine task, I sometimes can wander off into my own thoughts") were used in this study.

### Symptom Measure

To increase reliability and to avoid problems associated with dichotomous variables (e.g., deflation of correlations due to low base rates), psychopathology was operationalized as dimensions of symptom severity and not as categorical diagnoses. Symptoms were assessed with an interview. Interviews are more labor intensive than paper-and-pencil measures; however, there are important advantages to using interviews. First, reliance on paper-and-pencil self-report in measuring both personality and symptoms would introduce shared method variance in the analyses, which is likely to inflate estimates of the relations between them. Interview assessment of symptoms is believed to minimize this problem and thus would provide a stronger test of the study's hypotheses. Second, the interview format can enhance the quality of the data by (a) helping to ensure that participants understand the questions similarly, (b) providing an opportunity for researchers to obtain clarifications, and (c) minimizing the effects of some response biases (e.g., carelessness, or random responding). An interview may reduce these biases because the interpersonal nature of this assessment method can increase the engagement of respondents in the study. Also interview responses are recorded by the interviewer rather than by the participant, and these ratings can be expected to be more consistent and better standardized. This, of course, assumes that interviewers reliably adhere to the interview administration and scoring guidelines; procedures for ensuring adherence are described later in this section.

Existing interview measures of depression and anxiety suffer from two limitations: they utilize skip-outs (i.e., if respondents do not endorse a key symptom, they are not asked about a number of other symptoms that they may be experiencing), and the majority of these measures yield only one dichotomous score (present versus absent) for each disorder, which does not provide information regarding symptom severity. These limitations result in the loss of important clinical information; the use of such measures in the current project likely would lead to an underestimation of the strength of personality-

psychopathology relations. Consequently, I decided to assess psychopathology with the Interview for Mood and Anxiety Symptoms (IMAS). This measure is being developed by a team of University of Iowa researchers (graduate students in clinical psychology, including me, supervised by David Watson) specifically to overcome the limitations of existing structured clinical interviews.

The IMAS is a structured instrument designed to be administered by lay interviewers. It provides comprehensive assessment of symptoms of the four *DSM* disorders targeted in this study. The symptoms are scored on a three-point scale (0 = clearly absent, 1 = possibly present, 2 = clearly present), and each disorder is represented by a continuous score, that is, the sum of scores for symptoms of that disorder. The interview has a past-month time frame. Thus, it assesses current symptoms and does not rely on long-term retrospection, which is a limitation of many previous investigations of personality-psychopathology relations. The entire interview takes 30 minutes to an hour to complete.

A team of interviewers (advanced psychology undergraduates) was trained by the designers of the IMAS specifically for this study. The interviewers were familiarized with *DSM* descriptions of anxiety and mood disorders. They also were given extensive tutorials on interviewing skills, understanding the meaning of IMAS items, and scoring of the responses. Furthermore, the interviewers observed IMAS administrations conducted by the clinical psychology graduate students with other graduate students or undergraduates. Finally, the interviewers practiced on each other. Interviewers were supervised closely throughout the training process. For example, a trained interviewer was present at the last five practice interviews to provide feedback on interviewing skills and scoring. Before an interviewer was allowed to work with research participants, adherence to scoring criteria was assessed using a standard set of six audiotaped administrations of the IMAS performed by trained interviewers playing interviewers and interviewees. The interviewees were instructed to present specific types of problems

involving multiple disorders. They were asked to model psychopathology that they have observed in previous interviews with patients and give challenging responses.

IMAS symptom scales were developed based on data obtained in this study. Specifically, I considered the ability of items to discriminate between students and patients and evaluated associations between items and target scales. Items that produced small corrected item-total correlations ( $r < .30$ ) in both samples were dropped. Items that showed weak discrimination between the two samples ( $d < .40$ ) were also removed unless there were substantive reasons for the poor differentiation. For instance, a social phobia item “do you strongly fear or find it very uncomfortable to act, perform, or give a talk in front of an audience” failed the cutoff, as the effect size was  $d = .38$ . However, this was due to the relatively high prevalence of public speaking anxiety in the student sample, which is consistent with the prevalence of public speaking in normal populations (APA, 2000), and thus the item was retained. For diagnoses that include explicit symptom criteria, such as MDD and Panic Disorder, I also considered the correspondence between IMAS items and *DSM* criteria. Eleven experts—clinical psychologists and advanced graduate students in clinical psychology—were asked to match the items to criteria. The raters were given an option of marking an item as not matching any of the criteria. If fewer than nine raters matched a given item to the same criterion, the item was dropped.

The resulting Depression scale included 28 items. Each of the nine *DSM* symptoms was represented by two or three items. The composite also included two items tapping symptoms of dysthymia (low self-esteem and hopelessness), a question about diminished sexual drive, and an item measuring feelings of discouragement. This additional content was included to ensure adequate sampling of the entire domain of unipolar depression. Moreover, these items were strongly correlated with the composite in both samples (average corrected  $r = .58$ , range  $.41 - .67$ ).

The Panic scale included 16 items tapping each of the 13 panic attack symptoms. Criterion 9 “derealization or depersonalization” and criterion 10 “fear of losing control or

going crazy” were assessed with two items each. A question about dryness in the mouth also was included because of its conceptual and psychometric relevance.

The Social Anxiety scale was composed of 24 paired items. Participants were given a list of twelve social situations (e.g., “write, read, eat, or drink while someone watches”) and asked if they strongly fear each of these situations or find it very uncomfortable. Next, the participants were given the same list, and asked if they would avoid each of these situations if at all possible.

The OCD scale included 13 items tapping the three basic symptom domains of OCD—cleaning, checking, and rituals—that have emerged in structural analyses of this syndrome (e.g., Watson & Wu, 2005; Wu, 2005). Each domain was assessed by four or five items. All relevant portions of the interview are presented in the Appendix (items included in the composites are marked with asterisks).

To prevent rater drift, interrater reliability was assessed continuously throughout the study. All interviews were recorded and 100 tapes (34 patient and 66 undergraduate) were rescored by a different, randomly selected interviewer. The interrater reliability was very high in both samples. In the patient sample, intraclass correlations for the IMAS scale scores were .99 on the Depression, .99 on the Panic, .98 on the Social Anxiety, and .995 on the OCD scales. In the student sample, the corresponding intraclass correlations were .996, .98, .99, and .97, respectively.

#### Descriptive Statistics and Internal Consistency Reliability

Means and *SDs* of all of the measures are reported in Table A5. I compared the descriptive characteristics of the scales across samples by computing Cohen’s *d* on each measure with population type as the independent variable (see Table A5). Nearly all scales showed statistically significant ( $p < .01$ ) differences, except SNAP Manipulativeness, SNAP Disinhibition, SNAP Impulsivity, SNAP Propriety, and Public Self-Consciousness. Of the significant effects, five were weak ( $d < .40$ ), sixteen were

moderate ( $.40 \leq d < .80$ ), and eight were strong ( $d \geq .80$ ). Large sample differences were observed on IMAS Depression, IMAS Panic, IMAS Social Anxiety, BFI Neuroticism, SNAP Negative Temperament, SNAP Self-Harm, SNAP Detachment, and DEQ Self-Criticism. Directions of significant effects were all as expected; that is, the patient sample was more pathological than the student sample on every measure.

Reliabilities of the self-report and interview-based scales are reported in Table A6. The measures generally exhibited good reliability. All alphas were above .70, except for the reliability of BFI Agreeableness in the patient sample ( $\alpha = .68$ ). Moreover, the majority of alphas were above .80. In fact, only two measures produced reliabilities below .80 in both samples: the SNAP Manipulativeness and SNAP Disinhibition scales. I should note that the Disinhibition scale used in this study was a short 16-item version, as the full version includes items from other SNAP scales; thus, lower reliability can be expected for this measure.

### Procedures

Participants attended small group sessions held in the Department of Psychology at the University of Iowa. Each participant was provided with information about the study before giving informed consent for participation. Participants started with the self-report questionnaires but were asked to stop and do the interview at random time points during the session; thus, there was no systematic ordering of interview and self-report measures. To ensure confidentiality, data were coded using study identification numbers. These numbers were the only link between the identities of participants and their responses. All information pertaining to participants' identities was stored in a secure cabinet and a password-protected database.

### Data Analyses

Self-report data were scanned using an NCS OptiScan3 scanner. Interview data were entered by two teams of undergraduate assistants; one team entered the data and the

other team checked the entries. Fifty randomly selected protocols were rechecked and errors were found in fewer than 0.1% of entries.

I conducted four types of analyses to answer the four main questions of the study: (1) how strong is the contribution of NEM to each disorder, (2) what traits have incremental validity over NEM, (3) what traits have incremental validity and show diagnostic specificity, and (4) what traits are the main contributors to the disorders? The analyses were conducted separately within the undergraduate and the patient data sets, but the same series of analyses was performed in each sample.

First, a composite measure of NEM (the sum of standardized scores on SNAP Negative Temperament and BFI Neuroticism) was correlated to the four symptom composites. I hypothesized that the correlation with the depression composite would be the strongest, the correlation with the OCD composite would be next strongest, and correlations with the social anxiety and the panic composites would be weaker but not significantly different from each other.

Second, partial correlations between all other trait measures and the IMAS scales were computed while controlling for the NEM composite. A statistically significant correlation between a trait and a disorder would confirm the incremental validity of that trait vis-à-vis NEM.

Third, if a trait showed at least one significant partial correlation, I evaluated that trait's diagnostic specificity by comparing its partial correlations with the four symptom composites for statistically significant differences. Statistical significance was assessed using Williams' *t* test (Steiger, 1980; Steiger & Browne, 1984).

Fourth, I identified the main trait contributors for each disorder using a stepwise hierarchical regression with the NEM composite force-entered in the first step. Given that this investigation was somewhat exploratory, as no previous studies had examined such a diverse set of traits together, further predictors were entered using the forward regression method. Each of the four symptom composites (depression, social anxiety, panic, and



OCD) served as dependent variables in separate analyses. All predictors that accounted for at least 1% of additional variance in the dependent variable were considered main contributors.

I also conducted a secondary analysis to test the existence of direct associations between syndromes and relevant trait contributors. The relations were considered direct in the sense that they were not due to overlap between syndromes or overlap between the target trait and NEM. The analysis was performed using a modified regression approach. For each dependent variable (symptom composite), the other three symptom composites were entered in the first step, thus removing all non-specific symptom variance; the NEM composite was entered in the second step, thus controlling for general vulnerability; and one of the main predictors identified in previous analyses was entered at the last step. The analysis was repeated for each main predictor and allowed me to rule out predictors that were not linked to a given syndrome directly. Of note, some traits may be found to link directly to multiple syndromes, as a given trait can contribute independently to multiple disorders.

## RESULTS

Before beginning discussion of results, I want to clarify terms used to describe magnitude of an effect. I define weak as  $r < .20$ , moderate as  $|.50| > r \geq .20$ , moderately high as  $|.50| > r \geq .35$ , high as  $r \geq .50$ , and very high as  $r \geq .60$ . I use these labels consistently throughout the rest of the manuscript.

### Correlations Among Personality Measures

The pattern of correlations among the BFI scales (Tables A7 and A8) was consistent with previous research on the Big Five (Digman, 1990; John & Srivastava, 1999). The correlations were generally low to moderate in magnitude; most were less than  $|.30|$ . As would be expected based on previous findings (see Digman, 1997), the highest correlation was between the Agreeableness and Conscientiousness scales ( $r = .35$  and  $.46$  in the patient and student samples, respectively). The Neuroticism scale was negatively associated with the other scales. Almost all other intercorrelations were positive.

Correlations among the SNAP scales (Tables A9 and A10) were also similar to previous findings (Clark, 1993; Clark et al., in press). The correlations were generally low, with an average absolute value of  $.23$  and  $.25$  in the patient and student samples, respectively. A few high correlations ( $r > .50$ ) were observed—eight in the patient sample and five in the student sample—however, all of them were among scales belonging to the same domain/factor, which can be expected. The only exception was the strong association between the Manipulativeness and Disinhibition scales, but it has been documented previously (Clark, 1993; Clark et al., in press).

Correlations between the BFI and SNAP (Tables A11 and A12) were generally consistent with expectations. The BFI Neuroticism and SNAP Negative Temperament scales showed good convergence in both samples ( $r = .67$  and  $.74$ ); moreover, these scales had only one other high correlation (BFI Neuroticism correlated  $.52$  with Self-

Harm in the patient sample). The BFI Extraversion scale was highly correlated with SNAP Positive Temperament, but its associations with the SNAP Exhibitionism and Detachment scales were similar in magnitude. The BFI Conscientiousness scale correlated highly with SNAP Disinhibition and SNAP Impulsivity in the student sample ( $r = -.55$  and  $-.54$ , respectively), but the correlations were only moderately high in the patient sample ( $r = -.46$  and  $-.44$ ). The Agreeableness scale of the BFI showed strong convergence with SNAP Aggression in both samples ( $r = -.58$  and  $-.59$ ). Finally, the BFI Openness scale was largely unrelated to the SNAP scales (all  $r$ s  $< |.35|$ ). Given the very strong association between the BFI Neuroticism and SNAP Negative Temperament scales, as well as the clear discriminant pattern, the creation of the Negative Emotionality composite appeared to be warranted. I therefore standardized and summed scores on these two scales. Other measures did not converge so strongly and clearly (e.g., BFI Extraversion correlated equally strongly with three scales); thus, no other composites were created.

#### Correlations Among Measures of Clinical Traits

Many clinical trait measures correlated rather highly with each other (Tables A13 and A14). All associations were positive. Some were as high as  $.69$ , and the average correlation was  $.42$  in each sample. It is important to combine highly correlated predictors to avoid the problem of multicollinearity in regression analyses (Aiken, West, & Pitts, 2003; Maxwell, 2000). On the other hand, many of these scales are believed to tap distinct constructs, and collapsing conceptually different measures would complicate integration of present results with existing literatures. Nevertheless, some compositing of the scales seems to be warranted. As noted earlier, three pairs of clinical trait measures presumably reflect the same constructs, namely, anxiety sensitivity, negative evaluation sensitivity, and dissociation-proneness. In fact, in my review of the literature I considered these scales as markers of the same traits (e.g., Tables A1 and A3). I decided to collapse

these three pairs, if they would show strong empirical convergence in addition to conceptual similarity.

The two measures of Anxiety Sensitivity, the ASI and ACQ, exhibited notable convergence ( $r = .57$  and  $.61$  in the student and patient samples, respectively) and reasonable specificity, as all of their other correlations were only moderate ( $r < .50$ ). Thus, I created an Anxiety Sensitivity composite by standardizing and summing the ASI and ACQ scores. The two measures of Negative Evaluation Sensitivity (PSC and FNE) correlated very highly ( $.62$  and  $.69$  in the patient and student samples, respectively). I created a Negative Evaluation Sensitivity composite by standardizing and summing the PSC and FNE scores; the same composite was used by Kotov et al. (2005). The two markers of Dissociation-Proneness (DPS Obliviousness and DPS Detachment) also showed very strong associations ( $r = .66$  and  $.69$  in the patient and student samples, respectively). I created an Oddity composite by standardizing and summing scores on the DPS Obliviousness, DPS Detachment, and SNAP Eccentric Perceptions scales; reasons for including the SNAP Eccentric Perceptions are presented in the next section. Notably, the last two pairs of scales (i.e., PSC and FNE; DPS Obliviousness and DPS Detachment) were the only clinical trait measures to correlate above  $.60$  in both samples.

The creation of these composites significantly reduced redundancy among the clinical trait measures. Correlations among the resulting variables—the three composites and the four individual clinical scales—were all below  $.60$ , except for one relation in the patient sample (the Negative Evaluation Sensitivity composite and the Concern Over Mistakes scale correlated  $.61$ ) and a different relation in the student sample (the DEQ Self-Criticism and Concern Over Mistakes scales correlated  $.62$ ). Thus, the goal of compositing was largely accomplished without compromising interpretability of the results.

### Correlations Between Personality Scales and Measures of Clinical Traits

First, I consider relations between the clinical trait measures and the BFI scales (Tables A15 and A16). Almost all clinical traits showed moderately strong associations ( $r > .35$ ) with BFI Neuroticism. One exception was the Oddity composite and its component dissociation-proneness scales, which produced positive but somewhat weaker correlations (average  $r = .33$ ). The other exception was the PSC, which did not correlate notably with any of the BFI scales (highest  $r = .31$ ). The Self-Criticism scale was by far the strongest correlate of BFI Neuroticism ( $r = .66$  in both samples). It also showed appreciable negative associations with the BFI Conscientiousness and BFI Agreeableness scales; in the patient sample these correlations were  $-.42$  and  $-.43$ , respectively. Other clinical traits were fairly specific to Neuroticism, as their correlations with the other BFI scales were low to moderate (generally below  $|.30|$ ).

Associations between the clinical traits and the SNAP followed a similar pattern (Tables A17 and A18). Correlations with the Positive Temperament scales and Disinhibition scales were unremarkable and generally below  $|.30|$ . On the other hand, SNAP Negative Temperament, SNAP Mistrust, SNAP Self-Harm, and SNAP Eccentric Perceptions produced strong correlations at least with some of the clinical traits. Consistent with the BFI data, Self-Criticism showed a very strong association with the SNAP Negative Temperament scale ( $r = .65$  and  $.69$ ). It also related strongly to the SNAP Mistrust ( $r = .58$  and  $.62$ ) and SNAP Self-Harm ( $r = .51$  and  $.63$ ) scales. However, the Dissociation-Proneness scales exhibited the highest correlations. They were strongly and specifically linked with the Eccentric Perceptions scale; convergent correlations ranged from  $.57$  to  $.72$ , while all discriminant correlations were less than  $|.47|$ . On the basis of these data, I decided to include the SNAP Eccentric Perceptions in the Oddity composite.

In sum, I created four personality composites: Negative Emotionality, Anxiety Sensitivity, Negative Evaluation Sensitivity, and Oddity. From this point on, I only consider the composites and not the individual scales that were included in them. This approach reduced the number of independent variables to 25 predictors and lessened potential multicollinearity problems.

#### Correlations Among Symptom Composites

The four symptom scales showed moderate to strong associations with each other (Tables A19 and A20), with correlations ranging from .31 to .55 (average  $r = .40$  and  $.43$  in the student and patient samples, respectively). The hierarchical-vulnerability model posits that comorbidity among disorders is in part due to contributions from shared trait vulnerabilities. To evaluate the validity of this assertion, I computed partial correlations between the symptom composites controlling for all 25 personality variables. This resulted in a notable reduction in the magnitude of these associations (Tables A19 and A20). All partial correlations were .30 or less, and the average partial correlations were .22 and .21 in the student and patient samples, respectively. This is a two-fold decrease in correlations and a four-fold decrease in shared variance. Thus, 75% of the overlap between symptom dimensions was due to the personality traits.

Arguably, this is a very rough test of the hypothesis, since some of the personality variables are not specifically included in the model. I therefore repeated the analysis using only relevant personality traits, after the main predictors were identified for each syndrome. These analyses are reported in a later section.

#### Zero-Order Correlations Between Personality Traits and Symptom Dimensions

Next, I computed correlations between measures of traits and symptoms (Tables A21 and A22). These analyses revealed a number of strong relations. Specifically, fifteen correlations were high ( $r \geq .50$ ) and three of them were very high ( $r \geq .60$ ). Notably,

eleven of these correlations, including all of the very high ones, were observed in the patient sample.

All clinical traits were relevant to the IMAS scales, as they each produced at least one correlation above  $|.35|$ . Of the Big Five traits, only NEM and Extraversion showed notable associations with the symptom composites. NEM exhibited moderate to strong links with all four syndromes, although its association with OCD was the weakest one ( $r = .32$  and  $.35$  in the patient and student samples, respectively). BFI Extraversion produced moderate to high correlations with the IMAS Social Anxiety scale ( $r = -.53$  and  $-.34$ ) but showed weaker relations with the other symptom measures ( $r$ s ranged between  $-.06$  and  $-.32$ ). The other BFI scales did not exhibit any remarkable associations with the four composites (all  $r$ s  $<|.35|$ ).

A number of lower order traits had moderately high associations with the symptoms. Among the Negative Temperament scales of the SNAP, the Mistrust and Self-Harm scales showed such correlations. These two traits had particularly strong associations with IMAS Depression (average  $r = .52$ ). In the Positive Temperament domain, all scales, with the exception of SNAP Entitlement, were relevant to the symptom composites. In the patient sample, these scales showed moderate to strong associations ( $r$ s  $\geq|.45|$ ) with IMAS Social Anxiety and somewhat lower but still substantial associations with IMAS Depression ( $r$ s  $\geq|.35|$ ). In the student sample, the correlations were weaker but followed the same basic pattern. The Disinhibition scales were essentially irrelevant to the four symptom composites, as all correlations were below  $|.24|$ .

My hypothesis regarding relations between NEM and the four syndromes was only partially supported. As expected, the NEM composite was most strongly associated with the IMAS Depression scale. Contrary to prediction, however, its correlations with the OCD composite were lower than its correlations with the Panic and Social Anxiety composites. Next, I evaluated the correlations of each trait with the IMAS scales for

statistically significant differences using Williams' *t* test. NEM showed specificity to depression relative to OCD and Panic, as the corresponding *t* tests were significant in both samples. No other *t* tests for NEM were significant in both samples (see Tables A21 and A22).

Other traits that showed evidence of specificity in both samples were Extraversion (Social Anxiety < Panic, OCD; i.e., Extraversion had a stronger negative correlation with Social Anxiety than with Panic or OCD), Openness (Social Anxiety < OCD), Self-Harm (Depression > Panic, OCD, i.e., a stronger positive correlation with Depression than with Panic or OCD), Positive Temperament (Social Anxiety < Panic, OCD; Depression < OCD), Exhibitionism (Social Anxiety < Depression, Panic, OCD), Entitlement (Social Anxiety < OCD), Detachment (Social Anxiety > Panic, OCD), Ruminative Response Style (Depression > Panic, Social Anxiety, OCD), Self-Criticism (Depression > Panic, OCD), Perfectionism (Depression > Panic), and Thought Suppression (Depression > Panic, OCD). Note, however, that the results may be distorted by differential associations of these variables with the general vulnerability factor (NEM). For a more definitive test of specificity, contributions of NEM should be controlled. These analyses are considered in the following section.

Of the symptom composites, IMAS Depression showed the strongest associations with the personality traits. It had 11 correlations of .50 and greater (seven in the patient sample and four in the student sample), three of which were very high (all in the patient sample). IMAS Social Anxiety did not produce any very high correlations but showed three strong associations (all in the patient sample) and 19 moderately strong relations (11 in the patient sample). IMAS Panic had one high correlation and ten moderately high correlations (six in the patient sample). IMAS OCD exhibited fewer notable links to personality traits than the other composites. It had only four moderately strong correlations (three in the patient sample) and the highest of them was .39.



I also identified traits that were the highest correlates of a given symptom composite in both samples. IMAS Depression had four consistently strong associations ( $r \geq .50$  in both samples), namely, relations with the NEM composite, SNAP Mistrust scale, RSQ Rumination scale, and DEQ Self-Criticism scale. IMAS Panic consistently correlated .35 or higher with three traits: NEM, Anxiety Sensitivity, and Oddity. IMAS Social Anxiety consistently correlated .35 or higher with ten traits. Of these traits, the five highest correlates (in the patient sample) were NEM, SNAP Mistrust, SNAP Exhibitionism, SNAP Detachment, and DEQ Self-Criticism. IMAS OCD produced four correlations that were at least .30 in both samples, namely, associations with NEM, SNAP Mistrust, Oddity, and Self-Criticism. However, it showed no correlations that were consistently above .35.

### Correlations Between Personality Traits and Symptom

#### Dimensions Controlling for NEM

I computed partial correlations between traits and symptoms controlling for the NEM composite (Tables A23 and A24). A large number of associations remained significant (41 in the patient sample and 46 in the student sample), which provided evidence of incremental validity for many of the traits. I had a number of hypotheses about incremental contributions (see Table A3). Twenty five of these hypotheses were confirmed, eleven were not supported, and twenty new relations were identified. However, only eight of these new relations were significant in both samples. A hypothesis was considered confirmed or a new association identified if the correlation was significant at  $p < .05$  level in both samples or significant at  $p < .01$  level in one sample. These findings are summarized in Table A25.

A number of these associations were at least moderate in magnitude. Specifically, six traits had partial correlations with IMAS Depression that were above .20 in both samples: Mistrust, Self-Harm, Oddity, Ruminative Response Style, Self-Criticism, and

Thought Suppression. IMAS Social Anxiety had five such correlates: Extraversion, Positive Temperament, Exhibitionism, Detachment, and Anxiety Sensitivity. Only two traits showed consistently moderate associations with IMAS Panic, namely, Anxiety Sensitivity and Oddity. IMAS OCD did not have any such associations. It produced moderate partial correlations with Anxiety Sensitivity and Oddity in the patient sample and a moderate partial correlation with Perfectionism in the student sample.

I evaluated the specificity of trait contributions by comparing partial correlations for significant differences with Williams' *t* test. Eight traits exhibited specificity in both samples, and 11 traits showed evidence of specificity in only one sample (Table A26). I hypothesized 11 specific associations a priori. Three hypotheses were supported in both samples, six were supported in only one sample (see Table A26), and two were not supported (i.e., the hypothesized specificity of Oddity and Revised WBSI to OCD).

#### Identification of Main Predictors

To identify the main predictors of the symptom composites, I constructed eight regression models (one for each dependent variable in each sample). The IMAS composites were the dependent variables, and the personality measures were the independent variables. I force-entered the NEM composite at the first step of each model. Other predictors were entered next using the forward regression method, and new predictors were added until the partial correlations of all remaining personality variables were less than  $|\cdot 10|$ . I based the stopping rule on the magnitude of effects rather than significance levels, because the patient and student samples differed substantially in size.

Results of these analyses are reported in Tables A27 and A28. Note that some variables that passed the stopping rule actually accounted for less than one percent of the variance in the dependent variable (i.e.,  $\Delta R^2 < .01$ ). I decided *a priori* that such contributions are too small to have practical significance, and thus they were not interpreted. For interpreted predictors, I reported  $\beta$ -weights in the final equation and

corresponding  $t$  values (Tables A27 and A28), but the magnitude of  $\Delta R^2$  and the replicability of predictors across samples are the primary issues in these analyses.

In the patient sample, the interpreted predictors accounted for 59% of variance in the Depression composite, 38% in the Panic composite, 57% in the Social Anxiety composite, and 24% in the OCD composite. In the student sample, the corresponding values were somewhat lower: 44%, 22%, 39%, and 21%, respectively. The overall pattern was quite consistent across samples. In both samples, the personality scales accounted for much more of the variance in the IMAS Depression and Social Anxiety composites than in the Panic and OCD scales.

There also was appreciable consistency in the main contributors across samples. Twelve contributors were identified in both samples, while 16 predictors emerged in only one sample (see Table A29). The latter predictors appear to be potentially relevant, but additional studies are needed to clarify their status. Thus, the focus of subsequent analyses is on the robust predictors.

Inspection of final  $\beta$ -weights (Tables A27 and A28) indicated that all contributions were in the expected direction. Moreover, all  $\beta$ -weights were significant except for the NEM composite in two analyses and BFI Openness in two other analyses. Importantly, the NEM composite accounted for more than 10% of the variance in the dependent variable in both of the aforementioned analyses. BFI Openness, however, accounted for less than 3% of the variance and did not emerge as a predictor in the second sample in either case.

I hypothesized several main predictors (Table A3). Four hypothesized relations were supported in both samples, two were supported in one sample (Table A29), and two were not supported (i.e., the associations of PEM/Extraversion with MDD and Perfectionism with Social Phobia). Also, four unpredicted robust links were identified.

### Follow-up analyses

In developing the hierarchical-vulnerability model, I decided to focus on robust main predictors. This approach may be considered conservative, as potential trait contributors that received weak or inconsistent support in this study were excluded. Thus, I thought it important to examine the performance of this restricted set of predictors relative to the full set of traits.

First, I sought to determine how well the seven robust main contributors (NEM, Self-Harm, Revised WBSI, Anxiety Sensitivity, Oddity, Exhibitionism, Negative Evaluation Sensitivity) represent important associations between the four IMAS scales and available personality measures. I decided against using multiple regression to compare the predictive power of the selected seven traits relative to all 25 traits, as the latter predictor set would have ample opportunity to capitalize on chance and on trivial residual associations to exhibit higher predictive power. In fact, the complete set of predictors did show somewhat greater predictive power than the robust main predictors ( $\Delta R^2$  for these comparisons ranged from .03 to .10, with an average of .07). I decided to compute residual partial correlations (controlling for the seven robust main trait contributors) instead, and evaluate them for presence of consistent residual links that may be of practical significance ( $r \geq |.10|$ ).

Quite a few partial correlations were stronger than  $|.10|$  (31 and 18 in the patient and student samples, respectively), but only three of them exceeded the threshold in both samples and had consistent signs (Tables A30 and A31). Specifically, IMAS Depression showed positive associations with Ruminative Response Style and Self-Criticism, and IMAS Social Anxiety produced a negative relation with SNAP Positive Temperament. Thus, it appears that robust main trait contributors do not capture all important associations, and it may be necessary to add the three links to the model.

Second, I tested the ability of the robust main predictors to account for the overlap between the symptom composites. The hierarchical-vulnerability model posits that co-

occurrence of disorders is at least partially due to shared trait contributors. Thus, in these analyses I controlled only for the robust main trait contributors that showed relevance to more than one syndrome and therefore would be considered shared, namely the NEM, Anxiety Sensitivity, and Oddity composites.

The results (Table A32) were very similar to those obtained by controlling all 25 personality variables (Tables A19 and A20). In the new analysis, all partial correlations were .35 or less. Average partial correlations were .22 and .21 in the student and patient samples, respectively, which is exactly what was found in the initial analyses. Thus, it appears that the three traits identified as showing some generality account for just as much overlap between the IMAS scales as the full set of personality variables.

#### Identification of Direct Associations

To test the contributions of the robust main predictors for directness, I constructed a new set of regression models. In the first step of each model, I force-entered the three symptom composites other than the dependent variable. For instance, in the analyses predicting OCD, the IMAS Depression, Panic and Social Anxiety scales were entered in Step 1. The NEM composite was entered in the second step. In the final step of the model, I included one of the robust main predictors relevant to the dependent variable. In other words, two models (one in each sample) were constructed for each robust main contributor. In these analyses, I searched for personality traits that consistently accounted for at least 1% of variance in the dependent variable after the other symptom composites and the general trait vulnerability were controlled.

The results are presented in Tables A33 and A34. Six variables made appreciable direct contributions in both samples. The other two traits passed the criteria only in one sample—in the second sample their contributions were less than 0.5% of the variance and not significant. I interpreted only replicable relations. Thus, SNAP Self-Harm and Revised WBSI made direct contributions to IMAS Depression, Anxiety Sensitivity and

Oddity had direct links with IMAS Panic, while Exhibitionism and Negative Evaluation Sensitivity were directly related to IMAS Social Anxiety. Notably, no variables emerged as reliable direct predictors of IMAS OCD.

## DISCUSSION

The main goals of this study were: (1) to assess contributions of NEM to the four syndromes and (2) to identify secondary traits associated with these syndromes. Furthermore, I made a number of hypotheses regarding links between the syndromes and certain personality traits. This study provided me with information necessary to address the two overarching goals, to evaluate the hypotheses, and to further develop the hierarchical-vulnerability model. However, prior to discussing these findings, I need to review three general issues: the consistency of results across samples, relations among personality measures, and the general pattern of personality-psychopathology links observed in the study.

### General Issues

#### Consistency of Findings Across Samples

I started my evaluation of cross-sample consistency by examining relations among the personality measures. I computed the mean and *SD* of correlations in each relevant table (Tables A7 – A18) and performed pairwise comparisons of these values between samples. For example, I compared the mean and *SD* of Table A7 (correlations among the BFI scales in the patient sample) with the mean and *SD* of Table A8 (corresponding correlations in the student sample). The means ranged from -.04 to .46 and the *SDs* ranged from .16 to .30. These values were remarkably consistent, as no discrepancy in means or *SDs* was greater than  $|.03|$  across the two populations. The average discrepancy of means was .01, which indicates that correlations among the personality measures were slightly higher in the patient sample, and the average discrepancy of *SDs* was -.01, which indicates that the correlations were slightly more variable in the student sample.

These analyses suggest that the overall pattern of associations is very similar in the two populations, but they do not assess the consistency of individual correlations. To evaluate the latter issue, I decided to examine how consistently the correlations cleared the threshold that I used either (a) for commenting on the links or (b) for making inferences about them (e.g., deciding that the variables need to be collapsed). In each case, the relevant threshold was expressed in the corresponding tables as bolding. The threshold varied between different analyses (ranging from .35 to .60), but it was consistent across the samples. For the purposes of this analysis, I considered each pairing of personality scales a target and evaluated the degree of similarity between the two populations in classifying the pairing as being either above or below the threshold. There were 528 pairings of scales (1056 correlations) in Tables A7 – A18. Of these pairings, 52 were consistently bolded, 29 were bolded inconsistently, and 447 were consistently not bolded. Thus, the percent agreement between the samples was 95%, and the corresponding kappa was .75, which indicates excellent consistency (Fleiss, 1981, pp. 38 - 44).

I also examined the cross population consistency of the zero-order and partial correlations among the IMAS scales (Tables A19, A20, and A32). Table means ranged from .21 to .43 and the *SDs* ranged from .06 to .10. These values were quite consistent across the populations, as no discrepancy in means or *SDs* was greater than |.04|. The correlations were slightly higher and somewhat more variable in the patient sample (average discrepancy in means and *SDs* was .01 and .03, respectively). The threshold was the same in all of these analyses ( $r > .35$ ). Eighteen pairings of variables were presented in these three tables. Two of them were consistently bolded, three were bolded inconsistently, and 13 were consistently not bolded. The percent agreement was 83%, and the corresponding kappa was .47, which indicates fair consistency.

Next, I evaluated the consistency of the zero-order and partial correlations between the IMAS scales and the personality traits (Tables A21 – A24). The means



ranged from .03 to .15 and were quite consistent, with discrepancies of  $|\leq .02|$  or less. The *SDs* ranged from .14 to .32 and showed notable differences. The discrepancy was .09 for the zero-order correlations and .08 for the partial correlations. Nevertheless, individual relations were fairly consistent across the two populations. The threshold for zero-order correlations was .35 (Tables A21 and A22). Bolding of partial correlations was inconsistent across samples, however, as it was based on statistical significance rather than absolute values (Tables A23 and A24). I decided to use a consistent threshold of .20 for the current analyses, as I specifically concentrated on moderate ( $r \geq .20$ ) partial correlations in the text. There were 196 pairings of traits and symptoms in Tables A21 – A24. Thirty six of them were consistently highlighted, 32 were highlighted inconsistently, and 128 were consistently not highlighted. The percent agreement was 84%, and the corresponding kappa was .59, which indicates fair consistency. Taken together these findings indicate that the average level of association between traits and symptoms was essentially the same across the samples and many of the same links were identified in both samples; however, the relations were generally more pronounced in the patient population—some were more positive and others more negative—which resulted in greater variability.

Finally, I considered the results of the regression analyses (Tables A27 and A28). The explanatory power of the traits in these analyses was, on average, 29% less in the student sample. However, the predictor sets identified in the regression analyses were fairly similar across the populations. Of the 100 possible matches between traits and syndromes (25 independent variables times 4 dependent variables), 12 were identified in both samples, 17 were identified in only one sample, and 77 did not emerge in either sample. Thus, the percent agreement was 83%, and the corresponding kappa was .48, which again indicates fair consistency.

In sum, it appears that the patterns of relations examined in this study showed considerable generalizability across these two populations. Relations among personality

measures and among clinical scales were highly similar on average and showed fair to excellent consistency in individual comparisons. Associations between traits and symptoms were appreciably stronger in the patient sample. However, the pattern of associations was largely the same and many of the same predictors emerged in both populations. In other words, relevant predictors were strong enough to be identified even in the student sample.

I should note that the consistency of individual correlations was far from perfect. This finding suggests that true population differences may exist. Alternatively, the observed inconsistencies may be largely due to sampling error. The present samples are only moderate in size, and thus the sampling error is appreciable. For instance, the width of the 95% confidence interval for a correlation of .35 is .26 in the patient sample and .18 in the student sample. In the present analyses, sampling error would manifest as inconsistencies among the two samples, and it likely accounts for many, if not all, of the observed discrepancies. Thus, detection of true population differences is essentially impossible with samples of this size. Luckily, at this stage of the model's development, specific features of various populations are of secondary importance, as we are most interested in identifying the general structure.

Sampling error also can interfere with the detection of robust relations. I tried to alleviate this problem by focusing on replicable associations, as this approach reduces the possibility of spurious findings that are simply due to chance. It is, however, possible that some noteworthy relations were overlooked because they received support in only one sample. I return to this issue later.

### The Structure of Associations Among Personality Measures

Prior to testing the study hypotheses, I had to examine relations among the personality measures to ensure that they define a sound measurement model. Specifically, I needed to combine scales that tap the same underlying construct while making sure that

measures of different constructs are not collapsed together. In this section, I review the results of these analyses.

Correlations among the BFI scales (Tables A7 and A8) and among the SNAP scales (Tables A9 and A10) were consistent with previous research (Clark, 1993; Clark et al., in press; Digman, 1997; John & Srivastava, 1999). As predicted, the BFI scales showed low to moderate associations, indicating that the BFI assesses five distinct constructs. Correlations among SNAP scales were low to moderate, as well, with the exception of a few scales belonging to the same domain/factor, which is consistent with the Big Three structure. Overall, these analyses did not reveal any excessive redundancy that would suggest the need to collapse variables within these two sets of scales.

Correlations between the BFI and the SNAP were also consistent with expectations (Tables A11 and A12). The only notable finding was the non-specific association of BFI Extraversion with the Positive Temperament scales. I hypothesized that BFI Extraversion would be strongly related only to SNAP Positive Temperament, but it actually showed similar associations with SNAP Exhibitionism and SNAP Detachment. Although, I did not anticipate it, this finding is consistent with the conceptualization of Extraversion as a broad construct encompassing both PEM and sociability (Watson & Clark, 1997). As a result, I considered Extraversion (measured by the BFI Extraversion scale) and PEM (measured by the SNAP Positive Temperament scale) separately. Correlations between BFI Neuroticism and SNAP Negative Temperament, however, were very strong and highly specific. Thus, I combined them in a NEM composite.

Associations among the clinical trait measures were quite strong, with some correlations above .60 (Tables A13 and A14). These findings suggest that some of these purportedly distinct constructs actually are redundant with each other and should be combined. I was conservative in aggregating clinical scales to make sure that the results of the present study can be integrated with the existing literatures related to these traits. I

only combined scales that showed both strong empirical convergence and clear conceptual similarity. As the result, seven scales were collapsed into three composites, namely Anxiety Sensitivity, Negative Evaluation Sensitivity, and Oddity.

Correlations of the clinical trait measures with the BFI and SNAP (Tables A15 - A18) suggest that the clinical traits essentially can be considered facets of NEM, as they showed substantial and specific associations with NEM, as well as some of its facets (e.g., Mistrust and Self-Harm). The only possible exceptions are Public Self-Consciousness and Oddity, as both of them had low moderate relations with NEM. Self-Criticism was less specific to NEM than the other clinical traits; that is, it had moderate negative correlations with BFI Extraversion, BFI Conscientiousness, and BFI Agreeableness. However, Self-Criticism's link to NEM was by far the strongest. The nature of clinical traits and their place in the personality taxonomy is an important and largely neglected issue (Watson, Kotov, & Gamez, in press). It is not directly relevant to the goals and hypotheses of this study, however, and thus I will not discuss it here (for discussions of this issue, see Kotov et al., 2004; Watson et al, in press).

In sum, my examination of the associations among personality measures revealed a number of high correlations. To address this problem, I developed four composites, which considerably lessened the redundancy among these measures and reduced the number of predictors to 25 variables.

### Overview of Relations Between Traits and Symptoms

The basic finding of this study is that there is a very substantial overlap between personality and the distress disorders. Specifically, I found that the robust main trait contributors accounted for half of the variance in the Depression and Social Anxiety composites. This degree of overlap is very notable, especially since traits and symptoms were assessed using different methods, namely, self-report and interview.

Moreover, a few syndromes showed very strong links with certain personality traits (Tables A21 and A22). IMAS Depression correlated more than .60 with the DEQ Self-Criticism scale and NEM composite in the patient sample. These two traits were the strongest correlates of the Depression composite in the student sample as well, and both correlations were above .50. IMAS Social Anxiety correlated more than  $|.50|$  with the BFI Extraversion, SNAP Exhibitionism, and SNAP Detachment scales in the patient sample. These correlations also were notable (higher than  $|.30|$ ) in the student sample. The strongest correlate of the IMAS Panic scale was the Anxiety Sensitivity composite in both the patient and student samples ( $r = .56$  and  $.39$ , respectively). This degree of association suggests that personality traits play an important role at least in some distress disorders.

These results are consistent with previous findings. For instance, my review of research on the association between NEM and MDD (described in the Introduction) yielded an average effect size of 1.6, which corresponds to a correlation of .62. An extensive review of studies relating Anxiety Sensitivity and Panic Disorder indicated that this link is just as strong (see Taylor, 1999). Personality correlates of Social Phobia have not been studied as extensively, but Trull and Sher (1994) found that individuals with Social Phobia score one *SD* below the general population on Extraversion, which corresponds to a correlation of  $-.45$ . Some studies, however, have found personality-psychopathology links to be much weaker than the present estimates. For instance, Gamez et al. (2005) reported that Social Phobia correlates only  $-.12$  with SNAP Exhibitionism and only  $.18$  with SNAP Detachment. Importantly, many of these investigations did not compute effect sizes but instead examined biserial correlations between personality measures and dichotomous diagnoses. Biserial correlations are influenced by base rates and may substantially underestimate the strength of association.

I also found that personality traits significantly influence the associations among the distress disorders. In this study, syndrome co-occurrence was moderate to high

(average  $r = .40$  and  $.43$  in the student and patient samples, respectively), which is consistent with comorbidity rates for these disorders (Mineka et al., 1998). When personality traits were controlled, the average scale intercorrelations dropped to approximately  $.20$  (Tables A19 and A20). Thus, personality traits accounted for three quarters of the overlap among the four syndromes. In fact, the three traits that showed some degree of generality (NEM, Anxiety Sensitivity, and Oddity) provided almost all of this explanatory power. These findings corroborate a premise of the hierarchical-vulnerability model that concurrent comorbidity between disorders is largely a product of shared trait contributors.

It is important to note that personality traits accounted for much less variance in the Panic and OCD composites (21% to 38%) than in the Depression and Social Anxiety composites. This pattern emerged in correlational analyses as well. The IMAS Depression composite correlated strongly with a number of personality traits (Tables A21 and A22). The correlations of IMAS Social Anxiety were not as high, but a few of them exceeded  $|.50|$ . In contrast, IMAS Panic produced only one strong link, although the syndrome had a number of moderately strong relations. Associations of the OCD composite were unremarkable and very few of them were even moderately strong. Partial correlations controlling for NEM also replicated this pattern (Tables A23 and A24). IMAS Depression had the largest number of robust moderate partial correlations (six associations) and IMAS Social Anxiety was a close second (five relations); the Panic composite had only two such associations and the OCD composite had none.

These results confirm previous findings that personality predictors can account for depression quite well but have more difficulty explaining OCD (Brown et al., 1998, Kotov et al., 2005). These results may reflect the fact that depression has been studied extensively, so that many, if not all, of the relevant traits have been identified, whereas research on relations between personality and OCD is in its early stages. In fact, in my review I was able to identify several predictors of depression that already have well

developed literatures (e.g., Self-Criticism, Ruminative Response Style), whereas the hypothesized predictors of OCD have been examined only in a handful of studies. Another interpretation of the findings is that depression and social anxiety are much more common, and phenomena relevant to these conditions have been encoded in the universe of traits to a greater extent than experiences associated with OCD.

In sum, personality traits play an important role in at least some of the distress disorders. On the other hand, they do not account for all of the symptom variance and covariance. These results are consistent with the diathesis-stress model and suggest that exposure to stressors should be taken into account to arrive at a more complete picture of these disorders. Given the considerable success of the trait model, the full diathesis-stress model may be able to account for all, or nearly all, of the symptom variance and covariance at least in some distress disorders.

### Evaluation of Study Hypotheses

#### Contributions of NEM

I had four major hypotheses, and I discuss each of them in turn. The first hypothesis stipulated that NEM plays an important role in all distress disorders, but the impact of the trait varies across syndromes. Specifically, I expected NEM to show the strongest association with IMAS Depression, the second strongest with IMAS OCD, and weaker links with IMAS Social Anxiety and IMAS Panic. My hypotheses were only partially supported. IMAS Depression, in fact, had the strongest correlation with NEM (average weighted  $r = .56$ ), IMAS Social Anxiety and IMAS Panic showed weaker correlations ( $r = .45$  and  $.39$ , respectively), but IMAS OCD had a weighted average correlation of only  $.34$ . In other words, the OCD scale was less associated with NEM than I expected. This is not entirely surprising because my hypothesis about the strength of this relation was based on only three studies (Rector et al., 2002; Samuels et al., 2000; Wu, 2005). The other predictions were supported, however. NEM contributed

substantially to each of the four syndromes, and these results are consistent with multiple previous findings that NEM is a major contributor to the distress disorders (for a review, see L. A. Clark et al., 1994).

#### Incremental Validity of Traits Relative to NEM

I hypothesized that certain links between traits and symptoms would remain significant after NEM is controlled. This hypothesis specified thirty six associations (Table A3). Of the predicted relations, 20 were supported in both samples and five more were supported in one sample. Thus, 25 hypothesized links received some support, and 11 did not (Table A25). Moreover, 20 new associations were identified, although only eight of them were supported in both samples. It appears that my original hypothesis was incomplete and partially incorrect. It is important to note that I derived the predictions regarding incremental contributions on the basis of limited data that often were indirect, as very few studies controlled for NEM. Thus, I have greater confidence in results of this study than in the original predictions. It is also notable that unsupported relations were based on fairly limited evidence, and all of the hypothesized main associations were supported.

Eighteen traits showed some evidence of incremental validity, and 11 of them produced consistent moderate associations with at least one symptom composite; these 11 traits include Extraversion, Mistrust, Self-Harm, Positive Temperament, Exhibitionism, Detachment, Anxiety Sensitivity, Oddity, Ruminative Response Style, Self-Criticism, and Thought Suppression. This finding suggests that a variety of personality traits are relevant to the distress disorders, although some of these relations may be due to shared variance among the traits. Analyses of the main predictors address this issue and are discussed in a later section.

Of the traits that were hypothesized to show incremental validity, only Dependency failed to produce any significant partial correlations. I predicted that



Dependency would be relevant to Depression, Panic, and Social Anxiety, but these hypotheses were based entirely on zero-order correlations (Bagby et al., 1994; Bienvenue et al., 2001; Cox et al., 2000; Clark et al., 2003; Harkness et al., 2002; Rector et al., 2002). It appears that previous findings may simply reflect the association between Dependency and NEM. It is also possible that SNAP Dependency failed to show incremental validity because it does not capture some of the relevant variance assessed by other measures of Dependency, such as the DEQ Dependency scale.

Entitlement was the only trait that showed incremental validity in both samples even though I did not expect it to be a contributor. SNAP Entitlement had significant (negative) partial correlations with IMAS Social Anxiety. Consequently, I considered this trait in the analyses of the main predictors to determine if it needs to be included in the model.

It is notable that, except for the hypotheses pertaining to Dependency, all of the unsupported relations involved either IMAS Panic or IMAS OCD. Also, only a few of the newly identified links concerned these two symptom dimensions. These findings are consistent with the general pattern of relative difficulty in accounting for Panic Disorder and OCD with the personality traits observed in this study.

### Diagnostic Specificity

I hypothesized that 11 traits would show diagnostic specificity (see traits that have only one primary link in Table A3). The hypotheses were tested by comparing partial correlations across the syndromes for statistically significant differences (Tables A23 and A24). I also compared zero-order correlations, but the evaluation of partial correlations controlling for NEM provided a more direct test of diagnostic specificity.

Of the 17 traits showing evidence of incremental validity, all but Oddity produced specific associations in at least one sample (Table A26). However, only eight traits had consistent support for their specificity: Two were specific to Depression (Self-Harm and

Self-Criticism) and six were specific to Social Anxiety (Positive Temperament, Extraversion, Openness, Exhibitionism, Entitlement, and Detachment). I predicted both relations involving Depression, as well as the specific link between Social Anxiety and Exhibitionism. The other associations were unexpected but should be seriously considered given the consistency of the evidence. Of the remaining eight hypothesized specific associations, six received support in one sample, and two were not supported at all. Notably, all hypotheses pertaining to Panic and OCD received only weak support. In fact, both of the unsupported links involved OCD. These results are consistent with previous findings suggesting that OCD does not have a distinct personality profile relative to other distress disorders (Rector et al., 2002; Wu, 2005). Moreover, this is further evidence of the difficulty in accounting for OCD and Panic from the trait perspective.

I should note that Extraversion was considered separately from Positive Temperament and Conscientiousness separately from Disinhibition in these analyses, although I did not have independent hypotheses for these pairs of traits. The reason for this discrepancy is that the corresponding measures did not show the level of convergence that I expected, so I did not collapse them. Nevertheless, both Extraversion and Positive Temperament were specific to Social Phobia, and both of these associations were robust. On the other hand, Conscientiousness showed specificity to OCD, whereas Disinhibition was specific to MDD, and both of these associations were supported in only one sample. Thus, it seems likely that the evidence for the specificity of Conscientiousness and Disinhibition is spurious, but additional data are needed to resolve this inconsistency. Furthermore, Impulsivity showed specificity to MDD, although this trait did not exhibit any evidence of incremental validity and was not one of the hypothesized specific contributors. The evidence for the specificity of Impulsivity is based on only one sample and is probably due to sampling error.

Overall, the number of specific relations identified in these analyses is quite large (20 associations). Perhaps some of these findings simply reflect correlations among the traits; that is, some traits may show specificity only because they correlate with other traits that are highly specific to the disorder. I should emphasize that the specificity analyses only considered differences between the syndromes and did not control for the influence of traits other than NEM. The evaluation of main contributors addresses this issue more fully and may provide better, more compelling evidence of specificity. These analyses are discussed later.

### Main Contributors

In this study, six traits (in addition to NEM) were identified as main contributors in both samples, and nine other traits received partial support (Table A29). I hypothesized eight main contributors (Table A3). Of the hypothesized relations, four were supported in both samples—Self-Harm with MDD, Anxiety Sensitivity with Panic Disorder, (low) Exhibitionism with Social Phobia, and Oddity with OCD—two were supported in one sample—Ruminative Response Style with MDD and (low) Positive Temperament with Social Phobia—and two were not supported at all—(low) Positive Temperament with Depression and Perfectionism with Social Phobia.

Also, two traits that had not been hypothesized were identified as robust main predictors: Thought Suppression to MDD and Negative Evaluation Sensitivity to Social Phobia. Moreover, two of the hypothesized robust main predictors showed additional links: Anxiety Sensitivity with Social Phobia and Oddity with Panic. Given the consistency of the evidence, I decided to include these four relations in the model.

Seventeen other links, involving 12 traits and four syndromes, received partial support as main predictors. However, I decide not to include them in the model at this point. It seems likely that some, if not all, of these findings are due to sampling error; additional data are needed to elucidate the true main predictors among these 12 traits.

In the follow-up analyses, I found that three traits consistently contributed to the syndromes after the main robust predictors were controlled. Ruminative Response Style and Self-Criticism showed robust associations with IMAS Depression, and Positive Temperament was consistently linked with IMAS Social Anxiety. Importantly, all three relations were also supported in the main predictor analyses, albeit in only one sample, and two of them were hypothesized a priori (Ruminative Response Style with Depression and Positive Temperament with Social Anxiety). Thus, I decided to add these three traits to the model as provisional contributors pending confirmation (or rejection) in future studies.

All of the hypothesized main associations were included in the model, except for two relations: Perfectionism with Social Phobia and Positive Temperament with Depression. My hypothesis about the link between Perfectionism and Social Phobia was based entirely on zero-order correlations, and perhaps the observed correlations simply reflect the hidden influence of other trait contributors, such as NEM. In fact, Perfectionism has shown relatively weak and non-specific relations with the distress disorders in some previous studies (Frost & Steketee, 1997). On the other hand, my operationalization of the construct is somewhat narrow, as I used just one subscale from one of the available instruments. Thus, it is possible that other measures of Perfectionism may be able to capture additional variance in Social Phobia.

The association between PEM and Depression has been well documented (for a review, see Clark & Watson, 1991; Watson, Kotov, & Gamez, in press), although some studies have failed to confirm this link (for a review, see Enns & Cox, 1997). The present investigation falls in the minority, and it is likely that the negative result is due to sampling error. In fact, in the follow-up analyses, Positive Temperament showed a notable partial correlation with IMAS Depression in the patient sample ( $r = -.15$  controlling for all robust main predictors), albeit not in the student sample ( $r = .03$ ). On the other hand, the vast majority of studies that yielded positive results did not control for

NEM, and this may have distorted the findings, as there is a moderate negative association between NEM and PEM (Digman, 1997; Markon, Krueger, & Watson, 2005). In fact, studies that controlled for NEM often found that the independent contribution of PEM to Depression is not significant (Gershuny & Sher, 1998; Jorm et al., 2000), although there are exceptions (e.g., Gamez et al., 2005). In sum, it seems likely that the negative findings are due to sampling error. However, additional studies controlling for the influence of NEM are needed to rule out the possibility that the observed associations are simply due to the overlap between NEM and PEM.

### Review of the Hierarchical-Vulnerability Model

I used the results of the main predictor analyses and related findings to flesh out the trait component of the hierarchical-vulnerability model. The resulting model is summarized in Table A35. It includes one general trait (NEM), two specific traits (Anxiety Sensitivity contributes to Panic Disorder and Social Phobia, Oddity contributes to Panic Disorder and OCD), and seven unique traits. Four of the unique traits contribute to MDD, namely Self-Harm, Thought Suppression, Ruminative Response Style, and Self-Criticism, whereas the other three are linked with Social Phobia, namely, (low) Exhibitionism, Negative Evaluation Sensitivity, and (low) Positive Temperament. I was unable to identify traits uniquely associated with Panic Disorder and OCD. Although included in the model, Ruminative Response Style, Self-Criticism and Positive Temperament currently have a provisional status.

### Excluded Traits

Quite a few traits considered in this study were not included in the final model. It is particularly notable that none of the traits linked to Disinhibition was included, namely Disinhibition, Conscientiousness, Agreeableness, Impulsivity, Propriety, Workaholism, Manipulativeness, and Aggression. It appears that the Disinhibition domain is largely irrelevant to the distress disorders or at least to the four syndromes considered. My

review of the literature produced some support for associations between disinhibition-related traits and the distress disorders, but the reported relations were fairly weak and may simply reflect the indirect influence of NEM and PEM, as Disinhibition shows low to moderate negative association with both traits (Digman, 1997; Markon et al., 2005). Given the state of the literature, I cannot make strong claims about the relevance of disinhibition-related traits. More studies that control for the influence of NEM and PEM are needed. It is clear, however, that Disinhibition contributes much less to the distress disorders than NEM or PEM.

The same can be said about Openness. Openness received virtually no support in the literature as a relevant predictor. In this study, its contributions were generally weak and inconsistent. It is unlikely that future research will find Openness to be relevant to the distress disorders.

PEM and its facets received more support in this study. Two traits from the PEM domain were included in the model, namely Positive Temperament and Exhibitionism. It is somewhat surprising that some other PEM traits were left out, especially Extraversion and Detachment. It appears that all of the relevant variance in Extraversion is captured by Positive Temperament and Exhibitionism. Zero-order and partial correlations of BFI Extraversion with the four syndromes were weaker than the corresponding correlations of SNAP Positive Temperament or SNAP Exhibitionism, except for the association with IMAS Panic in the student sample, but it was weak in magnitude (Tables A21 – A24). Moreover, when the robust main contributors were controlled, BFI Extraversion produced only weak residual correlations (the highest was  $-.24$ ) and none of them replicated across samples (Tables A30 and A31).

Detachment showed more promise. Its zero-order correlations with the four syndromes were higher than the correlations of the other PEM traits, and it received partial support in the main predictor analyses. It is quite possible that sampling error prevented Detachment from emerging as a robust main predictor. On the other hand,

Detachment correlates significantly with both PEM and NEM (Clark, 1993; Clark et al., in press), and perhaps the combination of Positive Temperament and NEM accounts for all of the relevant variance in Detachment. Future studies should continue to examine SNAP Detachment as a potential contributor to Social Phobia.

The majority of traits linked to NEM were included in the model, with the exception of Mistrust and Dependency. SNAP Mistrust had many notable zero-order and partial correlations (Tables A21 – A24), and it received partial support as a main contributor to IMAS Depression and to IMAS OCD. It seems likely that Mistrust was not identified as a robust main predictor due to sampling error. However, it is also possible that the relevant variance in the trait is captured by NEM and Self-Harm, as Mistrust correlates highly with these two traits (Tables A9 and A10). Thus, future studies should continue assessing contributions of SNAP Mistrust to MDD and OCD.

In contrast, it is fairly clear that SNAP Dependency is irrelevant to the distress disorders or at least to the four syndromes considered in this study, as the trait failed to show any evidence of incremental validity relative to NEM in both samples. This is a fairly novel finding, and it requires replication. To my knowledge, only Gamez et al. (2005) examined the incremental validity of Dependency vis-à-vis NEM. These authors also found that with regard to the distress disorders SNAP Dependency lacks any predictive power above and beyond NEM. Nevertheless, other measures of Dependency may prove to be more useful.

All clinical traits were included in the model, except for Perfectionism. Perfectionism showed some relevance to the distress disorders. For instance, it correlated significantly with IMAS Social Anxiety, IMAS Depression, and IMAS OCD even after NEM was controlled. In fact, IMAS Social Anxiety correlated more strongly with Perfectionism than it did with Negative Evaluation Sensitivity, which is one of its unique contributors. Perfectionism was not supported as a main predictor of Social Anxiety, but it was identified as a main contributor to OCD, albeit only in the student sample. Thus,

the findings are somewhat ambiguous, and associations between Perfectionism and the distress disorders should be evaluated further. It would be important to examine other measures of the trait, as several Perfectionism scales are available.

### Model Structure and Diagnostic Specificity

As discussed earlier, analyses of diagnostic specificity identified an implausibly large number of specific relations (20 associations). The findings may be distorted by correlations among the traits. I proposed that the main predictor analyses should correct for this problem. Indeed, the updated hierarchical-vulnerability model includes only nine traits that have diagnostic specificity within the model's structure. Two of these traits are specific (linked to two disorders each) and seven are unique. This translates into 11 specific associations, which is more plausible.

An important question is whether there is consistency between the specific links implied in the model and the relations identified in the specificity analyses. All of the unique associations in the model also emerged in the specificity analyses. The specificity of Self-Harm, Self-Criticism, Exhibitionism, and Positive Temperament was supported in both samples, and the specificity of Thought Suppression, Ruminative Response Style, and Negative Evaluation Sensitivity was supported in one sample. Of the four specific links defined by the model, however, only the relation between Anxiety Sensitivity and Panic Disorder received any support in the specificity analyses. It appears that these analyses are able to detect unique relations but are largely insensitive to traits that are specific but not unique within the model's structure.

Conversely, analyses of diagnostic specificity identified a number of links not included in the model. Four such relations received support in both samples, namely associations of Social Phobia with Extraversion, Detachment, Entitlement, and Openness. As discussed earlier, it appears that Positive Temperament and Exhibitionism captured all of the relevant variance in Extraversion, Detachment, and Entitlement. On the other hand,



it is possible that at least some of these three traits were excluded by mistake (due to sampling error); the results of the specificity analyses further emphasize the need for considering these traits in future studies.

The evidence for the specificity of Openness to Social Anxiety was consistent but weak. It is noteworthy that the correlation between BFI Openness and IMAS Social Anxiety in the student sample was trivial and not significant ( $r = -.08$ ), although it was different from the comparison correlations, which were slightly positive (Table A24). It seems likely, therefore, that the evidence supporting the specificity of Openness is due to sampling error or the indirect influences of other traits, such as PEM.

In sum, there is appreciable consistency between the model's structure and the results of the specificity analyses. However, the specificity analyses clearly have some limitations. It appears that they are over inclusive but sensitive only to the unique relations. Nevertheless, these analyses suggested some potential revisions to the model, emphasizing that certain traits may have been omitted in error and should be included in future investigations.

### Direct Contributors

In this study, I examined each syndrome separately. For instance, I used multiple regression rather than structural equation modeling and constructed a separate regression model for each syndrome. This does not violate any assumptions of the hierarchical-vulnerability model, because the model is concerned with the prediction of symptoms as they are and does not consider comorbidity a problem, but rather a phenomenon to be explained. In other words, if trait X correlates with disorder A just because disorder A overlaps with disorder B (i.e., X is a strong predictor of B), the model would consider the trait a valid predictor of both disorders and of the comorbidity between them. Another view of this association pattern is that trait X influences disorder B, which in turn

influences disorder A, and the correlation between X and A does not need to be modeled, since it is explained by the two links.

To explore the latter framework, I assessed the directness of relations between the robust main predictors and syndromes to which they contribute. All links showed consistent evidence of directness, except for the associations between Social Anxiety and Anxiety Sensitivity and between OCD and Oddity (Tables A33 and A34). It appears that both indirect links are mediated by Panic, which has direct connections with Anxiety Sensitivity and Oddity. Moreover, Panic showed moderate overlap with Social Anxiety (weighted average  $r = .33$ ) and OCD ( $r = .35$ ). It is possible, however, that direct links are present in both cases, but they were too weak to be reliably detected. I should note that in these analyses no traits made direct contributions to multiple disorders. However, this does not have to be the case. In theory, a trait can independently contribute to more than one disorder.

In sum, these analyses identified two associations that appear to be indirect, but this finding needs to be replicated in other samples. This information is not relevant to the model presently. However, it may prove useful in studying temporal patterns of comorbidity, when links between disorders may be viewed as causal.

#### Explanatory Power of the Model

I evaluated the explanatory power of the hierarchical-vulnerability model by conducting new regression analyses, with the four syndromes as dependent variables and the trait contributors linked to the syndrome by the model as predictors. For instance, the regression model for IMAS Social Anxiety included the NEM composite, the Anxiety Sensitivity composite, the SNAP Exhibitionism scale, the Negative Evaluation Sensitivity composite, and the SNAP Positive Temperament scale. In the patient sample, the model's explanatory power (final  $R^2$ ) was .55 for IMAS Depression, .51 for IMAS Social Anxiety, .38 for IMAS Panic, and .16 for IMAS OCD. The corresponding values

for the student sample were .43, .38, .20 and .16. Again, traits accounted for much more variance in the Depression and Social Anxiety syndromes.

The ability of the hierarchical-vulnerability model to account for syndrome co-occurrence was assessed by computing partial correlations controlling for the NEM, Anxiety Sensitivity, and Oddity composites (Table A32). These results were discussed previously, and I concluded that the model explained three quarters of the overlap. However, this finding does not specify whether the model was successful in explaining the pattern of co-occurrence for each of the four syndromes; that is, it does not establish whether there was an even reduction in overlap across the IMAS scales. To address this question, I computed the average percent reduction from the zero-order correlations (Tables A19 and A20) to the partial correlations (Table A32) for each of the IMAS scales; the values were aggregated across the three correlations involving a given syndrome and across the two samples. The average reduction was 48% for IMAS Depression, 51% for IMAS Panic, 44% for IMAS Social Anxiety, and 47% for IMAS OCD. Thus, the ability of the hierarchical-vulnerability model to account for the intercorrelations among the IMAS scales remained essentially the same across different syndromes.

The ability of the model to explain symptom variance was roughly proportional to the number of relevant unique traits, with depression being the easiest to explain (four unique contributors) and OCD being the hardest (no unique predictors). On the other hand, the model performed well in accounting for the overlap among different syndromes, which is to be expected since unique traits are relevant to prediction of the variance but not of the covariance.

#### Evaluation of Model's Premises

The first premise of the model was that NEM is the primary shared predisposition to the distress disorders. I did not test this premise directly, as NEM was force-entered at

the first step of each regression. However, I did find that it was an important contributor to each syndrome; in fact, NEM almost always was one of the three strongest correlates of a given IMAS scale (Tables A21 and A22).

The second premise was that the symptom picture is a function not only of NEM but also of secondary trait contributors and stressors. This premise was supported by the fact that the study identified a number of powerful secondary trait contributors.

Furthermore, the average contribution of these additional relevant traits above and beyond NEM was  $\Delta R^2 = .19$  in the patient sample, which is 47% of the total predicted variance, and .10 in the student sample, which is 36% of the total predicted variance.

Thus, the secondary trait contributors almost equaled NEM in their predictive power. On the other hand, a substantial amount of symptom variance (45-84%) was unexplained by the traits, which leaves plenty of room for stressors to influence symptom presentation. I also hypothesized that multiple degrees of specificity are possible, and three such levels were identified in this study: NEM was related to all four disorders, Anxiety Sensitivity and Oddity were linked to two disorders each, and several traits were associated with only one disorder.

The third premise was that the contribution of NEM varies across disorders. This thesis was supported as well, as the correlations of NEM with the different IMAS scales ranged from .61 to .32. Moreover, the importance of NEM's contribution relative to the contribution of secondary traits also varied. The average (across samples) proportion of NEM's input in the total predicted variance was .69 for OCD, .67 for Depression, .58 for Panic, and .46 for Social Anxiety. My assertion that shared factors explain comorbidity among the disorders was supported as well, as correlations among the IMAS scales were greatly reduced by controlling for the shared traits. Some residual correlations remained, which suggests that shared stressors and perhaps additional shared traits need to be included in the model.

I also hypothesized that the model can explain temporal patterns of comorbidity, but the cross-sectional design of the study did not allow me to examine this question. For the same reason, I could not evaluate the fourth premise of the model that the stability of the distress disorders reflects the relative importance of traits, as compared to stressors, in determining the symptom presentation. These issues should be addressed in follow-up studies.

### Construct Validity of Clinical Traits

This study not only allowed me to test the hierarchical-vulnerability model but also provided novel information about the construct validity of clinical trait measures. These scales have not been examined in the context of multitrait-multidisorder studies, and the present results may add to our understanding of the clinical traits. These data are not directly relevant to the model, but they are potentially interesting, and thus I briefly discuss them.

The main finding was that all of the clinical scales produced notable associations with psychopathology, as each of them had at least one robust moderately high correlation ( $r \geq .35$  in both samples). Moreover, the measures showed the expected pattern of incremental validity vis-à-vis NEM. All hypothesized primary links were supported in both samples (Table A25). The same was true for the predicted secondary associations, with the exception of Perfectionism's links to OCD (supported only in the student population) and Panic Disorder (not supported at all). On the other hand, the analyses identified six relations that were not expected. In sum, clinical traits are clearly relevant to the four syndromes, but specificity of the associations is an issue. Next, I review the evidence of specificity for each of the clinical traits and discuss the implications of these results for the construct validity of these measures.

Anxiety Sensitivity is considered a general vulnerability to depression and anxiety with particular relevance to panic disorder (Taylor, 1999). In the present study, the trait

correlated highly with IMAS Depression and IMAS Panic in the patient sample and showed moderately high associations with the Panic, Depression, and Social Anxiety composites in the student sample. The Anxiety Sensitivity composite demonstrated incremental validity vis-à-vis NEM to all syndromes in both samples. Specificity analyses supported the specificity of the trait to IMAS Panic but only in the patient population. In the main predictor analyses, Anxiety Sensitivity made robust contributions to both the Panic and Social Anxiety composites, and made partial contributions to the other two syndromes. On the other hand, the contribution to IMAS Panic was notably stronger than the contribution to IMAS Social Anxiety in the patient sample ( $\Delta R^2$  of .16 versus .02).

Overall, the behavior of Anxiety Sensitivity was consistent with expectations. It showed relevance to all syndromes considered but exhibited certain specificity to panic. The replicable link with IMAS Social Anxiety was unexpected. A possible explanation is that the conceptualization of Anxiety Sensitivity explicitly includes interpersonal content (e.g., “It embarrasses me when my stomach growls”), and this probably strengthens the association of the trait with social anxiety. In fact, factor analyses of Anxiety Sensitivity measures have identified a Social Concerns factor (McNally, 2002; Taylor, 1999), which unlike the other subscales shows specificity to social phobia (Zinbarg & Barlow, 1996; Zinbarg, Barlow, & Brown, 1997). Although there is no reason to believe that interpersonal content is irrelevant to Anxiety Sensitivity, researchers interested in specific predictors of panic may consider concentrating on items that tap fear of physiological arousal.

I expected Oddity to show a fairly specific link to OCD. Surprisingly, the Oddity composite had moderately high associations with IMAS Depression and IMAS Panic in both samples and correlated as strongly with IMAS OCD only in the patient sample. Oddity showed incremental validity vis-à-vis NEM to all syndromes but produced absolutely no evidence of specificity in these analyses. In the main predictor analyses, the

trait made robust contributions to both OCD and Panic; moreover, sizes of these contributions were comparable.

It appears that Oddity is predictive of psychopathology largely because it reflects a general vulnerability to the distress disorders. Notably, some but not all of this variance is shared with NEM. The main predictor analyses were able to distill a component of Oddity that shows relative specificity to OCD and panic. The association with IMAS Panic was surprising. It may be due to the presence of dissociative content in the definition of a panic attack. Nevertheless, it is clear that the hypothesized strong and specific link between Oddity and OCD was not supported in this investigation. Importantly, I predicted the link on the basis of limited data, as the studies did not compare OCD with other disorders. In fact, so far no investigations were able to identify a distinct personality profile for OCD. On the other hand, it is possible that Oddity is specific to one subcomponent of OCD (i.e., checking), but the effect is lost when the entire syndrome is considered.

Negative Evaluation Sensitivity was hypothesized to be specific to social anxiety. In fact, the Negative Evaluation Sensitivity composite showed a moderately high correlation with IMAS Social Anxiety, and all other relations were weaker. In the patient sample, the trait exhibited incremental validity to Social Anxiety, and this association was specific. In the student sample, Negative Evaluation Sensitivity showed incremental validity to both Social Anxiety and OCD. In the main predictor analyses, the trait contributed only to Social Anxiety, and this relation was robust. In sum, these data fully supported my *a priori* conceptualization of Negative Evaluation Sensitivity.

Ruminative Response Style is established as a specific predictor of depression. In line with this, the Rumination scale correlated highly with IMAS Depression in both samples, and its other correlations were all below  $|.50|$ . In the patient sample, the scale showed incremental validity only to Depression; however, this link was not statistically significantly different from other associations. In the student sample, the measure

exhibited incremental validity to all syndromes except OCD, but it demonstrated some specificity to Depression. In the main predictor analyses, the scale made partial contributions to Depression and Panic but had no robust links. The follow-up analyses consistently supported the relation between the Rumination scale and the Depression composite, and thus the trait was included in the model on a provisional basis. In sum, these data support Ruminative Response Style as a specific and important predictor of depression, but we cannot rule out the possibility that all relevant variance in the trait is better captured by other predictors, most notably NEM. Future studies need to investigate this question further.

Self-Criticism has been linked to many distress disorders, but it is primarily associated with depression (Nietzel & Harris, 1990; Enns & Cox, 1997). In the present study, DEQ Self-Criticism exhibited high correlations with IMAS Depression in both samples, and its other correlations were no more than moderately high. The scale showed incremental validity both to Depression and Social Anxiety; however, the links with Depression were stronger, and specificity analyses supported the specificity of the measure to Depression in both samples. In the main predictor analyses, DEQ Self-Criticism made only partial contributions to Depression and showed no robust links. The follow-up analyses, however, consistently supported the association between DEQ Self-Criticism and IMAS Depression, and thus the trait was included in the model on a provisional basis. These data strengthened the case for the specificity of Self-Criticism to depression, but they also raised questions of whether the apparent relevance of the trait to the distress disorders is due to its overlap with other predictors, especially NEM. This issue requires further investigation.

I expected the White Bear Suppression Inventory to show clear specificity to OCD. Surprisingly, the OCD composite was the weakest correlate of the scale, and this link was only low moderate in both samples. The highest correlate of the measure in each sample was IMAS Depression ( $r = .60$  and  $.48$  in patient and student populations,



respectively). The scale showed incremental validity vis-à-vis NEM to all syndromes and produced evidence of specificity to IMAS Depression in the patient sample. In the main predictor analyses, the White Bear Suppression Inventory made robust contributions to IMAS Depression and produced no other links.

In sum, the present study suggests that the White Bear Suppression Inventory is not a useful predictor of OCD. In fact, the measure is an important and specific predictor of depression. This conclusion is plausible, as my original hypothesis was based on limited information. Also, some initial studies suggested that the scale lacks diagnostic specificity (Wegner and Zanakos, 1994). On the other hand, the measure has not been studied sufficiently, and more data are needed to understand its construct validity.

I predicted that the Concern over Mistakes scale would be associated with all of the syndromes considered but would show certain specificity to Social Anxiety. In fact, the scale had moderately high correlations with IMAS Social Anxiety and IMAS Depression in the patient sample. These associations remained notable in the student sample, and IMAS OCD exhibited a moderately high link in this population as well. The pattern of incremental contributions was the same. Specificity analyses produced partial evidence of specificity to both the Social Anxiety and OCD composites. In the main predictor analyses, the Concern over Mistakes scale exhibited only one link: A partial contribution to IMAS OCD. Follow-up analyses did not yield any consistent associations either, and thus the measure was excluded from the model. It appears that the scale correlates with several distress disorders but has no unique predictive power. However, other Perfectionism measures may prove to be more useful.

#### Limitations and Directions for Future Research

The present study had a number of limitations. The samples were moderate in size and sampling error was non-negligible. My focus on robust relations probably reduced Type I errors (false inclusion of relations in the model), but this very likely was done at

the expense of increasing Type II errors (false exclusion of associations from the model). Moreover, it is possible that the samples have systematic biases relative to the target populations (college students and psychiatric patients) or the general population. A series of studies employing moderate to large samples drawn with various sampling techniques is necessary to confirm the identities of trait contributors and the structure of the model. Also, the measures used in this study may have failed to accurately capture some of the target constructs. Future studies should investigate alternative operationalizations of the constructs and ideally would include multiple measures of each trait and syndrome.

In addition, there are several specific issues that future research needs to address. The present model showed impressive explanatory power, but the prediction of the Panic and OCD syndromes remains a challenge. It appears that to address this limitation, we need to identify traits specific to these disorders. It is possible that such traits simply do not exist, but definitive conclusions cannot be reached until more research is done. Regardless of the outcome, the search for traits specific to difficult-to-explain disorders is an important goal for future research.

I mentioned earlier that phenomena relevant to OCD and Panic may be inadequately represented in the taxonomy of normative personality traits. If future studies confirm this hypothesis, it may be prudent to focus research efforts on identifying clinical traits that specifically target these disorders. Another consideration for boosting the predictive power of the model is that a number of important trait contributors may have been excluded because of sampling error. Follow-up research should continue examining traits that received partial support in this investigation.

I should also note that some of the traits classified as unique in the present model actually may be shared with disorders not considered in this study. An important goal for future research is to examine the remaining distress disorders within this framework and to add them to the model. Comprehensive studies that include a variety of traits and syndromes would be of particular value for elaborating the model.

Now that the trait component of the model has been somewhat developed, we are in a better position to explicate the stress component. A central aim for future research is to identify relevant stressors and to examine patterns of interaction between stressors and traits. The present model is also sufficiently developed to be tested in prospective studies. Important goals for longitudinal research include an examination of the model's predictive power over significant time intervals, evaluation of the ability of personality traits to account for temporal patterns of comorbidity, and testing of the hypothesized association between the stability of a disorder and the size of its trait component.

### Conclusion

The present study had several strengths. Multiple samples were obtained, which allowed me to test the findings for replicability. Personality assessment included a wide range of potentially relevant traits. Several syndromes were examined, which permitted tests of diagnostic specificity. The symptoms were assessed with an interview measure, under the current timeframe, and were operationalized as dimensions. This approach minimized shared method variance between the trait and symptom assessments, reduced recall biases, and circumvented the base rate problem that plagues analyses of dichotomous criteria. The relative sophistication of the study's analytic methods allowed me to reduce the large pool of potential trait contributors to a small set of key players.

In sum, I believe that this study made significant progress toward organizing the disjointed literature on the relations between personality traits and the distress disorders. I hope that the present investigation has helped to develop a general framework for studying personality-psychopathology relations. Follow-up research can build on the current model by including other disorders and traits, expanding the model to include stressors, and evaluating its performance in prospective designs. I am hopeful that after further development the hierarchical-vulnerability model will present a rich and useful account of the distress disorders.

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APPENDIX A  
TABLES

Table A1. Descriptions of the Personality Traits

Trait	Description
Big Five	
Neuroticism	Essentially NEM, a tendency to experience distress and cope poorly with stress
Extraversion	cheerfulness, activity, sociability, and assertiveness, PEM is the core
Conscientiousness	good organization, strict adherence to principles and desire to achieve goals
Agreeableness	interpersonal dimension defined by trust, altruism, and cooperativeness
Openness	aesthetic sensitivity, imaginativeness, intellectual curiosity, rich and complex intellectual life
SNAP Negative Temperament scales	
Mistrust	pervasive suspiciousness, cynical attitude toward others, feelings of injustice and alienation
Manipulativeness	egocentric willingness to use people and to manipulate systems without regard for the rights or feelings of others
Aggression	high frequency and intensity of the experience of anger and its behavioral expression in aggression
Self-Harm	tendency to self-harm and to loathe oneself
Eccentric Perceptions	unusualness in somatosensory perceptions, cognitions, and beliefs
Dependency	low self-reliance, low self-confidence in decision-making, and external locus of control
SNAP Positive Temperament scales	
Exhibitionism	overt attention-seeking versus withdrawal from the attention of others
Entitlement	unrealistically positive self-regard and expectation of special treatment versus a humble, self-effacing attitude
Detachment	emotional and interpersonal distance; aloofness from others, emotional reserve, and a preference for being alone

Table A1. Continued

Trait	Description
SNAP Disinhibition scales	
Impulsivity	tendency to act on a momentary basis without an overall plan
Propriety	preference for traditional, conservative morality versus rejection of social rules and convention
Workaholism	positive attitudes toward work versus leisure time, a tendency to perfectionism and self-imposed demands for excellence
Clinical Traits	
Self-Criticism	high expectations for oneself and striving for achievement in order to prove self-worth
Ruminative Response Style	a tendency to react to depressed mood by focusing attention on depressive symptoms, their causes and implications
Anxiety Sensitivity	a propensity to responding fearfully to anxiety-related sensations
Perfectionism	setting of excessively high standards for performance accompanied by overcritical self-evaluation
Fear of Negative Evaluation	a tendency to fear situations in which the person expects to be negatively evaluated
Public Self-Consciousness	concern with self-presentation, directing attention to aspects of the self that are accessible to others
Thought Suppression	inclination to cope with anxiety provoking thoughts by pushing them out of consciousness
Dissociation-Proneness	predisposition to dissociate from one's surrounding or past experiences, such as natural entry into trance states and experience of disconnection from one's body

Table A2. Mapping of the MPQ and the NEO-PI-R scales on the SNAP traits

SNAP	MPQ	NEO
Negative Temperament	Stress Reaction	Anxiety, Angry Hostility, Depression
Mistrust	Alienation	Trust (low)
Manipulativeness	<i>Aggression</i>	Straightforwardness (low), Self-Discipline (low)
Aggression	Aggression	Compliance (low), Angry Hostility
Self-Harm	<i>Well-Being (low)</i>	Depression
Eccentric Perceptions	Absorption	---
Dependency	---	Self-Consciousness, Competence (low), Altruism
Positive Temperament	Well-being, <i>Social Potency</i>	Activity, Positive Emotions
Exhibitionism	Social Potency	Modesty (low), Gregariousness, Assertiveness
Entitlement	<i>Social Potency</i>	Modesty (low), Competence
Detachment	Social Closeness (low)	Gregariousness (low), Warmth (low), Assertiveness (low)
Disinhibition	<i>Control (low)</i> , Harm Avoidance	Deliberation (low), Excitement-Seeking, Self-Discipline (low), Compliance (low)
Impulsivity	Control (low)	Deliberation (low), Dutifulness (low)
Propriety	Traditionalism	---
Workaholism	Achievement	Achievement

*Note.* The MPQ column includes scales that correlated at least .50 with the corresponding SNAP scale. The NEO-PI-R column includes facets that contributed significantly to the corresponding SNAP scale and have some conceptual relation to it. Dashes indicate that the SNAP scale is not captured well by the measure (for the MPQ, no correlations above .50; for the NEO-PI-R, joint contribution of facets is less than 30% of variance). Italics mark secondary associations for MPQ scales that relate to multiple SNAP scales.

Table A3. Hypothesized Relations Between Personality Traits and Distress Disorders

Trait	Primary	Secondary	Tertiary
NEM	MDD	OCD	SP, PD
PEM/Extraversion	<b>MDD, SP</b>	PD, OCD	
Disinhibition/ Conscientiousness	MDD, OCD		
Mistrust	MDD	OCD	
Self-Harm	<b>MDD</b>	SP, OCD	
Eccentric Perceptions	OCD		
Dependency	MDD, SP, PD		
Exhibitionism	<b>SP</b>		
Detachment	MDD, SP, OCD		
Propriety	PD, OCD		
Workaholism	OCD		
Self-Criticism	MDD	SP	PD
Ruminative Response Style	<b>MDD</b>		
Anxiety Sensitivity	<b>PD</b>	MDD, SP, OCD	
Perfectionism	<b>SP</b>	MDD, PD, OCD	
Fear of Negative Evaluation	SP		
Public Self-Consciousness	SP		
Thought Suppression	OCD		
Dissociation-Proneness	<b>OCD</b>		

*Note.* MDD = Major Depressive Disorder, SP = Social Phobia, PD = Panic Disorder, OCD = Obsessive-Compulsive Disorder. For traits other than NEM the hypotheses reflect relations after NEM is controlled. Bold font indicates hypothesized main contributors of corresponding disorders.

Table A4. Frequency of Psychiatric Problems Reported by Participants

Psychiatric Problem	Patient	Student
Unipolar Depression	122 (65%)	51 (13%)
Bipolar Disorder	35 (19%)	2 (1%)
Anxiety Problems	89 (47%)	23 (6%)
Panic Attacks	14 (7%)	4 (1%)
Social Phobia	6 (3%)	3 (1%)
Obsessive-Compulsive Disorder	9 (5%)	3 (1%)
Generalized Anxiety Disorder	10 (5%)	5 (1%)
Post-Traumatic Stress Disorder	15 (8%)	1 (0%)
Phobia	4 (2%)	1 (0%)
Agoraphobia	4 (2%)	0 (0%)
Psychosis	12 (6%)	0 (0%)
Eating Disorders	7 (4%)	10 (3%)
Borderline Personality Disorder	21 (11%)	1 (0%)
Substance Use Disorders	5 (3%)	7 (2%)
Attention Deficit-Hyperactivity Disorder	19 (10%)	9 (2%)
Any and other	188 (100%)	123 (32%)

*Note.*  $N = 188$  (patients), 385 (students). Timeframe for psychiatric problems is lifetime. Percent of the sample reporting a problem is given in parentheses.

Table A5. Descriptive Characteristics of the Measures

Scale	Patient		Student		d
	Mean	SD	Mean	SD	
IMAS					
Depression	27.11	14.66	9.22	10.24	<b><u>1.51</u></b>
Panic	10.86	7.56	5.23	4.69	<b><u>0.97</u></b>
Social Anxiety	18.22	11.96	7.91	7.02	<b><u>1.15</u></b>
OCD	4.60	6.02	1.88	3.17	<b><u>0.63</u></b>
BFI					
Neuroticism	22.25	6.14	16.76	6.56	<b><u>0.85</u></b>
Extraversion	14.59	7.52	19.49	6.36	<b>-0.72</b>
Conscientiousness	19.51	6.70	23.28	6.05	<b>-0.60</b>
Agreeableness	23.43	5.92	25.66	6.31	-0.36
Openness	27.55	8.08	25.84	6.52	0.24
SNAP					
Negative Temperament	18.66	6.83	12.05	7.16	<b><u>0.94</u></b>
Mistrust	9.26	5.25	6.02	4.53	<b><u>0.68</u></b>
Manipulativeness	5.69	3.87	5.12	3.68	0.15
Aggression	5.71	4.71	4.13	4.25	0.36
Self-Harm	7.59	4.35	2.25	3.13	<b><u>1.49</u></b>
Eccentric Perceptions	5.07	3.75	3.42	3.01	<b><u>0.50</u></b>
Dependency	7.20	3.86	5.97	3.99	0.31
Positive Temperament	13.22	6.40	17.67	5.91	<b>-0.73</b>
Exhibitionism	5.52	4.04	7.93	4.03	<b>-0.60</b>
Entitlement	6.24	3.87	7.17	3.51	-0.26
Detachment	9.69	4.74	4.61	3.83	<b><u>1.22</u></b>
Disinhibition	4.94	3.08	5.12	3.03	-0.06
Impulsivity	7.46	4.01	6.52	4.14	0.23
Propriety	11.31	4.30	10.69	4.01	0.15
Workaholism	8.52	4.29	6.57	3.88	<b><u>0.49</u></b>
Anxiety Sensitivity Index	25.85	13.36	18.53	10.39	<b><u>0.64</u></b>
Agoraphobic Cognitions Questionnaire	12.10	8.77	6.43	6.20	<b><u>0.79</u></b>
Public Self-Consciousness Scale	18.38	5.46	18.11	4.92	0.05
Fear of Negative Evaluation Scale	30.88	13.40	25.00	12.07	<b><u>0.47</u></b>
Response Styles Questionnaire	32.41	12.30	22.78	12.86	<b><u>0.76</u></b>
DEQ Self-Criticism	22.57	7.19	15.34	7.42	<b><u>0.98</u></b>
MPS Concern Over Mistakes	18.37	9.39	14.64	7.62	<b><u>0.45</u></b>
Revised WBSI	24.75	9.07	18.31	10.34	<b><u>0.65</u></b>
DPS Obliviousness	31.23	11.57	23.59	11.64	<b><u>0.66</u></b>
DPS Detachment	8.13	6.46	4.65	5.22	<b><u>0.62</u></b>



*Note.*  $N = 180$  (patient) and  $367$  (student);  $d =$  Cohen's  $d$ ;  $ds > .25$  are significant  $p < .01$ ; moderate effect sizes are bolded; strong effect sizes are bolded and underlined. IMAS = Interview for Mood and Anxiety Symptoms; BFI = Big Five Inventory, SNAP = Schedule for Nonadaptive and Adaptive Personality, DEQ = Depressive Experiences Questionnaire, MPS = Multidimensional Perfectionism Scale, WBSI = White Bear Suppression Inventory, DPS = Dissociative Processes Scale.

Table A6. Internal Consistency Reliability of the Measures

Scale	Patient		Student		Items
	Alpha	AIC	Alpha	AIC	
IMAS					
Depression	0.92	0.28	0.90	0.24	28
Panic	0.82	0.23	0.72	0.15	16
Social Anxiety	0.91	0.29	0.83	0.17	24
OCD	0.87	0.36	0.75	0.18	13
BFI					
Neuroticism	0.78	0.32	0.85	0.41	8
Extraversion	0.84	0.39	0.85	0.42	8
Conscientiousness	0.76	0.26	0.81	0.33	9
Agreeableness	0.68	0.20	0.83	0.36	9
Openness	0.85	0.37	0.80	0.30	10
SNAP					
Negative Temperament	0.91	0.27	0.91	0.27	28
Mistrust	0.88	0.28	0.85	0.23	19
Manipulativeness	0.79	0.17	0.78	0.15	20
Aggression	0.88	0.26	0.87	0.26	20
Self-Harm	0.87	0.29	0.87	0.29	16
Eccentric Perceptions	0.84	0.26	0.79	0.22	15
Dependency	0.79	0.17	0.83	0.22	18
Positive Temperament	0.88	0.21	0.87	0.20	27
Exhibitionism	0.85	0.27	0.84	0.24	16
Entitlement	0.81	0.22	0.79	0.19	16
Detachment	0.86	0.26	0.84	0.23	18
Disinhibition	0.72	0.14	0.70	0.13	16
Impulsivity	0.78	0.16	0.80	0.18	19
Propriety	0.80	0.17	0.78	0.15	20
Workaholism	0.82	0.20	0.82	0.20	18
Anxiety Sensitivity Index	0.90	0.36	0.87	0.31	16
Agoraphobic Cognitions Questionnaire	0.87	0.33	0.84	0.30	14
Public Self-Consciousness Scale	0.81	0.40	0.80	0.37	7
Fear of Negative Evaluation Scale	0.97	0.70	0.96	0.67	12
Response Styles Questionnaire	0.91	0.30	0.93	0.38	22
DEQ Self-Criticism	0.83	0.35	0.85	0.39	9
MPS Concern Over Mistakes	0.92	0.56	0.90	0.50	9
Revised WBSI	0.89	0.44	0.92	0.54	10
DPS Obliviousness	0.88	0.35	0.90	0.40	14
DPS Detachment	0.88	0.56	0.87	0.53	6

*Note.*  $N = 180$  (patient) and 367 (student). AIC = Average interitem correlation; items = number of items on the scale; IMAS = Interview for Mood and Anxiety Symptoms; BFI = Big Five Inventory, SNAP = Schedule for Nonadaptive and Adaptive Personality, DEQ = Depressive Experiences Questionnaire, MPS = Multidimensional Perfectionism Scale, WBSI = White Bear Suppression Inventory, DPS = Dissociative Processes Scale.

Table A7. Correlations Among BFI scales in the Patient Sample

	1	2	3	4
1. Neuroticism				
2. Extraversion	-.30			
3. Conscientiousness	-.26	.20		
4. Agreeableness	-.25	.03	.35	
5. Openness	-.07	.31	.05	.08

*Note.*  $N = 180$ .  $r_s > .19$  are significant  $p < .01$ .

Table A8. Correlations Among BFI scales in the Student Sample

	1	2	3	4
1. Neuroticism				
2. Extraversion	-.31			
3. Conscientiousness	-.29	.16		
4. Agreeableness	-.39	.20	.46	
5. Openness	-.09	.16	.04	-.01

*Note.*  $N = 367$ .  $r_s > .13$  are significant  $p < .01$ .

Table A9. Correlations Among SNAP scales in the Patient Sample

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Negative Temperament														
2. Mistrust	<b>.57</b>													
3. Manipulativeness	.36	.38												
4. Aggression	.44	.43	.50											
5. Self-Harm	<b>.57</b>	<b>.52</b>	.33	.27										
6. Eccentric Perceptions	.41	.43	.33	.30	.37									
7. Dependency	.29	.25	.21	.08	.21	.15								
8. Positive Temperament	-.21	-.22	-.02	.01	-.41	.12	-.12							
9. Exhibitionism	-.14	-.23	.22	.11	-.32	.02	.18	.46						
10. Entitlement	-.05	-.02	.24	.09	-.33	.21	-.04	<b>.51</b>	.48					
11. Detachment	.34	.38	.08	.10	.45	.06	-.02	<b>-.55</b>	<b>-.59</b>	-.43				
12. Disinhibition	.18	.29	<b>.65</b>	.49	.27	.31	.22	.00	.25	.14	.00			
13. Impulsivity	.21	.17	.49	.37	.22	.30	.22	-.05	.21	.02	-.11	<b>.60</b>		
14. Propriety	.26	.36	-.03	.08	.08	.08	.21	.07	-.10	.08	.09	-.15	-.27	
15. Workaholism	.31	.32	-.08	.07	.11	.13	.06	.24	-.07	.08	.07	-.17	-.11	.40

Note.  $N = 180$ .  $r_s > .19$  are significant  $p < .01$ .  $r_s > .50$  are bolded.

Table A10. Correlations Among SNAP scales in the Student Sample

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Negative Temperament														
2. Mistrust	<b>.60</b>													
3. Manipulativeness	.39	.47												
4. Aggression	.47	.46	<b>.51</b>											
5. Self-Harm	.47	<b>.58</b>	.40	.39										
6. Eccentric Perceptions	.40	.44	.43	.35	.39									
7. Dependency	.44	.29	.25	.12	.32	.10								
8. Positive Temperament	-.27	-.31	-.12	-.22	-.39	-.04	-.28							
9. Exhibitionism	-.07	-.11	.23	.01	-.11	.03	.04	.40						
10. Entitlement	-.11	-.10	.08	-.04	-.29	.05	-.22	.43	.41					
11. Detachment	.36	.48	.22	.27	.42	.31	.04	-.49	-.43	-.14				
12. Disinhibition	.19	.39	<b>.63</b>	.38	.37	.34	.18	-.10	.25	-.09	.05			
13. Impulsivity	.16	.29	.49	.36	.32	.19	.17	-.09	.28	-.14	-.07	<b>.70</b>		
14. Propriety	.09	.04	-.13	-.21	-.07	.02	.16	.18	.06	.26	-.01	-.32	-.40	
15. Workaholism	.18	.18	-.06	.02	-.01	.26	-.11	.33	-.03	.26	.17	-.25	-.33	.40

Note.  $N = 367$ .  $r_s > .13$  are significant  $p < .01$ .  $r_s > .50$  are bolded.

Table A11. Correlations Between the SNAP and the BFI in the Patient Sample

	N	E	C	A	O
Negative Temperament	<b>.67</b>	-.19	-.29	-.36	-.09
Mistrust	.44	-.16	-.24	-.34	-.15
Manipulativeness	.24	.02	-.41	-.36	.00
Aggression	.30	.17	-.27	<b>-.58</b>	-.03
Self-Harm	<b>.52</b>	-.33	-.35	-.29	-.17
Eccentric Perceptions	.28	.03	-.22	-.22	.19
Dependency	.28	-.16	-.32	.01	-.16
Positive Temperament	-.30	<b>.58</b>	.33	.11	.34
Exhibitionism	-.23	<b>.55</b>	.02	.05	.34
Entitlement	-.20	.36	.20	.14	.31
Detachment	.27	<b>-.60</b>	-.15	-.34	-.32
Disinhibition	.10	.17	-.46	-.31	-.03
Impulsivity	.20	.20	-.44	-.22	.13
Propriety	.10	-.07	.15	.05	-.27
Workaholism	.23	.05	.29	-.06	.00

*Note.*  $N = 180$ .  $r_s > .19$  are significant at  $p < .01$ .  $r_s > .50$  are bolded. SNAP scales are rows. BFI scales are columns: Neuroticism (N), Extraversion (E), Conscientiousness (C), Agreeableness (A), and Openness (O).



Table A12. Correlations Between the SNAP and the BFI in the Student Sample

	N	E	C	A	O
Negative Temperament	<b>.74</b>	-.22	-.23	-.36	.00
Mistrust	.47	-.18	-.28	-.39	-.03
Manipulativeness	.16	.00	-.48	-.44	.07
Aggression	.34	-.06	-.33	<b>-.59</b>	.07
Self-Harm	.41	-.20	-.37	-.28	.01
Eccentric Perceptions	.20	-.07	-.23	-.23	.22
Dependency	.41	-.12	-.25	-.04	-.23
Positive Temperament	-.36	<b>.51</b>	.38	.28	.24
Exhibitionism	-.21	<b>.54</b>	.05	.03	.14
Entitlement	-.23	.17	.25	.00	.14
Detachment	.31	<b>-.65</b>	-.22	-.39	.05
Disinhibition	.07	.13	<b>-.55</b>	-.34	.00
Impulsivity	.12	.21	<b>-.54</b>	-.31	.04
Propriety	-.01	.03	.30	.23	-.12
Workaholism	.07	-.05	.39	.01	.11

*Note.*  $N = 367$ .  $r_s > .13$  are significant at  $p < .01$ .  $r_s > .50$  are bolded. SNAP scales are rows. BFI scales are columns: Neuroticism (N), Extraversion (E), Conscientiousness (C), Agreeableness (A), and Openness (O).

Table A13. Correlations Among Measures of Clinical Traits in the Patient Sample

	1	2	3	4	5	6	7	8	9	10	11	12
1. Anxiety Sensitivity Index												
2. Agoraphobic Cognitions Questionnaire	<b>.61</b>											
3. Public Self-Consciousness Scale	.28	.20										
4. Fear of Negative Evaluation Scale	.40	.37	<b>.62</b>									
5. Rumination Scale	.44	.41	.30	.52								
6. Self-Criticism Scale	.48	.46	.41	<b>.61</b>	.56							
7. Concern Over Mistakes Scale	.42	.35	.45	<b>.65</b>	.47	.59						
8. Revised WBSI	.43	.44	.27	.53	.53	.56	.39					
9. Obliviousness Scale	.31	.41	.23	.40	.46	.47	.30	.52				
10. Detachment Scale	.34	.42	.20	.28	.41	.41	.33	.48	<b>.66</b>			
<i>Composites</i>												
11. Anxiety Sensitivity	<b>.90</b>	<b>.90</b>	.27	.43	.47	.52	.43	.48	.40	.43		
12. Negative Evaluation Sensitivity	.38	.32	<b>.90</b>	<b>.90</b>	.46	.57	<b>.61</b>	.44	.35	.27	.39	
13. Oddity	.37	.47	.23	.35	.49	.47	.33	.54	<b>.85</b>	<b>.90</b>	.47	.32

Note.  $N = 180$ .  $r_s > .19$  are significant at  $p < .01$ .  $r_s > .60$  are bolded. WBSI = White Bear Suppression Inventory.

Table A14. Correlations Among Measures of Clinical Traits in the Student Sample

	1	2	3	4	5	6	7	8	9	10	11	12
1. Anxiety Sensitivity Index												
2. Agoraphobic Cognitions Questionnaire	.57											
3. Public Self-Consciousness Scale	.21	.17										
4. Fear of Negative Evaluation Scale	.41	.37	<b>.66</b>									
5. Rumination Scale	.37	.46	.19	.37								
6. Self-Criticism Scale	.41	.43	.33	.57	.56							
7. Concern Over Mistakes Scale	.38	.41	.38	<b>.60</b>	.36	<b>.62</b>						
8. Revised WBSI	.38	.48	.20	.45	.47	.58	.42					
9. Obliviousness Scale	.40	.49	.10	.30	.44	.46	.30	.59				
10. Detachment Scale	.39	.45	.11	.28	.37	.41	.28	.45	<b>.69</b>			
<i>Composites</i>												
11. Anxiety Sensitivity	<b>.88</b>	<b>.89</b>	.22	.44	.47	.48	.45	.49	.50	.48		
12. Negative Evaluation Sensitivity	.34	.30	<b>.91</b>	<b>.91</b>	.30	.49	.54	.36	.22	.22	.36	
13. Oddity	.41	.52	.11	.29	.43	.47	.32	.56	<b>.87</b>	<b>.89</b>	.53	.22

Note.  $N = 180$ .  $r_s > .19$  are significant at  $p < .01$ .  $r_s > .60$  are bolded. WBSI = White Bear Suppression Inventory.

Table A15. Correlations Between the Clinical Traits and the Big Five in the Patient Sample

	N	E	C	A	O
Anxiety Sensitivity Index	<b>.39</b>	-.18	-.10	-.08	-.07
Agoraphobic Cognitions Questionnaire	<b>.39</b>	-.17	-.22	-.27	-.03
Public Self-Consciousness Scale	.31	-.06	-.21	-.18	.08
Fear of Negative Evaluation Scale	<b>.51</b>	-.34	-.25	-.13	-.08
Rumination Scale	<b>.45</b>	-.27	-.20	-.15	-.01
Self-Criticism Scale	<b>.66</b>	-.33	-.33	-.33	-.20
Concern Over Mistakes Scale	<b>.44</b>	-.29	-.19	-.24	-.03
Revised WBSI	<b>.51</b>	-.12	-.17	-.20	-.01
Obliviousness Scale	<b>.37</b>	-.09	-.34	-.32	.02
Detachment Scale	.31	.00	-.18	-.26	.14
<i>Composites</i>					
Anxiety Sensitivity	<b>.43</b>	-.19	-.18	-.20	-.06
Negative Evaluation Sensitivity	<b>.46</b>	-.22	-.26	-.17	.00
Oddity	<b>.37</b>	-.02	-.28	-.31	.13

*Note.*  $N = 180$ .  $r_s > .19$  are significant at  $p < .01$ .  $r_s > .35$  are bolded. BFI scales are columns: Neuroticism (N), Extraversion (E), Conscientiousness (C), Agreeableness (A), and Openness (O). WBSI = White Bear Suppression Inventory.

Table A16. Correlations Between the Clinical Traits and the Big Five in the Student Sample

	N	E	C	A	O
Anxiety Sensitivity Index	<b>.42</b>	-.18	-.17	-.19	.00
Agoraphobic Cognitions Questionnaire	<b>.39</b>	-.20	-.22	-.23	.07
Public Self-Consciousness Scale	.24	-.02	-.03	-.05	-.03
Fear of Negative Evaluation Scale	<b>.48</b>	-.18	-.10	-.10	-.02
Rumination Scale	<b>.54</b>	-.21	-.31	-.23	.12
Self-Criticism Scale	<b>.66</b>	-.32	<b>-.42</b>	<b>-.43</b>	.03
Concern Over Mistakes Scale	<b>.40</b>	-.17	-.05	-.23	.01
Revised WBSI	<b>.50</b>	-.15	-.23	-.22	.02
Obliviousness Scale	.35	-.15	<b>-.40</b>	-.29	.12
Detachment Scale	.26	-.10	-.28	-.24	.19
<i>Composites</i>					
Anxiety Sensitivity	<b>.46</b>	-.21	-.22	-.24	.04
Negative Evaluation Sensitivity	<b>.39</b>	-.11	-.07	-.09	-.03
Oddity	.31	-.12	-.35	-.29	.20

Note.  $N = 367$ .  $r_s > .13$  are significant at  $p < .01$ .  $r_s > .35$  are bolded. BFI scales are columns: Neuroticism (N), Extraversion (E), Conscientiousness (C), Agreeableness (A), and Openness (O). WBSI = White Bear Suppression Inventory.

Table A17. Correlations Between the Clinical Traits and the SNAP in the Patient Sample

	ASI	ACQ	PSC	FNE	RS	S-C	CM	WBSI	OBL	DET	AS	NES	Oddity
Negative Temperament	.38	<b>.45</b>	.36	<b>.56</b>	<b>.52</b>	<u>.69</u>	<b>.50</b>	<b>.57</b>	<b>.41</b>	.34	<b>.46</b>	<b>.51</b>	<b>.44</b>
Mistrust	.40	<b>.48</b>	.25	<b>.41</b>	.36	<b>.58</b>	<b>.42</b>	<b>.43</b>	<b>.46</b>	.34	<b>.49</b>	.36	<b>.47</b>
Manipulativeness	.20	.34	.23	.20	.28	.31	.13	.30	.36	.31	.30	.23	.38
Aggression	.20	.33	.12	.10	.19	.33	.15	.28	.39	.34	.30	.12	.39
Self-Harm	.35	.38	.13	<b>.43</b>	<b>.48</b>	<u>.63</u>	<b>.41</b>	<b>.49</b>	.35	.31	<b>.41</b>	.31	.39
Eccentric Perceptions	.33	.40	.17	.24	<b>.41</b>	.36	.24	<b>.41</b>	<b>.57</b>	<u>.72</u>	<b>.41</b>	.23	<u>.87</u>
Dependency	.19	.25	.30	<b>.48</b>	.34	.36	<b>.42</b>	.16	.18	.16	.25	<b>.44</b>	.19
Positive Temperament	-.13	-.15	.02	-.24	-.20	-.33	-.24	-.11	-.11	.03	-.16	-.12	.01
Exhibitionism	-.10	-.08	.14	-.13	-.12	-.22	-.10	-.21	-.10	.01	-.10	.01	-.03
Entitlement	.02	.10	-.01	-.12	-.06	-.19	-.12	-.09	.00	.11	.07	-.07	.12
Detachment	.19	.22	.05	.30	.27	<b>.41</b>	.29	.27	.22	.11	.23	.19	.15
Disinhibition	.02	.22	.07	.11	.15	.18	.06	.24	.34	.29	.14	.10	.36
Impulsivity	.04	.17	.05	.05	.16	.15	.03	.17	.32	.29	.12	.06	.34
Propriety	.27	.13	.26	.36	.15	.22	.30	.17	.14	.03	.22	.34	.10
Workaholism	.19	.13	.18	.22	.17	.26	.30	.27	.11	.05	.18	.22	.11

Note.  $N = 180$ .  $r_s > .19$  are significant at  $p < .01$ ;  $r_s > .40$  are bolded;  $r_s > .60$  are underlined. SNAP scales are rows. Measures of clinical traits are columns. ASI = Anxiety Sensitivity Index, ACQ = Agoraphobic Cognitions Questionnaire, PSC = Public Self-Consciousness scale, FNE = Fear of Negative Evaluation Scale, RS = Rumination scale, S-C = Self-Criticism scale, CM = Concern over Mistakes scales, WBSI = White Bear Suppression Inventory, OBL = Obliviousness scale, DET = Detachment scale, AS = Anxiety Sensitivity composite, NES = Negative Evaluation Sensitivity composite.

Table A18. Correlations Between the Clinical Traits and the SNAP in the Student Sample

	ASI	ACQ	PSC	FNE	RS	S-C	CM	WBSI	OBL	DET	AS	NES	Oddity
Negative Temperament	<b>.46</b>	<b>.45</b>	.29	<b>.54</b>	<b>.48</b>	<u>.65</u>	<b>.48</b>	<b>.59</b>	<b>.46</b>	.35	<b>.52</b>	<b>.46</b>	<b>.47</b>
Mistrust	.33	.37	.22	<b>.41</b>	.36	<b>.62</b>	<b>.47</b>	<b>.49</b>	<b>.46</b>	.37	.40	.34	<b>.49</b>
Manipulativeness	.25	.25	.16	.22	.20	.37	.21	.31	.39	.30	.28	.21	<b>.43</b>
Aggression	.17	.31	.08	.13	.23	.35	.23	.26	.32	.24	.27	.12	.35
Self-Harm	.22	.37	.13	.28	.35	<b>.51</b>	.37	.40	.33	.30	.34	.23	.39
Eccentric Perceptions	.30	<b>.43</b>	.07	.18	.30	.35	.25	<b>.43</b>	<b>.58</b>	<u>.65</u>	<b>.41</b>	.13	<u>.85</u>
Dependency	.26	.27	.29	<b>.46</b>	.29	.37	.25	.30	.23	.14	.30	<b>.41</b>	.18
Positive Temperament	-.14	-.13	-.06	-.20	-.21	-.37	-.11	-.12	-.12	-.10	-.15	-.14	-.10
Exhibitionism	-.09	-.11	.28	.01	-.11	-.18	-.09	-.10	-.08	-.03	-.12	.16	-.03
Entitlement	-.04	-.11	.08	-.07	-.18	-.22	-.04	-.09	-.07	-.02	-.09	.00	-.01
Detachment	.24	.34	.00	.22	.31	<b>.46</b>	.32	.30	.34	.28	.32	.12	.36
Disinhibition	.06	.11	.06	.04	.16	.30	.08	.18	.32	.25	.10	.06	.35
Impulsivity	.00	.08	.07	.04	.17	.27	.03	.16	.30	.23	.05	.06	.28
Propriety	.16	.09	.23	.25	-.01	.00	.27	.11	-.02	.00	.14	.27	.00
Workaholism	.13	.14	.03	.12	.05	.05	.33	.14	.09	.10	.16	.08	.18

Note.  $N = 367$ .  $r_s > .13$  are significant at  $p < .01$ ;  $r_s > .40$  are bolded;  $r_s > .60$  are underlined. SNAP scales are rows. Measures of clinical traits are columns. ASI = Anxiety Sensitivity Index, ACQ = Agoraphobic Cognitions Questionnaire, PSC = Public Self-Consciousness scale, FNE = Fear of Negative Evaluation Scale, RS = Rumination scale, S-C = Self-Criticism scale, CM = Concern over Mistakes scales, WBSI = White Bear Suppression Inventory, OBL = Obliviousness scale, DET = Detachment scale, AS = Anxiety Sensitivity composite, NES = Negative Evaluation Sensitivity composite.

Table A19. Correlations Among the IMAS Scales in the Patient Sample

	Depression	Panic	Social Anxiety	OCD
Depression		.30	.15	.08
Panic	<b>.55</b>		.17	.29
Social Anxiety	<b>.53</b>	.35		.28
OCD	.33	<b>.43</b>	.39	

*Note.*  $N = 180$ . Zero-order correlations are below the diagonal ( $r_s > .19$  are significant  $p < .01$ ); partial correlations controlled for 25 personality traits are above the diagonal ( $r_s > .21$  are significant  $p < .01$ );  $r_s > .35$  are bolded.



Table A20. Correlations Among the IMAS Scales in the Student Sample

	Depression	Panic	Social Anxiety	OCD
Depression		.25	.23	.24
Panic	<b>.44</b>		.12	.19
Social Anxiety	<b>.47</b>	.32		.30
OCD	<b>.41</b>	.31	<b>.44</b>	

*Note.*  $N = 367$ . Zero-order correlations are below the diagonal ( $r_s > .13$  are significant  $p < .01$ ); partial correlations controlled for 25 personality traits are above the diagonal ( $r_s > .14$  are significant  $p < .01$ );  $r_s > .35$  are bolded.

Table A21. Correlations Between Symptoms and Personality Traits in the Patient Sample

	Depression	Panic	Social Anxiety	OCD
<i>Big Five</i>				
NEM	<b><u>.61</u></b> <sub>a</sub>	<b>.44</b> <sub>b</sub>	<b>.42</b> <sub>b</sub>	.32 <sub>b</sub>
Extraversion	-.32 <sub>a</sub>	-.06 <sub>b</sub>	<b><u>-.53</u></b> <sub>c</sub>	-.07 <sub>b</sub>
Conscientiousness	-.21	-.15	-.31	-.14
Agreeableness	-.26	-.18	-.19	-.22
Openness	-.23 <sub>a,c</sub>	-.04 <sub>b</sub>	-.34 <sub>c</sub>	-.13 <sub>a,b</sub>
<i>SNAP</i>				
Mistrust	<b><u>.50</u></b>	<b>.44</b>	<b>.44</b>	<b>.39</b>
Manipulativeness	.28	.29	.15	.23
Aggression	.26	.23	.10	.24
Self-Harm	<b><u>.59</u></b> <sub>a</sub>	<b>.38</b> <sub>b</sub>	<b>.47</b> <sub>a,b</sub>	.14 <sub>c</sub>
Dependency	.15	.07	.19	.15
Positive Temperament	-.35 <sub>a</sub>	-.13 <sub>b</sub>	<b><u>-.45</u></b> <sub>a,c</sub>	-.08 <sub>b</sub>
Exhibitionism	<b><u>-.36</u></b> <sub>a</sub>	-.16 <sub>b</sub>	<b><u>-.56</u></b> <sub>c</sub>	-.08 <sub>b</sub>
Entitlement	-.20 <sub>a,c</sub>	.12 <sub>b</sub>	-.28 <sub>c</sub>	-.02 <sub>a,b</sub>
Detachment	<b>.39</b> <sub>a</sub>	.13 <sub>b</sub>	<b><u>.59</u></b> <sub>c</sub>	.24 <sub>a,b</sub>
Disinhibition	.10	.14	.03	.16
Impulsivity	.09	.20	.01	.11
Propriety	.22	.13	.23	.17
Workaholism	.22	.08	.10	.12
<i>Clinical Traits</i>				
AS	<b><u>.51</u></b> <sub>a,b</sub>	<b><u>.56</u></b> <sub>a</sub>	<b>.37</b> <sub>b</sub>	<b>.39</b> <sub>a,b</sub>
NES	.32	.19	<b>.36</b>	.29
Oddity	<b>.46</b> <sub>a</sub>	<b>.45</b> <sub>a,b</sub>	.28 <sub>b</sub>	<b>.36</b> <sub>a,b</sub>
Rumination Scale	<b><u>.53</u></b> <sub>a</sub>	.33 <sub>b</sub>	<b>.36</b> <sub>b</sub>	.25 <sub>b</sub>
Self-Criticism Scale	<b><u>.64</u></b> <sub>a</sub>	<b>.39</b> <sub>b</sub>	<b>.49</b> <sub>b</sub>	.34 <sub>b</sub>
Concern Over Mistakes Scale	<b>.42</b> <sub>a</sub>	.20 <sub>b,c</sub>	<b>.39</b> <sub>a,b</sub>	.19 <sub>c</sub>
White Bear Suppression Inventory	<b><u>.60</u></b> <sub>a</sub>	<b>.44</b> <sub>b</sub>	<b>.36</b> <sub>b</sub>	.33 <sub>b</sub>

Note.  $N = 180$ .  $r_s > .19$  are significant at  $p < .01$ .  $r_s > .35$  are bolded,  $r_s > .50$  are underlined;  $r_s$  that do not share a subscript are significantly ( $p < .01$ ) different from each other. If there are no significant differences, subscripts are not given. NEM = Negative Emotionality Composite, AS = Anxiety Sensitivity Composite, NES = Negative Evaluation Sensitivity Composite.

Table A22. Correlations Between Symptoms and Personality Traits in the Student Sample

	Depression	Panic	Social Anxiety	OCD
<i>Big Five</i>				
NEM	<b><u>.53</u></b> <sub>a</sub>	<b>.36</b> <sub>b</sub>	<b>.47</b> <sub>a,b</sub>	.35 <sub>b</sub>
Extraversion	-.11 <sub>a</sub>	-.15 <sub>a</sub>	-.34 <sub>b</sub>	-.08 <sub>a</sub>
Conscientiousness	-.27 <sub>a</sub>	-.19 <sub>a</sub>	-.19 <sub>a</sub>	-.02 <sub>b</sub>
Agreeableness	-.21	-.15	-.12	-.09
Openness	.10 <sub>a</sub>	.04 <sub>a,b</sub>	-.10 <sub>b</sub>	.10 <sub>a</sub>
<i>SNAP</i>				
Mistrust	<b><u>.51</u></b> <sub>a</sub>	.26 <sub>b</sub>	<b>.38</b> <sub>b</sub>	.30 <sub>b</sub>
Manipulativeness	.23	.19	.10	.14
Aggression	.29 <sub>a</sub>	.17 <sub>a,b</sub>	.15 <sub>b</sub>	.15 <sub>b</sub>
Self-Harm	<b>.49</b> <sub>a</sub>	.25 <sub>b</sub>	.33 <sub>b</sub>	.20 <sub>b</sub>
Dependency	.26	.22	.29	.17
Positive Temperament	-.21 <sub>a</sub>	-.13 <sub>b,a</sub>	<b>-.35</b> <sub>c</sub>	-.04 <sub>b</sub>
Exhibitionism	-.11 <sub>a</sub>	-.06 <sub>a</sub>	-.33 <sub>b</sub>	-.08 <sub>a</sub>
Entitlement	-.24 <sub>a</sub>	-.15 <sub>a,b</sub>	-.21 <sub>a</sub>	-.04 <sub>b</sub>
Detachment	.28 <sub>a,b</sub>	.21 <sub>a</sub>	<b>.37</b> <sub>b</sub>	.18 <sub>a</sub>
Disinhibition	.21 <sub>a</sub>	.11 <sub>a,b</sub>	.00 <sub>b</sub>	-.01 <sub>b</sub>
Impulsivity	.18 <sub>a</sub>	.11 <sub>a,b</sub>	-.02 <sub>b,c</sub>	-.06 <sub>c</sub>
Propriety	.02 <sub>a</sub>	-.05 <sub>a</sub>	.10 <sub>a,b</sub>	.18 <sub>b</sub>
Workaholism	.13 <sub>a,b</sub>	.05 <sub>a</sub>	.07 <sub>a</sub>	.22 <sub>b</sub>
<i>Clinical Traits</i>				
AS	<b>.40</b> <sub>a,b</sub>	<b>.39</b> <sub>a,b</sub>	<b>.43</b> <sub>a</sub>	.29 <sub>b</sub>
NES	.28 <sub>a,b</sub>	.20 <sub>a</sub>	.35 <sub>b</sub>	.30 <sub>a,b</sub>
Oddity	<b>.43</b>	<b>.36</b>	.34	.30
Rumination Scale	<b><u>.50</u></b> <sub>a</sub>	<b>.36</b> <sub>b</sub>	<b>.36</b> <sub>b</sub>	.20 <sub>c</sub>
Self-Criticism Scale	<b><u>.56</u></b> <sub>a</sub>	.32 <sub>b,c</sub>	<b>.45</b> <sub>a,b</sub>	.31 <sub>c</sub>
Concern Over Mistakes Scale	<b>.39</b> <sub>a</sub>	.23 <sub>b</sub>	<b>.38</b> <sub>a</sub>	<b>.37</b> <sub>a,b</sub>
White Bear Suppression Inventory	<b>.48</b> <sub>a</sub>	.31 <sub>b,c</sub>	<b>.40</b> <sub>a,b</sub>	.29 <sub>c</sub>

Note.  $N = 367$ .  $r_s > .13$  are significant at  $p < .01$ .  $r_s > .35$  are bolded,  $r_s > .50$  are underlined;  $r_s$  that do not share a subscript are significantly ( $p < .01$ ) different from each other. If there are no significant differences, subscripts are not given. NEM = Negative Emotionality Composite, AS = Anxiety Sensitivity Composite, NES = Negative Evaluation Sensitivity Composite.

Table A23. Partial Correlations Between Symptoms and Personality Traits Controlling for Negative Emotionality in the Patient Sample

	Depression	Panic	Social Anxiety	OCD
<i>Big Five</i>				
Extraversion	<b><u>-.21</u></b> <sub>a</sub>	.07 <sub>b</sub>	<b><u>-.48</u></b> <sub>c</sub>	.01 <sub>a,b</sub>
Conscientiousness	-.04	-.01	<b><u>-.21</u></b>	-.05
Agreeableness	-.07	-.04	-.06	-.12
Openness	<b><u>-.23</u></b> <sub>a,c</sub>	.00 <sub>b</sub>	<b><u>-.34</u></b> <sub>c</sub>	-.11 <sub>a,b</sub>
<i>SNAP</i>				
Mistrust	<b><u>.24</u></b>	<b><u>.27</u></b>	<b><u>.27</u></b>	<b><u>.27</u></b>
Manipulativeness	.10	<b>.18</b>	.01	.14
Aggression	.02	.07	-.09	.12
Self-Harm	<b><u>.36</u></b> <sub>a</sub>	<b>.16</b> <sub>b</sub>	<b><u>.29</u></b> <sub>a,b</sub>	-.06 <sub>c</sub>
Dependency	-.05	-.08	.06	.06
Positive Temperament	<b><u>-.23</u></b> <sub>a</sub>	-.01 <sub>b</sub>	<b><u>-.38</u></b> <sub>a</sub>	.01 <sub>b</sub>
Exhibitionism	<b><u>-.30</u></b> <sub>a</sub>	-.08 <sub>b</sub>	<b><u>-.53</u></b> <sub>c</sub>	-.02 <sub>b</sub>
Entitlement	-.14 <sub>a,c</sub>	<b><u>.20</u></b> <sub>b</sub>	<b><u>-.25</u></b> <sub>c</sub>	.03 <sub>a,b</sub>
Detachment	<b><u>.24</u></b> <sub>a</sub>	-.02 <sub>b</sub>	<b><u>.52</u></b> <sub>c</sub>	<b>.15</b> <sub>a,b</sub>
Disinhibition	.02	.08	-.04	.12
Impulsivity	-.06	.11	-.10	.04
Propriety	.13	.05	<b>.16</b>	.12
Workaholism	.06	-.06	-.03	.03
<i>Clinical Traits</i>				
AS	<b><u>.30</u></b> <sub>a,b</sub>	<b><u>.44</u></b> <sub>a</sub>	<b><u>.21</u></b> <sub>b</sub>	<b><u>.28</u></b> <sub>a,b</sub>
NES	-.01 <sub>a</sub>	-.06 <sub>a</sub>	<b>.18</b> <sub>b</sub>	.14 <sub>a,b</sub>
Oddity	<b><u>.27</u></b>	<b><u>.31</u></b>	.12	<b><u>.25</u></b>
Rumination Scale	<b><u>.31</u></b>	.12	<b>.18</b>	.10
Self-Criticism Scale	<b><u>.36</u></b> <sub>a</sub>	.10 <sub>b</sub>	<b><u>.28</u></b> <sub>a,b</sub>	<b>.17</b> <sub>a,b</sub>
Concern Over Mistakes Scale	<b>.16</b> <sub>a,b</sub>	-.04 <sub>a</sub>	<b><u>.22</u></b> <sub>b</sub>	.03 <sub>a,b</sub>
White Bear Suppression Inventory	<b><u>.38</u></b> <sub>a</sub>	<b><u>.24</u></b> <sub>a,b</sub>	.14 <sub>b</sub>	<b>.18</b> <sub>a,b</sub>

Note.  $N = 180$ .  $r_s$  significant at  $p < .05$  are bolded;  $r_s$  significant at  $p < .01$  are bolded and underlined;  $r_s$  that do not share a subscript are significantly ( $p < .01$ ) different from each other. If there are no significant differences, subscripts are not given. AS = Anxiety Sensitivity Composite, NES = Negative Evaluation Sensitivity Composite.

Table A24. Partial Correlations Between Symptoms and Personality Traits Controlling for Negative Emotionality in the Student Sample

	Depression	Panic	Social Anxiety	OCD
<i>Big Five</i>				
Extraversion	.05 <sub>a</sub>	-.06 <sub>a</sub>	<b><u>-.24</u></b> <sub>b</sub>	.01 <sub>a</sub>
Conscientiousness	<b><u>-.15</u></b> <sub>a</sub>	<b><u>-.11</u></b> <sub>a</sub>	-.07 <sub>a</sub>	.09 <sub>b</sub>
Agreeableness	.01	.00	.09	.06
Openness	<b>.14</b> <sub>a</sub>	.06 <sub>a,b</sub>	-.08 <sub>b</sub>	<b>.13</b> <sub>a</sub>
<i>SNAP</i>				
Mistrust	<b><u>.30</u></b> <sub>a</sub>	.07 <sub>b</sub>	<b><u>.15</u></b> <sub>a,b</sub>	<b><u>.14</u></b> <sub>b</sub>
Manipulativeness	.09	.09	-.05	.04
Aggression	.08	.02	-.06	.00
Self-Harm	<b><u>.32</u></b> <sub>a</sub>	.10 <sub>b</sub>	<b><u>.14</u></b> <sub>b</sub>	.04 <sub>b</sub>
Dependency	.03	.07	.09	.02
Positive Temperament	-.04 <sub>a</sub>	-.01 <sub>a</sub>	<b><u>-.23</u></b> <sub>b</sub>	.09 <sub>a</sub>
Exhibitionism	-.03 <sub>a</sub>	.00 <sub>a</sub>	<b><u>-.30</u></b> <sub>b</sub>	-.03 <sub>a</sub>
Entitlement	<b><u>-.18</u></b> <sub>a</sub>	-.09 <sub>a,b</sub>	<b><u>-.14</u></b> <sub>a</sub>	.02 <sub>b</sub>
Detachment	<b>.11</b> <sub>a,b</sub>	.09 <sub>a</sub>	<b><u>.24</u></b> <sub>b</sub>	.07 <sub>a</sub>
Disinhibition	<b><u>.16</u></b> <sub>a</sub>	.06 <sub>a,b</sub>	-.07 <sub>b</sub>	-.06 <sub>b</sub>
Impulsivity	<b>.12</b> <sub>a</sub>	.06 <sub>a,b</sub>	<b><u>-.11</u></b> <sub>b,c</sub>	<b><u>-.12</u></b> <sub>c</sub>
Propriety	-.01 <sub>a</sub>	-.07 <sub>a</sub>	.09 <sub>a,b</sub>	<b><u>.17</u></b> <sub>b</sub>
Workaholism	.07 <sub>a,b</sub>	.01 <sub>a</sub>	.00 <sub>a</sub>	<b><u>.19</u></b> <sub>b</sub>
<i>Clinical Traits</i>				
AS	<b><u>.17</u></b>	<b><u>.25</u></b>	<b><u>.24</u></b>	<b><u>.14</u></b>
NES	.05	.05	<b><u>.17</u></b>	<b><u>.17</u></b>
Oddity	<b><u>.27</u></b>	<b><u>.25</u></b>	<b><u>.18</u></b>	<b><u>.18</u></b>
Rumination Scale	<b><u>.29</u></b> <sub>a</sub>	<b><u>.21</u></b> <sub>a</sub>	<b><u>.15</u></b> <sub>a,b</sub>	.01 <sub>b</sub>
Self-Criticism Scale	<b><u>.31</u></b> <sub>a</sub>	.10 <sub>b</sub>	<b><u>.20</u></b> <sub>a,b</sub>	.10 <sub>b</sub>
Concern Over Mistakes Scale	<b><u>.19</u></b> <sub>a,b</sub>	.07 <sub>a</sub>	<b><u>.20</u></b> <sub>a,b</sub>	<b><u>.25</u></b> <sub>b</sub>
White Bear Suppression Inventory	<b><u>.25</u></b>	<b>.13</b>	<b><u>.17</u></b>	<b>.12</b>

Note.  $N = 367$ .  $r$ s significant at  $p < .05$  are bolded;  $r$ s significant at  $p < .01$  are bolded and underlined;  $r$ s that do not share a subscript are significantly ( $p < .01$ ) different from each other. If there are no significant differences, subscripts are not given. AS = Anxiety Sensitivity Composite, NES = Negative Evaluation Sensitivity Composite.

Table A25. Status of Hypothesized Incremental Trait Contributions Over NEM

Trait	Confirmed	Unexpected	Not Supported
PEM/Extraversion	<u>SP</u> , MDD		PD, OCD
Disinhibition/ Conscientiousness	MDD	SP	OCD
Openness		MDD, SP	
Mistrust	<u>MDD</u> , <u>OCD</u>	<u>SP</u> , PD	
Self-Harm	<u>MDD</u> , <u>SP</u> ,		OCD
Dependency			MDD, SP, PD
Exhibitionism	<u>SP</u>	MDD	
Entitlement		<u>SP</u> , PD, MDD	
Detachment	<u>MDD</u> , <u>SP</u>		OCD
Propriety	OCD	SP	PD
Workaholism	OCD		
Anxiety Sensitivity	<u>PD</u> , <u>MDD</u> , <u>SP</u> , <u>OCD</u>		
Perfectionism	<u>SP</u> , <u>MDD</u> , OCD		PD
Self-Criticism	<u>MDD</u> , <u>SP</u>	<u>OCD</u>	PD
Thought Suppression	<u>OCD</u>	<u>MDD</u> , <u>PD</u> , SP	
Oddity	<u>OCD</u> ,	<u>PD</u> , <u>MDD</u> , SP	
Ruminative Response Style	<u>MDD</u>	<u>SP</u> , PD	
Negative Evaluation Sensitivity	<u>SP</u>	OCD	

*Note.* MDD = Major Depressive Disorder, SP = Social Phobia, PD = Panic Disorder, OCD = Obsessive-Compulsive Disorder, PEM = Positive Emotionality. Underline indicates that the association was significant in both samples.

Table A26. Traits Showing Evidence of Specificity in Comparisons of Partial Correlations

Trait	Target	Contrast	Sample
<i>Robust Evidence</i>			
(low) Extraversion	SP	PD, OCD, MDD	
(low) Openness	SP	OCD	
Self-Harm	<b>MDD</b>	PD, OCD	
(low) Positive Temperament	SP	PD, OCD	
(low) Exhibitionism	<b>SP</b>	MDD, PD, OCD	
(low) Entitlement	SP	OCD	
Detachment	SP	PD, OCD	
Self-Criticism	<b>MDD</b>	PD	
<i>Partial Evidence</i>			
Conscientiousness	OCD	MDD, PD, SP	Student
Mistrust	<b>MDD</b>	PD, OCD	Student
Disinhibition	MDD	SP, OCD	Student
Impulsivity	MDD	SP, OCD	Student
Propriety	OCD	MDD, PD	Student
Workaholism	<b>OCD</b>	PD, SP	Student
Anxiety Sensitivity	<b>PD</b>	SP	Patient
Negative Evaluation Sensitivity	<b>SP</b>	MDD, PD	Patient
Ruminative Response Style	<b>MDD</b>	OCD	Student
Perfectionism	<b>SP</b>	PD	Patient
	OCD	PD	Student
Thought Suppression	MDD	SP	Patient

*Note.* Target = syndrome(s) with which the trait showed a specific association, Contrast = syndrome(s) that had significantly weaker links with the trait than the target syndrome(s), Robust Evidence = specificity of a link was supported in both samples, Partial Evidence = specificity was supported only in one sample, Sample = sample where specificity of the relation was identified, MDD = Major Depressive Disorder, SP = Social Phobia, PD = Panic Disorder, OCD = Obsessive-Compulsive Disorder. Bold indicates specific relations that were hypothesized a priori.

Table A27. Main Predictors in the Patient Sample

Predictor	$\Delta R^2$	<i>p</i>	$\beta$	<i>t</i>
Dependent Variable: IMAS Depression				
Negative Emotionality Composite	.373	.00	.12	1.57
White Bear Suppression Inventory	.090	.00	.25**	3.76
SNAP Self-Harm	.050	.00	.16*	2.30
BFI Openness	.027	.00	-.10	-1.89
Anxiety Sensitivity Composite	.019	.01	.15*	2.44
SNAP Exhibitionism	.014	.02	-.14*	-2.52
Self-Criticism Scale	.012	.03	.19*	2.26
Rumination Scale	.008	.07		
Oddity Composite	.005	.14		
Dependent Variable: IMAS Panic				
Negative Emotionality Composite	.197	.00	.17*	2.34
Anxiety Sensitivity Composite	.159	.00	.40**	5.46
Oddity Composite	.025	.01	.19**	2.64
SNAP Entitlement	.009	.12		
SNAP Self-Harm	.009	.10		
Dependent Variable: IMAS Social Anxiety				
Negative Emotionality Composite	.180	.00	.03	0.50
SNAP Exhibitionism	.230	.00	-.35**	-5.49
SNAP Detachment	.059	.00	.23**	3.42
NES Composite	.040	.00	.20**	3.21
BFI Conscientiousness	.026	.00	-.17**	-3.13
Anxiety Sensitivity Composite	.019	.01	.16**	2.71
BFI Openness	.014	.02	-.13*	-2.38
SNAP Entitlement	.007	.09		
Concern Over Mistakes Scale	.005	.16		
Dependent Variable: IMAS OCD				
Negative Emotionality Composite	.103	.00	.04	0.45
Anxiety Sensitivity Composite	.072	.00	.20*	2.40
SNAP Mistrust	.035	.01	.17*	2.01
Oddity Composite	.014	.07	.18*	2.17
BFI Openness	.013	.09	-.12	-1.69

Note. *N* = 180. *p* = significance of  $\Delta R^2$ ;  $\beta$  = final  $\beta$ -weights; *t* = *t*-value of a  $\beta$ -weight (\* = *p* < .05, \*\* = *p* < .01). NES = Negative Evaluation Sensitivity.



Table A28. Main Predictors in the Student Sample

Predictor	$\Delta R^2$	$p$	$\beta$	$t$
Dependent Variable: IMAS Depression				
Negative Emotionality Composite	.286	.00	.14*	2.44
SNAP Self-Harm	.072	.00	.19**	3.77
Rumination Scale	.046	.00	.23**	4.71
SNAP Mistrust	.022	.00	.18**	3.23
White Bear Suppression Inventory	.011	.01	.13**	2.62
SNAP Entitlement	.009	.01		
BFI Openness	.009	.02		
Dependent Variable: IMAS Panic				
Negative Emotionality Composite	.129	.00	.13*	2.10
Anxiety Sensitivity Composite	.053	.00	.17**	2.77
Oddity Composite	.022	.00	.15**	2.66
Rumination Scale	.013	.01	.14*	2.45
Dependent Variable: IMAS Social Anxiety				
Negative Emotionality Composite	.218	.00	.15**	2.80
SNAP Exhibitionism	.071	.00	-.28**	-5.88
NES Composite	.050	.00	.22**	4.48
Anxiety Sensitivity Composite	.027	.00	.15**	2.78
Oddity Composite	.010	.02	.12*	2.49
SNAP Positive Temperament	.011	.01	-.12*	-2.49
Dependent Variable: IMAS OCD				
Negative Emotionality Composite	.119	.00	.18**	3.23
Concern Over Mistakes Scale	.056	.00	.23**	4.29
Oddity Composite	.018	.01	.19**	3.50
SNAP Impulsivity	.019	.00	-.15**	-2.98

*Note.*  $N = 367$ .  $p$  = significance of  $\Delta R^2$ ;  $\beta$  = final  $\beta$ -weights;  $t$  =  $t$ -value of a  $\beta$ -weight (\* =  $p < .05$ , \*\* =  $p < .01$ ). NES = Negative Evaluation Sensitivity.

Table A29. Summary of Results for the Main Predictors

Disorder	Contributors
<i>Robust Contributors</i>	
Depression	NEM, <b>Self-Harm</b> , Thought Suppression
Panic	NEM, <b>Anxiety Sensitivity</b> , Oddity
Social Phobia	NEM, <b>(low) Exhibitionism</b> , Negative Evaluation Sensitivity, Anxiety Sensitivity
OCD	NEM, <b>Oddity</b>
<i>Potential Contributors</i>	
Depression	<b>Ruminative Response Style</b> , Self-Criticism, Mistrust, Anxiety Sensitivity, (low) Exhibitionism, (low) Openness
Panic	Ruminative Response Style
Social Phobia	Detachment, (low) Conscientiousness, (low) Openness, <b>(low) Positive Temperament</b> , Oddity
OCD	Anxiety Sensitivity, Perfectionism, Mistrust, (low) Impulsivity, (low) Openness

*Note.* Robust contributors were identified in both samples. Potential contributors were identified only in one sample. Bold indicates main contributors that were hypothesized a priori. NEM = Negative Emotionality.

Table A30. Partial Correlations Between Symptoms and Personality Traits Controlling for Main Robust Predictors in the Patient Sample

	Depression	Panic	Social Anxiety	OCD
<i>Big Five</i>				
Extraversion	-.09	<b>.12</b>	<b>-.24</b>	.02
Conscientiousness	.00	-.01	<b>-.19</b>	-.05
Agreeableness	-.03	-.01	-.05	<b>-.12</b>
Openness	<b>-.21</b>	-.01	<b>-.22</b>	<b>-.17</b>
<i>SNAP</i>				
Mistrust	.05	<b>.11</b>	<b>.12</b>	<b>.21</b>
Manipulativeness	.07	<b>.11</b>	<b>.15</b>	<b>.11</b>
Aggression	.00	-.05	.01	.09
Dependency	.01	-.09	<b>.13</b>	.02
Positive Temperament	<b>-.15</b>	-.01	<b>-.18</b>	-.05
Entitlement	-.03	<b>.20</b>	.00	-.08
Detachment	.03	<b>-.13</b>	<b>.28</b>	<b>.19</b>
Disinhibition	-.07	.01	.07	<b>.11</b>
Impulsivity	-.08	.09	.02	.04
Propriety	<b>.12</b>	.01	.07	.04
Workaholism	.04	<b>-.11</b>	-.04	.00
<i>Clinical Traits</i>				
Rumination Scale	<b>.14</b>	-.08	.07	<b>-.10</b>
Self-Criticism Scale	<b>.22</b>	-.04	<b>.12</b>	<b>.10</b>
Concern Over Mistakes Scale	<b>.10</b>	<b>-.14</b>	<b>.10</b>	-.08

Note.  $N = 180$ .  $r_s > .19$  are significant  $p < .01$ ;  $r_s \geq .10$  are bolded.

Table A31. Partial Correlations Between Symptoms and Personality Traits Controlling for Main Robust Predictors in the Student Sample

	Depression	Panic	Social Anxiety	OCD
<i>Big Five</i>				
Extraversion	<b>.11</b>	-.05	-.06	.07
Conscientiousness	-.03	-.04	-.03	<b>.14</b>
Agreeableness	.06	.03	.08	.06
Openness	<b>.11</b>	.01	-.09	<b>.10</b>
<i>SNAP</i>				
Mistrust	<b>.13</b>	-.03	.04	.07
Manipulativeness	-.08	.00	-.06	-.01
Aggression	.00	-.04	-.06	-.01
Dependency	-.02	.05	.08	-.02
Positive Temperament	.03	-.01	<b>-.12</b>	<b>.12</b>
Entitlement	<b>-.15</b>	<b>-.11</b>	-.03	.03
Detachment	-.05	.01	.05	.00
Disinhibition	.02	.00	-.05	<b>-.11</b>
Impulsivity	.01	.02	-.06	<b>-.15</b>
Propriety	.00	<b>-.11</b>	.05	<b>.14</b>
Workaholism	.06	-.03	-.04	<b>.16</b>
<i>Clinical Traits</i>				
Rumination Scale	<b>.21</b>	<b>.13</b>	.05	-.07
Self-Criticism Scale	<b>.18</b>	.01	.02	-.01
Concern Over Mistakes Scale	.09	-.01	.04	<b>.17</b>

Note.  $N = 367$ .  $r_s > .13$  are significant  $p < .01$ ;  $r_s \geq .10$  are bolded.

Table A32. Partial Correlations Among the IMAS Scales Controlling for the NEM, Anxiety Sensitivity, and Oddity composites

	Depression	Panic	Social Anxiety	OCD
Depression		.28	.35	.08
Panic	.25		.12	.22
Social Anxiety	.25	.13		.24
OCD	.22	.16	.30	

*Note.*  $N = 367$  (student) and 180 (patient). Correlations in the student sample are below the diagonal ( $r_s > .14$  are significant  $p < .01$ ); correlations in the patient sample are above the diagonal ( $r_s > .21$  are significant  $p < .01$ ).

Table A33. Direct Predictors in the Patient Sample

Predictor	$\Delta R^2$	$p$	$\beta$	$t$
Dependent Variable: IMAS Depression				
SNAP Self-Harm	.029	.00	.23	3.34**
White Bear Suppression Inventory	.042	.00	.26	4.09**
Dependent Variable: IMAS Panic				
Anxiety Sensitivity Composite	.067	.00	.32	4.54**
Oddity Composite	.022	.01	.17	2.48*
Dependent Variable: IMAS Social Anxiety				
SNAP Exhibitionism	.158	.00	-.43	-7.32**
NES Composite	.022	.02	.18	2.45*
Anxiety Sensitivity Composite	.003	.38	.07	0.88
Dependent Variable: IMAS OCD				
Oddity Composite	.019	.04	.16	2.11*

*Note.*  $N = 180$ .  $p$  = significance of  $\Delta R^2$ ;  $\beta$  = final  $\beta$ -weights;  $t$  = t-value of a  $\beta$ -weight (\* =  $p < .05$ , \*\* =  $p < .01$ ). Each line represents a separate regression model. NES = Negative Evaluation Sensitivity.

Table A34. Direct Predictors in the Student Sample

Predictor	$\Delta R^2$	$p$	$\beta$	$t$
Dependent Variable: IMAS Depression				
SNAP Self-Harm	.050	.00	.26	5.73**
White Bear Suppression Inventory	.021	.00	.18	3.57**
Dependent Variable: IMAS Panic				
Anxiety Sensitivity Composite	.028	.00	.20	3.64**
Oddity Composite	.019	.00	.16	3.01*
Dependent Variable: IMAS Social Anxiety				
SNAP Exhibitionism	.064	.00	-.26	-6.12**
NES Composite	.010	.02	.12	2.38*
Anxiety Sensitivity Composite	.020	.00	.17	3.32**
Dependent Variable: IMAS OCD				
Oddity Composite	.004	.17	.07	1.36

*Note.*  $N = 367$ .  $p$  = significance of  $\Delta R^2$ ;  $\beta$  = final  $\beta$ -weights;  $t$  = t-value of a  $\beta$ -weight (\* =  $p < .05$ , \*\* =  $p < .01$ ). Each line represents a separate regression model. NES = Negative Evaluation Sensitivity.

Table A35. Summary Model of Personality Contributors

Disorder	Shared	Specific	Unique
MDD	NEM		Self-Harm Thought Suppression <i>Ruminative Response Style</i> <i>Self-Criticism</i>
Social Phobia	NEM	Anxiety Sensitivity	(low) Exhibitionism Negative Evaluation Sensitivity <i>(low) Positive Temperament</i>
Panic Disorder	NEM	Anxiety Sensitivity Oddity	
OCD	NEM	Oddity	

*Note.* MDD = Major Depressive Disorder, OCD = Obsessive-Compulsive Disorder, NEM = Negative Emotionality. Provisional trait contributors are italicized.



APPENDIX B  
RELEVANT MODULES OF THE INTERVIEW FOR  
MOOD AND ANXIETY DISORDERS (IMAS)

### Depression

This first group of questions is about feelings of sadness or lack of interest. During **the past month** have you experienced any of the following:

- 01 Have you had a period of time lasting several days or longer when most of the day you felt sad, empty or depressed? \*
- 02 Have you had a period of time lasting several days or longer when most of the day you were very discouraged about how things were going in your life? \*
- 03 Have you had a period of time lasting several days or longer when you lost interest in most things you usually enjoy like work, hobbies, and personal relationships? \*

§ IF RECEIVED A SCORE OF 1 OR 2 ON AT LEAST ONE OF THE ABOVE ITEMS (1-3), ASK:

ASK ABOUT A STATE ENDORSED ABOVE, IF MULTIPLE STATES ARE ENDORSED USE "OR" (E.G. "SADNESS OR LACK OF INTEREST")

- 04 Were your feelings of (sadness / discouragement / lack of interest) usually worse in the morning than later in the day?
- 05 Episodes of this sort sometimes happen as a result of physical causes such as physical illness or injury or the use of medication, drugs, or alcohol. Do you think your feelings of (sadness / discouragement / lack of interest) occurred as a result of such physical causes?

IF NO SCORE 0, IF YES ASK: How much of these feelings were due to these physical causes: (3) all of them, (2) most of them, (1) some of them? ASK: Can you tell me what these physical causes were?

- 06 Overall, how many days during **the past month** have you felt (sad / discouraged / uninterested) **most of the day**: (4) three weeks or more, (3) about two weeks, (2) about one week, (1) a few days, or (0) a day or less?
- 07 When you were feeling (sad / discouraged / uninterested) did it **usually** last: (4) all day long, (3) most of the day, (2) about half the day, (1) a few hours, or (0) less than a few hours?

§ END OF THE SKIP OUT

Now I am going to ask you whether you experienced certain things for **at least several days during the past month**. Tell me only about experiences that lasted at least several days.

[IF YOU HAVE ANY DOUBTS THAT THE RESPONDENT DOES NOT FOLLOW THE TIME FRAME, REMIND THEM: “Just to remind you, I am only asking about experiences that lasted at least several days; they did not have to last the whole month” SAY IT NO MORE THAN TWICE]

THE FIRST TWO TIMES A PARTICIPANT GIVES A POSITIVE RESPONSE,  
PROBE: “And was this going on for at least several days during the past month?”

- 8 Did you feel so sad that nothing could cheer you up for at least several days? \*
- 9 Did you feel a lot less close to your friends and relatives for at least several days?
- 10 Did you lose the ability to take pleasure in having good things happen to you, like winning something or being praised or complimented? \*
- 11 Have you had a much smaller appetite than usual? \*
- 12 Did you eat a lot less than usual?
- 13 Have you slept much less than usual? \*
- 14 Did you have a lot of trouble falling asleep? \*
- 15 Was it difficult to stay asleep? \*
- 16 Were you waking up much earlier than you needed?  
IF SAYS YES, PROBE: “Was it also much earlier than you wanted?”  
IF RESPONDS NEGATIVELY TO EITHER QUESTION, SCORE 0
- 17 Did you sleep a lot more than usual?  
IF SAYS YES, PROBE: “And did you sleep much more than you wanted?”  
IF RESPONDS NEGATIVELY TO EITHER QUESTION, SCORE 0
- 18 Were you feeling drowsy almost all day long?
- 19 Have you felt very tired or low in energy even when you haven't been working very hard? \*
- 20 Did it take you a lot of effort to do your everyday activities? \*

- 21 Did you stop many of your usual activities because you didn't have the energy to do them? \*
- 22 Did you talk or move more slowly than is normal for you? \*
- 23 Has anyone noticed that you were talking or moving more slowly? \*
- 24 Did you feel the need to keep your hands occupied at all times?
- 25 Were you so restless or jittery that you paced up and down or couldn't sit still? \*
- 26 Has anyone noticed that you were restless? \*
- 27 Did your thoughts come much more slowly than usual?
- 28 Have you had a lot of trouble concentrating? \*
- 29 Did you feel that you could not make up your mind about things you ordinarily have no trouble deciding about? \*
- 30 Did you feel hopeless about the future? \*
- 31 Did you feel completely worthless? \*
- 32 Did you feel very guilty? \*
- 33 Was your self-esteem much lower than usual? \*
- 34 Did you feel that you had a lot more trouble coping with your everyday responsibilities?
- 35 Did you pay much less attention to your physical appearance?
- 36 Did you feel that you wanted to be alone rather than spend time with friends or relatives much more than usual?
- 37 Were you unable to enjoy the things you used to? \*
- 38 Did you feel a lot less talkative than usual?
- 39 Were you unable to laugh and see the funny side of things?
- 40 Were you much less interested in sex? \*
- 41 Were you much less interested in eating? \*

42 Have you felt desperate?

43 Were you often thinking about death; either your own, someone else's, or death in general? \*

Have you experienced any of the following in the past month; it did not have to last for several days

44 Have you thought that it would be better if you were dead? \*

45 Have you hurt yourself on purpose?

46 Have you seriously thought about committing suicide? \*

§ IF RECEIVED A SCORE OF 1 OR 2 ON AT LEAST ONE OF THE ABOVE ITEMS (8-41), ASK:

47. IF ONLY ONE QUESTION WAS ENDORSED:

In this section you mentioned a problem that has been bothering you. Overall, how much did this problem interfere with your life while you were having it: (4) extremely, (3) quite a bit, (2) somewhat, (1) a little, or (0) not at all?

IF TWO OR MORE QUESTIONS WERE ENDORSED:

In this section you mentioned some problems that have been bothering you. Overall, how much did these problems interfere with your life while you were having them: (4) extremely, (3) quite a bit, (2) somewhat, (1) a little, or (0) not at all?

Panic

This group of questions is about feeling afraid and experiencing certain bodily sensations. During **the past month**:

- 01 Have you had an episode of fear or panic when all of a sudden you felt very frightened, anxious, or uneasy?
- 02 Have you had an episode when all of a sudden you became short of breath, dizzy, nauseous, or your heart pounded, (PAUSE) or you thought you might lose control, die, or go crazy?

§ IF RECEIVED A SCORE OF 1 OR 2 ON AT LEAST ONE OF THE ABOVE QUESTIONS:

- 3 Episodes of this sort can happen in three different situations. First, they can happen unexpectedly, or “out of the blue.” Second, they can happen when a person has a very strong fear. For example, some people have a terrible fear of bugs or of heights or of being in a crowd. Third, they can happen when a person is in real danger, like a car accident or a bank robbery.  
Which of these situations describe your experiences the best – (2) did you have episodes that happened unexpectedly, (PAUSE) (1) happened in a situation that you strongly fear, (PAUSE) (0) or in a situation of real danger?  
[RECORD THE HIGHEST SCORE THAT APPLIES]
- 4 Episodes like this sometimes happen as a result of physical causes such as physical illness or injury or the use of medication, drugs, or alcohol. In the past month, do you think these episodes occurred as the result of such physical causes?  
IF NO SCORE 0, IF YES ASK: How much of these feelings were due to these physical causes: (3) all of them, (2) most of them, (1) some of them?  
ASK: Can you tell me what these physical causes were?
- 5 Did you often worry that you might have another episode?
- 6 Did you often worry that something terrible might happen because of the episode(s), like having a car accident, having a heart attack, or losing control?
- 7 Have you changed your everyday activities because of the episode(s)?
- 8 Did you avoid certain situations because of fear about having another episode(s)?

- 9 In the past month, how much did problems related to this episode(s) interfere with your life: (4) extremely, (3) quite a bit, (2) somewhat, (1) a little, or (0) not at all?

Think of a **typical** episode of this sort that you have had in the past month.  
(PAUSE) During that time, which of the following experiences did you have?  
(BEGIN ASKING SYMPTOMS)

§ END OF THE SKIP OUT

IF RECEIVED A SCORE OF 0 ON BOTH 01 AND 02:

Think of a time during the past month when you were very nervous or scared.  
(PAUSE) Can you think of such an occasion? \* During that time, which of the following experiences did you have? (BEGIN ASKING SYMPTOMS)

\*IF DENIES BEING “VERY NERVOUS OR SCARED,” SAY “Can you think of a time when you were the most nervous that you can remember, even if you were not very nervous? (PAUSE) During that time, which of the following experiences did you have?”

- 10 During that time did your heart pound heavily or race rapidly? \*
- 11 During that time were you short of breath? \*
- 12 Did you have nausea or discomfort in your stomach? \*
- 13 Did you feel dizzy or faint? \*
- 14 Did you sweat noticeably? \*
- 15 Did you tremble or shake? \*
- 16 Did you have a dry mouth? \*
- 17 Did you feel like you were choking? \*
- 18 Did you have pain or discomfort in your chest? \*
- 19 Were you afraid that you might lose control of yourself? \*
- 20 Were you afraid that you might go crazy? \*
- 21 Did you feel that you weren't real or that you were disconnected from your body? \*
- 22 Did you feel that things around you weren't real? \*

- 23 Were you afraid that you might die? \*
- 24 Did you have hot flashes or chills? \*
- 25 Did you have numbness or tingling sensations? \*
- 26 Did you fear that you might lose control of your bowels or bladder?
- 27 Did you fear that you might throw up?
- 28 Did you feel like you had a lump in your throat?

§ IF RECEIVED A SCORE OF 1 OR 2 ON AT LEAST ONE ABOVE ITEM (10-28),  
ASK:

- 29. How long did these feelings usually last: (4) a few hours or more, (3) about one hour, (2) about half an hour, (1) about 10 minutes, or (0) a few minutes or less?



### Social Anxiety

This group of questions is about experiences related to social situations. I am going to give you a list of situations and ask if you **strongly fear** them or find them **very uncomfortable**.

THE FIRST TWO TIMES A PARTICIPANT GIVES A POSITIVE RESPONSE,  
PROBE: “And do you strongly fear it or find it very uncomfortable?”

- 01 Do you strongly fear or find it very uncomfortable to meet new people? \*
- 02 Do you strongly fear or find it very uncomfortable to talk to people in authority? \*
- 03 Talk to people that you are attracted to? \*
- 04 Speak up in a meeting or class? \*
- 05 Act, perform, or give a talk in front of an audience? \*
- 06 Take an important exam or interview for a job, even though you are well prepared? \*
- 07 Work while someone watches? \*
- 08 Enter a room where others are already present? \*
- 09 Having your body exposed, for example when wearing tight clothes or a bathing suit? \*
- 10 Express disagreement to people you don't know very well? \*
- 11 Write, read, eat, or drink while someone watches? \*
- 12 Urinate in a public bathroom or use a bathroom away from home? \*

Now I am going to ask if you would **avoid** any of these situations **if it at all possible**?

IF SAYS “NO” TO ALL IN ADVANCE SAY “I understand, but I need to read the list to you because you might remember something new as you listen to it”

THE FIRST TWO TIMES A PARTICIPANT GIVES A POSITIVE RESPONSE,  
PROBE: “And would you avoid it if at all possible?”

- 13 Would you avoid meeting new people if at all possible? \*
- 14 Would you avoid talking to people in authority if at all possible? \*
- 15 Talking to people that you are attracted to? \*
- 16 Speaking up in a meeting or class? \*
- 17 Acting, performing, or giving a talk in front of an audience? \*
- 18 Taking an important exam or interviewing for a job, even though you are well prepared? \*
- 19 Working while someone watches? \*
- 20 Entering a room where others are already present? \*
- 21 Having your body exposed, for example when wearing tight clothes or a bathing suit? \*
- 22 Expressing disagreement to people you don't know very well? \*
- 23 Writing, reading, eating, or drinking while someone watches? \*
- 24 Urinating in a public bathroom or using a bathroom away from home? \*

§ IF RECEIVED A SCORE OF 1 OR 2 ON AT LEAST ONE ABOVE ITEM (01-24), ASK:

25 IF ONLY ONE QUESTION WAS ENDORSED:

In this section you mentioned that you have difficulties with a certain social situation. Do you think that your fear of this situation is much stronger than it should be?

IF TWO OR MORE QUESTIONS WERE ENDORSED:

In this section you mentioned that you have difficulties with certain social situations. Do you think that your fear of these situations is much stronger than it should be?

- 26 Are these difficulties related to embarrassment about having a physical or mental health problem or disability?
- 27 Overall, how much did these difficulties interfere with your life **in the past month**: (4) extremely, (3) quite a bit, (2) somewhat, (1) a little, or (0) not at all?

Obsessive-Compulsive

This group of questions is about repetitive thoughts and behaviors. During the past month, have you experienced any of the following:

THE FIRST TWO TIMES A PARTICIPANT GIVES A POSITIVE RESPONSE, PROBE ABOUT FREQUENCY, E.G. "Would you say that you did it often?"

- 01 Did you have thoughts about dirt, germs, or contamination that kept coming back? \*
- 02 Did you feel the need to wash your hands again and again? \*
- 03 Did you **repeatedly** avoid physical contact with people because you were concerned about getting dirty or contaminated? \*
- 04 Would you avoid handling things that were touched by others whenever possible? \*
- 05 Have you often wondered if everything was right even after you checked it multiple times? \*
- 06 Did you check things, such as turning off appliances or locking doors, again and again? \*
- 07 Have you **often** found yourself worrying whether you actually did something that you intended to do, such as turning off lights? \*
- 08 Were you checking what you were doing for mistakes over and over again (for example, while reading, writing, or using a calculator)? \*
- 09 Have you **often** experienced thoughts or images that were unpleasant or disturbing?
- 10 Have you **often** had unwanted thoughts or images that you **could not get out of your head**?
- 11 Did you have **repeated** thoughts that something terrible is going to happen, although you knew that it was not likely?
- 12 Did you have **recurring** thoughts involving aggression, injury, or violence?
- 13 Did you have unpleasant or disturbing thoughts involving sex that kept coming back?
- 14 Did you have **recurring** concerns about doing something sinful or evil?
- 15 Have you **often** felt compelled to line things up or arrange them so that they were neat and orderly? \*

- 16 Did you **repeatedly** feel the need to count objects, such as the books on a shelf, or floor tiles? \*
- 17 Did you **regularly** perform certain activities in a fixed, exactly defined order? \*
- 18 Were you repeating certain activities a lot more than you needed to? \*
- 19 Did you repeat certain **routine** activities to avoid some terrible consequences? \*

§ IF RECEIVED A SCORE OF 1 OR 2 ON AT LEAST ONE ABOVE ITEM (01-19),  
ASK:

In this section you mentioned that you have certain repetitive thoughts and behaviors. Overall, how much do these thoughts and behaviors interfere with your life: (4) extremely, (3) quite a bit, (2) somewhat, (1) a little, or (0) not at all?