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Facet-Level Personality Relations of the Symptom Dimensions of the Tripartite Model

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Abstract

The tripartite model (Clark and Watson, *Journal of Abnormal Psychology, 100*(3), 316–336 1991) was developed to explain both the strong comorbidity and the distinction between anxiety and depression. The model includes a shared general distress factor that is most strongly associated with Neuroticism/Negative Emotionality (N/NE); a unique depression factor, anhedonia, which is most strongly associated with low Positive Emotionality/Extraversion; and anxious arousal, a unique anxiety factor that subsequent research has shown to be most strongly related to panic/agoraphobia among the anxiety disorders (e.g., Mineka et al. *Annual Review of Psychology, 49*, 377–412 1998) and to have the weakest link to personality. The present study extends past work by demonstrating that narrower facets of personality domains show nuanced relations that are masked when only the broader domains are examined. Specifically, we investigated facet-level relations of the tripartite model's symptom dimensions using three hierarchical personality measures (BFI-2, NEO-PI-3, and FI-FFM) and data from three separate samples (*Ns* = 353–451). In one sample, the tripartite-model dimensions were assessed twice across a 9.5-month interval. At the domain level, N/NE, Extraversion, and Conscientiousness were the strongest predictors of these factors. At the facet level, general distress and anhedonia were most strongly related to N/NE's Depression facet; anhedonia also was substantially linked to the low Energy/Positive Temperament component of Extraversion. Finally, anxious arousal was best predicted by the Somatic Complaints facet of N/NE. This pattern of results was highly stable across measures, samples, and time points. Theoretical implications of the findings are discussed, including connecting these findings to the dimensional Hierarchical Taxonomy of Psychopathology framework.

Keywords Personality facets · Depression · Anxiety · Tripartite model

Over the past several decades, research investigating the structure of personality traits has converged to show that personality is hierarchical in nature (Markon et al. 2005; Watson et al. 1994), with broad higher order domains composed of several distinct but empirically correlated lower order facets. This hierarchical framework integrates different personality factor models—including both the Big Three (Eysenck 1991) and the Big Five (Goldberg 1993)—into a single personality structure (Markon et al. 2005). This article focuses on the Big Five model of personality and its lower order, facet traits.

Researchers have made substantial progress in understanding how the Big Five personality domains relate to psychopathology (Kotov et al. 2010; Watson and Naragon-Gainey 2014). For example, studies consistently have shown that Neuroticism/Negative Emotionality (N/NE) is elevated in many forms of psychopathology, whereas Extraversion has greater specificity, such that low Extraversion most strongly predicts depression, dysthymia, and social phobia (Kotov et al. 2010), as well as schizophrenia (Horan et al. 2008). Part of the reason why researchers have been able to make such substantial progress in investigating the links between the personality domains and psychopathology is because all Big Five models contain broadly similar content, even though various personality researchers have conceptualized and labeled trait domains somewhat differently. For example, in McCrae and Costa Jr. (2010) conceptualization, the domains are termed Neuroticism, Extraversion, Conscientiousness,

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Agreeableness, and Openness, whereas in Soto and John's (2017) model they are called Negative Emotionality, Extraversion, Conscientiousness, Agreeableness, and Open-Mindedness. Nonetheless, these models cover the same broad content areas (Soto and John 2017).

In recent years, personality researchers have increasingly emphasized the need to investigate relations of specific personality facets with various criteria, including psychopathology (Paunonen 2003; Watson et al. 2015). Specifically, Paunonen (2003) argued that some—but not all—personality facets might be predictive of a particular criterion, such that criterion-related variance could be diluted by the nonpredictive variance when facets are aggregated at the domain level. For example, Reynolds and Clark (2001) reported that small subsets of NEO-PI-R facets outperformed all five domains entered as a block in a multiple regression predicting *DSM-IV* personality disorder diagnoses. Similarly, in Samuel and Widiger's (2008) meta-analysis, single facets outperformed their respective domains in predicting disorder diagnoses 23% of the time.

Despite evidence indicating that facets can provide valid information above and beyond domains, there currently is a dearth of research studying facet-level relations of personality with psychopathology. One reason for this is that there is no consensus regarding the number and content of facets within each domain. For example, the NEO Personality Inventory-3 (McCrae, Costa, & Martin, 2005) divides N/NE into six facets: Anxiety, Depression, Angry Hostility, Self-consciousness, Impulsiveness, and Vulnerability. In contrast, the Big Five Inventory-2 (BFI-2; Soto & John., 2017) divides it into three facets: Anxiety, Depression, and Emotional Volatility, whereas the Faceted Inventory of the Five-Factor Model (FI-FFM; Watson, Nus, & Wu, 2017) divides it into five facets: Anxiety, Depression, Anger Proneness, Somatic Complaints, and Envy. Clearly, researchers will obtain somewhat different results at the facet level depending on which of these models/measures is used.

Tripartite Model of Anxiety and Depression

The tripartite model of anxiety and depression (Clark and Watson 1991) was developed to explain both the strong comorbidity and the distinction between anxiety and depression. This model posits a shared general factor, as well as unique aspects to both anxiety and depression. Clark and Watson (1991) factor analyzed a set of anxiety and depression measures, obtaining a three-factor solution. The shared factor, termed general distress, is strongly related to the personality trait of N/NE, that is, the tendencies to be temperamentally sensitive to negative stimuli and experience negative mood states (Clark et al. 1994). The specific factor of anxiety, anxious arousal, is characterized by symptoms of physiological hyperarousal, such as a racing heart, shortness of breath, and dizziness (Clark et al. 1994). The specific factor of depression, anhedonia, is strongly associated with low positive affectivity, that is, the infrequent experience of positive emotions such as joyfulness, enthusiasm, and pride (Clark et al. 1994). The tripartite model has been found to replicate well across multiple diverse samples, including students, adults, and patients (Watson et al. 1995), child and adolescent psychiatric samples (Joiner Jr. et al. 1996), and older adults (Cook et al. 2004).

It has been noted that anxiety disorders are extremely heterogenous and relate differentially to depression, with some disorders overlapping with depression more than others. Researchers criticized the original tripartite model as being insufficient to account for the substantial heterogeneity within anxiety disorders (Brown et al. 1998). Accordingly, both its authors (e.g., Mineka et al. 1998; Watson 2005) and others have offered revised models, including the tri-level model of anxiety and depression (Naragon-Gainey et al. 2016) and the Hierarchical Taxonomy of Psychopathology (HiTOP) framework (Kotov et al. 2017), that capture the variance of a fuller range of anxiety disorders. Within these broader frameworks, anxious arousal is no longer viewed as the specific component of all anxiety disorders, but rather, is identified as defining a specific fear based dimension underlying *DSM-5* based disorders such as social phobia and panic (Kotov et al. 2017; Mineka et al. 1998; Watson 2005).

Although the tripartite model has been subsumed within these broader frameworks, research conducted from the tripartite model perspective nonetheless can inform—and has important implications for—these broader nosological schemes. Specifically, the tripartite model framework can be used to advance of understanding of the overlap and differences between various distress- (e.g., sadness, anhedonia) and fear-based (e.g., anxious arousal) symptom dimensions subsumed within the HiTOP framework.

Personality and the Tripartite Model

Studies on relations of anxiety and depression with personality often are conducted using *DSM* diagnoses (Bienvenu et al. 2004; Kotov et al. 2010). Generally, consistent with Clark and Watson's (1991) tripartite model, such studies have found N/NE to be elevated across both types of disorders (Bienvenu et al. 2004; Gamez et al. 2007; Kotov et al. 2010; Watson and Naragon-Gainey 2014), but a more nuanced picture appears with regard to Extraversion. In particular, consistent with the tripartite model, depressive disorders have been found to be strongly linked with low Extraversion (Bienvenu et al. 2004; Gamez et al. 2007; Kotov et al. 2010; Watson and Naragon-Gainey 2014). However, low Extraversion is not specific to depressive disorders; it also has been linked to

some anxiety disorders, particularly social anxiety disorder and agoraphobia (Bienvenu et al. 2004; Gamez et al. 2007; Kotov et al. 2010; Watson et al. 1988) as well as schizophrenia (Horan et al. 2008). This work has led to modifications in the original tripartite model, in which low Extraversion (anhedonia) was posited to be specific to depression (Mineka et al. 1998).

DSM diagnoses consistently have been found to show both considerable heterogeneity and comorbidity (Clark et al. 1995); therefore, it is important to examine personality relations with symptom dimensions, such as the tripartite model, that more accurately reflect the topology of psychopathology. Subica et al. (2016) examined relations between personality and the tripartite-model constructs in adult psychiatric inpatients by running a bifactor model with two uncorrelated specific factors using the Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al. 2006) and the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al. 2001). They obtained a general distress factor, as well as specific factors representing anxiety and depression. They then correlated these factors with N/NE and Extraversion, and found that N/NE correlated most strongly ($r = .56$) with general distress, and much less strongly with specific anxiety and specific depression (r-s = .25 and .19, respectively), supporting the tripartite model's view of N/NE as a nonspecific predictor of both anxiety and depression. Subica et al. (2016) also found that Extraversion had moderate negative correlations with both the specific depression and general distress factors (rs = −.31 and − .21, respectively), but not the specific anxiety factor ($r = .04$).

As previously mentioned, substantially fewer studies have investigated facet-level relations of personality with anxiety and depression. Of those that have, the Depression facet of N/NE and the low Positive Emotions facet of Extraversion generally have been found to be the most strongly associated with depression (Bienvenu et al. 2004; Naragon-Gainey & Watson, 2014; Rector et al. 2012). However, several studies also have found the Anxiety and Hostility facets of N/NE to be substantially related to depression (Chioqueta and Stiles 2005; Costa Jr. et al. 2005; Harkness et al. 2002), and others have found that the Extraversion facets of (low) Assertiveness and (low) Warmth are linked to depression (Chioqueta and Stiles 2005; Costa Jr. et al. 2005; Rector et al. 2012). Thus, there is little consensus on which N/NE and Extraversion facets consistently relate to depression.

Results also vary regarding which personality facets best predict anxiety, due largely again to the heterogeneous nature of the anxiety disorders. For example, social anxiety disorder recently was found to be related to the N/NE facets of Self-consciousness, Vulnerability, and Impulsiveness (Newby et al. 2017), as well as the Extraversion facets of Sociability, Dominance, Warmth, and Positive Emotions (Bienvenu et al. 2004; Naragon-Gainey and Watson 2011). However, agoraphobia was found to be negatively associated with the Agreeableness facet of Trust (Bienvenu et al. 2004).

The Current Study

The current study investigated facet-level personality relations of tripartite-model symptom dimensions using three hierarchical Big 5 inventories (NEO-PI-3, BFI-2, and FI-FFM). Thus, it not only reflects the growing body of work focusing on dimensional constructs rather than categorical disorders, but also advances understanding of the nuances of personality facet and psychopathology relations. We also evaluate the degree of replicability of personality facet links across measures by examining the links of personality facets from different measures with the symptom dimensions of the tripartite model.

As far as we could determine, this is the first study to examine associations between lower order personality traits and the tripartite model's three main symptom groups. We report results from three samples—one community adult sample and two online adult samples. In the community sample, the tripartite-model constructs were assessed twice across a 9.5-month interval, which allowed us to examine the degree to which observed relations were maintained longitudinally. We had three primary aims: (1) to identify distinctive personality-facet relations for each of the tripartite symptom constructs; (2) to test the replicability of facet-level relations across different faceted personality measures; and (3) to test the replicability of facet-level relations in predicting scores on measures of tripartite symptom dimensions longitudinally. As stated, addressing these aims is particularly important given the inconsistency of the facet-level relations reported in the literature (e.g., Costa et al. 2005; Naragon-Gainey & Watson 2014a, b).

Based on previous studies, we hypothesized that the N/NE domain would be positively correlated with all three tripartite symptom dimensions, whereas low Extraversion would be specific to anhedonia, the unique component of depression. At the facet level, we predicted that the Depression facet of N/NE would be the facet most strongly linked to general distress and anhedonia, whereas the (low) Energy/Positive Temperament facet of Extraversion would be the facet most strongly related to anhedonia. Based on the limited evidence in the current literature, the anxious-arousal component of the tripartite model appears to have the weakest links to personality. Consequently, we made no predictions regarding the facets that would be the best predictors of this dimension.

Method

Participants and Procedures

Sample 1: Community Adult Sample The study consisted of three 3-hour sessions conducted at the Center for Advanced Measurement of Personality and Psychopathology

(CAMPP); participants were paid $60 for each session. Participants ($N = 439$) were community adults from several counties in northern Indiana and southwestern Michigan. Session 1 contained an extensive battery of personality measures, including the NEO-PI-3 and FI-FFM. Session 2 was held approximately 3 weeks later (mean interval = 20.3 days; $SD = 13.57$ days) and contained an extensive battery of self-report psychopathology scales. Session 3 was conducted approximately 9.5 months after session 2 (mean interval = 286.6 days; $SD = 50.44$ days) and also consisted of an extensive battery of self-report psychopathology scales, including several instruments that were retested from session 2. The results reported herein used only those participants who completed at least sessions 1 and 2 ($n = 409$) and some results are based only on data from participants who completed all three sessions ($n = 292$).[1] Participants were excluded if they were below 18 years old, had a diagnosis of intellectual disability or dementia, or had less than an 8th grade education. The overall sample ($N = 439$) was 68.1% female; 47.5% were White, 44.1% Black, 6.8% other, and 1.6% did not report race/ethnicity. Mean age was 45.0 years ($SD = 13.46$; range = 18–77).

Sample 2: Amazon Mechanical Turk (mTurk) Sample 1 Participants were 451 community adults recruited online through mTurk. Participants completed a battery of self-report questionnaires assessing personality and psychopathology that was administered online at times and locations of their choice using Qualtrics survey software.[2] Study completion required approximately 50 min and participants received $4 compensation. Inclusion criteria included being at least 18 years of age and able to read and write English. Participants' IP addresses were also restricted to be from the United States, United Kingdom, Canada, and Australia. The sample was 53.0% female; 73.6% White, 8.1% Black, 9.5% Asian, 4.0% Hispanic, and 4.6% other. Mean age was 35.5 years ($SD = 11.0$; range = 19–71).

Sample 3: mTurk Sample 2 Participants were 353 community adults recruited on mTurk. They completed a battery of self-report questionnaires assessing personality and psychopathology administered online at times and locations of their choice using Qualtrics survey software. The personality and psychopathology measures administered in this study differed from those administered in Sample 2. Study completion required approximately 40 min and participants received $4 compensation. Inclusion criteria included being at least 18 years of age and able to read and write English. Participants' IP addresses were also restricted to be from the United States. The sample was 47.9% female; 79.6% White, 7.1% Black, 6.5% Asian, 6.2% Hispanic, and .6% other. Mean age was 35.5 years ($SD = 10.4$; range = 19–70).

Measures

Measures of Tripartite-Model Constructs

Inventory of Depression and Anxiety Symptoms—Second Version (IDAS-II; Watson et al. 2012): Samples 1 (Sessions 2 and 3), 2, and 3 The 99-item IDAS-II measures anxiety- and depression-related symptoms in the past 2 weeks. Respondents indicated how much they have experienced each symptom using a five-point scale (*not at all, a little bit, moderately, quite a bit, extremely*). This study used three IDAS-II scales to represent the tripartite constructs: Dysphoria (e.g., *felt depressed, felt discouraged about things, found myself worrying all the time*) to assess general distress, Panic (e.g., *felt dizzy or lightheaded, heart was racing or pounding, had a very dry mouth*) to measure anxious arousal, and Well-Being (reverse keyed; e.g., *looked forward to things with enjoyment, felt like I had interesting things to do, felt I had a lot to look forward to*) to assess (low) anhedonia. Across the three samples, Cronbach's alphas ranged from .90 to .92 for Dysphoria, .86 to .91 for Panic, and .81 to .94 for Well-Being.

Mini Mood and Anxiety Symptom Questionnaire (Mini-MASQ; Casillas and Clark 2000): Sample 2 The Mini-MASQ is a 26-item short form of the original 90-item Mood and Anxiety Symptom Questionnaire (MASQ; Watson et al. 1995), which was developed to measure the tripartite-model's symptom dimensions. The measure asks respondents to rate the extent to which they have experienced symptoms over the past 2 weeks using a five-point scale (*not at all, a little bit, moderately, quite a bit, extremely*). It contains an 8-item General Distress scale (e.g., *felt depressed, felt hopeless, felt worthless*), a 10-item Anxious Arousal scale (e.g., *was short of breath, felt dizzy or lightheaded, hands were shaky*), and an 8-item Anhedonic Depression scale (e.g., *felt withdrawn from other people, felt like I had a lot to look forward to [reversed], felt like nothing was enjoyable*). Cronbach's alphas were .94, .92, and .90 for General Distress, Anxious Arousal, and Anhedonic Depression, respectively.

Measures of Big Five Personality Traits

Faceted Inventory of the Five-Factor Model (FI-FFM; Watson et al. 2019): Samples 1 (Session 1) and 3 The FI-FFM contains 207 items that form 22 facet scales: five facets each for N/NE,

[1] Prior research using this dataset has explicated relations between various personality factors (including Extraversion and emotion regulation) and a broad range of psychopathology (e.g., Stanton, Rozek, Stasik-O'Brien, Ellickson-Larew, & Watson, 2016; Stanton, Stasik-O'Brien, Ellickson-Larew, & Watson, 2016b; Watson et al. 2015), but none have explored the personality relations of the tripartite constructs.

[2] This dataset was used for an earlier review (Watson et al. 2017) of self-report indicators of negative valence constructs within the Research Domain Criteria (RDoC).

Extraversion, and Conscientiousness; four facets for Agreeableness, and three facets for Openness. Respondents rate their level of agreement with each statement on a five-point Likert scale (*strongly disagree, disagree, neutral or cannot decide, agree, strongly agree*). Cronbach's alphas for the five domains ranged from .83 to .95 (median $\alpha = .91$) in Sample 1, and from .89 to .97 (median $\alpha = .94$) in Sample 3. Cronbach's alphas for the 22 facets ranged from .73 to .90 (median $\alpha = .81$) in Sample 1 and from .83 to .94 (median $\alpha = .89$) in Sample 3.

NEO Personality Inventory-3 (NEO-PI-3; McCrae et al. 2005): Sample 1 (session1) The NEO-PI-3 contains 240 items; each domain has six 8-item facet scales. The NEO-PI-3 is a revised version of the NEO-PI-R, in which 38 items were modified to make the instrument more suitable for younger respondents and those with lower educational levels. Respondents rate their level of agreement with each statement on a five-point Likert scale (*strongly disagree, disagree, neutral or cannot decide, agree, strongly agree*). Cronbach's alphas for the domain scores ranged from .83 to .93 (median $\alpha = .88$); corresponding values for the facets ranged from .52 to .81 (median $\alpha = .78$).

Big Five Inventory-2 (BFI-2; Soto and John 2017): Sample 2 In the BFI-2, each domain contains three facets. The BFI-2 consists of 60 statements to which the respondents rate their level of agreement on a five-point Likert scale (*disagree strongly, disagree a little, neutral; no opinion, agree a little, agree strongly*). Cronbach's alphas for the domains ranged from .86 to .94 (median $\alpha = .91$); values for the facets ranged from .72 to .90 (median $\alpha = .80$). Note that descriptive statistics for all measures described are included in Supplemental Tables A to E.

Results

Preliminary Analyses

Creation of Composite Tripartite-Model Scales in Sample 2 IDAS-II Dysphoria, Panic, and Well-being correlated .88, .87, and − .89, respectively, with Mini-MASQ General Distress, Anxious Arousal, and Anhedonic Depression (see Watson et al. 2017, Table 1). Accordingly, three composite scores were created by standardizing the scales and combining the scores of each pair to weight them equally in the composite.

Creation of Composite Personality Domain and Facet Scales in Sample 1 Many of the NEO-PI-3 and FI-FFM scales have been shown to assess the same underlying traits (see Watson et al. 2019). Consequently, in Sample 1, we created composite measures based on correlations between FI-FFM and NEO-PI-3 scales reported in the FI-FFM scale development article (Watson et al. 2019) and correlations in the Sample 1 data, in which correlations between domain scores were .83 for N/NE, .81 for Extraversion, .86; Conscientiousness, .79 for Agreeableness, and .75 for Openness. Table 1 presents correlations between corresponding facets used to create lower order composites in Sample 1. Scores were standardized and aggregated for each set of domain and facet scales. Correlations between NEO-PI-3 domains and FI-FFM domains, as well as NEO-PI-3 facets and FI-FFM facets by domains are reported in Supplemental Tables F to K.

Attrition Analyses for Sample 1 Seven percent of the Sample 1 participants did not complete session 2. To determine the effect of attrition on session 2 data, we conducted independent samples *t*-tests comparing mean levels of personality scores between participants who completed versus attritted from session 2. Of the 40 *t*-tests conducted, only two (5%) were significant: Individuals who did not participate in session 2 had higher mean scores on the Conscientiousness facets of Order and Deliberation (Supplemental Table L); both effect sizes were small in magnitude (for Order, $d = 0.38$; for Deliberation, $d = 0.39$) (Cohen 1992a, b).

Slightly more than a third (33.6%) of the Sample 1 participants did not complete session 3. To determine the effect of attrition on session 3 data, we conducted independent samples *t*-tests comparing mean levels of participants' psychopathology and personality scores between participants who completed versus attritted from session 3. Of the 43 *t*-tests conducted, 10 (23.3%) indicated a significant difference in mean levels of psychopathology/personality: Individuals who did not attend session 3 had higher levels of psychopathology and Neuroticism (see Supplemental Tables M and N); all of these effect sizes were small in magnitude (*d*s ranged from .23 to .49).

Correlations between Symptom Measures Across all three samples, correlations for general distress with the other two symptom dimensions were consistently higher than correlations between the two specific factors. Correlations between general distress and anxious arousal ranged from .63 to .78, with a weighted mean $r = .70$; for general distress and anhedonia, *r*s ranged from .29 to .62, weighted mean $r = .45$; for anxious arousal and anhedonia, *r*s ranged from .12 to .20, weighted mean $r = .17$.

Mean Level Comparisons across Samples To determine whether the level of psychopathology differed across samples, we conducted *t*-tests comparing the means of the three IDAS-II scales representing the tripartite-model constructs. The results are reported in Table 2. In general, the Sample 3 participants reported the highest level of psychopathology, including

Table 1 Correlations between Corresponding FI-FFM and NEO PI-3 Facets Used to Create Composites in Sample 1

Composite scale	FI-FFM facet	NEO PI-3 facet	*r*
Neuroticism			
Anxiety	Anxiety	Anxiety	.81
Depression	Depression	Depression	.70
Anger	Anger Proneness	Angry Hostility	.77
Extraversion			
Sociability	Sociability	Gregariousness	.62
Assertiveness	Ascendance	Assertiveness	.72
Excitement-Seeking	Venturesomeness	Excitement-Seeking	.71
Positive Temperament	Positive Temperament	Activity	.64
		Positive Emotions	.60
Conscientiousness			
Order	Order	Order	.77
Dutifulness	Dutifulness	Dutifulness	.71
Achievement Striving	Achievement Striving	Achievement Striving	.70
Self-Discipline	Self-Discipline	Self-Discipline	.73
Deliberation	Deliberation	Deliberation	.73
Agreeableness			
Trust	Trust	Trust	.82
Straightforwardness	Straightforwardness	Straightforwardness	.65
Empathy	Empathy	Altruism	.60
Openness			
Intellectance	Intellectance	Aesthetics	.70
		Ideas	.58

$N = 409$

FI-FFM Faceted Inventory of the Five-Factor Model; *NEO PI-3* NEO Personality Inventory-3

significantly higher levels of Panic than respondents in Sample 2, and lower scores on Well-Being than both of the other samples. The Sample 1 participants were intermediate: They had higher scores on Panic and lower levels of Well-Being than those in Sample 2. There were no significant differences in the level of psychopathology between session 2 and session 3 in Sample 1.

Domain Level Analyses

The distributions for the scales representing anxious arousal (i.e., the Mini-MASQ Anxious Arousal scale and IDAS-II Panic Scale) were highly positively skewed (skewness = 1.32 to 2.21, mean skewness = 1.75) and leptokurtic (kurtosis = 4.16 to 8.07; mean kurtosis = 5.88; see

Table 2 T-tests of IDAS-2 Scales across Samples

Scale	Sample 1 Session 2		Sample 1 Session 3		Sample 2		Sample 3	
	$N = 409$		$n = 292$		$N = 451$		$N = 353$	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Dysphoria	20.6^{ab}	8.61	19.8^{a}	8.07	20.2^{a}	8.53	21.5^{abs}	9.38
Panic	13.3^{a}	5.89	12.8^{a}	5.76	11.3^{bm}	4.81	12.6^{a}	6.09
Well-being	23.7^{a}	6.31	23.7^{a}	6.33	21.3^{bm}	7.80	18.1^{cl}	7.64

Means with the same superscript are not significantly different from each other after Bonferroni correction. Italicized superscripts indicate effect sizes: *s* = small (< .30); *m* = medium (.30 to .50); *l* = large (> .50). Effect sizes for Dysphoria are small; those for Panic are medium; and those for Well-being are medium for comparisons involving Sample 2 and both Sample 1 sessions, medium for the Sample 2–Sample 3 comparison, and large for Sample 3 versus both Sample 1 sessions

Table 3 Spearman Correlations for Big 5 Domains with Tripartite Constructs

	General Distress[a]	Anxious Arousal[b]	Anhedonia[c]
Neuroticism/Negative Emotionality			
Sample 1 Session 2: NEO-PI-3/FI-FFM	**.66**	**.55**	**.39**
Sample 1 Session 3: NEO-PI-3/FI-FFM	**.61**	**.53**	.27
Sample 2: BFI-2	**.82**	**.52**	**.68**
Sample 3: FI-FFM	**.79**	**.59**	**.59**
Weighted mean correlation	**.72**	**.55**	**.52**
Extraversion			
Sample 1 Session 2: NEO-PI-3/FI-FFM	−.29	−.20	**−.41**
Sample 1 Session 3: NEO-PI-3/FI-FFM	−.28	−.20	**−.37**
Sample 2: BFI-2	**−.52**	−.27	**−.67**
Sample 3: FI-FFM	**−.40**	−.22	**−.56**
Weighted mean correlation	**−.39**	−.23	**−.53**
Conscientiousness			
Sample 1 Session 2: NEO-PI-3/FI-FFM	**−.47**	**−.35**	**−.43**
Sample 1 Session 3: NEO-PI-3/FI-FFM	**−.42**	**−.30**	**−.38**
Sample 2: BFI-2	**−.47**	**−.31**	**−.42**
Sample 3: FI-FFM	**−.48**	**−.36**	**−.35**
Weighted mean correlation	**−.46**	**−.34**	**−.40**
Agreeableness			
Sample 1 Session 2: NEO-PI-3/FI-FFM	−.28	−.27	−.24
Sample 1 Session 3: NEO-PI-3/FI-FFM	**−.33**	**−.36**	−.17
Sample 2: BFI-2	**−.37**	−.27	**−.39**
Sample 3: FI-FFM	−.21	−.24	−.16
Weighted mean correlation	**−.30**	−.28	−.26
Openness/Open-Mindedness			
Sample 1 Session 2: NEO-PI-3/FI-FFM	−.02	−.01	−.14
Sample 1 Session 3: NEO-PI-3/FI-FFM	−.11	−.14	−.11
Sample 2: BFI-2	−.12	−.09	−.21
Sample 3: FI-FFM	−.03	−.02	−.15
Weighted mean correlation	−.07	−.06	−.16

n = 409, 292, 451, and 353 for Sample 1 Session 2, Sample 1 Session 3, Sample 2, and Sample 3 respectively. [a] In Sample 1 and 3 = IDAS-II Dysphoria; in Sample 2 = average of standardized Mini-MASQ General Distress scale and IDAS-II Dysphoria scale. [b] In Sample 1 and 3 = IDAS-II Panic scale; in Sample 2 = average of standardized Mini-MASQ Anxious Arousal scale and IDAS-II Panic scale. [c] In Sample 1 and 3 = reverse-scored IDAS-II Well-being scale; in Sample 2 = average of standardized Mini-MASQ Anhedonia scale and reverse scored IDAS-II Well-being scale. Correlations ≥ |.30| are bolded

Supplemental Tables A to E), such that distributions for these scales were thin tailed. When data are not normally distributed, it is recommended that Spearman rather than Pearson correlations be used to increase the power and precision of the analyses (de Winter et al. 2016). Therefore, Spearman correlations were computed for all bivariate associations.

Weighted mean zero-order bivariate correlations between the Big 5 personality domains and the tripartite constructs are reported in Table 3. Weighted mean correlations were computed by transforming Spearman ρ to Fischer's z and averaging them with sample size as a weight before transforming the averaged *z*-score back to Spearman's ρ. As hypothesized, N/NE had the strongest overall links to the symptom dimensions (weighted mean ρs ranged from .52 to .72). When correlations were compared using the Williams correction to the Hotelling test, the N/NE domain was shown to correlate significantly more strongly with general distress than with anxious arousal ($z = 5.64$, $p < .05$) and anhedonia ($z = 5.51$, $p < .05$). Except for the weaker correlation between Extraversion and Anxious Arousal (weighted mean $\rho = -.23$), Extraversion and Conscientiousness displayed moderate negative associations with tripartite domains (weighted mean ρs ranged from −.34 to −.53), whereas Agreeableness and Openness had relatively weak relations in these data (weighted mean ρs ranged from −.06 to −.30).

In terms of the tripartite constructs, General Distress correlated very strongly (weighted mean $\rho = .72$) with N/NE; moderately with Conscientiousness, Extraversion, and Agreeableness (mean ρs ranged from −.30 to −.46); and weakly with Openness (weighted mean $\rho = -.07$). Anxious Arousal showed a similar pattern, albeit its relations tended to be weaker in magnitude: It correlated mostly strongly with N/NE ($\rho = .55$); more moderately with Conscientiousness, Agreeableness, and Extraversion (mean ρs ranged from −.23 to −.34); and weakly with Openness (weighted mean $\rho = -.06$). In contrast, Anhedonia displayed a somewhat different pattern. It had its strongest associations with both N/NE (weighted mean $\rho = .52$) and Extraversion (weighted mean $\rho = -.53$); a moderate link to Conscientiousness (weighted mean $\rho = -.40$); and somewhat weaker links to Agreeableness (weighted mean $\rho = -.26$) and Openness (weighted mean $\rho = -.16$). Notably, these correlational patterns were consistent across personality measures, samples, and time points.

Facet-Level Analyses

General Distress

Spearman correlations between the tripartite symptom dimensions and personality facets of the five domains are reported in Tables 4, 5, 6, 7 and 8. The tables are organized by personality domain whereas the results are discussed by tripartite model constructs to allow for more efficient presentation; an overview of the most relevant results is reported in Supplemental Table O. General distress correlated the most strongly[3] with the Depression facet of N/NE ($\rho = .71$ to .82, mean $\rho = .78$), although it consistently had substantial links to all other N/NE facets ($\rho = .34$ to .74, mean $\rho = .55$; Table 4). To test the specificity of these relations, we compared the correlation of general distress with the Depression facet versus all other N/NE facets (see Supplemental Table P) using the Williams correction to the Hotelling test. These analyses revealed that the Depression facet was a significantly stronger predictor ($p < .05$) of general distress than the other N/NE facets in all 13 comparisons, even after correcting for multiple comparisons.

Furthermore, when we ran multiple regressions[4] with all the N/NE facets predicting general distress, the standardized betas of the Depression facet were substantially larger than those of the other facets (.46 to .59 vs. -.10 to .25). The presence of multiple suppressor effects (Watson et al. 2013) across the other N/NE facets, yielding mostly standardized betas of near zero and even a few negative values, showcases that only the unique component of the Depression facet is a strong predictor of general distress above and beyond the general N/NE variance shared among all lower order traits.

In addition to its strong links with N/NE, general distress showed moderately strong links with several Extraversion (Table 5), Conscientiousness (Table 6), and Agreeableness (Table 7) facets. Specifically, general distress displayed moderately strong links with the low Energy/Positive Temperament facet of Extraversion ($\rho = -.35$ to −.56, mean $\rho = -.48$). Furthermore, it had moderately strong links with the Self-Discipline, Dutifulness, Responsibility, Productiveness, and Competence facets of Conscientiousness ($\rho = -.34$ to −.53, mean $\rho = -.46$), and with the Trust facet of Agreeableness ($\rho = -.34$ to −.43, mean $\rho = -.37$). General distress was weakly correlated with all Openness facets ($\rho = -.21$ to .13, mean $\rho = -.10$; Table 8).

Longitudinal Links The pattern of longitudinal relations between personality facets and General Distress (Sample 1 Session 3; Table 4) was consistent with the cross-sectional results, such that the Depression facet (Neuroticism; $\rho = .64$) was the strongest predictor of General Distress. Follow-up tests revealed that the Depression facet was a significantly better predictor ($p < .05$) of general distress than the other N/NE facets in all 7 comparisons, both before and after correcting for multiple comparisons. Furthermore, when multiple regressions were conducted, the standardized beta for Depression ($\beta = .46$) was substantially larger than those of other Neuroticism facets ($\beta = -.07$ to .15).

Anxious Arousal

Anxious arousal correlated most strongly with the FI-FFM N/NE facet of Somatic Complaints ($\rho = .58$ and .65 in samples 1 and 3 respectively), and had non-significantly lower correlations with the Depression facet of N/NE ($\rho = .55$ and .57 in samples 1 and 3 respectively). Anxious arousal also correlated moderately ($\rho = .25$ to .49) with the other facets of N/NE, although never as strongly as did general distress. When we compared the correlation of anxious arousal with Somatic Complaints versus the other N/NE facets (see Supplemental Table Q), Somatic Complaints had a significantly stronger association ($p < .05$) in 10 of 11 comparisons (90.9%). However, it was not a significantly stronger predictor than the Depression facet at either Sample 1 time point. After correcting for multiple comparisons, Somatic Complaints was no longer a significantly stronger predictor than the Depression, Anxiety, and Hostility facets at Sample 1 Session 2 and was no longer a significantly stronger predictor than the Depression facet in Sample 3.

Moreover, when we ran multiple regressions using all the N/NE facets to predict anxious arousal, the standardized betas

[3] According to Cohen (1992a, b), $r \geq |.10|$ represents a small effect, $r \geq |.30|$ represents a medium effect, and $r \geq |.50|$ represents a large effect.

[4] As we had used Spearman correlations to calculate bivariate analyses, we ranked the raw data before conducting multiple regressions.

Table 4 Neuroticism/Negative Emotionality Facets' Spearman Correlations and Standardized Regression Weights with Tripartite Constructs

	General Distress[a]		Anxious Arousal[b]		Anhedonia[c]	
	ρ	std β	ρ	std β	ρ	std β
Sample 1: NEO-PI-3 and FI-FFM						
Session 2 IDAS-2 ($N = 409$)						
C: Anxiety	**.58**	.09	**.49**	.04	.28	.17
C: Depression	**.71***	**.59***	**.55**	**.37***	**.46***	**.48***
C: Hostility	**.51**	.04	**.48**	.17	.24	.14
NEO: Self consciousness	**.48**	.03	**.33**	−.05	**.32**	−.03
NEO: Impulsiveness	**.40**	.03	**.31**	.03	.26	−.03
NEO: Vulnerability	**.49**	−.07	**.34**	−.15	**.40**	−.22
FI-FFM: Somatic Complaints	**.53**	.14	**.58***	**.38***	.25	−.01
FI-FFM: Envy	**.34**	−.10	.25	−.16	.25	−.03
Session 3 IDAS-2 ($n = 292$)						
C: Anxiety	**.51**	.03	**.42**	−.02	.18	−.13
C: Depression	**.64***	**.46***	**.51***	**.31**	**.32***	.25
C: Hostility	**.47**	.09	**.44**	.15	.17	−.09
NEO: Self consciousness	**.42**	.00	**.30**	−.09	.26	.11
NEO: Impulsiveness	**.38**	.03	**.32**	.04	.25	.11
NEO: Vulnerability	**.50**	.05	**.38**	.00	.29	.16
FI-FFM: Somatic Complaints	**.47**	.15	**.52***	**.36***	.14	−.05
FI-FFM: Envy	**.33**	−.07	.29	−.08	.15	.01
Sample 2: BFI-2 ($N = 451$)						
Anxiety	**.74**	.25	**.46***	.12	**.59**	.10
Depression	**.82***	**.58***	**.47***	.19	**.79***	**.86***
Emotional Volatility	**.64**	.07	**.48***	.25	**.43**	−.22
Sample 3: FI-FFM ($N = 353$)						
Anxiety	**.66**	.06	**.45**	−.14	**.52**	.13
Depression	**.80***	**.58***	**.57**	**.30**	**.68***	**.72***
Anger Proneness	**.63**	.04	**.49**	.10	**.42**	−.16
Somatic Complaints	**.66**	.22	**.65***	**.50***	**.40**	−.06
Envy	**.55**	.03	**.37**	−.03	**.43**	.03

ρ = Spearman's rho. Std. β = standardized beta weight. C = Composite scales created for sample 1 Big Five facets. [a] In Sample 1 and 3 = IDAS-II Dysphoria; in Sample 2 = average of standardized Mini-MASQ General Distress scale and IDAS-II Dysphoria scale. [b] In Sample 1 and 3 = IDAS-II Panic scale; in Sample 2 = average of standardized Mini-MASQ Anxious Arousal scale and IDAS-II Panic scale. [c] In Sample 1 and 3 = reverse-scored IDAS-II Well-being scale; in Sample 2 = average of standardized Mini-MASQ Anhedonia scale and reverse scored IDAS-II Well-being scale. Correlations ≥ |.30| are bolded. *Facets with the strongest correlation in each sample, within ± .01 and if ≥ |.30|

of Somatic Complaints (βs = .38 and .50 in samples 1 and 3 respectively) were consistently the largest, with the values for the Depression facet (βs = .37 and .30 in samples 1 and 3 respectively) a close second. Similar to general distress, the multiple suppressor effects across the other N/NE facets, yielding mostly standardized betas near zero and even some negative ones, highlight that only the unique components of the Somatic Complaints and Depression facets are substantial predictors of anxious arousal above and beyond the shared variance across all N/NE facets.

Anxious arousal was weakly to moderately related to the facets of the Extraversion (Table 5), Conscientiousness (Table 6), Agreeableness (Table 7), and Openness (Table 8) domains. Although several facets (e.g., Sample 3 Positive Temperament; Table 5) were more strongly linked to anxious arousal compared to the other facets within the same domain, none of these facet-level relations replicated consistently across samples.

Longitudinal Links The pattern of longitudinal relations between personality facets and Anxious Arousal (Sample 1 Session 3; Table 4) was consistent with the cross-sectional results such that the Somatic Complaints ($\rho = .52$) and Depression facets ($\rho = .51$) were the strongest predictors of

Table 5 Extraversion Facets' Spearman Correlations and Standardized Regression Weights with Tripartite Constructs

	General Distress[a]		Anxious Arousal[b]		Anhedonia[c]	
	ρ	std β	ρ	std β	ρ	std β
Sample 1: NEO-PI-3 and FI-FFM						
Session 2 IDAS-2 ($N = 409$)						
C: Sociability	−.28	−.19	−.22	−.16	−.28	−.06
C: Assertiveness	−.19	−.06	−.11	−.02	−.28	−.07
C: Excitement-Seeking	−.07	.18	−.05	.11	−.18	.10
C: Positive Temperament	**−.35***	**−.34***	−.24	−.23	**−.48***	**−.44***
NEO: Warmth	−.28	−.03	−.21	−.02	**−.35**	−.07
FI-FFM: Frankness	−.01	.10	.05	.12	−.11	.04
Session 3 IDAS-2 ($n = 292$)						
C: Sociability	−.25	−.16	−.18	−.04	−.23	−.05
C: Assertiveness	−.18	−.07	−.08	−.01	−.28	−.11
C: Excitement-Seeking	−.07	.14	−.02	.11	−.16	.10
C: Positive Temperament	**−.32***	−.26	−.26	−.22	**−.42***	**−.36***
NEO: Warmth	−.27	−.06	**−.30***	−.19	−.29	−.06
FI-FFM: Frankness	−.03	.05	−.04	.10	−.13	−.02
Sample 2: BFI-2 ($N = 451$)						
Sociability	**−.41**	−.08	−.19	−.01	**−.54**	−.15
Assertiveness	**−.38**	−.09	−.18	−.03	**−.42**	.03
Energy Level	**−.56***	**−.46***	**−.30***	−.28	**−.77***	**−.69***
Sample 3: FI-FFM ($N = 353$)						
Positive Temperament	**−.52***	**−.50***	**−.32***	**−.33***	**−.69***	**−.65***
Sociability	**−.37**	−.19	−.26	−.17	**−.42**	−.04
Ascendance	−.27	−.03	−.07	.15	**−.41**	−.06
Venturesomeness	−.23	.21	−.15	.03	**−.40**	.06
Frankness	−.20	−.07	−.06	−.00	−.28	−.05

ρ = Spearman's rho. Std. β = standardized beta weight. C = Composite scales created for sample 1 Big Five facets. [a] In Sample 1 and 3 = IDAS-II Dysphoria; in Sample 2 = average of standardized Mini-MASQ General Distress scale and IDAS-II Dysphoria scale. [b] In Sample 1 and 3 = IDAS-II Panic scale; in Sample 2 = average of standardized Mini-MASQ Anxious Arousal scale and IDAS-II Panic scale. [c] In Sample 1 and 3 = reverse-scored IDAS-II Well-being scale; in Sample 2 = average of standardized Mini-MASQ Anhedonia scale and reverse scored IDAS-II Well-being scale. Correlations ≥ |.30| are bolded. *Facets with the strongest correlation in each sample, within ± .01 and if ≥ |.30|

Anxious Arousal. Follow-up tests revealed that Somatic Complaints was a significantly stronger predictor of Anxious Arousal compared to all other N/NE facets, except Depression and Hostility (Supplemental Table Q). However, after multiple comparison corrections, Somatic Complaints was no longer a significantly stronger predictor than the Depression, Anxiety, Hostility, and Vulnerability facets. Nevertheless, when multiple regressions were conducted, the standardized beta of Somatic Complaints (β = .36) was the largest, with the standardized beta of Depression (β = .31) a close second.

Anhedonia

Anhedonia correlated most strongly with the low Energy/Positive Temperament component (i.e., the Positive Temperament composite in Sample 1; BFI-2 Energy Level in Sample 2; FI-FFM Positive Temperament in Sample 3) of Extraversion ($\rho = -.48$ to $-.77$, mean $\rho = -.65$). However, it also had comparable correlations with the Depression facet ($\rho = .46$ to .79, mean $\rho = .64$) of N/NE. Although it generally had weak correlations with the other N/NE facets of Sample 1 ($\rho = .24$ to .40; median $\rho = .26$), it correlated more strongly with the BFI-2 and FI-FFM N/NE facets in Samples 2 and 3 (range = .40 to .59; median $\rho = .43$). Similarly, anhedonia correlated moderately with the other Extraversion facets in Sample 1 ($\rho = -.11$ to $-.35$, median = $-.28$), and more strongly with the other Extraversion facets in Samples 2 and 3 (range = $-.28$ to $-.54$; median = $-.42$). When we compared the correlations of anhedonia with Energy/Positive Temperament versus all other Extraversion facets (see Supplemental Table R), we found that Energy/Positive

Table 6 Conscientiousness Facets' Spearman Correlations and Standardized Regression Weights with Tripartite Constructs

	General Distress[a]		Anxious Arousal[b]		Anhedonia[c]	
	ρ	std β	ρ	std β	ρ	std β
Sample 1: NEO-PI-3 and FI-FFM						
Session 2 IDAS-2 ($N = 409$)						
C: Order	**−.34**	−.02	−.25	−.01	−.27	−.02
C: Dutifulness	**−.35**	.04	−.29	−.03	**−.36**	−.08
C: Achievement Striving	−.27	.11	−.20	.08	**−.45***	−.28
C: Self-Discipline	**−.49***	**−.39***	**−.36***	−.27	**−.37**	−.07
C: Deliberation	**−.35**	−.11	−.28	−.13	−.22	.08
NEO: Competence	**−.42**	−.19	−.29	−.06	**−.41**	−.18
Session 3 IDAS-2 ($n = 292$)						
C: Order	−.26	.08	−.20	.00	−.25	−.03
C: Dutifulness	**−.34**	−.03	**−.31***	−.19	−.27	.01
C: Achievement Striving	−.23	.15	−.11	.20	**−.40***	−.29
C: Self-Discipline	**−.42***	−.04	−.28	−.16	**−.31**	−.05
C: Deliberation	**−.31**	−.11	−.25	−.10	−.24	−.04
NEO: Competence	**−.38**	−.18	−.27	−.12	**−.33**	−.09
Sample 2: BFI-2 ($N = 451$)						
Organization	−.17	.12	−.11	.09	−.19	.05
Productiveness	**−.51***	**−.40***	**−.30**	−.15	**−.47***	**−.46***
Responsibility	**−.46**	−.22	**−.33***	−.26	**−.36**	−.04
Sample 3: FI-FFM ($N = 353$)						
Self-Discipline	**−.53***	**−.50***	**−.34**	−.17	**−.38**	−.29
Dutifulness	**−.45**	−.18	**−.39***	**−.35***	**−.31**	−.08
Deliberation	−.20	.11	−.20	.05	−.03	.24
Achievement Striving	**−.37**	−.11	−.21	.01	**−.44***	**−.33***
Order	**−.32**	.15	−.24	.08	−.24	.03

ρ = Spearman's rho. Std. β = standardized beta weight. C = Composite scales created for sample 1 Big Five facets. [a] In Sample 1 and 3 = IDAS-II Dysphoria; in Sample 2 = average of standardized Mini-MASQ General Distress scale and IDAS-II Dysphoria scale. [b] In Sample 1 and 3 = IDAS-II Panic scale; in Sample 2 = average of standardized Mini-MASQ Anxious Arousal scale and IDAS-II Panic scale. [c] In Sample 1 and 3 = reverse-scored IDAS-II Well-being scale; in Sample 2 = average of standardized Mini-MASQ Anhedonia scale and reverse scored IDAS-II Well-being scale. Correlations ≥ |.30| are bolded. *Facets with the strongest correlation in each sample, within ± .01 and if ≥ |.30|

Temperament was a significantly stronger predictor ($p < .05$) in all 11 comparisons, even after correcting for multiple comparisons.

Furthermore, when we ran multiple regressions with all the Extraversion facets predicting anhedonia, the standardized betas of Energy/Positive Temperament (βs = −.46 to −.69) were consistently larger than those for the other Extraversion facets (βs = −.15 to .10). Moreover, as before, these analyses yielded mostly near zero and some positive standardized betas for the other Extraversion facets, highlighting that only the unique component of Energy/Positive Temperament is a strong predictor of anhedonia above and beyond its shared variance with the other Extraversion facets.

In addition to its links with N/NE and Extraversion, anhedonia had moderately strong correlations with several Conscientiousness facets (Table 6), including Self-Discipline, Competence, Productiveness, Responsibility, and Achievement Striving ($\rho = -.36$ to $-.47$, mean $\rho = .38$). Anhedonia generally had weak correlations with the Agreeableness (Table 7) and Openness (Table 8) facets.

Longitudinal Links The pattern of longitudinal relations (Sample 1, Session 3) was consistent with the cross-sectional results: The Positive Temperament facet ($\rho = -.42$; Table 5) was the strongest predictor of Anhedonia. Follow-up tests revealed that Positive Temperament was a significantly stronger predictor of Anhedonia than all other Extraversion facets (Supplemental Table R). However, after correcting for multiple comparisons, Positive Temperament was no longer a significantly stronger predictor than the Assertiveness and Warmth facets. Nevertheless, when multiple regressions were conducted, the standardized beta of Positive Temperament

Table 7 Agreeableness Facets' Spearman Correlations and Standardized Regression Weights with Tripartite Constructs

	General Distress[a]		Anxious Arousal[b]		Anhedonia[c]	
	ρ	std β	ρ	std β	ρ	std β
Sample 1: NEO-PI-3 and FI-FFM						
Session 2 IDAS-2 ($N = 409$)						
C: Trust	**−.34***	−.29	**−.31***	−.21	−.21	−.13
C: Straightforwardness	−.24	−.21	−.19	−.09	−.18	−.11
C: Empathy	−.12	.10	−.13	.09	**−.33***	**−.31***
NEO: Modesty	.13	−.22	.08	−.18	.16	−.24
NEO: Compliance	−.23	−.06	−.29	−.18	−.05	.11
NEO: Tender-mindedness	−.02	.01	−.04	−.01	−.14	−.01
FI-FFM: Modesty	−.13	.06	−.15	.10	−.10	−.03
Session 3 IDAS-2 ($n = 292$)						
C: Trust	**−.34***	−.26	**−.37***	−.26	−.16	−.11
C: Straightforwardness	−.28	−.24	−.23	−.08	−.17	−.20
C: Empathy	−.14	.15	−.20	−.00	−.24	−.18
NEO: Modesty	.10	.26	.01	.14	.23	.29
NEO: Compliance	−.29	−.13	**−.31***	−.15	−.03	.08
NEO: Tender-mindedness	−.02	.02	−.02	.09	−.13	−.07
FI-FFM: Modesty	−.20	−.16	−.23	−.15	−.01	.07
Sample 2: BFI-2 ($N = 451$)						
Compassion	−.18	.14	−.16	.06	−.26	−.04
Respectfulness	**−.31**	−.19	−.28	−.23	−.26	.01
Trust	**−.43***	**−.39***	−.24	−.15	**−.45***	**−.43***
Sample 3: FI-FFM ($N = 353$)						
Trust	**−.35***	−.27	**−.34***	**−.30***	−.28	−.26
Straightforwardness	**−.34***	**−.31***	−.28	−.12	−.14	−.09
Empathy	−.17	.12	−.21	.06	−.12	−.02
Modesty	−.11	.04	−.22	−.12	−.05	.15

ρ = Spearman's rho. Std. β = standardized beta weight. C = Composite scales created for sample 1 Big Five facets. [a] In Sample 1 and 3 = IDAS-II Dysphoria; in Sample 2 = average of standardized Mini-MASQ General Distress scale and IDAS-II Dysphoria scale. [b] In Sample 1 and 3 = IDAS-II Panic scale; in Sample 2 = average of standardized Mini-MASQ Anxious Arousal scale and IDAS-II Panic scale. [c] In Sample 1 and 3 = reverse-scored IDAS-II Well-being scale; in Sample 2 = average of standardized Mini-MASQ Anhedonia scale and reverse scored IDAS-II Well-being scale. Correlations ≥ |.30| are bolded. *Facets with the strongest correlation in each sample within ± .01 and if ≥ |.30|

(β = −.36) was substantially larger than all other Extraversion facets (βs = −.11 to .10).

Discussion

Summary of Results

The tripartite model (i.e., general distress, anhedonia, and anxious arousal dimensions) was developed to explain both the strong overlap and differentiating features of anxiety and depression. Past studies have found N/NE to be elevated across all tripartite constructs, although it best predicts general distress. Anhedonia is differentiated from general distress primarily through its low extraversion component. Anxious arousal has shown the weakest links to personality. The present study extends this literature—and informs dimensional classification systems of psychopathology such as the HiTOP model—by reporting on facet-level links between the five-factor model personality traits and the tripartite model constructs using three faceted personality inventories (BFI-2, NEO-PI-3, and FI-FFM) in three different samples. Another key strength of our study is testing the replicability of cross-sectional results over a 10-month interval.

These study strengths aligned with our three main goals: (1) to identify distinctive personality-facet relations for each tripartite model construct, (2) to test the replicability of facet-level relations across different personality measures, and (3) to test the replicability of the facet-level relations in predicting the tripartite symptom dimensions longitudinally. Results

Table 8 Openness Facets' Spearman Correlations and Standardized Regression Weights with Tripartite Constructs

	General Distress[a]		Anxious Arousal[b]		Anhedonia[c]	
	ρ	std β	ρ	std β	ρ	std β
Sample 1: NEO-PI-3 and FI-FFM						
Session 2 IDAS-2 ($N = 409$)						
C: Intellectance	−.06	.05	.02	−.05	−.20	.13
NEO: Actions	−.19	.22	−.17	.21	−.12	.11
NEO: Values	−.10	.16	−.11	.17	−.03	.01
NEO: Feelings	−.07	.07	−.08	.07	−.10	−.04
NEO: Fantasy	−.11	.14	−.11	.11	−.03	.03
FI-FFM: Novel Experience Seeking	−.07	.01	−.04	.01	−.21	.16
FI-FFM: Nontraditionalism	.13	−.22	.08	−.17	.20	.29
Session 3 IDAS-2 ($n = 292$)						
C: Intellectance	−.11	−.07	−.14	−.08	−.18	−.19
NEO: Actions	−.23	−.29	−.15	−.14	−.04	−.07
NEO: Values	−.09	−.11	−.12	−.14	−.12	.16
NEO: Feelings	−.02	−.03	−.07	−.03	−.17	−.16
NEO: Fantasy	.05	.10	−.07	−.02	−.02	.05
FI-FFM: Novel Experience Seeking	−.09	.03	−.09	.03	−.12	−.07
FI-FFM: Nontraditionalism	.13	.25	.08	.20	.20	.20
Sample 2: BFI-2 ($N = 451$)						
Intellectual Curiosity	−.14	−.06	−.09	−.00	−.21	−.09
Aesthetic Sensitivity	−.04	.12	−.03	.08	−.04	.05
Creative Imagination	−.18	−.17	−.15	−.16	−.24	−.19
Sample 3: FI-FFM ($N = 353$)						
Intellectance	−.13	−.08	−.08	.02	−.19	−.12
Novel Experience Seeking	−.21	−.24	−.23	−.26	−.26	−.26
Nontraditionalism	−.10	.20	−.03	.05	−.06	.18

ρ = Spearman's rho. Std. β = standardized beta weight. C = Composite scales created for sample 1 Big Five facets. [a] In Sample 1 and 3 = IDAS-II Dysphoria; in Sample 2 = average of standardized Mini-MASQ General Distress scale and IDAS-II Dysphoria scale. [b] In Sample 1 and 3 = IDAS-II Panic scale; in Sample 2 = average of standardized Mini-MASQ Anxious Arousal scale and IDAS-II Panic scale. [c] In Sample 1 and 3 = reverse-scored IDAS-II Well-being scale; in Sample 2 = average of standardized Mini-MASQ Anhedonia scale and reverse scored IDAS-II Well-being scale. Correlations ≥ |.30| are bolded. *Facets with the strongest correlation in each sample, within ± .01 and if ≥ |.30|

showed that at the domain level, N/NE, Extraversion, and Conscientiousness were the strongest predictors of the tripartite-model symptoms. At the facet level, general distress and anhedonia were most strongly related to the Depression facet of N/NE. Anhedonia also was linked to the low Energy/Positive Temperament component of Extraversion, whereas anxious arousal was best predicted by the Somatic Complaints facet of N/NE, followed fairly closely by Depression. The pattern of these relations was highly replicable across personality measures and samples. The only exception was in Sample 2, which did not contain a Somatic Complaints scale because it did not include the FI-FFM, which currently is the only personality measure that includes this physically oriented component of N/NE. In this sample, Depression predicted anxious arousal fairly well ($\rho = .47$). Finally, the facet-level pattern also replicated quite well across a 10-month interval (the Session 2-to-3 analyses in Sample 1). These results suggest that the pattern of results is generalizable to predicting future levels of tripartite symptom dimension scores at least across a number of months.

Consensus with the Tripartite Model Literature

According to Clark and Watson's (1991) tripartite model, general distress is defined by high N/NE, whereas anhedonia is defined by both high N/NE and low extraversion. Consistent with the tripartite model and our hypotheses based on the model and subsequent literature, the N/NE domain was found to be elevated across all three tripartite constructs, though it was clearly and consistently a better marker of general distress compared to anhedonia and anxious arousal. Similarly, low extraversion showed greater specificity in relation to

anhedonia compared to general distress and anxious arousal. This is consistent with past studies that have shown the unique role of low extraversion in differentiating depressive from anxiety disorders (Bienvenu et al. 2004; Gamez et al. 2007; Subica et al. 2016; Watson and Naragon-Gainey 2014).

At the facet level, N/NE's Depression facet was the best marker of both general distress and anhedonia. This is consistent with Rector et al.'s (2012) study that showed strong links between MDD and N/NE's Depression facet. Anhedonia also was substantially linked with the low Energy/Positive Temperament component of extraversion, which is consistent with previous findings reported by Bienvenu et al. (2004) and Naragon-Gainey and Watson (2014). Taken together, this means that N/NE's Depression facet is shared by general distress and anhedonia, whereas the presence of low Energy/Positive Temperament differentiates anhedonia from general distress. This pattern of results replicated across samples, measures, and time points.

The Role of Somatic Complaints

Anxious arousal, which historically has the weakest links to personality, was most strongly related to the N/NE facet of Somatic Complaints, assessed by the FI-FFM. This result, while novel to the field, is unsurprising given that anxious arousal and Somatic Complaints both contain a substantial physical component. As was the case with general distress and anhedonia, this pattern of results replicated across samples and time points. Past studies have not been able to observe this relation due to using personality inventories that do not include a facet scale assessing physical manifestations of N/NE (e.g., HEXACO, BFI-2, and NEO-PI-3). However, Watson and Pennebaker (1989) previously stressed the importance of a physical component in N/NE by showing that trait negative affectivity (equivalent to N/NE) strongly and consistently correlated with health-complaint scales. Based on our results, it is reasonable to suggest that a Somatic Complaints facet should be considered for inclusion in other hierarchical measures of personality. It should be noted however, that Somatic Complaints did not remain a significantly stronger predictor of anxious arousal as compared to the consensual facets of Neuroticism (e.g. Depression, Anxiety, and Hostility facets; Naragon-Gainey & Watson, 2014) after adjusting for multiple comparisons. Therefore, the consensual facets of Neuroticism may be sufficient in predicting anxious arousal. However, more research is required before any conclusions can be drawn on the predictive ability of the Somatic Complaints facet.

The Importance of Personality Facets

As these key points of our findings underscore, we see substantial specificity of facet-level relations in predicting the tripartite symptom dimensions, especially within the Extraversion, Conscientiousness, and Agreeableness domains. The increased specificity at the facet level helps to pinpoint the dispositional core of symptom constructs. For example, although it is well known that anhedonia is strongly related to low Extraversion, linking it with the Extraversion domain as a whole does not clarify which components of Extraversion, if any, specifically predict and define anhedonia. However, based on our facet-level analyses, we were able to pinpoint the low Positive Temperament/Energy facet of Extraversion as the core component related to anhedonia. Similarly, when Extraversion facets were entered in a multiple regression to predict general distress, the results indicated the specific component of Energy/Positive Temperament drives this relation at the domain level. Further, the presence of suppressor effects indicates that the specific components of the other Extraversion facets (i.e., the variance remaining after partialling out their common Extraversion variance) may be either unrelated (e.g., NEO Warmth or FI-FFM Dominance) or slightly positively correlated (e.g., Excitement-Seeking) with general distress.

It also is noteworthy that the importance of facets differs across constructs. For example, general distress had nearly identical associations with the N/NE domain (mean ρ = .73) and its Depression facet (mean ρ = .75), demonstrating that the N/NE domain and facets both predict this symptom dimension similarly well. However, in the case of anhedonia, the Depression facet (mean ρ = .57) consistently shows a somewhat stronger relation with anhedonia than does the N/NE domain (mean ρ = .50) or any of its other facets. This suggests that general distress is defined by a non-specific elevation of the N/NE domain, whereas anhedonia is somewhat better defined by a specific elevation in the Depression facet. In the case of anhedonia, collapsing the Depression facet into a broader domain-level composite with the other N/NE facets actually reduces overall predictive power (for a general discussion of this issue, see Sackett et al. 2017). These results emphasize the need for researchers to consider the optimal level of the personality hierarchy for the relations of interest in a given context.

Clinical Implications of Study Findings

Recently, researchers have developed interventions designed specifically to target changes in Big 5 personality traits (Armstrong and Rimes 2016; Barlow et al. 2014; Roberts et al. 2017a). Relatedly, a meta-analysis by Roberts et al. (2017b) examined the effects of both clinical and non-clinical interventions on personality trait change. They found that interventions, even those that did not involve intentionally changing personality, were associated with positive trait changes, with the largest effects observed for neuroticism and extraversion. The specificity of these effects raises the

possibility of tailoring interventions to target those traits with particularly salient links to different types of psychopathology (see also Kotelnikova et al. in press). The results of the current study suggest that interventions focused broadly on treating depression and anxiety should specifically target the Depression (i.e. low mood) facet of Neuroticism, whereas interventions more specifically focused on treating depression should target the low Energy/ Positive Temperament facet of Extraversion.

The results of the current study can also be used to guide interventions that do not specifically target personality change. For example, our results suggest that depression is specifically linked with low Energy/ Positive Temperament, whereas panic disorder is specifically linked with elevated Somatic Complaints. Low energy/positive temperament could be emphasized when diagnosing depression to distinguish depression from panic disorders, whereas the presence of multiple physical complaints could be emphasized when diagnosing panic disorders from depression. Clinicians can then choose interventions that are the most related to this facet of Extraversion (e.g. behavioral activation approaches) in treating depression. Similarly, the specific link between anxious arousal and the Somatic Complaints facet suggests that individuals with panic disorders are particularly attuned to physical-health complaints. Based on this result, clinicians should choose interventions that focus on targeting the physiological arousal characteristic of panic disorder (e.g., interoceptive exposure).

Limitations and Future Directions

There have been increasing calls for psychopathology research to move from a focus on heterogenous categorical disorders to dimensional constructs (Haslam et al. 2012; Kotov et al. 2017; Markon and Krueger 2005). The current study adopts a dimensional approach by examining the links between personality facets and the tripartite-model symptom dimensions, thereby sharpening our knowledge of the nature of various internalizing symptoms. Strengths of this study include the replication of results across multiple samples and the use of three different faceted personality inventories. We also tested the stability of the results by assessing the tripartite constructs at two time points approximately 9.5 months apart. That said, the study also has several limitations to be addressed in future work. First, all measures were self-report questionnaires. To examine the generalizability of the results, the study needs to be replicated using a variety of assessment methods, such as interviews or informant ratings.

Moreover, none of the study samples contained all three faceted personality instruments, and it would be interesting to examine relations among facets of all three measures simultaneously in predicting the tripartite-model constructs. There also are several other faceted personality measures that could be used for these purposes, such as the Multidimensional Personality Questionnaire (MPQ; Tellegen 1982) and the Hogan Personality Inventory (HPI; Hogan and Hogan 1992). An interesting future direction would be to factor analyze multiple faceted personality inventories to obtain a consensual faceted personality structure (e.g., Naragon-Gainey and Watson 2014a, b; Naragon-Gainey et al. 2009; Watson et al. 2015) and then to examine consensual, aggregated factors in relation to the tripartite-model constructs.

Furthermore, a substantial proportion (33.6%) of Sample 1 participants dropped out of the study by session 3. One likely reason for the relatively high rates of attrition was the nature of the data-recruitment process. Many participants were of low socioeconomic status; in fact, less than half of the sample was currently employed at the beginning of the study (Watson et al. 2015). Given the unstable nature of their life circumstances, we were not able to locate some of these participants for follow-up testing. Our analyses also indicated that the participants who did not participate in session 3 had higher levels of psychopathology and N/NE compared to those who completed session 3, which is common in longitudinal studies (Allott et al. 2006; Fröjd et al. 2011). Past research has shown that this type of systematic attrition may bias the results of the study (Asendorpf et al. 2014; Hardy et al. 2009). Therefore, the longitudinal findings of the current study should be interpreted with caution and need to be replicated in future studies. Having said that, however, we also must emphasize that despite the high level of attrition, we obtained the same basic pattern of trait-symptom relations at session 2 and session 3, which increases confidence in our key findings.

Finally, as noted earlier, anxiety disorders are extremely heterogeneous and the tripartite model has been criticized as being insufficiently detailed to account for the broad range of symptoms subsumed by the anxiety disorders (Brown et al. 1998). Anxious arousal is now viewed as playing a more limited role as the specific component of panic disorder rather than anxiety disorders in general. More recent proposals such as the tri-level model of anxiety and depression or the HiTOP model represent broader nosological frameworks spanning internalizing, externalizing, and thought disorder symptoms. Our study focused specifically on internalizing dimensions. Therefore, it also will be important to examine personality facet level relations with externalizing and thought disorder symptom dimensions in future research.

Despite these limitations, this study helped pinpoint the core trait relations of the tripartite model dimensions. General distress and anhedonia were the most strongly linked with the Depression facet of N/NE. Anhedonia also was substantially linked with the low Energy/Positive Temperament component of Extraversion, whereas anxious arousal was best predicted by the Somatic Complaints facet of N/NE. Future work should build on these findings to articulate more specifically the dispositional substrates of anxiety and depression.

Compliance with Ethical Standards

Conflict of Interest Shereen Khoo, Kasey Stanton, Lee Anna Clark, and David Watson declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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

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