NIH Public Access
Author Manuscript

Clin Psychol Rev. Author manuscript; available in PMC 2011 November 1.

On the Specificity of Positive Emotional Dysfunction in Psychopathology: Evidence from the Mood and Anxiety Disorders and Schizophrenia/Schizotypy

David Watson and **Kristin Naragon-Gainey**
University of Iowa

Abstract

We review recent research to establish that the associations between positive emotional experience and major forms of psychopathology show considerable specificity. Although indicators of low positive affect are consistently related to both social anxiety/social phobia and schizophrenia/ schizotypy, they are more strongly linked to depression, thereby displaying relative specificity. Moreover, low positive affect actually shows greater specificity than the diagnostic criteria for depression and is most strongly related to those symptoms (anhedonia, dysphoria, lassitude, suicidality) that are specific to the disorder. With regard to social phobia, findings suggest that low positive affect is more strongly related to the generalized subtype than to the non-generalized performance subtype. Analyses of schizophrenia/schizotypy indicate that although low positive affect is consistently associated with the negative symptoms (e.g., constricted affect, social aloofness), it is only weakly related to positive symptoms (e.g., magical thinking, perceptual aberrations, suspiciousness). Other data suggest that schizophrenia is associated with an anticipatory pleasure deficit, such that individuals with the disorder engage in rewarding activities less frequently because they do not expect to derive pleasure from them. Finally, we summarize evidence indicating that elevated positive affect is both a risk factor for bipolar disorder and a concomitant of manic symptoms.

Keywords

positive affect; depression; social anxiety; schizophrenia; mania

Our goal in this paper is to explicate the nature of the associations between positive emotional experience and major forms of psychopathology. We will show that positive mood displays impressive specificity and clearly has much stronger links to some symptoms and disorders than to others. Although psychopathologists have appreciated the clinical significance of anhedonia and low positive affect for several decades, interest in this topic increased dramatically in the 1980s as a result of two key developments. First, starting in the 1970s, researchers reported consistently strong associations between depression and anxiety scales across diverse samples, such as children, college students, adults, and clinical patients. Moreover, this finding was robust and generalizable across different methods,

including self-reports and teachers', parents' and clinicians' ratings (for reviews, see Brady & Kendall, 1992; Clark & Watson, 1991). Subsequent work in the 1980s extended these results by establishing similarly strong comorbidity between *DSM* diagnoses of the unipolar mood and anxiety disorders (see Mineka, Watson, & Clark, 1998; Watson, 2005, 2009).

Second, an explosion of research in the 1980s helped to establish the basic hierarchical structure of affective experience. Most notably, extensive evidence demonstrated the existence of two dominant higher order dimensions: Negative Affect and Positive Affect (Watson & Tellegen, 1985; Watson, Wiese, Vaidya, & Tellegen, 1999). Negative Affect is a general dimension of subjective distress and dissatisfaction that subsumes a broad range of negative mood states, including fear, sadness, anger, and guilt. Its emergence in structural analyses indicates that these various negative emotions significantly co-occur both within and across individuals. Thus, someone who is feeling sad also is likely to report significant levels of fear, anger, guilt, and so on. In parallel fashion, the general Positive Affect dimension reflects important co-occurrences among positive mood states; for example, someone who is happy also will report feeling interested, energetic, confident, and alert. These two higher order factors have been identified in both intra- and interindividual analyses, and they emerge consistently across diverse sets of descriptors, time frames, response formats, and languages (Watson & Clark, 1997b; Watson et al., 1999).

Structural Models of Depression and Anxiety

The Two-Factor Affective Model

Influence of the general Negative Affect factor—Extrapolating from these mood data, Watson, Clark, and Carey (1988) argued that this general Negative Affect dimension was largely responsible for the substantial overlap/comorbidity between depression and anxiety. In other words, this higher order factor produces strong correlations among different types of negative emotion, including sad/depressed affect and fearful/anxious affect.

This key point can be illustrated using data from our ongoing work that led to the creation of the Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al., 2007). The 99-item version of the IDAS contains a rich pool of affective content, including four items assessing sad, depressed mood (e.g., *I felt depressed, I felt like crying*) and seven items related to worry and anxious mood (e.g., *I felt anxious, I worried a lot*) (for more details, see Watson et al., 2007, Appendix G). Table 1 reports correlations between these Depressed Mood and Anxious Mood scales in 1,006 adult psychiatric patients and 980 college students. In addition, in order to demonstrate the broad nature of this general dimension, we show correlations with a 7-item scale of Angry Mood (e.g., *I felt angry, I got annoyed easily)* (these results are adapted from Watson, O'Hara & Stuart, 2008, who also report data from several additional samples).

Table 1 indicates that the Anxious Mood and Depressed Mood scales are very strongly related in both a clinical ($r = .75$) and a nonclinical ($r = .72$) sample. These results have important implications for the classification of emotional disorders, as they establish a very strong link between sad/depressed mood (a core, defining element of the *DSM* mood disorders) and anxious/worried mood (a central feature of the *DSM* anxiety disorders) (see also Watson, 2005). Moreover, these data demonstrate that this strong overlap is a more general feature of emotional experience, as Angry Mood also showed strong associations with both Depressed Mood and Anxious Mood (rs ranged from .57 to .65, mean $r = .61$).

The role of Positive Affect—How, then, can depression and anxiety be distinguished? Findings from the mood literature establish that the Positive Affect factor has stronger and

more consistent (negative) associations with depression than with anxiety. This pattern also is illustrated in Table 1, which reports correlations between these negative mood scales and the 8-item IDAS Well-Being scale, which contains items tapping high energy and positive mood (e.g., *I felt cheerful, I looked forward to things with enjoyment, I felt like I had a lot of energy*). Table 1 demonstrates that Well-Being had a significantly stronger correlation with Depressed Mood ($r = -.49$ and $-.46$) than with Anxious Mood and Angry Mood (rs ranged from $-.19$ to $-.37$) in both samples. Watson (2005) reported similar findings based on the Sadness (e.g., *sad, lonely*), Fear (e.g., *scared, nervous*), and Joviality (e.g., *happy, enthusiastic*) scales of the Expanded Form of the Positive and Negative Affect Schedule (PANAS-X; Watson & Clark, 1999). Across 14 samples (overall $N = 9,663$), Joviality consistently was more strongly related to Sadness (overall mean $r = -.36$) than to Fear (overall mean $r = -.10$).

The two-factor model of affect—On the basis of similar data, Watson et al. (1988) proposed that low positive affect (i.e., anhedonia) is a specific feature of depression that distinguishes it from anxiety. Thus, in this two-factor model, negative affect represents a nonspecific factor that is common to depression and anxiety, whereas low positive affect is a specific factor that is primarily related to depression. With one noteworthy exception, this model has received extensive support (e.g., Jolly, Dyck, Kramer, & Wherry, 1994). For example, Watson et al. (1988) found that a negative affect scale was broadly related to measures of both depression and anxiety (including indicators of panic disorder, phobias, and obsessive-compulsive disorder [OCD]), whereas low positive emotionality was related primarily to depressive symptoms and diagnoses. The one contrary finding is that low positive affect also shows consistent negative associations with social anxiety/social phobia (e.g., Brown, Chorpita, & Barlow, 1998; Kashdan, 2007; Naragon-Gainey, Watson, & Markon, 2009; Watson, Gamez, & Simms, 2005); we return to this issue subsequently.

The Tripartite Model

Clark and Watson (1991) subsequently expanded this two-factor model by proposing a second unique factor—anxious arousal—that is relatively specific to anxiety. Because the role of anhedonia/low positive affect remained unchanged in this "tripartite" model, we will not review it in any detail. For our purposes, the key point is that this model led to the creation of the Mood and Anxiety Symptom Questionnaire (MASQ; Watson & Clark, 1991). The MASQ contains two depression scales: Anhedonic Depression assesses anhedonia/low positive affect, whereas General Distress: Depressive Symptoms (GD: Depression) contains several items reflecting sad, depressed mood and other nonspecific symptoms of mood disorder (e.g., *felt like a failure*). Consistent with both the two-factor and tripartite models, Anhedonic Depression is a purer, more specific indicator of depression than is GD: Depression. For example, Watson (2000) summarizes data indicating that anxiety symptom measures correlate significantly more strongly with GD: Depression than with Anhedonic Depression. These results again demonstrate that anhedonia/low positive affect is a distinguishing feature of depression that differentiates it from anxiety.

Integrative Hierarchical Model

Subsequent data revealed that the anxious arousal component of the tripartite model was not broadly characteristic of the anxiety disorders but instead was more specifically related to panic disorder (Brown et al., 1998) and posttraumatic stress disorder (PTSD; Brown, Campbell, Lehman, Grisham, & Mancill, 2001). In response to this evidence, Mineka et al. (1998) proposed an integrative hierarchical model in which each individual syndrome is hypothesized to contain both a common and a unique component. Consistent with the earlier models, the shared component again represents broad individual differences in general distress and negative affectivity. In addition, each disorder contains unique features that

differentiate it from all of the others. Mineka et al. (1998) also incorporated an explicitly quantitative component into this integrative scheme; that is, they summarized a range of evidence indicating that the size of these general and specific components differs markedly across disorders (see also Watson, 2005, 2009).

The role of anhedonia/low positive affect again remained largely unchanged in this new scheme, leading Mineka et al. (1998) to conclude as before that "anhedonia, disinterest, and the absence of Positive Affect comprise the specific, unique component of depression." (p. 397) However, they qualified this conclusion in a significant way by acknowledging that "symptom specificity must be viewed in relative rather than absolute terms," such that "It is highly unlikely that any group of symptoms will be found to be unique to a single disorder across the entire *DSM*." (p. 398) Thus, synthesizing the then-available evidence, they argued: "Anhedonia and low positive affect are not confined solely to depression, but also characterize—to a lesser degree, perhaps—schizophrenia, social phobia, and other disorders." (p. 398)

In the following sections, we reevaluate this conclusion in light of more recent data. Specifically, we examine three types of psychopathology that clearly are associated with anhedonia and low positive affect: (a) depression, (b) social anxiety/social phobia, and (c) schizophrenia/schizotypy. We then go beyond the scope of previous reviews by examining data related to the bipolar disorders. In contrast to these other syndromes, the bipolar disorders have been linked to elevated and dysregulated positive mood.

Depression

Specificity to Depression

Our IDAS-based work has helped to clarify the nature of the associations between low positive affect and the mood and anxiety disorders. This research has yielded two key conclusions. First, although positive affect measures are significantly related to many indicators of anxiety (including social anxiety/social phobia), they are more strongly and systematically linked to depression. Thus, although positive affect is not exclusively related to depression, it displays the type of "relative" specificity emphasized by Mineka et al. (1998). Second, positive affect actually shows greater specificity than traditional indicators of depression, including the formal symptom criteria for a *DSM-IV* (American Psychiatric Association [APA], 2000) major depressive episode. Our data therefore demonstrate that the differential diagnosis and assessment of depression can be enhanced by focusing more on this positive affect component and deemphasizing nonspecific aspects of the disorder.

Relations with the Beck Inventories—We present three types of evidence to support these conclusions. First, the IDAS contains six scales that jointly capture all of the symptom content included in the nine *DSM-IV* diagnostic criteria for a major depressive episode (see Watson, 2009): Dysphoria (which contains items assessing depressed mood [Criterion 1], anhedonia/loss of interest [Criterion 2], psychomotor disturbance [Criterion 5], worthlessness/guilt [Criterion 7], and cognitive problems [Criterion 8]), Lassitude (which captures both fatigue/anergia [Criterion 6] and the hypersomnia portion of Criterion 4), Suicidality (which measures criterion 9), Insomnia (which taps the corresponding portion of Criterion 4), and Appetite Loss and Appetite Gain (which jointly capture Criterion 3).

Table 2 presents correlations between these scales and traditional, widely used measures of depression (the Beck Depression Inventory-II [BDI-II]; Beck, Steer, & Brown, 1996) and anxiety (the Beck Anxiety Inventory [BAI]; Beck & Steer, 1990) in four large samples: psychiatric patients ($N = 965$), postpartum women ($N = 1,056$), college students ($N = 674$) and community adults ($N = 743$). Table 2 also displays results for the IDAS Well-Being

scale, which, as noted earlier, is a measure of positive emotional experience (portions of these data were presented in modified form in Watson et al. (2007), Table 6; and Watson (2009), Table 7).

It is noteworthy that three scales—Insomnia, Appetite Loss and Appetite Gain—show very little evidence of specificity in these data, even though they are formal symptoms of major depression (for further discussion, see Watson, 2009). The three remaining depression symptom scales (Dysphoria, Lassitude, and Suicidality) have significantly stronger correlations with the BDI-II than with the BAI in all four samples, thereby displaying some degree of specificity to depression. Clearly, however, Well-Being demonstrates the greatest specificity in these data, as it correlates much more strongly with the BDI-II (overall mean r = −.59) than with the BAI (overall mean r = −.33) in all four samples.

Relations with DSM-IV mood and anxiety diagnoses—Second, Well-Being shows impressive specificity in relation to *DSM-IV* mood and anxiety disorder diagnoses. Watson, O'Hara, Chmielewski, et al. (2008) reported mean level comparisons involving the IDAS scales and relevant *DSM-IV* diagnoses in their large patient sample (N = 575). These analyses were conducted separately for each diagnosis by first computing the mean scale scores for those individuals with ("cases") and without ("non-cases") the disorder and then dividing the difference between these means by the pooled standard deviation.

Table 3 presents the resulting d values for major depression and four anxiety disorders: generalized anxiety disorder (GAD), PTSD, panic disorder, and social phobia (these data are adapted from Watson, O'Hara, Chmielewski, et al., 2008, Table 5). Well-Being again displays the greatest specificity in these data: It has the second largest effect size with major depression (d = −0.89, which represents a large effect; see J. Cohen, 1992) and has substantially weaker associations with all four anxiety disorders (ds ranged from −.31 to −.51). It is important to note that Well-Being has a much stronger association with major depression (d = −0.89) than with social phobia (d = −0.31). In other words, although positive affect is negatively related to social anxiety, it has a substantially stronger link to major depression. Consistent with the Table 2 results, Insomnia and the appetite disturbance scales show no specificity in these analyses. For example, Insomnia has very similar associations with major depression, GAD, PTSD and panic disorder (ds range from 0.69 to 0.79), whereas Appetite Loss has slightly stronger links to panic disorder and PTSD than to depression (see also Watson, 2009).

Third, Watson, O'Hara, Chmielewski et al. (2008) reported a series of logistic regression analyses that were designed to establish the unique, incremental predictive power of individual IDAS scales in relation to *DSM-IV* mood and anxiety disorders. The IDAS scales were the predictors in these analyses; each of six individual *DSM-IV* mood and anxiety disorder diagnoses (major depression, GAD, PTSD, panic disorder, social phobia, OCD) served as criteria in separate analyses (see their Table 7). Well-Being (a) contributed significantly to the prediction of major depression (odds ratio = 0.60; 95% confidence interval = 0.45 to 0.80) but (b) did not add to the prediction of any of the anxiety disorders. Among the IDAS Depression scales, only Dysphoria added significantly to the prediction of major depression; in contrast to Well-Being, however, Dysphoria also was significantly related to GAD and panic disorder. Thus, Well-Being again showed specificity to depression and, in fact, showed greater specificity than formal symptoms of depression.

Relations with Specific Depression Symptoms

Low positive affectivity clearly shows impressive specificity to depression vis-à-vis the anxiety disorders. One limitation of the existing evidence, however, is that it does not clarify which aspects of depression have the strongest, most systematic links to low positive mood.

Our IDAS-related work can shed some light on this issue. Watson et al. (2007, Study 2) gave 23 experts the nine *DSM-IV* symptom criteria for a major depressive episode as well as the depression symptoms from the IDAS item pool. The raters were asked to read each item and then indicate which of these nine *DSM* criteria—if any—it assessed. These ratings were used to create *DSM*-based scales reflecting each of these symptom criteria; an item was included in a scale if it was judged to assess this criterion by at least 18 raters. The 99-item version of the IDAS contains abbreviated versions of all of these scales (Watson et al., 2007, Appendix G).

Table 4 presents correlations between these *DSM*-based scales and IDAS Well-Being in adult psychiatric patients ($N = 1,006$) and college students ($N = 980$). The table classifies the symptoms into three groups based on the strength of their associations with positive affect. Table 4 indicates that positive mood correlates most strongly with the core affective disturbance in depression: Anhedonia (mean $r = -.51$), Depressed Mood (mean $r = -.48$), Worthlessness (mean $r = -44$) and Lassitude (mean $r = -.40$). It has more moderate associations with Cognitive Disturbance (mean $r = -.33$) and Suicidality (mean $r = -.32$), and is weakly related to motor, sleep and appetite disturbance (mean rs ranged from $-.05$ to $-.20$). Follow-up tests revealed that the correlations in the first group were significantly higher than those in the other two groups in 55 of 56 individual comparisons; the lone exception was that the coefficient for Lassitude in the patients was not significantly greater than that for Suicidality; $z = -1.81$, $p < .10$). Along these same lines, correlations in the second group were significantly higher than those in the third group in 19 of 20 comparisons (the single exception is that the coefficients for Suicidality and Hypersomnia did not differ in the students; $z = -1.89$, $p < .10$).

These results demonstrate that low positive mood is more strongly related to certain types of depression symptoms than to others. It is noteworthy, moreover, that positive affect is linked most strongly to those symptoms (e.g., anhedonia, depressed mood/dysphoria, lassitude, suicidality) that show some specificity to depression (see Watson, 2009) and is more weakly related to non-specific symptoms of the disorder (such as sleep and appetite disturbance).

The Table 4 findings are based on self-report. How well do they generalize across methods? We can examine this issue using the Clinician Rating version of the IDAS (IDAS-CR; Watson, O'Hara, Chmielewski, et al., 2008). The IDAS-CR consists of a series of single-item ratings corresponding to each of the IDAS scales. Each rating is made on a 3-point scale (*absent, subthreshold, present*). To rate each symptom, the clinicians asked a standard initial probe question, as well as several standard follow up questions. Watson, O'Hara, Chmielewski, et al. (2008a) established strong interrater reliability for these scores in both students (intraclass correlations ranged from .65 to .95, median = .87) and patients (range = .74 to .99, median = .89).

Table 5 presents correlations between IDAS Well-Being and the IDAS-CR depression items in both a patient and a student sample (for descriptions of these samples, see Watson, O'Hara, Chmielewski, et al., 2008). The table also includes correlations with the three IDAS-CR anxiety items (Panic, Traumatic Intrusions, Social Anxiety) for comparison purposes. Two aspects of these data are worth highlighting. First, replicating the findings reported in Table 4, Well-Being again tended to correlate more strongly with Dysphoria (mean $r = -.43$), Lassitude (mean $r = -.30$) and Suicidality (mean $r = -.27$) than with Insomnia and appetite disturbance (mean rs ranged from only $-.04$ to $-.14$). In particular, the correlations for Dysphoria and Lassitude were significantly stronger than those for Insomnia, Appetite Loss and Appetite Gain in 11 of 12 comparisons (the one exception was Lassitude vs. Insomnia in the student sample). Second, we again see evidence that low positive affect has a stronger link to depression than to social anxiety. Most notably, Well-

Being had a significantly stronger correlation with Dysphoria (mean $r = -.43$) than with Social Anxiety (mean $r = -.23$) in both samples ($z = -4.18$ and -3.81 in the patients and students, respectively).

Social Anxiety/Social Phobia

Associations with Extraversion Versus Positive Affect

As stated previously, low positive affect also is consistently related to social anxiety, although the magnitude is weaker than its association with depression. When examining relations between positive affect and social anxiety, it is helpful to include extraversion, one of the "Big Five" personality traits that is particularly relevant to social anxiety and that is closely linked to positive affect. Numerous studies have shown that although extraversion and positive emotionality are clearly related, they are not identical, with most correlations ranging from about .50 to .70 (Burger & Caldwell, 2000; Lucas & Fujita, 2000; Watson & Clark, 1992). Broadly speaking, extraversion is a multidimensional higher order trait that includes both positive affectivity and interpersonal facets (Watson & Clark, 1997a). We recently examined the lower order structure of extraversion in two samples (students and psychiatric patients) and found evidence for four related but distinguishable facets: sociability, positive emotionality (or positive affectivity), ascendance, and fun-seeking (Naragon-Gainey et al., 2009).

Whereas depression tends to be more strongly correlated with positive affect than with extraversion, social anxiety shows the reverse pattern (e.g., Watson et al., 2005). Among the mood and anxiety disorders, social phobia consistently has the strongest negative association with extraversion, typically corresponding to a moderate correlation ($r = -.35$ to $-.55$; e.g., Bienvenu et al., 2004; Trull & Sher, 1994; Watson et al., 2005). The negative relation between social anxiety and positive affect is weaker but still significant: Kashdan (2007) reported a weighted mean correlation of $-.36$ in a meta-analysis of 19 studies.

These same trends are evident in our own analyses. Table 3 also includes parallel results for the Extraversion and Neuroticism scales of the Big Five Inventory (John & Srivastava, 1999). As expected, Extraversion has its strongest effect size with social phobia ($d = -0.84$). Moreover, Extraversion has a stronger association with social phobia than with major depression ($d = -0.52$). Similarly, Table 5 indicates that Extraversion had a significantly stronger correlation with IDAS-CR Social Anxiety (mean $r = -.35$) than with Dysphoria (mean $r = -.22$) in both samples ($z = -2.53$ and -2.47 in the patients and students, respectively). As discussed earlier, Well-Being shows the opposite pattern, consistently correlating more strongly with major depression/dysphoria than with social phobia/social anxiety. Overall, therefore, the available data indicate that positive affect and extraversion have relatively specific associations with depression and with social anxiety, respectively.

Clarifying the Social Anxiety-Positive Affect Relation: Covariates and Moderators

Given that social phobia is highly comorbid with depression (see Watson, 2005, 2009), it is important to examine whether the association between social anxiety and positive affect is largely due to this overlap. The available evidence indicates that although the magnitude of the association is somewhat weakened, social anxiety remains significantly correlated with positive affect independent of depressive symptoms. Kashdan (2007) analyzed 13 studies that reported partial correlations between social anxiety symptoms and positive affect, after controlling for depression or related constructs (i.e., negative affect, posttraumatic stress disorder; 11 of these studies controlled specifically for depressive symptoms). The weighted mean partial correlation was $-.21$; although this is weaker than the zero-order meta-analytic correlation ($r = -.36$), it is substantial enough to suggest an independent association between social anxiety and positive affect.

To tease apart the unique variance of these constructs from their shared component, Naragon-Gainey et al. (2009) used structural equation modeling to examine each of the four facets of extraversion (including positive affect) in relation to social anxiety and depressive symptoms. After controlling for shared variance among these constructs (i.e., symptom covariation and overlap among the extraversion facets), positive affect remained significantly related to social anxiety in two independent samples. In fact, in these multivariate analyses, positive affect was comparably related to social anxiety and to depression (standardized parameter estimates = −.48 and −.61, respectively). Thus, the social anxiety-positive affect association appears to extend beyond comorbidity with depression and beyond shared variance with the interpersonal components of extraversion. Taken together, the above results suggest that social anxiety is specifically associated with a positive affect deficit.

Most of the studies described thus far were based on concurrent self-reports of social anxiety and positive affect. Two recent studies by Kashdan and colleagues help to shed light on temporal issues and causal directions, while also controlling for negative affect and depression. In an experience sampling study, Kashdan and Steger (2006) found that socially anxious people reported lower levels of daily positive affect and fewer daily positive events than nonanxious individuals. Furthermore, both socially anxious and nonanxious participants reported lower positive affect on those days they experienced greater social anxiety. In a prospective, 3-month longitudinal study, those with high levels of social anxiety subsequently endorsed stable, low levels of positive affect. However, the reverse causal pattern was not supported, in that changes in positive emotions did not predict changes in social anxiety (Kashdan & Breen, 2008). It is interesting to note that a tendency to suppress emotions (as opposed to accepting them) was relevant to positive affect in both of these studies: emotion suppression was associated with reduced positive affect in the experience sampling study (Kashdan & Steger, 2006) and moderated the relation between social anxiety and positive affect in the longitudinal study (Kashdan & Breen, 2008).

Finally, there is evidence that the subtypes of social phobia may be differentially related to positive affect. Generalized social phobia consists of anxiety during most or all social interactions, whereas the non-generalized or performance subtype is limited to the fear of being observed by others while performing an action (APA, 2000). Hughes et al. (2006) found that, after partialing out negative affect, the generalized subtype was associated with low levels of positive affect. In contrast, the nongeneralized type was unrelated to positive affect, but was instead characterized by high autonomic arousal. Similarly, Kashdan (2002) reported that positive subjective experiences (a factor on which positive affect loaded highly) continued to be moderately correlated with generalized social anxiety after removing shared variance with nongeneralized social anxiety; in contrast, the association with nongeneralized social anxiety became non-significant after partialing out generalized social anxiety.

Our lab also has collected data supporting this differential pattern in that generalized social anxiety correlated significantly more strongly with positive affect ($r = -.44$) than did performance anxiety ($r = -.31$) in a psychiatric patient sample ($n = 204$; $p < .01$). After controlling for negative affect, the partial correlation with generalized social anxiety remained significant ($r = -.26$), whereas the partial correlation with performance anxiety dropped to non-significance ($r = -.08$). Additional studies of these subtypes may provide further insight into the nature of the relation between social anxiety and positive affect.

Schizophrenia/Schizotypy

The Hedonic Deficit in Schizophrenia/Schizotypy

Overview—Anhedonia/low positive affect long has been recognized as a key feature of schizophrenia and schizotypy. Meehl (1962), for example, described anhedonia as a "quasi-pathognomonic sign" of schizophrenia that "is one of the most consistent and dramatic behavioral designs of the disease." (p. 829) There has been considerable recent research on emotional dysfunction in schizophrenia and related disorders (including schizotypy and schizotypal personality), as well as several integrative reviews. This rapidly accumulating evidence yields two broad conclusions. First, schizophrenia and schizotypy clearly are associated with a marked deficit in positive affect, although the nature of this deficit differs somewhat from that observed in depression and social anxiety. Second, the limited existing evidence suggests that this deficit is not as great as that observed in depression. Thus, these data further suggest that low positive affect shows relative specificity to depression.

The expressive deficit—One striking aspect of schizophrenia—which distinguishes it from depression and other disorders—is that it is associated with a specific deficit in emotional expression. That is, individuals with schizophrenia display a reduced capacity to communicate their feelings both facially and vocally. Kring and Moran (2008) reviewed 23 emotional expression studies (see their Table 1) and concluded: "Compared to individuals without schizophrenia, individuals with schizophrenia display fewer positive and negative emotional expressions in response to emotionally evocative film clips, foods, and social interactions. Moreover, schizophrenia patients' diminished facial and vocal expression distinguishes them from other patient groups, including individuals with depression" (p. 821).

The experiential deficit—This expressive deficit partly accounts for clinical reports of anhedonia in the disorder (i.e., inexpressiveness can be misinterpreted as flat, constricted affect). Clearly, however, there is an experiential deficit as well. Horan, Blanchard, Clark and Green (2008) reviewed 13 studies that compared schizophrenia patients and nonclinical controls on trait measures of neuroticism/negative affectivity and extraversion/positive affectivity (see their Table 2). Compared to the nonclinical controls, the schizophrenia patients showed a consistent pattern of higher neuroticism/negative affectivity and lower extraversion/positive affectivity. Nine of the reviewed studies used trait measures of extraversion, but the remaining four obtained results based on clear, direct indicators of positive affectivity. These four studies reported standardized group differences (Cohen's *d*) ranging from −0.68 to −0.78 (median = −0.72), which suggests a medium effect size. Similarly, Barch, Yodkovik, Sypher-Locke and Hanewickel (2008) reported a medium-sized difference (*d* = −0.61) in positive affectivity between individuals with schizophrenia and healthy controls.

It is interesting to compare these data to the results reported in our own Table 3, which displays a large effect size (−0.89) for the IDAS Well-Being scale in relation to major depression. Note, moreover, that our analyses compare depressed patients to non-depressed patients, most of whom met *DSM-IV* criteria for other disorders (including social phobia and other anxiety disorders; see Watson, O'Hara, Chmielewski, et al., 2008); in contrast, the Horan et al. (2008) and Barch et al. (2008) results compare individuals with schizophrenia to healthy, nonclinical controls (who can be expected to report greater positive affect than a typical patient). These data tentatively suggest that the positive emotional deficit in schizophrenia is not as large as that observed in depression; we return to this issue subsequently.

Before leaving this issue, we should acknowledge that many studies have reported results comparing individuals with schizophrenia and healthy controls on the Chapmans' measures of social and physical anhedonia. For example, Horan et al. (2008, Table 3) summarized the findings of 15 studies. Individuals with schizophrenia consistently reported higher scores on both physical and social anhedonia; moreover, the effect sizes tended to be large in magnitude. We must emphasize, however, that despite their names, these anhedonia scales are not pure markers of low positive affectivity. In fact, measures of extraversion and positive affectivity generally correlate in the −.30 to −.50 range with social anhedonia scores, with an average coefficient of approximately −.45. Corresponding relations with physical anhedonia are even lower, tending to fall in the −.20 to −.40 range, with an average correlation of approximately −.30 (e.g., Blanchard, Mueser & Bellack, 1998; Camisa et al., 2005; Franken, Rassin & Muris, 2007; Germans & Kring, 2000; Muntaner, Garcia-Sevilla, Fernandez & Torrubia, 1988; Ross, Lutz & Bailley, 2002). Consequently, for our present purposes, comparisons based on these anhedonia measures are much less informative than those involving direct measures of positive affectivity.

Positive versus negative symptoms—Several studies have correlated trait affectivity scores with self-report measures of schizotypy and schizotypal personality (e.g., Chmielewski & Watson, 2008; Kerns, 2006; Ross et al., 2002; for a review, see Horan et al., 2008). Paralleling the schizophrenia data, these results again show that elevated schizotypy/schizotypal personality scores are associated with higher neuroticism/negative affectivity and lower extraversion/positive emotionality. It is noteworthy, moreover, that neuroticism/negative affectivity is broadly related to both the negative (e.g., constricted affect, social aloofness) and positive (e.g., magical thinking, perceptual aberrations, suspiciousness) symptoms of schizotypy, whereas extraversion/positive emotionality shows greater specificity: It is consistently associated with the former but only weakly related to the latter. For example, Chmielewski and Watson (2008) examined relations between extraversion and five symptom factors derived from the Schizotypal Personality Questionnaire (Raine, 1991); Extraversion correlated strongly with Social Anxiety ($r = −.60$ and $−.62$ at Time 1 and Time 2, respectively), moderately with Social Anhedonia ($r = −.29$ and $−.31$, respectively), and weakly with Eccentricity/Oddity, Mistrust, and Unusual Beliefs and Experiences (rs ranged from only $−.07$ to $.10$).

The anticipatory deficit—Surprisingly, however, individuals with schizophrenia display a full, normal capacity to experience pleasure; that is, they show no impairment in positive affect following a pleasant mood induction (for reviews, see A. S. Cohen & Minor, in press; Kring & Moran, 2008). A. S. Cohen and Minor (in press) conducted a meta-analysis of 14 studies that compared the positive affect levels of (a) patients with schizophrenia versus (b) nonclinical controls in response to positive stimuli (see their Table 2). The group difference was small (Hedges $D = −0.16$) and non-significant, leading them to conclude that "there was little evidence to suggest that patients were anhedonic in response to laboratory stimuli." (p. xx)

Why, then, do schizophrenia patients consistently report anhedonia/low positive affect on trait measures (Horan et al., 2008)? There is growing evidence that schizophrenia is associated with an anticipatory pleasure deficit, such that individuals with the disorder do not expect to experience positive affect when engaging in future goal-directed activities (A. S. Cohen & Minor, in press; Kring & Moran, 2008). For example, Gard, Kring, Gard, Horan and Green (2007) found that schizophrenia patients anticipated less pleasure from future activities than did healthy controls, particularly in relation to goal-directed activities. Furthermore, this anticipatory deficit was associated with a reduction in goal-directed activity in the schizophrenia group. These results suggest that although individuals with schizophrenia experience normal levels of pleasure in response to rewarding activities, this

anticipatory deficit causes them to engage in these activities less frequently, thereby leading to lower overall levels of positive affect (see A.S. Cohen & Minor, in press).

In support of this argument, experience-sampling studies suggest that individuals with schizophrenia do report lower levels of positive affect in their everyday lives (Gard et al., 2007; Kimhy et al., 2006). Kimhy et al. (2006), for instance, collected repeated mood ratings from 10 hospitalized schizophrenia patients and 10 healthy controls over the course of a single day. Compared to the controls, the patients reported elevated levels of sadness/ depression and loneliness and lower levels of cheerfulness.

Specificity of the Deficit in Relation to Depression

To examine the specificity of this hedonic deficit, however, it is much more instructive to compare (a) patients with schizophrenia versus (b) those with other disorders. Myin-Germeys et al., (2003) reported the best available evidence to date. They obtained experience sampling data from 42 patients with non-affective psychosis (a total of 1,890 momentary assessments), 46 patients with current major depression (2,070 assessments), and 49 healthy controls (2,499 assessments); analyses were based on a three-item measure of positive affect (*happy, cheerful, satisfied*). Replicating the results of other studies, the schizophrenia group reported substantially lower levels of positive affect (overall mean = 4.4) than the healthy controls (mean = 5.5); using the standard deviation of the psychosis patients, this translates into a *d* of −1.10.

More importantly, however, the schizophrenia patients also reported substantially *higher* positive affect than the depressed patients (mean = 2.2; again using the standard deviation of the psychotic patients, this translates into a *d* = 2.20). These results suggest that although schizophrenia is associated with a reduction in positive affect, this hedonic deficit is not as great as that observed in depression. It should be noted, however, that whereas all of the depressed patients currently were experiencing an acute episode, most of the schizophrenia patients were (a) in remission and (b) on medication. Thus, these findings very likely exaggerate the true magnitude of the difference between these groups.

Joiner, Brown and Metalsky (2003) reported similar findings. Joiner et al. compared the BDI responses of 50 patients with major depression and 52 patients with schizophrenia. They created two scores from the BDI, one using three items assessing anhedonic symptoms and the other based on the 18 remaining items. It is interesting to note that the two groups did not differ significantly on the non-anhedonic items or on the BDI total score. Consistent with the results of Myin-Germeys et al. (2003), however, patients with major depression obtained significantly higher scores on the anhedonic symptom scale than the patients with schizophrenia. Overall, therefore, the available data suggest that anhedonia/low positive affect is more strongly linked to depression than to schizophrenia.

Mania

Associations with Trait Positive Affect

Up until now, we have reviewed disorders that are associated with low levels of positive affect. We conclude with an examination of the bipolar disorders, which show a very different relation to positive mood. Heightened positive affect clearly is relevant to mania, in that the definition of manic episodes includes "abnormally and persistently elevated, expansive, [or irritable] mood" (APA, 2000, p. 362). Manic symptoms are, in fact, associated with the experience of elevated positive mood, with one daily diary study reporting a strong positive correlation between mean levels of manic symptoms and positive affect over several weeks in a non-clinical group (*r* = .54; T. D. Meyer & Hofmann, 2005). Because current mania is likely to impact ratings of trait positive affect (see Johnson,

Gruber, & Eisner, 2007), we emphasize findings in remitted patients or analogues in the discussion that follows.

Self-report data based on "pure" trait positive affect scales (as opposed to related constructs, such as those described subsequently) have yielded mixed results for those at risk for mania. Studies have found that trait positive affect levels among currently remitted individuals diagnosed with bipolar I disorder do not differ from those of normal controls (e.g., Bagby et al., 1996, 1997). Likewise, in a daily diary study, mean levels of daily positive affect over 28 days among those with a lifetime diagnosis of cyclothymia were similar to levels reported by normal controls (Lovejoy & Steuerwald, 1995). However, other results suggest atypical levels of trait positive affect among those with a bipolar disorder or who are at risk for developing a bipolar disorder. For instance, an experimental paradigm identified elevated levels of positive affect in an analogue sample: When shown positive, neutral, and negative film clips, those at high risk for mania (as identified using a self-report measure) reported greater levels of positive mood than those at low risk for mania, regardless of the valence of the clip (Gruber, Johnson, Oveis, & Keltner, 2008). In contrast, Gruber et al. (2009) reported unexpectedly low levels of positive affect among individuals in recovery from bipolar I or a bipolar spectrum disorder, as compared to normal controls ($d = -1.5$). In interpreting these conflicting results, we should note that because individuals with bipolar disorders experience extreme levels of positive affect during mania and depression, their subjective scale for rating positive affect might differ from those who have never been manic (Johnson et al., 2007).

Hypersensitivity of the Behavioral Activation System

The behavioral activation system—The above studies report data on pure measures of positive affect, but most research relating mania to positive emotions has focused on a different but related construct: the Behavioral Activation System (BAS; also referred to as the Behavioral Approach System or Behavioral Facilitation System). Positive affect represents the subjective component of the goal-oriented BAS, which directs organisms toward situations and experiences that potentially may yield pleasure and reward. This system is adaptive in that it ensures the procuring of resources (e.g., food and water, warmth and shelter, the cooperation of others, sexual partners) that are essential to the survival of both the individual and the species (Watson, 2000; Watson et al., 1999).

Depue and colleagues hypothesized that the affective dysfunction characteristic of the bipolar disorders (i.e., alternating manic and depressive episodes) may be due to dysregulation of the BAS. In the case of manic episodes, the BAS becomes overly sensitive to minor signals of reward, leading to excessive positive affect and an increase in goal-seeking/approach behavior. In contrast, during depressive episodes, the BAS shuts down and fails to respond properly to reward incentives, resulting in anhedonia, lethargy, and hopelessness (e.g., Depue & Iacono, 1989).

Concurrent and prospective associations with mania—Several lines of research provide support for the theory that greater BAS sensitivity increases one's vulnerability to the bipolar disorders. First, there is a concurrent association between symptoms of mania and self-reported BAS scores among students diagnosed with a lifetime bipolar spectrum disorder ($r = .18$; Alloy et al., 2008), and between daily reported mean levels of the two constructs in a student sample ($r = .38$; T. D. Meyer & Hofmann, 2005). In addition, recovered individuals diagnosed with bipolar I report higher levels of BAS responsivity than do normal controls (Salavert et al., 2007); conversely, individuals with high BAS levels are significantly more likely to have a lifetime bipolar spectrum diagnosis than those with low BAS levels (Alloy et al., 2008). Compared to controls, analogues with elevated levels of

hypomanic symptoms (e.g., Carver, & White, 1994) and individuals diagnosed with current bipolar I (B. Meyer, Johnson, & Winters, 2001) also have higher BAS sensitivity scores.

The association between BAS sensitivity and mania remains in prospective studies, in which higher BAS levels predicted a shorter time to onset of a manic episode among those with a lifetime bipolar spectrum disorder (Alloy et al., 2008). Individuals with bipolar I disorder who also had higher BAS scores when asymptomatic were more likely than those with lower BAS levels to subsequently enter a manic episode (Salavert et al., 2007). Similarly, scores on a BAS-relevant achievement striving scale predicted increases in manic symptoms six months later among a recovered bipolar I sample (Lozano & Johnson, 2001). Taken together, there is evidence that elevated positive affect—when operationalized as heightened BAS activity that promotes goal-seeking behavior —is a risk factor for mania, as well as a concomitant of these symptoms.

Goal-attainment life events—Consistent with the BAS hypersensitivity hypothesis, events relevant to goal attainment (e.g., marriage, a major promotion) often precede the development of mania. For example, in a sample of individuals with bipolar I disorder (most of whom were currently manic), goal-attainment events predicted an increase in manic symptoms over the subsequent two months. Supporting the specificity of this association, these events did not predict increases in depressive symptoms, and non goal-attainment positive events (e.g., receiving a tax refund) were not predictive of manic symptoms (Johnson et al., 2000). Similarly, goal-attainment events predicted an increase in manic symptoms among those with bipolar I over the course of a two year longitudinal study (Johnson et al., 2008). In a study of bipolar spectrum college students, those who took final exams (a goal-attainment event) exhibited more hypomanic episodes than did those who were not taking exams at that time; in contrast, normal controls did not show an increase in hypomanic symptoms when taking exams (Nusslock, Abramson, Harmon-Jones, Alloy, & Hogan, 2007). Thus, events relevant to the attainment of goals may be a proximal trigger of manic symptoms in vulnerable groups. In the absence of these specific events, those at risk for mania may not exhibit symptoms such as euphoria, perhaps explaining why trait levels of positive affect are not generally elevated among those vulnerable to mania.

Conclusion

Our basic goal in this paper was to explicate the nature of the associations between positive emotional experience and major forms of psychopathology. As we have seen, although positive affect is related to several disorders, it nevertheless shows impressive specificity in its associations. That is, the reviewed data establish that low levels of positive affect are a distinguishing feature of depression, social anxiety and schizophrenia/schizotypy. Moreover, a more limited range of evidence suggests that indicators of positive affect are more strongly and systematically linked to depression than to these other syndromes. Thus, although positive affect is not exclusively related to depression, it displays the type of "relative" specificity emphasized by Mineka et al. (1998).

Specificity evidence of this type is important for several reasons. First, it can be used to improve the assessment of these disorders. For example, as discussed earlier, the MASQ Anhedonic Depression scale—which contains items that explicitly tap high positive affect— is a purer, more specific indicator of depression than is the MASQ GD: Depression scale (which does not include these types of items). Thus, specificity data can be used to enhance the discriminant validity of related measures.

Second, specificity evidence can play a significant role in improving differential diagnosis. In this regard, one particularly striking aspect of the reviewed data is that positive affect

actually shows greater specificity than traditional indicators of depression, including the formal symptom criteria for a *DSM-IV* (APA, 2000) major depressive episode. Watson (2009) reviews a broader range of evidence indicating that symptoms such as appetite loss and insomnia show little or no specificity to depression. Moreover, Watson, O'Hara, Chmielewski, et al. (2008) found that the corresponding IDAS scales failed to add significant incremental information to the prediction of major depression. These findings demonstrate the need to reevaluate whether the inclusion of these symptoms actually improves the diagnosis of major depression.

Finally, specificity evidence is vital in clarifying the nature of important etiological factors. For example, as was discussed earlier, considerable data now indicate that BAS dysregulation is an important contributor to the bipolar disorders. Similarly, the evidence we reviewed has explicated the nature of the affective dysfunction in schizophrenia.

At the same time, however, our review of the literature also has exposed some significant limitations of the current evidence; these gaps in the literature provide an important impetus for future research. We will conclude this paper by highlighting three basic considerations that should inform future work in this area. First, specificity evidence still is limited in a number of key areas. For instance, very few studies have directly compared the magnitude of the affective deficits in depression and schizophrenia. Although the limited evidence tentatively suggests a greater positive mood deficit in the former compared to the latter, more work clearly is needed before any firm conclusions can be drawn. More generally, given that deficits in positive affect now are very well established for depression, schizophrenia and other disorders, further comparisons between patients and healthy controls would not be particularly informative. We therefore encourage future investigators to concentrate more on direct comparisons of affective processes across multiple disorders (e.g., contrasting depression with anxiety disorders and/or schizophrenia).

Second, our review demonstrates the importance of distinguishing carefully between strongly related—but separable—constructs. For instance, our review established that depression is more strongly negatively correlated with measures of positive affect than with scales assessing extraversion, whereas social anxiety shows the reverse pattern. Future work in this area will benefit from a more intensive assessment strategy that targets multiple related constructs within this domain (e.g., positive affect, extraversion, BAS sensitivity), rather than relying on single instruments. Moreover, as is demonstrated by the results of Naragon-Gainey et al. (2009), it can be very informative to assess multiple subcomponents within these each of these basic constructs (e.g., different facets within extraversion; specific types of positive affect).

Third, future studies should clarify the nature and specific source of these observed deficits. One particularly crucial issue is the extent to which observed deficits reflect (a) reduced exposure to rewarding activities versus (b) a diminished capacity to experience pleasure in response to such activities. For example, the reviewed evidence suggests that individuals with schizophrenia retain a full, normal capacity to experience pleasure, but engage in rewarding activities less frequently because of an anticipatory deficit that leads them to underestimate the hedonic value of these activities. How do these processes compare/contrast with those experienced in depression and other disorders? This is a critical question for future research.

References

Alloy LB, Abramson LY, Walshaw PD, Cogswell A, Grandin LD, Hughes ME, et al. Behavioral approach system and behavioral inhibition system sensitivities and bipolar spectrum disorders:

Prospective prediction of bipolar mood episodes. Bipolar Disorders. 2008; 10:310–322. [PubMed: 18271911]

Alloy LB, Abramson LY, Walshaw PD, Cogswell A, Smith JM, Neeren, et al. Behavioral approach system (BAS) sensitivity and bipolar spectrum disorders: A retrospective and concurrent behavioural high-risk design. Motivation and Emotion. 2006; 30:143–155.

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. (4th ed., text revision). Washington, DC: Author; 2000.

Bagby RM, Bindseil KD, Schuller DR, Rector NA, Young LT, Cooke RG, et al. Relationship between the five-factor model of personality and unipolar, bipolar and schizophrenic patients. Psychiatry Research. 1997; 70:83–94. [PubMed: 9194202]

Bagby RM, Young LT, Schuller DR, Bindseil KD, Cooke RG, Dickens SE, et al. Bipolar disorder, unipolar depression and the five factor model of personality. Journal of Affective Disorders. 1996; 41:25–32. [PubMed: 8938202]

Barch DM, Yodkovik N, Sypher-Locke H, Hanewickel M. Intrinsic motivation in schizophrenia: Relationships to cognitive function, depression, anxiety and personality. Journal of Abnormal Psychology. 2008; 117:776–787. [PubMed: 19025225]

Beck, AT.; Steer, RA. Beck Anxiety Inventory manual. San Antonio, TX: Psychological Corporation; 1990.

Beck, AT.; Steer, RA.; Brown, GK. Beck Depression Inventory manual. 2nd ed.. San Antonio, TX: Psychological Corporation; 1996.

Bienvenu OJ, Samuels JF, Costa PT, Reti IM, Eaton WW, Nestadt G. Anxiety and depressive disorders and the five-factor model of personality: A higher- and lower-order personality trait investigation in a community sample. Depression and Anxiety. 2004; 20:92–97. [PubMed: 15390211]

Blanchard JJ, Mueser KT, Bellack AS. Anhedonia, positive and negative affect, and social functioning in schizophrenia. Schizophrenia Bulletin. 1998; 24:413–424. [PubMed: 9718633]

Brady EU, Kendall PC. Comorbidity of anxiety and depression in children and adolescents. Journal of Consulting and Clinical Psychology. 1992; 111:244–255.

Brown TA, Campbell LA, Lehman CL, Grisham GR, Mancill RB. Current and lifetime comorbidity of the *DSM-IV* anxiety and mood disorders in a large clinical sample. Journal of Abnormal Psychology. 2001; 110:585–599. [PubMed: 11727948]

Brown TA, Chorpita BF, Barlow DH. Structured relationships among dimensions of the *DSM-IV* anxiety and mood disorders and dimensions of negative affect, positive affect, and autonomic arousal. Journal of Abnormal Psychology. 1998; 107:179–192. [PubMed: 9604548]

Burger JM, Caldwell DF. Personality, social activities, job-search behavior and interview success: Distinguishing between PANAS trait positive affect and NEO extraversion. Motivation and Emotion. 2000; 24(1):51–62.

Camisa KM, Bockbrader MA, Lysaker P, Rae LL, Brenner CA, O'Donnell BF. Personality traits in schizophrenia and related personality disorders. Psychiatry Research. 2005; 133:23–33. [PubMed: 15698674]

Carver CS, White TL. Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. Journal of Personality and Social Psychology. 1994; 67:319–333.

Chmielewski M, Watson D. The heterogeneous structure of schizotypal personality disorder: Item-level factors of the Schizotypal Personality Questionnaire and their associations with obsessive-compulsive disorder symptoms, dissociative tendencies, and norma personality. Journal of Abnormal Psychology. 2008; 117:364–376. [PubMed: 18489212]

Clark LA, Watson D. Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. Journal of Abnormal Psychology. 1991; 100:316–336. [PubMed: 1918611]

Cohen AS, Minor KS. Emotional experience in patients with schizophrenia revisited: Meta-analysis of laboratory studies. Schizophrenia Bulletin. (in press).

Cohen J. A power primer. Psychological Bulletin. 1992; 112:155–159. [PubMed: 19565683]

Depue RA, Iacono WG. Neurobehavioral aspects of affective disorders. Annual Review of Psychology. 1989; 40:457–492.

Franken IHA, Rassin E, Muris P. The assessment of anhedonia in clinical and non-clinical populations: Further validation of the Snaith-Hamilton Pleasure Scale (SHAPS). Journal of Affective Disorders. 2007; 99:83–89. [PubMed: 16996138]

Gard DE, Kring AM, Gard MG, Horan WP, Green MF. Anhedonia in schizophrenia: Distinctions between anticipatory and consummatory pleasure. Schizophrenia Research. 2007; 93:253–260. [PubMed: 17490858]

Germans MK, Kring AM. Hedonic deficit in anhedonia: Support for the role of approach motivation. Personality and Individual Differences. 2000; 28:659–672.

Gruber J, Culver JL, Johnson SL, Nam JY, Keller KL, Ketter TA. Do positive emotions predict symptomatic change in in bipolar disorder? Bipolar Disorders. 2009; 11:330–336. [PubMed: 19419390]

Gruber J, Johnson SL, Oveis C, Keltner D. Risk for mania and positive emotional responding: Too much of a good thing? Emotion. 2008; 8:23–33. [PubMed: 18266513]

Horan WP, Blanchard JJ, Clark LA, Green MF. Affective traits in schizophrenia and schizotypy. Schizophrenia Bulletin. 2008; 34:856–874. [PubMed: 18667393]

Hughes AA, Heimberg RG, Coles ME, Gibb BE, Liebowitz MR, Schneier FR. Relations of the factors of the tripartite model of anxiety and depression to types of social anxiety. Behaviour Research and Therapy. 2006; 44:1629–1641. [PubMed: 16457777]

John, OP.; Srivastava, S. The big five trait taxonomy: History, measurement, and theoretical perspectives. In: Pervin, LA.; John, OP., editors. Handbook of personality: Theory and research. 2nd ed.. New York: The Guilford Press; 1999. p. 102-138.

Johnson SL, Cueller AK, Ruggero C, Winett-Perlman C, Goodnick P. Life events as predictors of mania and depression in bipolar I disorder. Journal of Abnormal Psychology. 2008; 117:268–277. [PubMed: 18489203]

Johnson, SL.; Gruber, J.; Eisner, LR. Emotion and bipolar disorder. In: Rottenberg, J.; Johnson, SL., editors. Emotion and psychopathology: Bridging affective and clinical science. Washington, D. C: American Psychological Association; 2007. p. 123-150.

Johnson SL, Sandrow D, Meyer B, Winters R, Miller I, Keitner G, Solomon D. Increases in manic symptoms following life events involving goal attainment. Journal of Abnormal Psychology. 2000; 109:721–727. [PubMed: 11195996]

Joiner TE, Brown JS, Metalsky GI. A test of the tripartite model's prediction of anhedonia's specificity to depression: Patients with major depression versus patients with schizophrenia. Psychiatry Research. 2003; 119:243–250. [PubMed: 12914895]

Jolly JB, Dyck MJ, Kramer TA, Wherry JN. Integration of positive and negative affectivity and cognitive content-specificity: Improved discrimination of anxious and depressive symptoms. Journal of Abnormal Psychology. 1994; 103:544–552. [PubMed: 7930054]

Kashdan TB. Social anxiety dimensions, neuroticism, and the contours of positive psychological functioning. Cognitive Therapy and Research. 2002; 26:789–810.

Kashdan TB. Social anxiety spectrum and diminished positive experiences: Theoretical synthesis and meta-analysis. Clinical Psychology Review. 2007; 27:348–365. [PubMed: 17222490]

Kashdan TB, Breen WE. Social anxiety and positive emotions: A prospective examination of a self-regulatory model with tendencies to suppress or express emotions as a moderating variable. Behavior Therapy. 2008; 39:1–12. [PubMed: 18328865]

Kashdan TB, Steger MF. Expanding the topography of social anxiety: An experience-sampling assessment of positive emotions, positive events, and emotion suppression. Psychological Science. 2006; 17:120–128. [PubMed: 16466419]

Kerns JG. Schizotypy facets, cognitive control, and emotion. Journal of Abnormal Psychology. 2006; 115:418–427. [PubMed: 16866583]

Kimhy D, Delespaul P, Corcoran C, Ahn H, Yale S, Malaspina D. Computerized experience sampling method (ESMc): Assessing feasibility and validity among individuals with schizophrenia. Journal of Psychiatric Research. 2006; 40:221–230. [PubMed: 16300791]

Kring AM, Moran EK. Emotional response deficits in schizophrenia: Insights from affective science. Schizophrenia Bulletin. 2008; 34:819–834. [PubMed: 18579556]

Lovejoy MC, Steuerwald BL. Subsyndromal unipolar and bipolar disorders: Comparisons on positive and negative affect. Journal of Abnormal Psychology. 1995; 104:381–384. [PubMed: 7790640]

Lozano BE, Johnson SL. Can personality traits predict increases in manic and depressive symptoms? Journal of Affective Disorders. 2001; 63:103–111. [PubMed: 11246086]

Lucas RE, Fujita F. Factors influencing the relation between extraversion and positive affect. Journal of Personality and Social Psychology. 2000; 79:1039–1056. [PubMed: 11138753]

Meehl PE. Schizotaxia, schizotypy, schizophrenia. American Psychologist. 1962; 17:827–838.

Meyer B, Johnson SL, Winters R. Responsiveness to threat and incentive in bipolar disorder: Relations of the BIS/BAS scales with symptoms. Journal of Psychopathology and Behavioral Assessment. 2001; 23:133–143.

Meyer TD, Hofmann BU. Assessing the dysregulation of the behavioral activation system: The Hypomanic Personality Scale and the BIS-BAS Scales. Journal of Personality Assessment. 2005; 85:318–324. [PubMed: 16318571]

Mineka S, Watson D, Clark LA. Comorbidity of anxiety and unipolar mood disorders. Annual Review of Psychology. 1998; 49:377–412.

Muntaner C, Garcia-Sevilla L, Fernandez A, Torrubia R. Personality dimensions, schizotypal and borderline personality traits and psychosis proneness. Personality and Individual Differences. 1988; 9:257–268.

Myin-Germeys I, Peeters F, Havermans R, Nicolson NA, deVries MW, Delespaul P, van Os J. Emotional reactivity to daily life stress in psychosis and affective disorder: An experience sampling study. Acta Psychiatrica Scandinavica. 2003; 107:124–131. [PubMed: 12534438]

Naragon-Gainey K, Watson D, Markon K. Differential relations of depression and social anxiety symptoms to the facets of extraversion/positive emotionality. Journal of Abnormal Psychology. 2009; 118:299–310. [PubMed: 19413405]

Nusslock R, Abramson LY, Harmon-Jones E, Alloy LB, Hogan ME. A goal-striving life event and the onset of hypomanic and depressive episodes and symptoms: Perspective from the behavioral approach system (BAS) dysregulation theory. Journal of Abnormal Psychology. 2007; 116:105–115. [PubMed: 17324021]

Raine A. The SPQ: A scale for the assessment of schizotypal personality based on *DSM-III-R* criteria. Schizophrenia Bulletin. 1991; 17:555–564. [PubMed: 1805349]

Ross SR, Lutz CJ, Bailley SE. Positive and negative symptoms of schizotypy and the five-factor model: A domain and facet-level analysis. Journal of Personality Assessment. 2002; 79:53–72. [PubMed: 12227668]

Salavert J, Caseras X, Torrubia R, Furest S, Arranz B, Duenas R, San L. The functioning of the behavioral activation and inhibition systems in bipolar I euthymic patients and its influence in subsequent episodes over an eighteen-month period. Personality and Individual Differences. 2007; 42:1323–1331.

Trull TJ, Sher KJ. Relationship between the five-factor model of personality and Axis I disorders in a nonclinical sample. Journal of Abnormal Psychology. 1994; 103:350–360. [PubMed: 8040504]

Watson, D. Mood and temperament. New York: Guilford Press; 2000.

Watson D. Rethinking the mood and anxiety disorders: A quantitative hierarchical model for *DSM-V*. Journal of Abnormal Psychology. 2005; 114:522–536. [PubMed: 16351375]

Watson D. Differentiating the mood and anxiety disorders: A quadripartite model. Annual Review of Clinical Psychology. 2009; 5:221–247.

Watson, D.; Clark, LA. The Mood and Anxiety Symptom Questionnaire. Iowa City, IA: University of Iowa; 1991. Unpublished manuscript

Watson D, Clark LA. On traits and temperament: General and specific factors of emotional experience and their relation to the five-factor model. Journal of Personality. 1992; 60:441–476. [PubMed: 1635050]

Watson, D.; Clark, LA. Extraversion and its positive emotional core. In: Hogan, R.; Johnson, J.; Briggs, S., editors. Handbook of personality psychology. San Diego, CA: Academic Press; 1997a. p. 767-793.

Watson D, Clark LA. Measurement and mismeasurement of mood: Recurrent and emergent issues. Journal of Personality Assessment. 1997b; 68:267–296. [PubMed: 16370781]

Watson, D.; Clark, LA. The PANAS-X: Manual for the Positive and Negative Affect Schedule-Expanded Form. Department of Psychology Web site: University of Iowa; 1999. Retrieved from http://www.psychology.uiowa.edu/Faculty/Watson/Watson.html.

Watson D, Clark LA, Carey G. Positive and negative affectivity and their relation to anxiety and depressive disorders. Journal of Abnormal Psychology. 1988; 97:346–353. [PubMed: 3192830]

Watson D, Gamez W, Simms LJ. Basic dimensions of temperament and their relation to anxiety and depression: A symptom-based perspective. Journal of Research in Personality. 2005; 39:46–66.

Watson D, O'Hara MW, Chmielewski M, McDade-Montez EA, Koffel E, Naragon K, Stuart S. Further validation of the IDAS: Evidence of convergent, discriminant, criterion, and incremental validity. Psychological Assessment. 2008; 20:248–259. [PubMed: 18778161]

Watson D, O'Hara MW, Simms LJ, Kotov R, Chmielewski M, McDade-Montez E, Gamez W, Stuart S. Development and validation of the Inventory of Depression and Anxiety Symptoms (IDAS). Psychological Assessment. 2007; 19:253–268. [PubMed: 17845118]

Watson D, O'Hara MW, Stuart S. Hierarchical structures of affect and psychopathology and their implications for the classification of emotional disorders. Depression and Anxiety. 2008; 25:282–288. [PubMed: 18415951]

Watson D, Tellegen A. Toward a consensual structure of mood. Psychological Bulletin. 1985; 98:219–235. [PubMed: 3901060]

Watson D, Wiese D, Vaidya J, Tellegen A. The two general activation systems of affect: Structural findings, evolutionary considerations, and psychobiological evidence. Journal of Personality and Social Psychology. 1999; 76:820–838.

Table 1

Correlations between IDAS Well-Being and Negative Mood Scales

Scale	1	2	3	4
1. Depressed Mood	.—	.72	.65	−.46[a]
2. Anxious Mood	.75	.—	.64	−.37[b]
3. Angry Mood	.57	.59	.—	−.31[c]
4. Well-Being	−.49[a]	−.37[b]	−.19[c]	.—

Note. Patient (N=1,006) correlations are below the diagonal; student correlations (N=980) are above the diagonal). Within a sample, Well-Being correlations not sharing the same superscript differ significantly at *p* < .05. Watson, O'Hara, and Stuart (2008, Table 1) present correlations among these negative mood scales in this same student sample and in a preliminary version of the patient sample.

Table 2

Correlations between Depression Scales from the IDAS and the Beck Depression and Anxiety Inventories

IDAS Scale	Psychiatric Patients		Postpartum Women		College Students		Community Adults		Weighted Mean	
	BDI-II	BAI	BDI-II	BAI	BDI-II	BAI	BDI-II	BAI	BDI-II	BAI
Dysphoria	**.82**	.67	**.82**	.72	**.77**	.67	**.85**	.77	**.82**	.71
Lassitude	**.57**	.45	**.63**	.56	**.60**	.45	**.70**	.64	**.62**	.53
Suicidality	**.61**	.50	**.48**	.41	**.56**	.46	**.66**	.53	**.57**	.47
Insomnia	.45	.48	.56	.51	.44	.39	.58	.53	.51	.48
Appetite Loss	.38	.36	**.41**	.35	.34	.37	.45	**.52**	.40	.40
Appetite Gain	.24	.19	.30	.27	**.38**	.26	.37	.31	**.32**	.25
Well-Being	**−.58**	−.22	**−.57**	−.38	**−.55**	−.35	**−.65**	−.39	**−.59**	−.33

Note. $N = 965$ (Psychiatric patients), 1056 (Postpartum women), 674 (College Students), 743 (Community adults). Highlighted correlations are significantly stronger than the corresponding coefficient for the other Beck inventory ($p < .01$, 2-tailed). IDAS = Inventory of Depression and Anxiety Symptoms. BDI-II = Beck Depression Inventory-II. BAI = Beck Anxiety Inventory. Portions of these data are adapted from Watson et al. (2007), Table 6.

Table 3

Mean-Level Comparisons of Diagnosed Cases versus Non-Cases (Expressed as Cohen's d)

Scale	MDD	GAD	PTSD	Panic Disorder	Social Phobia
IDAS Scales					
Dysphoria	**1.25**	**0.90**	**0.85**	**1.13**	0.63
Suicidality	**0.88**	0.54	0.64	**0.83**	0.36
Lassitude	**0.81**	0.49	0.59	**0.89**	0.49
Insomnia	0.69	0.70	0.74	0.79	0.35
Appetite Loss	0.56	0.39	0.65	0.78	0.45
Appetite Gain	0.23	0.10	0.23	-0.07	0.06
Well-Being	**-0.89**	-0.51	-0.39	-0.46	-0.31
BFI Scales					
Neuroticism	**0.85**	**0.88**	0.61	**0.81**	0.49
Extraversion	-0.52	-0.44	-0.30	-0.28	**-0.84**

Note. N = 575 (IDAS scales), 571 (BFI scales). Large effect sizes (*d*s of |.80| and greater) are in bold. Medium effect sizes (*d*s ranging from |.50| to |.79|) are underlined. IDAS = Inventory of Depression and Anxiety Symptoms. BFI = Big Five Inventory. MDD = major depression. GAD = generalized anxiety disorder. PTSD = posttraumatic stress disorder. Adapted from Watson, O'Hara, Chmielewski, et al. (2008), Table 5.

Table 4

Correlations between IDAS Well-Being and DSM-Based Content Scales

DSM Symptom Scale	Patients	Students	Mean
Group 1			
C2: Anhedonia	**−.55**	**−.46**	**−.51**
C1: Depressed Mood	**−.49**	**−.46**	**−.48**
C7: Worthlessness	**−.46**	**−.42**	**−.44**
C6: Lassitude	**−.42**	−.37	**−.40**
Group 2			
C8: Cognitive Disturbance	−.35	−.31	−.33
C9: Suicidality	−.37	−.27	−.32
Group 3			
C4: Hypersomnia	−.19	−.20	−.20
C4: Insomnia	−.21	−.18	−.19
C3: Appetite Loss	−.18	−.19	−.19
C5: Motor Disturbance	−.14	−.17	−.15
C3: Appetite Gain	−.02	−.08	−.05

Note. $N = 1,006$ (Patients), 980 (Students). Correlations of |.40| and greater are in bold. Correlations of |.30| to |.39| are underlined. Correlations of |.08| and greater are significant at $p < .05$.

Table 5

Correlations between the IDAS Well-Being and BFI Extraversion Scales and Depression and Anxiety Items from the IDAS-CR

IDAS-CR Item	IDAS Well-Being			BFI Extraversion		
	Patients	Students	Mean	Patients	Students	Mean
Depression Items						
Dysphoria	−.44 **	−.42 **	−.43	−.24 **	−.17 **	−.22
Lassitude	−.30 **	−.30 **	−.30	−.17 **	−.09	−.14
Suicidality	−.32 **	−.16 **	−.27	−.18 **	−.12 *	−.16
Insomnia	−.12 **	−.19 **	−.14	−.08	−.04	−.06
Appetite Loss	−.14 **	−.11	−.13	−.01	−.09	−.04
Appetite Gain	.00	−.12 *	−.04	−.03	−.04	−.03
Anxiety Items						
Social Anxiety	−.25 **	−.19 **	−.23	−.36 **	−.33 **	−.35
Panic	−.18 **	−.18 **	−.18	−.11 **	−.02	−.08
Traumatic Intrusions	−.10 *	−.14 *	−.11	.02	−.07	−.01

Note. N = 587 (Patients), 302 (Students). Correlations of |.30| and greater are in bold; correlations ranging from |.20| to |.29| are underlined. IDAS = Inventory of Depression and Anxiety Symptoms. BFI = Big Five Inventory. IDAS-CR = Clinician Rating version of the IDAS.

*
p < .05, 2-tailed.

**
p < .01, 2-tailed.