Published in final edited form as:

J Pers Disord. 2003 April ; 17(2): 152–172.

SEPARATE PERSONALITY TRAITS FROM STATES TO PREDICT DEPRESSION

Lee Anna Clark, PhD, Jeffrey Vittengl, PhD, Dolores Kraft, PhD, and Robin B. Jarrett, PhD
From the Department of Psychology; University of Iowa (L. A. C.); the Division of Social Science, Truman State University (J. R. V.); and the Department of Psychiatry, The University of Texas Southwestern Medical Center at Dallas (D. K. & R. B. J.).

Abstract

Results have been inconsistent regarding the ability of personality measures to predict future depression severity levels, leading some researchers to question the validity of personality assessment, especially when patients are acutely depressed. Using a combination of regression and factor analytic techniques, we separated the variance of personality measures into stable trait and variable state-affect components. Findings supported the hypotheses that depression severity measured at different time points would correlate with both stable trait and concurrent state-affect components in personality measures, whereas change in depression severity would correlate with state changes but not with stable trait scores. Thus, personality assessments tap both state affect and trait variance, with the state-affect variance masking the trait variance when patients are depressed.

Although the full nature and extent of their relations remain unclear, it is well established that personality is related to depression (Frank, Kupfer, Jacob, & Jarrett, 1987; Hirschfeld et al., 1989; Hirschfeld & Shea, 1992; Holahan & Moos, 1991; Katon et al., 1994; Klein, Wonderlich, & Shea, 1993; Watson & Clark, 1995; for a review see Clark, Watson, & Mineka, 1994). The best-documented findings concern relations between depression and both negative temperament (also known as negative affectivity or neuroticism) and positive temperament (also known as positive affectivity or extraversion), which are two broad dimensions of affective temperament sometimes known as “the Big Two.” Measured concurrently, these temperament dimensions are correlated with both depressive symptom severity and clinical diagnoses (Watson, Clark, & Carey, 1988). More broadly, both traits (a) appear to be vulnerability factors for the development of depression, (b) predict poor long-term prognosis, and (c) are themselves affected by the experience of disorder, although the data are stronger for negative than positive temperament (Clark et al., 1994). Other psychosocial dimensions (e.g., attributional style, sociotropy or dependency, and autonomy or self-criticism) also may constitute specific vulnerability factors but the data are more equivocal for these traits (Clark et al., 1994).

Taken together, the facts that personality and depression are related and that (high) negative and (low) positive temperament may be risk factors for depression suggest the hypothesis that

Correspondence to: Lee Anna Clark; Robin B. Jarrett.

Address correspondence to Lee Anna Clark, PhD, Department of Psychology, University of Iowa, Iowa City, IA 52242-1407; E-mail: la-clark@uiowa.edu. Address correspondence to Robin B. Jarrett, PhD, Department of Psychiatry, The University of Texas Southwestern Medical Center, Dallas, TX, 75390-9149; E-mail: robin.jarrett@UTSouthwestern.edu..

The clinical trial was conducted at the University of Texas Southwestern Medical Center at Dallas, Department of Psychiatry, in the Psychosocial Research and Depression Clinic directed by Dr. Jarrett and was supported in part by grants MH-38238 and MH-01571 from the National Institute of Mental Health. The research also was supported by the University of Minnesota Press (Dr. Clark).

these dimensions would predict treatment outcomes for depressed patients, with higher negative and lower positive temperament yielding poorer outcomes. However, somewhat surprisingly, the results of studies investigating this question have been inconsistent. Whereas some treatment outcome studies have found these traits to have significant predictive power (Geerts & Bouhuys, 1998; Joyce, Mulder, & Cloninger, 1994; Tome, Cloninger, Watson, & Isaac, 1997), others have not (Bagby et al., 1995; Boyce & Parker, 1985; Sato et al., 1999). Regrettably, the number of studies is too few and the designs and measures used are too varied to discern the basis for the inconsistent results. Importantly, despite inconclusive findings regarding the predictive power of these traits for treatment outcome, a consistent finding is that personality test scores change from pre- to posttreatment. Specifically, reflecting the concurrent correlation between depressive symptom severity and both negative and positive temperament, scores on negative temperament decrease and positive temperament scores increase in parallel with the extent of improvement in depressive symptomatology (Clark et al., 1994).

Various interpretations of these findings have been offered. Some researchers have questioned the validity of personality assessment, either in general or when patients are acutely depressed (Reich et al., 1987). The more general argument is that the personality measures themselves are invalid because they reflect state affect rather than trait variance. Critics who take this position argue either that personality traits are, by definition, highly stable and, therefore, any measure that is influenced by changes in affective state is invalid as a trait measure, or else they call into question the basic notion that personality is stable (Reich, Noyes, Coryell, & O'Gorman, 1986; for a discussion see Santor, Bagby, & Joffe, 1997). The more specific argument is that depression so distorts self-perception and cognition that depressed persons' responses may be invalid. Although patients' "true" personality may be stable, when in a depressed state, patients are unable to report accurately regarding their true selves.

However, considerable data argue against both these positions, which also are inconsistent with current theory linking temperament and depression. First, with regard to the "distortion" argument in both currently and previously depressed samples, personality scales generally demonstrate the same internal consistency and structural relations as in normal samples (Clark, 1993; Kleinfeld, Sunday, Hurt, & Halmi, 1994; Sato, et al., 2001). Moreover, personality measures show similar retest reliabilities for comparable time intervals regardless of the nature of the sample (i.e., normal samples or clinical samples with or without intervention) (Bronisch & Klerman, 1991). Finally, correlations between self and other reports are comparable between depressed and nonclinical samples (Ready & Clark, 2002). Given these consistencies, if patient responses do not accurately reflect their true selves, then they are inaccurate in a similar manner and to a similar degree as the responses of nonpatients. This is logically inconsistent with the distortion hypothesis, which contrasts patient with nonpatient reports.

A fundamental problem with the more general argument is that it reflects a misconception regarding the stability of affective personality traits (i.e., temperament dimensions). It obviously would be problematic if personality measures purely assessed state affect, but clearly they do not, as evidenced by their having substantially stronger temporal stability coefficients, compared with state affect measures (Vaidya, Gray, Haig, & Watson, 2002; Watson & Clark, 1984). However, it also would be problematic if they were not at all responsive to changes in state affect, particularly major changes such as one might see in patients treated successfully for major depression. The conceptual core of negative and positive temperament is trait affect, which can be defined as a propensity to experience state affects with a certain level of frequency and intensity. Major and systematic changes in state affect, such as those that accompany treatment, would be expected to influence measures of trait affect. Thus, changes in these personality trait measures are linked theoretically with changes in depressive affect, so it would be theoretically inconsistent to consider them invalid because they were influenced by changes in affective state.

Moreover, Santor et al. (1997) have argued that conclusions regarding the instability of personality in relation to depression symptom severity have been drawn without differentiating relative stability among individual differences (test-retest reliability) from absolute stability of change scores (pre-to post mean score differences) and also without considering whether changes in personality scores are related to changes in depression severity. Using measures of neuroticism and extraversion, they demonstrated that both neuroticism and extraversion showed relative stability (i.e., high test-retest correlations) and absolute change over a 5-week pharmacotherapy trial. Importantly, the personality trait changes were not, or only modestly, accounted for by changes in depression scores. They concluded that claims of state-dependent instability in personality scores were premature and needed to be reconsidered.

Therefore, there are empirical, theoretical, and methodological reasons for rejecting the argument that personality measures are invalid simply because they are correlated with depressive state. A more sophisticated interpretation is that certain personality dimensions, specifically affective temperament, tap both unstable (state and error) and stable (trait) variance and that the unstable variance may mask the stable variance when clients are depressed. In this view, removing the unstable component in relevant personality measures should unmask the stable trait component and allow the underlying relation between stable personality and depression severity to emerge. If this interpretation is correct, it is possible that the inconsistent results reported in the literature stem from the fact that, due to diverse sample and study design characteristics, the personality measures in different studies' depressed samples represent varying proportions of state, error, and trait variance. In those samples where the unstable component is large, little predictive power would be found, whereas in those samples with a relatively large trait component, pretreatment personality measures would have predictive power for depression treatment outcome. Interestingly, although the idea that personality measures tap both state and trait variance is not new (and might even be considered fairly widely accepted), it has never been subjected to a direct empirical test. A primary aim of this article is to report on such a test.

Two comments are needed regarding this study. First, our focus is on personality traits, not personality disorder (PD) per se. To be sure, personality traits and disorders are not entirely independent constructs; indeed, PD is defined in terms of personality traits. However, personality traits run the gamut from adaptive to maladaptive, whereas PDs are maladaptive by definition. Thus, it is not surprising that, in contrast to the inconsistent evidence regarding the predictive power of personality traits, PD repeatedly has been found to be associated with poorer treatment outcome, both short-term (Shea et al., 1990) and long-term (Alnaes & Torgerson, 1997). However, this phenomenon is by no means unique to depression and PD; comorbidity is generally a negative prognostic sign regardless of the disorders involved (Clark, Watson, & Reynolds, 1995). The meaning of this general finding is a topic of some debate and we do not enter that debate in this article. We address relations between the full range of personality traits (including the maladaptive end) and psychopathology (specifically, depression), not those between two types of psychopathology (i.e., comorbidity between depression and PDs).

Second, we collected a wide range of psychosocial measures, several of which fall broadly in the domain of personality (e.g., Inventory of Interpersonal Problems; Horowitz, Rosenberg, Baer, Ureño, and Villaseñor, 1988; Self-Efficacy Scale; Sherer et al., 1982). We focus this report, however, on a set of 15 traits assessed using a single omnibus personality inventory with well-known psychometric properties (i.e., internal consistency, temporal stability, and factor structure) and that also is linked both theoretically and empirically with the Big-Three tradition (i.e., negative and positive temperament, plus disinhibition vs. constraint) in personality theory and assessment (Clark, 1993; Clark & Watson, 1999). This focus on a set

of traits with known properties facilitates systematic generalizability of our findings to the broader personality literature.

METHOD

PARTICIPANTS

Patients were recruited at the University of Texas Southwestern Medical Center, Psychosocial Research and Depression Clinic, through media, printed announcements, and self- and practitioner referrals. After a process of telephone screening and diagnostic interviews, including a supplemented version of the Structured Clinical Interview for DSM-III-R (SCID-Outpatient Version; Spitzer, Williams, Gibbon, & First, 1989) that yielded both DSM-III-R and DSM-IV diagnoses, 156 study-eligible patients provided written informed consent to enter acute-phase cognitive therapy (A-CT; Beck, Rush, Shaw, & Emery, 1979). Eligibility criteria included: (a) DSM-IV nonpsychotic, unipolar, recurrent major depressive disorder (MDD) with clear interepisode recovery (two or more episodes of MDD, each separated by at least 2 months of a return to normal functioning); and (b) a 17-item Hamilton Rating Scale for Depression (HRSD-17; Hamilton, 1960) score greater than or equal to 16.

Patients who otherwise met the inclusion criteria were excluded if they: (a) had a concurrent medical disorder or treatment that might cause depressive symptoms; (b) had other organic mental disorders, psychotic disorders, schizophrenia, schizoaffective disorders, current drug abuse or dependency, or borderline personality disorder; (c) had primary obsessive-compulsive or eating disorder, with primary defined as the disorder with the most functional impairment; (d) could not complete questionnaires or comply with the protocol; or (e) refused consent to psychosocial treatment alone or to randomization. Patients who did not meet entry criteria were referred for alternate treatment. See Jarrett et al. (2001) for additional detail about patient recruitment, inclusion and exclusion, and sample characteristics.

Axis II PD Diagnoses. As noted, we did not explicitly exclude patients with personality disorder except DSM-IV borderline PD (assessed with a structured interview), but the self-report instrument we used to assess personality traits was designed to tap both normal personality and personality pathology. There is considerable debate regarding the use of self-report instruments to diagnose PD (for a review; see Clark & Harrison, 2001); specifically, most self-report measures yield considerably higher PD base rates than do structured interviews and thus may be more appropriate as screening than diagnostic instruments. Nevertheless, consistent with recent reviews of the comorbidity of PD with major depression (Corruble, Ginestet, & Guelfi, 1996; Melartin & Isometsae, 2000), approximately 70% of our sample met DSM-IV PD criteria when assessed via self-report before or after the second treatment session and, of those with PD, two-thirds met criteria for more than one diagnosis, which again is a typical finding. The two most frequent diagnoses were Avoidant PD and PD-Not Otherwise Specified, at approximately 35% each (with a 40% overlap between them; thus, nearly 80% of those with PD met criteria for one or both of these diagnoses.) Consistent with the literature, those who responded to A-CT and were randomized into the experimental phase of the study (see Jarrett et al., 2001) had fewer initial PD diagnoses than those who were not randomized (e.g., because of failure to respond to A-CT) (1.5 vs. 2.1, $p < .04$), although presence of PD per se was not related to treatment response.

PROCEDURE

Cognitive Therapy. Acute-phase cognitive therapy A-CT was conducted by five experienced therapists within a 12 to 14 week protocol, including 20 individual sessions (50 to 60 minutes) held twice weekly for the first 8 weeks and once weekly for the last 4 weeks. No

pharmacotherapy was provided. Additional detail about the therapy procedure is provided in Jarrett et al. (2001).

Assessment. In addition to the interview-based measures used to establish study eligibility, patients were evaluated at multiple time points with a broad range of symptom and psychosocial measures, including (a) the same session as the eligibility determination (Pre1), (b) at a follow-up assessment before beginning A-CT (Pre2), (c) at various points during the 20 therapy sessions (T1-T20), and (d) at the conclusion of A-CT (Post). This multitrait, multimethod, multi-occasion design permitted application of data reduction techniques to yield more reliable assessment. As mentioned earlier, personality was assessed by a single, omnibus instrument; what was collected, but not reported on here, were measures of interpersonal functioning and cognition and measures of therapeutic alliance and expressed emotion.

Analyses of the four depression severity measures (described briefly subsequently and in more detail in Vittengl, Clark, Kraft, & Jarrett, manuscript in preparation), for which by far the most data were available in terms of the number both of measures and of assessment time points, led us to aggregate appropriate subsets of the multiple assessments into two sets of scores, which we term simply “early” and “late” assessments. Fortunately, these results generally coincided with the collection of the primary personality measure, the Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark, 1993), near the beginning and at the end of A-CT (T2 and Post, respectively).

ASSESSMENT OF PERSONALITY

Schedule for Nonadaptive and Adaptive Personality (SNAP). Personality was measured with the SNAP (Clark, 1993), a 375-item, factor analytically derived self-report inventory that uses a true-false format to assess 15 dimensions of personality functioning relevant to personality disorder (e.g., mistrust, impulsivity). The SNAP scales have demonstrated good internal consistency (median α s = .80 to .85 in student, adult, and patient samples), test-retest reliability (e.g., in normal adults, 1 week to 4 months $M, r = .87$), and discriminant validity (M interscale, $r = \sim .20$) (Clark, Simms, Wu, & Casillas, in press). The three higher-order temperament dimensions (i.e., positive temperament, negative temperament, and disinhibition) reflect the factor structure of the instrument and the scales' validity has been supported in several studies (Harlan & Clark, 1999; Ready & Clark, 2002; Ready, Watson, & Clark, 2002; Reynolds & Clark, 2001; Vittengl, Clark, Owen-Salters, & Gatchel, 1999). Psychometric properties of the instrument in this study are reported subsequently.

ASSESSMENT OF DEPRESSION SEVERITY

Depression severity was measured with two self-report and two clinician-rating scales that we aggregated as described subsequently.

Hamilton Rating Scale for Depression, 17-Item Version (HRS-D-17). The HRS-D-17 (Hamilton, 1960) is a widely used clinician rating scale to assess severity of depression. The scale has good interrater reliability with trained raters ($r = \sim .85$; Clark & Watson, 1991), adequate internal consistency (Schwab, Bialow & Clemmons, 1967) and good convergent validity with self-report depression measures (r s = range from .70 to .83; Clark & Watson, 1991). Internal consistency (Cronbach's α) in this sample ranged from .37 (Pre1) to .88 (Post) over 15 assessments (median = .80).

Beck Depression Inventory (BDI). This 21-item, self-report measure is the most widely used measure of depressive symptom severity (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Summarizing 25 years of BDI research, Beck, Steer and Garbin (1988) found an average internal consistency of .87, an average short-term (< 1 month) test-retest reliability of .60, and

considerable evidence of convergent validity with clinical ratings of depression, the HRS-D-17, and other self-report measures of depressive symptoms. Internal consistency (Cronbach's α) in this sample ranged from .80 (Pre1) to .93 (T19) over 14 assessments (median = .90).

Inventory for Depressive Symptomatology (IDS). This 28-item questionnaire (Rush, Gullion, Basco, Jarrett, & Trivedi, 1996) has both self-report (IDS-SR) and clinician (IDS-C) versions to measure specific signs and symptoms of depression in patients. Mean IDS score patterns in patients with depression, other diagnoses, and normal controls support the measure's construct validity. Rush et al. (1996) reported internal consistency reliabilities (Cronbach's α) of .77 (IDS-SR) and .67 (IDS-C) in a sample ($N=434$) of depressed patients; corresponding values in the total sample ($N=552$; 434 patients plus 15 remitted depressed patients and 103 normal controls) were .93 (IDS-SR) and .92 (IDS-C). They also reported high correlations with the BDI (IDS-SR, $r = .92$; IDS-C, $r = .83$) and HRS-D-17 (IDS-SR $r = .85$; IDS-C, $r = .94$) in the total sample. Internal consistency (Cronbach's α) in this sample ranged from .48 (Pre2) to .90 (Post) over 15 assessments (median = .84) for the IDS-C, and from .70 (Pre1) to .91 (Post) over 14 assessments (median = .89) for the IDS-SR.

Aggregation of Depression Severity Measures. As mentioned earlier, aggregation of the depression severity measures is described in detail in Vittengl et al. (in preparation), but we summarize the procedures here. We first performed a principal components analysis with varimax rotation using scores for each of the four indices over all available assessments. In the two-component solution, the later assessments (T13 through Post) loaded highly on the first component and not on the second, whereas the early assessments (Pre1 through T3) loaded highly on the second component and not the first, with intermediate assessments (T5 - T9) typically splitting between components. Thus, the loadings clearly indicated that time rather than either method (i.e., self-report vs. clinical assessment) or instrument was the critical variable. Therefore, we reduced the depression severity indices into "early" and "late" components. Data from all four indices over the first three (pretreatment) assessments were aggregated into early depression scores and all data from the T13 through Post assessments were aggregated into a late depression score. Data from the T3 - T11 assessments were dropped from further analyses.

To form these aggregated early and late depression scores, each depression measure at the Pre1 assessment was standardized to a mean of 100 ($SD = 10$) and all subsequent assessments were standardized in reference to this assessment. This put all 58 depression severity measurements on the same metric and allowed us to aggregate over both multiple instruments and assessments. Using this technique, the early depression score (mean of Pre1, Pre2, and T1 assessments aggregated over the four measures) had a mean of 97.1 ($SD = 7.6$), and the late depression score (mean of the T13 through Post assessments aggregated over the four measures) had a mean of 62.2 ($SD = 12.8$). Consistent with the efficacy data for cognitive therapy for depression (Jarrett & Rush, 1994), the average depression score decreased more than three standard deviations from the early to late periods and the variability of scores increased, most likely reflecting differential treatment response. Consistent with the two-factor principal components analyses described earlier, the correlation between the aggregated early and late depression indices was only .23. Thus, there was considerable absolute and relative change in depression symptom severity over the course of the 20-session A-CT.

¹In the three-component solution, the early, intermediate, and late assessments each formed a factor. Therefore, the three-component solution also was compatible with

RESULTS

PERSONALITY OVER THE COURSE OF A-CT

Preliminary Analyses. Comparisons of scale means by gender revealed that only two scales (manipulativeness and disinhibition) showed mean level differences that replicated across assessments, so the data were combined across gender for all analyses. Of the 148 participants who completed a SNAP at the early (T2) assessment, 108 also completed a late (Post) assessment SNAP. A multivariate comparison of the early SNAP scores of A-CT completers and non-completers revealed no significant difference ($F[21, 126] = 1.08, p = .37$) indicating that there was no systematic relation between pretreatment personality and treatment completion. The scales showed good internal consistency at both assessments, with only one value below .74 (Pre1 values are shown in Table 1; for the Post assessment, α s ranged from .64 to .93, median = .82).

A principal factor analysis of the early SNAP scores was conducted to ensure that the SNAP was functioning in a typical manner in this sample. Consistent with previous analyses, three factors, which accounted for 98% of the common variance, were identifiable as (a) Negative Temperament (marked by negative temperament, mistrust, aggression, self-harm, and eccentric perceptions), (b) Positive Temperament (marked by positive temperament, exhibitionism, and entitlement vs. detachment), and (c) Disinhibition (marked by disinhibition and on the low end by propriety and workaholism). Several scales exhibited split loadings but none were unusual or unique to this sample. These results thus confirm that the SNAP scales may be interpreted in the usual manner (see Clark, 1993).

Stability and Change. Table 1 presents descriptive, retest, and change information for the early and late assessments of personality on those participants who completed both assessments. All scales showed significant mean changes in the direction of increased psychological health. At the same time, however, considerable temporal, rank-order stability was found (range of test-retest r s = .48 to .82; $M = .69$), indicating that the mean level decreases over time were relatively consistent across participants. Nonetheless, some scales showed greater change than others, so it was of interest to evaluate whether the primary dimensions (i.e., positive temperament, negative temperament, disinhibition) changed similarly or whether the two dimensions more directly implicated in depression (i.e., positive and negative temperament) changed to a greater degree than disinhibition, which is theoretically unrelated to depression, over A-CT.

To examine this question, we created a common change index by dividing each scale's average change score by the number of items in the scale. This is a linear transformation, so the significance of this change index is identical to that for the raw scales. Consistent with theoretical prediction, the absolute change in both positive (−.19) and negative temperament (.24) was significantly greater than that for disinhibition (.03; $p < .0001$, two-tailed in both cases). More generally, scales theoretically associated with each of the primary dimensions showed the same overall pattern. The nine scales theoretically and empirically (via the factor analysis reported earlier) associated with the positive or negative temperament dimensions changed significantly more, on average, than the three scales associated with disinhibition (.13 vs. .06; $p < .0001$, two-tailed). These results support the validity of the SNAP's higher-order structure but, more importantly, they support the theoretical relation between depression and the general personality dimensions of negative and positive temperament that was discussed earlier.

It also is important to note that when change in depression was partialled out, the temporal, rank-order stability of the traits increased modestly (range of r increase = .07 to .12) for four scales (Negative Temperament, Positive Temperament, Self-harm, Detachment), very slightly (.01 to .05) for five scales (Entitlement, Mistrust, Workaholism, Exhibitionism), and not at all

for the remaining seven scales. All four scales that showed the most depression-related change have an affective component theoretically, whereas the scales of the disinhibition factor, which are theoretically unrelated to depression, showed no or virtually no (.02) depression-related change. Other scales fell in between these two groups. These data thus speak directly to Santor et al.'s (1997) contention that claims of depression state-dependent instability in personality scores needed to be reconsidered. Specifically, depression state-dependent instability was seen only in those scales in which such instability would be predicted theoretically, and not in others. Moreover, depression state-dependent instability was only moderate, even in those scales.

In summary, both depressive symptom severity and personality showed considerable (and typical) mean-level change from early to late treatment. Notably, those personality dimensions theoretically related to depression (i.e., negative and positive temperament) showed greater change than those not theoretically related to depression. By contrast, temporal rank-order stability differed between depression and personality. Specifically, early and late depression were not strongly related ($r = .23$), whereas personality was relatively stable across this same time period ($Mr = .69$). Furthermore, those personality traits theoretically related to depression showed greater stability when change in depression severity was partialled out, whereas those traits unrelated to depression did not.

PREDICTION OF DEPRESSION

We next analyzed relations between the personality and depression data more directly and in greater detail. Specifically, we examined (a) whether our data replicated the common finding of strong concurrent correlations between depression severity and personality; (b) whether early personality had predictive validity for late depression levels (a question with mixed findings in the literature); and (c) the extent to which change in personality and depression were related (a question rarely investigated). To examine these questions, we correlated all variables both concurrently and longitudinally, as well as calculating correlations between change scores. Given our sample size, correlations of approximately .19 or greater were significant at the $p < .05$ level and those of .25 or greater were significant at the $p < .01$ level, enabling focus on the absolute magnitude of the correlations (i.e., effect size) rather than statistical significance per se. Patterns of noteworthy relations are emphasized over individual results.

Nine SNAP scales showed few or no significant correlations with depression, either concurrently, longitudinally, or change scores. Specifically, for these nine scales, only three of 81 personality-depression correlations were significant (i.e., $> .25$), regardless of whether we examined (a) early (or late) personality scores with early (or late) depression scores, respectively; (b) early personality with late depression or vice versa; or (c) change in personality with change in depression. Two of the three exceptions involved correlated change scores, which we discuss below. Of the nine scales, three were associated with the negative temperament factor (i.e., manipulateness, aggression, and eccentric perceptions) and two were associated with the positive temperament factor (i.e., exhibitionism and entitlement). Although these scales fall broadly in the domains of negative or positive temperament, their specific nonaffective content-based variance is apparently sufficiently large that they are unrelated to depression. For example, eccentric perceptions primarily taps cognitive and perceptual deviance, whereas exhibitionism is a primarily behavioral dimension. As theory would predict, all four scales associated with the disinhibition factor (i.e., disinhibition, impulsivity, propriety, and workaholism) were quite unrelated to depression. These nine scales, therefore, are not considered further, except as their data provide an important contrast to the six remaining scales.

Concurrent Validity. Of the six remaining personality scales that were correlated with depression, four are associated with the negative temperament factor, three of them quite

strongly (i.e., negative temperament, mistrust, self-harm), and one (i.e., dependency) more moderately; two are associated with the positive temperament factor (i.e., positive temperament and detachment). These results are presented in the first two columns of Table 2. All six scales correlated concurrently with depression, with one exception; pretreatment dependency correlated only .06 with early depression. Stronger relations were found at the late assessment (range of absolute r s = .39 to .57; median = .42)², compared with the early assessment (range of absolute r s = .26 to .35, median = .31). This finding most likely is attributable to the greater variance in state depression at the late versus early assessment (SD = 12.6 vs. 7.6, respectively). The magnitude of the early (vs. late) concurrent correlations was affected predictably by the more (vs. less) restricted variance of depression scores. Notably, variance of the personality scores did not differ at the two assessments (M of SD s = 4.1 vs. 4.2, respectively). Predictably strong relations were found for late scores between depression and the two scales most clearly related theoretically to depression, that is, negative (r = .57) and positive (r = -.43) temperament.

Change Scores. Two additional pieces of data provide further evidence that these six traits and depression have a common component. First, change in depression and change in these personality traits were related (range of absolute r s = .26 to .55; median = .50); these data are presented in the last column of Table 2. Consistent with the literature (and with the partial correlations reported earlier), negative temperament and the traits associated with it (i.e., mistrust, self-harm, and dependency) decreased, and positive temperament and detachment (when reversed keyed) increased as depression improved. In contrast, change in seven of the other nine scales was unrelated to depression change, with correlations ranging from .06 to .23 (median = .10). The two exceptions were Entitlement and Workaholism (r s = -.39 and .31, respectively); scores on Entitlement increased, and those on Workaholism decreased as depression improved.

Second, as noted earlier, when change in depression was partialled from the six depression-related scales (see Table 1), their stability increased slightly (raw r s = .48 to .70; M = .60; partial r s = .55 to .74, M = .66). These data indicate that some of the instability of these traits is directly associated with change in depressive affect. In contrast, the nine scales that were not related to depression were both more stable initially than the six scales that were related to depression (raw r s = .57 to .82; M = .74) and, moreover, showed no change in stability when change in depression was partialled out (partial r s = .61 to .83; M = .74). Examination of the two scales whose change was correlated with depression change revealed that the stability of Entitlement increased from .57 to .62, whereas that for Workaholism increased from .75 to .77. Thus, these two traits are unusual in that they are unrelated to depression (all other r s were not significant), but at least some of their change over the course of A-CT was related to change in depression. In general, however, change in these nine traits was largely independent of change in depression, adding to the evidence that the constructs themselves are not related to depression.

Predictive Validity: Raw Scores. In these data, quite strikingly, there was a complete lack of forward prediction for depression. Despite strong concurrent relations between depression and the six depression-related personality traits both early and late in treatment, none of the pretreatment scores afforded any glimpse of late-therapy depression status (range of absolute r s = .00 to .16, median = .13); these data are presented in the third column of Table 2. Perhaps needless to say, the correlations for the nine other traits also were all nonsignificant. Yet, personality was relatively stable across the course of A-CT (as just noted, median retest r = .60 for the six depression-related scales). We, therefore, confront a paradox: How is it that relatively stable personality scores, which are correlated with depression concurrently both

²Medians rather than means are used as the measure of central tendency for correlations involving just the six scales correlated with the depression severity scores because

early and late in treatment (Table 2, columns 1 and 2), nevertheless do not afford any prediction of late-treatment depression when measured pretreatment (Table 2, column 3)?

Predictive Validity: State Versus Trait Variance. As mentioned earlier, one possibility is that assessment of personality taps both state and trait variance, with the state variance masking the trait variance when clients are depressed. We sought to test this interpretation in our data. Specifically, we hypothesized that depression would correlate with both trait and concurrent state variance in personality measures, whereas change in depression would correlate more strongly with state changes than with trait variance (which, based on the assumption of trait stability, should show little change). To test these hypotheses, we used regression and factor analyses first to partition the variance of each set of personality scores into stable (trait) and unstable (state + error) variance and second to partition further the unstable variance at each assessment into a shared component across the personality dimensions (personality-based state variance) and a component unique to each personality dimension (specific and error variance). First, the score for each assessment (Pre or Post) was modeled as a function of the other. The predicted scores may be considered markers of the trait variance, whereas the residual scores represent the unstable variance, the personality-based state affect plus error variance, for each personality dimension at each assessment. The two sets of predicted scores were averaged to form a single measure for each personality trait.³ Second, personality-based, state-affect scores were computed for each assessment by factoring the residuals for the Pre and Post assessments, respectively, and calculating factor scores for each assessment. These procedures thus yielded stable trait scores for each personality dimension and a common personality-based state score for each assessment.

These personality trait and state scores were then correlated with depression severity, and these results are presented in Table 3. The first hypothesis—that at each assessment depression would relate to personality-based state affect—was moderately to strongly supported. For the early assessment, the correlation between depression severity and the common personality-based, state-affect measure was .28; for the late assessment it was .63, and change in depression severity correlated .58 with change in personality-state affect. As with the raw personality scores, concurrent correlations were considerably stronger for the late, compared with early, depression scores, again likely attributable to the greater variance of the late depression scores.

The second hypothesis—that depression would relate to trait variance equally at both assessments—was well supported (see Table 3). All trait assessments correlated significantly with depression severity at both the early and late assessments (with the exception of dependency, range of absolute r s = .22 to .41, M = .28 for early depression and .31 for late depression). Dependency similarly correlated .30 with late depression, but only $-.07$ with early depression. The depression-trait correlations were somewhat stronger for the late depression assessment for Negative and Positive Temperament and Self-Harm, whereas they were stronger for the early assessment for Mistrust and Detachment. Although these differences were not large, this pattern is consistent with the view that the personality dimensions of Negative and Positive Temperament are inherently affective, because they related more strongly to depression when there was more variation in depression severity. Nonetheless, the more general conclusion is that, consistent with theory, relevant personality trait variance is moderately related to depression regardless of clinical state, irrespective of whether the sample consists of patients in a more-or-less uniformly severely depressed state or is a more mixed group of patients, some of whom have responded to treatment and others who have not.

The third hypothesis—that change in depression would relate to state change but not to trait levels—also was strongly supported, once again for all scales but dependency (see Table 3).

³Trait scores are equivalent to the first factor score from a factor analysis.

Specifically, change in depression severity correlated .58 with change in personality-based affective state but only from $-.02$ to $-.23$ (median = $-.14$) with personality trait scores other than dependency. Thus, these data are consistent with traditional conceptualizations of traits as largely stable and of affect (including both depression severity and personality-based states) as variable. In contrast to this expected and usual pattern, however, depression change was correlated significantly with trait dependency ($r = -.33$), which we discuss subsequently. Moreover, trait negative temperament correlated $-.23$ with change in depression severity, with lower negative temperament associated with greater decrease in depression. This finding may be taken to indicate that the affective component of negative temperament is greater than that of the other traits.

Finally, the early personality-based, state-affect scores were somewhat more predictive of late depression than were the raw scores ($r = -.31$ vs. $M r = .13$). Moreover, it is noteworthy that the correlation of early personality-based state affect with late depression was opposite in sign from those with the early personality raw scores. Those with higher pretreatment negative affective states (and lower pretreatment positive affective states) were more likely to have lower (or higher, respectively) depression severity scores late in treatment. This finding may reflect the statistical phenomenon of regression to the mean (where patients with the most extreme personality-based affect—whose early depression severity also is likely to be more extreme, $r = .28$)—are unlikely to maintain such high (or low) scores at a later testing.

DISCUSSION

Previous research has yielded inconsistent results regarding the power of personality measures to predict depression treatment outcomes. Researchers have offered various interpretations for the lack of consistent prediction, going so far as to question the validity of personality assessment either in general or when clients are acutely depressed. Our data, however, contribute to the body of empirical evidence against simplistic interpretations. First, the personality scales demonstrated good internal consistency and structural integrity both before and after therapy. Moreover, concurrent correlations with depression severity were consistent with theory and change in personality scores paralleled change in depression severity scores in a theoretically consistent manner.

Furthermore, even for those personality scales most strongly correlated with depression severity, retest reliabilities were moderately strong ($M r = .60$), consistent with the conceptualization of personality as stable traits. Moreover, when change in depression severity was partialled from these scales, their stability increased slightly ($M r = .66$). By contrast, depression severity itself was not particularly stable ($r = .23$) from the beginning to end of therapy, thus appropriately failing to demonstrate the longer retest reliability expected of a personality construct. Finally, the correlations with depression severity of the six personality traits that were related to depression severity were somewhat stronger for the late assessment than the early assessment (median $r = .42$ vs. $.31$; $p < .02$). As noted earlier, this is most likely attributable to the greater variance in depression severity levels at the late versus early assessment. Taken together, these results are consistent with systematic responding on the part of the patients. Thus, it is unreasonable to conclude simplistically that the personality assessments were either inherently invalid or rendered invalid by distorted responding of depressed patients.

We offer a more complex, alternative explanation, arguing that personality assessments tap both state and trait variance, with the state variance masking the trait variance when patients are depressed. Specifically, we hypothesized that depression severity would correlate with both trait and concurrent state variance in personality measures, whereas change in depression

severity would correlate more strongly with state changes than with stable trait scores. We found moderate to strong support for these hypotheses.

First, a strong correlation ($r = .63$) between depression severity and concurrent personality-based state affect was observed for late depression but for early depression the correlation was only moderate ($r = .28$). This finding suggests that in a sample of moderately to severely depressed patients, individual differences in personality-based affect may not be very meaningful. There are at least two not mutually exclusive reasons why this might be so. First, during pretreatment, when most patients are highly distressed, there may be a ceiling effect in the assessment of personality-based affect. Second, response biases, such as the tendency to extreme responding, may play a role. Whereas the observed raw score correlations all were in the expected direction (i.e., higher negative temperament, mistrust, etc. correlated with greater depression severity), the correlation between early personality state scores and late depression scores were negative: higher early personality state scores predicted lower late depression scores. We suggested that this initially counterintuitive finding may reflect regression to the mean but a psychological interpretation of this statistical phenomenon also may be offered. Specifically, in some patients, the early personality-based state affect may reflect an exaggerated, distressed, call-for-help response that is manifested only when they experience an acute depressive episode and is disproportional to the severity of their depression, such that their depression scores drop notably after the acute phase. In contrast, other patients may have a strong anhedonic response so that their personality-based affectivity is reduced during a depressive episode. Either singly or together, these patterns of responding would yield a lower early (vs. late) concurrent correlation between depression severity and personality-based state affect, and would create a negative correlation between initial personality-based state affect and later depression severity scores.

Our second hypothesis that affective personality trait variance would be related to depression severity regardless of clinical state was well supported, except for trait dependency, which was related only to late depression. The general finding is consistent with the theoretical view that there is an inherent personality-psychopathology link between depression and the broad dimensions of positive and negative temperament, as well as related traits such as mistrust, self-harm, and detachment. There is increasing evidence that this shared affective trait variance has a genetic component which, for negative temperament and related traits, appears to be quite general and underlies a broad range of psychopathology but which, for positive temperament, appears to be related to a more limited set of disorders (e.g., Brown, Chorpita, & Barlow, 1997; for a review see Mineka, Watson, & Clarkson, 1998). In this context it also bears noting that factor analyses of the SNAP scales have shown consistently that of those scales that load on the first “negative temperament” factor, trait dependency relates the least strongly. Thus, the divergence of the correlations involving dependency may be reflecting that the negative affect component of dependency is relatively weak.

The third hypothesis—that change in depression severity would relate to personality-based state change but not to trait levels—also was supported, again for all scales but dependency. Trait dependency correlated $-.33$ with change in depression severity, whereas the corresponding correlations of the other five traits (with that for Positive Temperament reversed) ranged from $-.02$ to $-.23$ (median = $.14$).

Together, these data both explain the changes observed in personality measures over the course of depression treatment and support traditional conceptualizations of traits as stable. Personality scores can be parsed into state and trait components. When personality scores change over the course of treatment, what is changing is the state (including error) component, with the trait component remaining stable. The relative size of the state and trait components vary by personality dimension, with some traits (e.g., negative and positive temperament)

having relatively larger affect state components and others (e.g., disinhibition, impulsivity) having relatively larger stable trait components. The relative size of these two components affects the degree of both mean-level change and rank-order temporal stability in personality measures when state affect (such as that seen for depression) changes, as over a course of treatment.

The one exception to this general pattern was dependency. Neither dependency raw nor trait scores were related to the severity of early depression; moreover, change in dependency raw scores was the least related to depression severity change of any of the traits ($r = .26$ vs. median $r = .50$). However, late dependency scores, both raw and trait, were related to late depression severity, and trait dependency was associated with change in depression severity. One plausible explanation for this pattern of results is that trait dependency is distinct from depression but is nonetheless related to treatment outcome. Specifically, patients high in trait dependency may respond less well to cognitive therapy (trait dependency correlated negatively with depression change) but do not necessarily experience more severe depression in an acute episode (raw and trait dependency not correlated with early depression severity scores). This may exemplify how the influence of state affect can mask trait scores, such that a relation between trait dependency and depression severity does not emerge until after several months of treatment, when patients have adjusted to the therapeutic context. Another not mutually exclusive possibility is that the relation between depression and trait dependency is heteroscedastic; specifically, depression severity and dependency may be linearly related at low to moderate ranges of depression but unrelated at high depression levels. Clearly there is room for further research concerning this interesting construct that can be especially important in therapeutic relationships.

A limitation of this study is that it is based on a sample of outpatients with moderate to severe recurrent major depressive disorder who completed a course of acute phase cognitive therapy and, moreover, the findings regarding personality are necessarily based on the subset of patients who provided responses at both the early and late time points. These findings cannot be generalized, therefore, to all depressed patients, or even to all those with recurrent depression. Specifically, they do not provide information about depression severity in depressed patients who begin but do not complete treatment. Nevertheless, the large majority (over 80%) of our sample did complete the treatment, and almost 70% provided repeated personality assessments. Thus, we believe that despite this limitation, these findings will have wide applicability.

Moreover, the data presented most likely represent an oversimplification of personality-based state affect. Most glaringly, we modeled state affect as a single dimension, whereas it is well-established that affect has at least a two-dimensional structure (Clark et al., 1994; Watson & Clark, 1992). To illustrate our primary points more simply and clearly, we combined positive and negative affect into a single general “pleasantness-unpleasantness” affective dimension—parallel to the convention of assessing depressive symptoms with one dimension—but separate analyses of these affective dimensions may prove fruitful in the long run.

CONCLUSION

These data provide some conceptual explanation for the lack of forward prediction of depression severity from personality that is sometimes found. Forward prediction may be difficult because early personality assessment reflects, in part, unstable state affect that is related to acute depression severity but not to treatment response. It also may reflect extreme responding or other error variance for some traits. In contrast, stable trait variance does predict depression severity both pre- and posttreatment. The inconsistent results found in the literature may reflect varying proportions of trait and state (plus error) variance in different samples. For example, baseline personality has been shown to predict the development of depression in

normal individuals, for whom the state component should be small relative to the trait component (Hirschfeld et al., 1989). In contrast, weaker results often are seen in patient samples; thus, in a highly selected patient sample such as the current study, in which the influence of personality-based state affect is relatively more salient, pretreatment personality measures may afford no predictive power at all.

Regrettably, this elegant conceptual model provides no easy solutions for the clinician attempting to predict an acutely depressed patient's likelihood to benefit from therapy because it may be difficult to tease apart trait and state variance with a single pretreatment personality assessment (for some progress toward this goal for interpersonal problems see Vittengl, Clark, & Jarrett, 2003). However, although such research would present practical obstacles, a program aimed at identifying personality test items that are inherently more "trait-like" and have high stability over life changes, as well as concurrent validity, could facilitate the construction of an instrument with better forward predictive ability with highly distressed individuals. In the context of research on depression, it may be most fruitful to begin the search for such items in the domain of positive, rather than negative, temperament, since positive temperament measures may be somewhat less vulnerable to extreme cry-for-help responding and because of the more specific relation of positive temperament with depression. Conversely, if more trait-like items could be identified in the negative temperament domain, they might have broad predictive power not only for depression but also for other "distress disorders," such as the anxiety disorders (Mineka et al., 1998). Finally, these data suggest the value of specific research into separating state from trait elements in dependency, which proved to have a unique relation with depression in these data. We look forward to further elucidation of the trait-state distinction in this very important domain.

Acknowledgements

The authors thank many colleagues for contributing to this research: Jeanette Doyle, MA, Greg Eaves, PhD, Paul Silver, PhD, Marjorie Woodruff, PhD, Bethany Hampton, PhD, Catherine Judd, PA-C, MS, Douglas Lisle, PhD, Regina Kinney, PhD, Maria Marwill-Magee, PhD, Andrew Clifford, PhD, Martin Schaffer, MD, and Rodger Kobes, MD provided clinical support. Research support was provided by Michelle White, B.S., Edna Christian, MA, Joseph Begue, BA, Julie Lowe, BA, Daisha Cipher, PhD, Patricia Green, MS, Demetria Clinton, BA, and Paula Reese. Barbara M. Foster, PhD, Janet Smith, BA, and Richard C. Risser, MS provided programming support. The authors appreciate the administrative support of both Eric J. Nestler, MD, PhD and Kenneth Z. Altshuler, MD, as well as Jon Whitmore, PhD, and Michael O'Hara, PhD.

REFERENCES

- Alnaes R, Torgersen S. Personality and personality disorders predict development and relapses of major depression. *Acta Psychiatrica Scandinavica* 1997;95:336–342. [PubMed: 9150829]
- Bagby RM, Joffe RT, Parker JDA, Kalembo V, Harkness KL. Major depression and the five-factor model of personality. *Journal of Personality Disorders* 1995;9:224–234.
- Beck, AT.; Rush, AJ.; Shaw, BF.; Emery, G. *Cognitive therapy of depression*. Guilford; New York: 1979.
- Beck AT, Steer RA, Garbin MG. Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review* 1988;8:77–100.
- Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Archives of General Psychiatry* 1961;4:561–571. [PubMed: 13688369]
- Boyce P, Parker G. Neuroticism as a predictor of outcome in depression. *Journal of Nervous & Mental Disease* 1985;173:685–688. [PubMed: 4056783]
- Bronisch T, Klerman GL. Personality functioning: Change and stability in relationship to symptoms and psychopathology. *Journal of Personality Disorders* 1991;5:307–317.
- Brown TA, Chorpita BF, Barlow DH. Structural 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* 1997;106:179–192.

- Clark, LA. Schedule for nonadaptive and adaptive personality (SNAP). University of Minnesota Press; Minneapolis, MN: 1993.
- Clark, LA.; Harrison, JA. Assessment instruments. In: Livesley, WJ., editor. Handbook of personality disorders. Guilford; New York: 2001. p. 277-306.
- Clark, LA.; Simms, LJ.; Wu, KD.; Casillas, A. Schedule for nonadaptive and adaptive personality-2nd Edition (SNAP-2): Manual for administration, scoring, and interpretation. University of Minnesota Press; Minneapolis, MN: in press
- 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]
- Clark, LA.; Watson, D. Temperament. In: Pervin, L.; John, O., editors. Handbook of Personality. 2nd. Guilford; New York: 1999. p. 399-423.
- Clark LA, Watson D, Mineka S. Temperament, personality, and the mood and anxiety disorders. *Journal of Abnormal Psychology* 1994;103:103–116. [PubMed: 8040472]
- Clark LA, Watson D, Reynolds S. Diagnosis and classification in psychopathology: Challenges to the current system and future directions. *Annual Review of Psychology* 1995;46:121–153.
- Corruble E, Ginestet D, Guelfi JD. Comorbidity of personality disorders and unipolar major depression: A review. *Journal of Affective Disorders* 1996;37:157–170. [PubMed: 8731079]
- Frank E, Kupfer DJ, Jacob M, Jarrett D. Personality features and response to acute treatment in recurrent depression. *Journal of Personality Disorders* 1987;1:14–26.
- Geerts E, Bouhuys N. Multi-level prediction of short-term outcome of depression: Non-verbal interpersonal processes, cognitions and personality traits. *Psychiatry Research* 1998;79:59–72. [PubMed: 9676828]
- Hamilton M. A rating scale for depression. *Journal of Neurology, Neuro-surgery & Psychiatry* 1960;23:56–61.
- Harlan E, Clark LA. Short-forms of the schedule for nonadaptive and adaptive personality (SNAP) for self and collateral ratings: Development, reliability, and validity. *Assessment* 1999;6:131–146. [PubMed: 10335018]
- Hirschfeld RMA, Klerman GL, Lavori P, Keller M, Griffith P, Coryell W. Premorbid personality assessments of first onset of major depression. *Archives of General Psychiatry* 1989;46:345–350. [PubMed: 2649038]
- Hirschfeld, RMA.; Shea, T. Personality. In: Paykel, ES., editor. Handbook of affective disorders. 2nd. Guilford; New York: 1992. p. 185-194.
- Holahan CJ, Moos RH. Life stressors, personal and social resources, and depression: A 4-year structural model. *Journal of Abnormal Psychology* 1991;100:31–38. [PubMed: 2005268]
- Horowitz LM, Rosenberg SE, Baer BA, Ureño G, Villaseñor VS. Inventory of interpersonal problems: Psychometric properties and clinical applications. *Journal of Consulting and Clinical Psychology* 1988;56:885–892. [PubMed: 3204198]
- Jarrett RB, Kraft D, Doyle J, Foster BM, Eaves GG, Silver PC. Preventing recurrent depression using cognitive therapy with and without a continuation phase: A randomized clinical trial. *Archives of General Psychiatry* 2001;58:381–388. [PubMed: 11296099]
- Jarrett RB, Rush AJ. Short-term psychotherapy of depressive disorders: Current status and future directions. *Psychiatry: Interpersonal and biological processes* 1994;5:115–132.
- Joyce PR, Mulder RT, Cloninger CR. Temperament predicts clomipramine and desipramine response in major depression. *Journal of Affective Disorders* 1994;30:35–46. [PubMed: 8151047]
- Katon W, Lin E, Von Korff M, Bush T, Walker E, Simon G, Robinson P. The predictors of persistence of depression in primary care. *Journal of Affective Disorders* 1994;31:81–90. [PubMed: 8071479]
- Kleinfeld EI, Sunday S, Hurt S, Halmi KA. The effects of depression and treatment on the Tridimensional Personality Questionnaire. *Biological Psychiatry* 1994;36:68–70. [PubMed: 8080908]
- Klein, MH.; Wonderlich, S.; Shea, MT. Models of relationships between personality and depression: Toward a framework for theory and research. In: Klein, MH.; Wonderlich, S.; Shea, MT., editors. Personality and depression: A current view. Guilford; New York: 1993. p. 1-54.
- Melartin T, Isometsä E. Psychiatric comorbidity of major depressive disorder—A review. *Psychiatria Fennica* 2000;31:87–100.

- Mineka S, Watson D, Clark LA. Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology* 1998;49:377–412.
- Ready RE, Clark LA. Correspondence of psychiatric patient and informant ratings of personality traits, temperament, and interpersonal problems. *Psychological Assessment* 2002;14:39–49. [PubMed: 11911048]
- Ready R,E, Watson D, Clark LA. Psychiatric patient and informant reported personality: Predicting concurrent and future behavior. *Assessment* 2002;9:361–372. [PubMed: 12462756]
- Reich J, Noyes R, Coryell W, O'Gorman TW. The effect of state anxiety on personality measurement. *American Journal of Psychiatry* 1986;143:760–763. [PubMed: 3717400]
- Reich J, Noyes R, Hirschfeld R, Coryell W, O'Gorman TW. State and personality in depressed and panic patients. *American Journal of Psychiatry* 1987;144:181–187. [PubMed: 3812784]
- Reynolds SK, Clark LA. Predicting personality disorder dimensions from domains and facets of the five-factor model. *Journal of Personality* 2001;69:199–222. [PubMed: 11339796]
- Rush AJ, Gullion CM, Basco MR, Jarrett RB, Trivedi MA. The Inventory for depressive symptomatology (IDS): Psychometric properties. *Psychological Medicine* 1996;26:477–486. [PubMed: 8733206]
- Santor DA, Bagby RM, Joffe RT. Evaluating stability and change in personality and depression. *Journal of Personality & Social Psychology* 1997;73:1354–1362. [PubMed: 9418283]
- Sato T, Narita T, Hirano S, Kusunoki K, Goto M, Sakado K, Uehara T. Factor validity of the Temperament and Character Inventory in patients with major depression. *Comprehensive Psychiatry* 2001;42:337–341. [PubMed: 11458309]
- Sato T, Hirano S, Narita T, Kusunoki K, Kato J, Goto M, Sakado K, Uehara T. Temperament and character inventory dimensions as a predictor of response to antidepressant treatment in major depression. *Journal of Affective Disorders* 1999;56:153–161. [PubMed: 10701472]
- Shea MT, Pilkonis PA, Beckham E, Collins JF, Elkin I, Sotsky SM, Docherty JP. Personality disorders and treatment outcome in the NIMH Treatment of Depression Collaborative Research Program. *American Journal of Psychiatry* 1990;147:711–718. [PubMed: 2343912]
- Sherer M, Maddux J, Mercandante B, Prentice-Dunn S, Jacobs B, Rogers R. The Self-Efficacy Scale: Construction and validation. *Psychological Reports* 1982;51:663–671.
- Schwab JJ, Bialow MR, Clemmons RS. Hamilton Rating Scale for Depression with medical inpatients. *British Journal of Psychiatry* 1967;113:83–88. [PubMed: 6029372]
- Spitzer, RL.; Williams, JBW.; Gibbon, M.; First, MB. Structured clinical interview for DSM-III-R - Outpatient version (with psychotic screen). New York State Psychiatric Institute, Biometrics Research Department; New York: 1989.
- Tome MB, Cloninger CR, Watson JP, Isaac MT. Serotonergic autoreceptor blockade in the reduction of antidepressant latency: Personality variables and response to paroxetine and pindolol. *Journal of Affective Disorders* 1997;44:101–109. [PubMed: 9241570]
- Vaidya J, Gray E, Haig J, Watson D. On the temporal stability of personality Evidence for differential stability and the role of life experiences. *Journal of Personality & Social Psychology* 2002;83:1469–1484. [PubMed: 12500825]
- Vittengl JR, Clark LA, Kraft D, Jarrett RB. Multiple measures, methods, and moments: Change in depression during acute phase cognitive therapy. 2003Manuscript in preparation
- Vittengl JR, Clark LA, Owen-Salters E, Gatchel RJ. Diagnostic change and personality stability following functional restoration treatment in a chronic low back pain patient sample. *Assessment* 1999;6:79–92. [PubMed: 9971886]
- Vittengl JR, Clark LA, Jarrett RB. Interpersonal problems, personality pathology, and social adjustment after cognitive therapy for depression. *Psychological Assessment* 2003;15:29–40. [PubMed: 12674722]
- Watson D, Clark LA. Negative affectivity: The disposition to experience unpleasant emotional states. *Psychological Bulletin* 1984;95:465–490. [PubMed: 6393179]
- Watson D, Clark LA. On traits and temperament: General and specific factors of emotional experience and their relations to the five-factor model. *Journal of Personality* 1992;60:443–476.
- Watson D, Clark LA. Depression and the melancholic temperament. *European Journal of Personality* 1995;9:351–366.

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]

TABLE 1
Descriptive, Retest, and Change Statistics for Early and Late Assessments on the SNAP

SNAP Scale	Early α^a	Early		Late		Retest r (pr)	t	M Change Index
		M	SD	M	SD			
Negative Temperament	.86	20.5	5.4	13.9	7.8	.48 (.55)	9.8	.24
Mistrust	.88	8.6	5.0	5.4	4.7	.62 (.65)	8.0	.17
Manipulativeness	.75	4.2	3.0	3.4	2.8	.73 (.73)	3.7	.04
Aggression	.83	5.2	4.1	4.1	3.5	.78 (.78)	4.7	.06
Self-harm	.78	7.3	3.1	4.3	3.3	.48 (.60)	9.6	.19
Eccentric Perceptions	.65	2.9	2.4	2.0	2.0	.68 (.68)	5.4	.06
Dependency	.84	6.9	4.3	4.8	4.0	.70 (.70)	7.1	.12
Positive Temperament	.86	10.4	5.6	15.6	6.3	.64 (.71)	10.5	-.19
Exhibitionism	.80	5.1	3.4	5.9	3.5	.82 (.83)	4.0	-.05
Entitlement	.74	5.7	3.2	7.5	3.3	.57 (.62)	6.0	-.11
Detachment	.84	9.3	4.3	6.7	4.1	.66 (.74)	7.7	.14
Disinhibition	.82	8.8	5.2	7.7	4.9	.82 (.82)	4.0	.03
Impulsivity	.78	6.4	3.9	5.5	3.8	.78 (.78)	3.8	.05
Propriety	.75	13.2	3.8	11.9	4.4	.61 (.61)	3.7	.06
Workaholism	.84	8.8	4.7	7.6	4.3	.75 (.77)	3.7	.06

Note. Except as noted, $n = 108$. All correlations and change scores are significant, $p < .01$. pr = retest correlations with change in depression severity scores partialled out.

α^a
 $n = 148$.

TABLE 2

Correlations of Personality Raw Scores with Depression Severity

Personality Trait	Concurrent Relations		Predictive Correlations ^a	Change Scores
	Early	Late		
Negative Temperament	.26 [*]	.57 ^{***}	.14	.49 ^{***}
Mistrust	.35 ^{**}	.39 ^{***}	.15	.30 [*]
Self-harm	.30 [*]	.54 ^{***}	.05	.55 ^{***}
Positive Temperament	-.33 ^{**}	-.43 ^{***}	-.12	-.50 ^{***}
Detachment	.31 ^{**}	.40 ^{***}	.00	.51 ^{***}
Dependency	-.06 ^b	.39 ^{**}	.16	.26 [*]
Median	.31 ^{**}	.42 ^{***}	.13	.50

Notes. $n = 108$. Change scores calculated as "Early minus Late" (positive values indicate decreasing scores).

^aEarly personality trait correlations with late depression severity scores.

^bPositive Temperament reversed keyed.

*
 $p < .01$;

**
 $p < .001$;

 $p < .0001$, two-tailed.

TABLE 3**Correlations of Personality Trait and State Scores with Depression Severity**

Personality Trait	Depression		
	Early	Late	Change
Negative Temperament	.27*	.41***	-.23 [†]
Mistrust	.36*	.30*	-.07
Self-Harm	.28*	.34**	-.16
Positive Temperament	-.26*	-.31*	.14
Detachment	.31*	.22 [†]	-.02
Dependency	-.07	.30*	-.33**
Median Trait ^a	.28*	.31*	-.15
Concurrent personality state	.28*	.63***	.58***

Note. $n = 108$. Change scores calculated as "Early minus Late" (positive values indicate decreasing scores). See text for calculation of personality trait and state scores.

^aPositive Temperament reverse keyed.

[†]
 $p < .05$;

*
 $p < .01$;

**
 $p < .001$;

 $p < .0001$, two-tailed.