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Temperamental and acute symptoms of borderline personality disorder: Associations with normal personality traits and dynamic relations over time

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Abstract

Background—Recent research suggests the utility of distinguishing temperamental and acute symptoms of Borderline Personality Disorder (BPD). Temperamental symptoms, such as chronic anger and odd thinking, remit relatively slowly and have been hypothesized to reflect a hyperbolic predisposition to emotional pain and negativistic cognitions, whereas acute symptoms, such as substance abuse and chaotic relationships, remit relatively quickly and have been hypothesized to represent the consequences of maladaptations to triggering environmental events.

Method—The relations of temperamental and acute BPD symptoms with normal personality traits and stability and dynamic associations over time across these symptom sets were tested in a 10-year longitudinal study of 362 patients with personality disorders.

Results—Temperamental symptoms were associated with high neuroticism whereas acute symptoms were associated with low agreeableness. These symptoms had similar rank-order stabilities and relative changes in symptom sets were reciprocally linked in a cross-lagged path model suggesting dynamic associations between temperamental and acute symptoms over time.

Conclusions—The distinction between temperamental and acute BPD symptoms is supported by differential relations of these symptom sets to normal personality traits. Moreover, these symptoms appear to be linked in a mutually reinforcing dynamic over time. This distinction should be kept in mind in future studies of the aetiology of BPD and in diagnostic and treatment considerations.

Although broad empirical support exists for the validity of borderline personality disorder (BPD; Gunderson, 2008; Lieb et al. 2004), research also consistently demonstrates that BPD is a heterogeneous construct. The differentiation of sub-components of BPD may be important for diagnosis, intervention, and understanding the aetiology of the disorder. Common frameworks for organizing these sub-components typically involve distinctions between the phenomenological content or empirical structure of symptoms. For example, BPD measures often have sections that are organized by content areas (e.g., Morey, 1991; Zanarini et al. 1989) and factor analyses of BPD symptoms have suggested sub-components such as affective, interpersonal, or impulsivity symptoms (e.g., Sanislow et al. 2002).

However, other approaches beyond content-based groupings and factor analytic techniques may also prove useful for identifying subcomponents of BPD. Most notably, temporal considerations might be particularly important for differentiating symptom sets within psychiatric disorders (e.g., see Anderluh et al. 2008). Zanarini et al. (2003; 2007) identified

distinct subgroups of *temperamental* and *acute* BPD symptoms based on considerations of varying remission rates (Table 1). In their 2007 study, 20-40% of BPD patients who experienced temperamental symptoms at baseline maintained them at 10-year follow-up, whereas less than 15% of BPD patients who experienced acute symptoms maintained them for 10 years. Similar results were observed in a different clinical sample (McGlashan et al. 2005). Although these subgroups cut across content-based groupings, affective symptoms tend to be more temperamental and impulsive symptoms tend to be more acute (see Table 1), suggesting the possibility of integrating BPD conceptualizations in terms of both manifest content and temporal stability.

Based in part on these findings, Zanarini and Frankenburg (2007) argued that BPD emerges due to the interaction of “hyperbolic” temperamental features that represent a core feature of the disorder and ineffective strategies for modulating this temperament in the context of triggering or “kindling” events in the environment that lead to acute symptomatology. Characteristics of the hyperbolic temperament described by Zanarini and Frankenburg, such as chronic unpleasant emotions or thoughts, appear to resemble the BPD temperamental symptoms listed in Table 1, which were distinguished empirically as slower to remit in BPD patients (Zanarini et al. 2007). The second element of this model involves the kinds of malleable symptoms that result from ineffective strategies for modulating inner states in an adaptive manner, such as the acute symptoms identified as remitting more quickly (Zanarini et al. 2007) and shown in Table 1. These symptoms may also reflect the kinds of difficulties that are most likely to bring people to treatment. For example, a person with a hyperbolic temperament, in the face of a kindling event such as a romantic break up, may engage in impulsive self-damaging behavior such as a suicidal gesture, leading to hospitalization. These acute symptoms may remit more quickly because they are more closely linked to dynamic changes in the environment, perhaps even including the effects of treatment.

Despite the promising empirical support for the distinction between temperamental and acute BPD symptoms, additional work is needed to further establish the validity of this distinction and to evaluate how both temperamental and acute symptoms may reinforce each other over time in those individuals with BPD. Accordingly, the present study extends the conceptual and empirical articulation of this temperamental/acute framework for BPD in two ways. First, we evaluate distinctions between temperamental and acute BPD symptoms from the perspective of a structural model of normal personality traits. A number of investigators have demonstrated specific patterns of correlations between BPD and “normal” personality traits such as the elements of the well-known Five Factor Model (FFM) of personality (see Samuel & Widiger, 2008). Research has also shown that a trait constellation linked to BPD is dynamically related to the diagnosis in a manner that suggests that trait change leads to symptom change, whereas symptom change does not lead to trait change (Warner et al., 2004). However, these studies have generally assessed these relations at the level of the BPD diagnosis, rather than potentially important sub-elements of the disorder. A better understanding of the personality factors associated with BPD and its sub-components is important given the wide body of evidence linking personality traits to other outcomes (Roberts et al., 2007) and the potential utility of personality variables for treatment planning (Harkness & Lilienfeld, 1997). A finding that different BPD symptoms have varying associations with personality domains would provide further support for the meaningful distinction between temperamental and acute aspects of this disorder.

Two FFM traits, neuroticism and extraversion, would appear to be most related to temperamental features of BPD, as these factors predispose individuals to a number of mood problems (Clark et al. 1994) of the sort that appear to be relatively enduring in BPD. In general, neuroticism depicts a propensity for negative emotions such as depression, anger, and anxiety, whereas extraversion indicates the propensity for positive emotions (and thus

low scores indicate limited experiences of positive emotions) and sociable behavior. Consistent with this claim, previous research has linked BPD with extremely high levels of neuroticism and low levels of extraversion (Samuel & Widiger, 2008). This constellation of traits may offer an alternative way to characterize the predisposition for negative affect and limited capacity for positive emotions that comprise the hyperbolic temperament.

Two other FFM traits, agreeableness and conscientiousness, would appear to be most related to acute symptoms. Agreeableness denotes the general tendency to be trusting, friendly, and compliant as opposed to being antagonistic or hostile with others. Conscientiousness is a broad trait that includes tendencies to be dutiful, achievement-striving, and orderly. Research has consistently shown relations of BPD with low levels of both of these traits (Samuel and Widiger, 2008). Low agreeableness would be expected to link closely to some of the acute interpersonal symptoms of BPD, such as devaluation or entitlement. More generally, disagreeableness may signal an ineffective coping strategy for managing stress as it tends to strain the very relationships that could afford support and comfort during difficult times. Low conscientiousness might be associated with the impulsive behaviors that characterize many of the acute symptoms, such as substance abuse, promiscuity, or self-harming behaviors. Furthermore, low conscientiousness may limit dutiful or achievement-striving behaviors that may otherwise lead to educational and occupational successes that could buffer individuals against the difficulties associated with BPD. However, while these traits are similar to one another and to theoretical accounts of acute symptoms of BPD in that they “tap important aspects of self-regulation” (Shiner, 2009), it should also be noted that conscientiousness is linked to the temperament trait disinhibition (Clark, 2005), and perhaps it should relate to both temperamental and acute symptoms of BPD.

Beyond examining the distinction between temperamental and acute BPD symptoms from the perspective of a general model of personality functioning, the second goal of this study was to examine potentially dynamic relations between temperamental and acute symptom sets across time. Temperamental difficulties would be expected to create situations that challenge one's ability to cope. It is reasonable to expect then that greater temperamental severity should be associated with increasing coping difficulties, and thus relative increases in temperamental symptoms should predispose individuals to increases in maladaptive outcomes stemming from ineffective coping, as represented by acute symptoms. At the same time, the presence of acute symptoms suggests that ineffective coping strategies have failed to manage the environment effectively. Ineffective coping and its symptomatic consequences would be expected to lead to an exacerbation of the temperamental features of BPD, including depression, anger, and anxiety. In other words, increases in maladaptive acute symptoms would be anticipated to lead to greater levels of temperamental symptoms. Accordingly, we would expect to find mutually reinforcing connections between temperamental and acute symptoms over time.

In the current study, we used data that had been previously used to identify temperamental and acute symptoms of BPD based on different rates of mean-level change (Zanarini et al., 2007) over time to test two hypotheses. First, we expected that temperamental symptoms of BPD would link to high neuroticism and low extraversion whereas acute symptoms of BPD would link to low agreeableness and conscientiousness. Second, we expected that temperamental and acute symptoms would be dynamically linked to one another over time.

Method

Participants were 362 McLean Hospital inpatients diagnosed with BPD ($N = 290$) or other PDs (the OPD group: $N = 72$) at baseline from the Mclean Study of Adult Development (MSAD; see Zanarini et al. 2003; 2005). All were between the ages of 18 and 35 with IQ

scores above the cutoff for mental retardation at baseline. Women represented 77% (N = 279) of participants, and 315 (87%) were Caucasian. All patients were fluent in English and had no recorded history of schizophrenia, schizoaffective disorder, bipolar disorder, or organic conditions that could cause psychiatric symptoms. The mean socioeconomic status was 3.3 (SD=1.5), where 1=highest and 5=lowest (Hollingshead, 1957), and the mean Global Assessment of Functioning (GAF) score was 39.8 (SD=7.8) indicating major impairment in several areas, such as work or school, family relations, judgment, thinking, or mood. Formal consent preceded interview assessment of personality pathology and other clinical variables by masters-level clinicians as well as the completion of self-report questionnaires.

Measures

The *Revised Diagnostic Interview for Borderlines* (DIB-R; Zanarini et al. 1989) represented the primary diagnostic measure for BPD. This interview was supplemented by the *Diagnostic Interview for DSM-III-R Personality Disorders* (Zanarini et al. 1987), which assesses all DSM-III-R PDs. At baseline, 4% of the comparison sample met criteria for a Cluster A PD, 33% for a Cluster C PD, and 18% for a Cluster B PD other than BPD (Zanarini et al. 2005). The remaining members of this group met criteria for all but one required criteria for at least two PDs, and were classified as PD not otherwise specified. Participants were placed into BPD or OPD groups based on a cutoff score of eight on the DIB-R and five of nine BPD criteria on the DIPD-R. For this study, the 22 DIB-R symptoms and two DSM-III-R symptoms not assessed by the DIB-R (affective instability and identity problems) were assessed at baseline and 2, 4, 6, 8, and 10-year follow-ups and divided into temperamental and acute subgroups based on the findings of Zanarini et al. (2007). Median internal consistency coefficients averaged across assessments for these variables were .71 (acute; range = .63-.77) and .85 (temperamental; range = .75-.85). The cross-sectional correlation between these symptom sets averaged across all intervals was .66.

The *NEO Five Factor Inventory* (NEO-FFI; Costa & McCrae, 1992) is a 60-item self-report measure of FFM traits that was administered at study baseline and each follow-up.

Analyses

Data analyses occurred in two steps that correspond to the two major study hypotheses. First, bivariate and partial correlations between temperamental and acute BPD symptoms with FFM traits were assessed. Partial correlations are of particular interest because they address the fact that all BPD symptoms are likely to have a pattern of relations to FFM traits involving greater neuroticism and lower extraversion, agreeableness, and conscientiousness, whereas what is of interest here is the specific relation of each BPD symptom set to these traits.

Second, a maximum-likelihood cross-lagged path model was estimated in AMOS 17.0. This model provided an evaluation of the differential (i.e., rank-order) stability of temperamental and acute symptoms and provided an efficient way to test whether symptoms were dynamically linked over time in a single analysis. To test stability differences, we compared a model in which stabilities were freely estimated to one in which stability paths were constrained to be equal within assessment interval and across symptom sets. This model also allowed for an assessment of cross-lagged effects (e.g., baseline temperamental symptoms leading to 2-year acute symptoms) which permitted a test of the hypothesis that acute and temperamental symptoms are reciprocally linked over time. We tested this hypothesis by assessing the statistical significance of the cross-lagged path coefficients.

Results

Table 2 shows bivariate and partial correlations between temperamental and acute BPD symptoms and FFM traits. As predicted, temperamental symptoms were generally associated with high neuroticism and low extraversion, whereas acute symptoms were associated with low agreeableness and conscientiousness. This pattern¹ is clearest in partial correlations, presumably because bivariate correlations do not take into account the empirical overlap between BPD symptom sets. However, it is also notable that only the partial coefficients for neuroticism and agreeableness were significantly different from one another. Thus, it appears that temperamental symptoms are primarily related to neuroticism whereas acute symptoms are primarily related to agreeableness, with weaker evidence suggesting specific links between temperamental symptoms with extraversion and acute symptoms with conscientiousness. All in all, Table 2 provides support from the perspective of a general model of personality for a meaningful distinction between temperamental and acute symptoms of BPD, but it offers only partial support for study hypotheses.

A cross-lagged path model was used to test the second hypothesis regarding the dynamic associations between temperamental and acute symptoms over time. The model fit the data reasonably well with stability paths freely estimated ($\chi^2_{(40)} = 125.888$; CFI = .967, TLI = .935, RMSEA = .075), but this model did not fit better than one in which stability paths were constrained to be equal within assessment intervals ($\chi^2_{(45)} = 136.648$; CFI = .964, TLI = .938, RMSEA = .073) ($\chi^2_{\text{difference}}(5) = 10.760$, n.s.). As such, the rank-order stability was judged to be similar across symptoms sets. In other words, although acute symptoms are likely to decrease more quickly than temperamental symptoms among individuals with BPD, the rank-ordering of individuals is similar over time for both sets of symptoms. Table 3 shows standardized stability and cross-lagged path coefficients from this constrained model. Consistent with our hypothesis, the cross-lagged path coefficients show that relative changes in the temperamental symptoms led to relative changes in the next assessment of acute symptoms at every interval. Likewise, relative changes in the acute symptoms led to relative changes in temperamental symptoms at every interval.

Discussion

Overall, this study extends support for a conceptualization of borderline personality disorder (BPD) involving related but meaningfully distinct temperamental and acute symptom sets. There were three main findings. First, as hypothesized, temperamental and acute symptoms of BPD showed varying patterns of relation with FFM traits. In particular, temperamental symptoms were associated with neuroticism, and to a less specific degree, extraversion, whereas acute symptoms were associated with agreeableness, and to a less specific degree, conscientiousness. Previous research showed that temperamental and acute symptom sets could be differentiated conceptually and by their remission rates (Zanarini et al. 2003; 2007). The current results suggest that they can also be distinguished by their personality correlates. Such findings are consistent with theorizing about different etiological influences on these symptoms and can be used to help link research on BPD with more basic research on personality and emotion (e.g., Clark et al. 1994; 2005), and augment previous research showing relations of BPD in general to FFM traits in the MSAD (Morey & Zanarini, 2000) and other (Samuel & Widiger, 2008) samples.

Second, this study found that, despite their varying patterns of mean-level change over time, temperamental and acute symptoms were similarly rank-order stable. Third, data provided

¹Although not reported here, this pattern was quite consistent across follow-up intervals. These results are available from the first author upon request.

intriguing evidence that temperamental and acute symptom sets of BPD are reciprocally linked over time. This finding demonstrates the importance of temporal considerations in characterizing BPD and implies that temperamental and acute symptoms may be mutually influential from a longitudinal perspective.

Overall, these results suggest that BPD temperamental symptoms are linked to the propensity to experience high levels of negative affect. This “hyperbolic temperament” appears to represent a recipe for emotional distress, dysregulation, and dysfunction of a chronic nature, and may represent a risk factor for a number of mood conditions that are commonly comorbid with BPD (affective and anxiety disorders) (McGlashan et al. 2005; Zanarini et al. 1998). This kind of temperament also likely places individuals at risk for developing cognitive patterns that serve to reinforce, rather than ameliorate, their emotional difficulties, such as self-concepts involving being bad or evil (Zanarini & Frankenburg, 2007). Interpersonal patterns are likely affected as well, as withdrawal and relational disruptions that are related to emotional turmoil may lead to thought patterns including overvalued ideas about the self as defective or of others as likely to be abusive or neglectful which contribute to social disconnection.

Further compounding the difficulties associated with BPD, this temperamental predisposition is likely to increase the odds of negative experiences linked to low levels of agreeableness such as relational disruption or family chaos. Disrupted social environments may in turn limit the opportunities that hyperbolic individuals have to develop coping strategies that could effectively modulate their temperamental predispositions. Instead, individuals with this set of problems appear to develop less adaptive coping strategies, including self-damaging behaviors that are acutely symptomatic of BPD, such as substance abuse, promiscuous sexual behavior, self-mutilating acts, and suicidal gestures. Furthermore, dysregulated individuals are likely to develop ineffective social strategies that lead to negative relational outcomes, including disrupted treatment courses. This could be particularly problematic given the important role that relationships, therapeutic and otherwise, may have for BPD recovery.

Given the apparently meaningful distinctions between temperamental and acute aspects of BPD and their links with basic dimensional personality models, this framework should be considered in the assessment and classification of BPD. In particular, it appears that the hyperbolic temperament and several specific maladaptive coping strategies represent symptoms that are uniquely able to distinguish BPD from other conditions. Notably, some research suggests that differentiating temperamental and more dynamic symptoms sets in a “hybrid model” of personality pathology is useful for understanding distinctions among personality disorders in general, and not just BPD (McGlashan et al. 2005; Morey et al. 2007). Distinguishing each ostensible personality disorder from the others at both the temperamental and acute levels and articulating the dynamic relations across these levels would be a productive avenue for continued research and would helpfully inform issues related to nosology. Indeed, this may represent a viable prospective from which to evaluate the validity of and distinctions among putatively different forms of personality pathology. Several study limitations are notable. The first set of limitations has to do with how personality traits and disorders were operationalized. Personality traits were assessed with an abbreviated measure of the FFM. Future work should continue to examine the relations of temperamental and acute BPD symptoms against longer and more comprehensive FFM measures. With regard to the conceptualization of BPD, the term ‘temperament’ for symptoms of BPD is somewhat ambiguous, in that it has also been used to refer to normative individual differences that are thought to be biologically-influenced precursors to traits (Rothbart & Bates, 1998). From this perspective, temperament should be discernable from early childhood and should be quite stable over time. However, the term ‘hyperbolic

temperament' is used here to depict a predisposition to a personality style that is defined, in part, by instability (Schmideberg, 1959). While we believe that the term 'temperament' is supported in this study by the relations of these symptoms to neuroticism and extraversion, which correspond to basic dimensions of affect, and is buttressed by significant theoretical articulation of the 'hyperbolic' nature of temperamental precursors to BPD (Zanarini & Frankenburg, 2007), we also acknowledge the ambiguity that can be caused by the use of a broad term with multiple connotations.

The second set of limitations has to do with ascertaining the causality of change in BPD symptoms. Although this study was able to demonstrate dynamic relations across symptom sets over time, methodologies that permit causal interpretations are needed to adequately test theoretical models regarding the influences of temperamental and acute symptoms on one another over time. Such research should also seek to better understand how each of these symptom sets contributes to dysfunction longitudinally. Similarly, developmental research is needed to better understand the antecedents of both temperamental and acute symptoms of BPD. The current study suggests that personality traits, and particularly neuroticism and agreeableness, are promising targets for such research. A related issue is that previous work showed that changes in FFM traits lead to changes in BPD symptoms, whereas the converse is not the case (Warner et al., 2004). This study suggests reciprocal links over time among symptom sets that also show different patterns of relation to the FFM. Overall, FFM traits may be important concurrent predictors of BPD symptoms, but also may represent fairly stable diatheses for symptom subsets of BPD that are reciprocally influential. Future work should integrate these complementary patterns of results in order to better understand the role of normative personality traits in BPD.

Overall, this study adds to an emerging literature that suggests the importance of considering temporal and content-based distinctions among BPD symptoms in the identification of core sub-components. Temperamental and acute symptoms can be differentiated by course, content, and relations to normal personality characteristics, and this distinction likely carries important treatment implications that should be tested in future research. This and other models that take both course and content into account should also be considered in the ongoing development of nosological models for borderline and other forms of personality pathology.

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Table 1

Content domains associated with BPD temperamental and acute symptoms.

Content Domain	Temperamental Symptoms	Acute Symptoms
Affect	Anger	Affective instability
	Depression	
	Anxiety	
	Helplessness	
	Loneliness or emptiness	
Cognitive	Odd thinking/unusual perceptions	Quasi-psychotic thought
	Non-delusional paranoia	Identity disturbance
Impulsivity	Generalized impulsivity	Substance abuse
		Promiscuity
		Self-mutilation
		Help-seeking suicide efforts
Interpersonal	Intolerance of aloneness	Stormy relationships
	Abandonment or engulfment concerns	Devaluation or manipulation
	Counterdependency	Entitlement
	Dependency or masochism	Treatment regression
		Countertransference problems

Table 2

Cross-sectional correlations of BPD temperamental and acute symptoms with personality traits at baseline.

	Temperamental Symptoms		Acute Symptoms	
	r	Partial r	r	Partial r
N	.54 *	.43 *	.36 *	.09
E	-.22 *	-.16 *	-.15 *	-.04
O	.04	.06	-.02	-.05
A	-.12 *	.03	-.27 *	-.25 *
C	-.04	.03	-.11 *	-.11 *

Note. r = correlation. Partial r was computed controlling for the other symptom set (e.g., acute symptoms correlated with traits, controlling for temperamental symptoms). N = neuroticism, E = extraversion, O = openness to experience, A = agreeableness, C = conscientiousness. Partial correlations were significantly different ($p < .05$) for N ($t = 4.97$), A ($t = 3.03$) but were not significantly different for extraversion ($t = 1.63$), openness ($t = 1.48$), or conscientiousness ($t = 1.08$)

* $p < .05$.

Table 3

Standardized parameters from a cross-lagged path model of BPD temperamental and acute symptoms over 10 years.

MSAD study interval	Temperamental		Acute	
	Stability	Cross-Lag	Stability	Cross-Lag
Baseline-2 years	.35	.13	.45	.20
2-4 years	.48	.17	.57	.23
4-6 years	.51	.10	.63	.29
6-8 years	.50	.13	.57	.23
8-10 years	.60	.09	.62	.16

Note. All coefficients were significantly > 0 at $p < .05$. Stability refers to paths within each symptom set, whereas Cross-Lag refers to prospective connections across symptom sets (e.g., Baseline Temperamental statistically predicting Year 2 Acute symptoms). The correlation between symptom sets in this model at baseline was .54; correlations between residuals within subsequent time interval were .64, .53, .46, .48, and .43 at 2, 4, 6, 8, and 10 years, respectively. Similar results were obtained when modeled without data from the first interval; this model was tested because baseline data were somewhat kurtotic and negatively skewed.