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The Contributions of Neuroticism and Childhood Maltreatment to Hyperbolic Temperament

Christopher J. Hopwood, Ph.D. and **Mary C. Zanarini, Ed.D.**

Abstract

Zanarini and colleagues have proposed that hyperbolic temperament, involving a preponderance of negative emotions and cognitions combined with a need for those dysphoric inner states to be validated and understood, underlies borderline symptomatology. This study examined neuroticism and childhood maltreatment as predictors of hyperbolic features measured 10 years later in a clinical sample. Neuroticism and childhood maltreatment were significant and independent predictors of prospective hyperbolic temperament. These findings expand upon the hyperbolic temperament model of borderline phenomenology by depicting its developmental antecedents.

Borderline personality disorder (BPD) is a severe and common psychiatric disorder for which available treatments are only modestly effective. Etiological research suggests that BPD results from a confluence of constitutional and developmental misfortune – it is associated with heritable personality factors (Kendler, Myers, & Reichborn-Kjennerud, in press) as well as the experience of childhood maltreatment (Johnson et al., 2000; Zanarini et al., 1989). Understanding more clearly how these influences contribute to BPD would likely facilitate the development of more effective diagnostic and treatment methods.

Zanarini and colleagues (Zanarini et al., 2008; Zanarini & Frankenburg, 1994, 1997, 2007) have developed a model for understanding the development of this complex construct with considerable potential for integrating several etiological theories. In this model, BPD is a consequence of hyperbolic temperament, or the general tendency to experience negative inner states and to "easily take offense and to try to manage the resulting sense of perpetual umbrage by persistently insisting that others pay attention to the enormity of one's inner pain" (Zanarini & Frankenburg, 2007, p. 520). Individuals with a hyperbolic temperament characteristically employ ineffective methods to try to manage this predisposition, which usually lead to or interact with symptom-kindling events (i.e., social experiences, which can be normative in nature or traumatic, that exacerbate symptoms) in the interpersonal environment such as disruptions in significant relationships. Hyperbolic temperament is distinct from other models of BPD in its emphasis on both cognitive and affective vulnerabilities, the inner pain experienced by individuals with hyperbolic features, and the active efforts on the part of such individuals to communicate their distress to others.

This model is depicted in Figure 1: both hyperbolic temperament and kindling events are thought to contribute to the development of borderline symptoms. Research supports these (right side) elements of the figure. It is well known that BPD relates to interpersonal problems (Trull et al., 1997) and kindling events are implicated in the diagnostic criteria for BPD. Hopwood, Thomas, and Zanarini (in press) recently found that a self-report scale measuring hyperbolic temperament correlates strongly with BPD features in clinical (r = .63) and non-clinical (r = .59) samples.

The factors that contribute to hyperbolic temperament (left side of Figure 1) have not yet been investigated. There are theoretical reasons to expect that both constitutional (e.g., the temperamental predisposition to negative affectivity and neuroticism) and developmental

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(e.g., childhood maltreatment) factors are involved, as the hyperbolic temperament is thought of as a consequence of heightened negative inner states that is exacerbated by events that occur in the interpersonal environment, such as invalidation, abuse, or neglect. Hopwood et al. (in press) reported that a constitutional factor, neuroticism (r = .78) and developmental factors including childhood experiences of emotional abuse (r = .20) and neglect (r = .23) were related to hyperbolic temperament. However, they did not compare the influences of these factors directly and in the same sample. They also did not report correlations between developmental experiences and hyperbolic temperament among patients. Furthermore, all correlations reported in Hopwood et al. (in press) were cross-sectional. In the current study, we evaluate the influences of baseline neuroticism and childhood maltreatment variables in a clinical sample on ratings of hyperbolic temperament gathered 10 years later.

Method

We sampled 309 individuals who participated for 10 years in the McLean Study of Adult Development (Zanarini, Frankenburg, Hennen, Reich, & Silk, 2005). Participants were selected for the MSAD if they were between the ages of 18 and 35, had borderline (77% of baseline sample) or another PD, and were free from mental retardation, serious organic conditions, schizophrenia, schizoaffective disorder, or bipolar I. Most participants were women (77%) and Caucasian (87%). At baseline, patients completed the 12-item neuroticism scale of the *NEO Five Factor Inventory (NEO-FFI;* Costa & McCrae, 1992) and were administered the Revised *Childhood Experiences Questionnaire (CEQ-R)* (Zanarini et al., 1989), which retrospectively evaluates childhood sexual, physical, verbal, and emotional abuse and caretaker neglect. CEQ-R scores were summarized with variables reflecting sexual abuse (range = 0–12, mean = 1.61, S.D. = 2.14), other (e.g., verbal, physical) abuse (range = 0–18, mean = 6.63, S.D. = 5.40), and neglect (range = 0–42, mean = 13.18, S.D. = 10.55). These variables were square root transformed due to significant positive skew prior to analysis. At ten-year follow-up, participants completed the 11-item *Hyperbolic Temperament Questionnaire*. Items included ‘I get upset very easily’ and ‘I frequently feel that people are insensitive to my feelings’. In a previous study using this sample (Hopwood et al., in press), this questionnaire had an internal consistency of .85 and correlated .63 with BPD as measured by structured interview. We correlated 10-year hyperbolic temperament scores with baseline neuroticism and childhood maltreatment scores to test the hypothesis that neuroticism and childhood maltreatment would significantly and incrementally influence prospective hyperbolic temperament.

Results

Overall, 179 (58%) of respondents reported at least one instance of sexual abuse, 249 (81%) reported at least one type of verbal, emotional, or physical abuse, and 269 (87%) reported at least one type of neglect. Ten-year hyperbolic temperament scores correlated significantly ($p < .05$) with baseline emotional abuse (r = .19), neglect (.18), and neuroticism (.29). They were not significantly correlated with sexual abuse (r = .02). Emotional abuse and neglect strongly correlated with one another (r = .74) and less so with sexual abuse (both rs < .52). Given that they also correlated similarly with hyperbolic temperament, they were collapsed using principle components analysis (both variables had pattern coefficients = .86). This component (child maltreatment) was then entered into a regression model with neuroticism to predict hyperbolic temperament. Both neuroticism ($\beta = .25$) and child maltreatment ($\beta = .13$) significantly ($p < .05$) related to prospective hyperbolic temperament. Regressions were also constructed for emotional abuse and neglect separately, and in each analysis neuroticism and maltreatment variables were significant. Sexual abuse was never a significant predictor in models that included neuroticism.

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Discussion

Research has previously shown that both hyperbolic temperament and kindling events contribute to borderline symptoms. This study adds to this literature by demonstrating that both a propensity for negative emotions and childhood maltreatment contribute to hyperbolic temperament in a clinical sample. These findings replicate previous cross-sectional results showing a relation between neuroticism and hyperbolic temperament in a clinical sample and between childhood emotional abuse and neglect in a non-clinical sample. Current findings also extend these previous results by showing the incremental contributions of neuroticism and childhood maltreatment to predict ten-year prospective hyperbolic temperament.

It was surprising that sexual abuse was unrelated to the development of a hyperbolic temperament, since sexual abuse is a risk factor for BPD and it correlates with the severity of borderline symptoms among diagnosed individuals (Zanarini & Frankenburg, 2007). One potential explanation for this finding is psychometric – there may have been insufficient variability in sexual abuse experiences to observe covariance with features of hyperbolic temperament. This relation may have been further attenuated by skew that persisted even after transforming the sexual abuse variable. These factors might also potentially explain relatively weak correlations between sexual abuse and other forms of abuse and neglect. The potential relation between sexual abuse and hyperbolic temperament was further constrained by the use of different methods, as childhood experiences were evaluated by interview and hyperbolic temperament by questionnaire, as well as the time lag between assessments. Given the possibility that psychometric and design factors limited statistical power, it should not be inferred from these results that sexual abuse would not contribute to the development of hyperbolic features at the level of the individual. The influence of sexual abuse on BPD symptoms in general and the hyperbolic temperament in particular should be evaluated in future research.

Future research should more generally build upon these preliminary results and address the limitations of initial validation studies. Despite the use of a ten-year prospective design, adult assessments of neuroticism and childhood maltreatment are limited as markers of childhood standing on these variables by recall biases and other factors. Thus this study assesses childhood predictors of hyperbolic temperament indirectly. Developmental or behavior genetic research that could disentangle constitutional and environmental factors would thus be informative. In addition, this research utilized self-report methods to assess personality and hyperbolic features and a diagnostic interview to assess childhood maltreatment. Each of these methods may be subject to various limitations. For instance, in this study neuroticism may have been overpowered by shared method variance, and the impact of childhood maltreatment may have been underestimated because it was assessed using a different method than hyperbolic temperament. Future research on antecedents of hyperbolic temperament and borderline personality should use multiple assessment methods.

A particular area of interest for future research involves the potential links between childhood experiences and kindling events. Several theories of personality pathology posit internal schemas or working models that link past and current interpersonal situations and thus contribute to pathological behavior (e.g., Benjamin, 1996; Kernberg & Caligor, 2005; Pincus & Hopwood, in press). These theories would suggest that kindling events replicate aspects of early experiences, particularly perhaps those that were experienced as traumatic, abusive, or neglectful. In this way, individuals with personality pathology are thought to unwittingly contribute to interpersonal dysfunction by creating situations in which past trauma are likely to recur. The hyperbolic model may offer a new way of conceptualizing such processes; conversely research documenting how past interpersonal situations may

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provide a template for contemporary kindling events, as implied by the dashed arrow of Figure 1, would usefully inform the hyperbolic theory.

In summary, the current study provided additional preliminary support for Zanarini's model of hyperbolic temperament as a key underlying factor in borderline personality disorder by showing that neuroticism, emotional abuse, and neglect significantly relate to 10-year prospective ratings of hyperbolic features. Furthermore, neuroticism and childhood maltreatment predict incremental variance in hyperbolic temperament, suggesting the independent contributions of constitutional and developmental factors. This model has considerable potential for furthering understanding of the development of BPD and thus merits further investigation.

Acknowledgments

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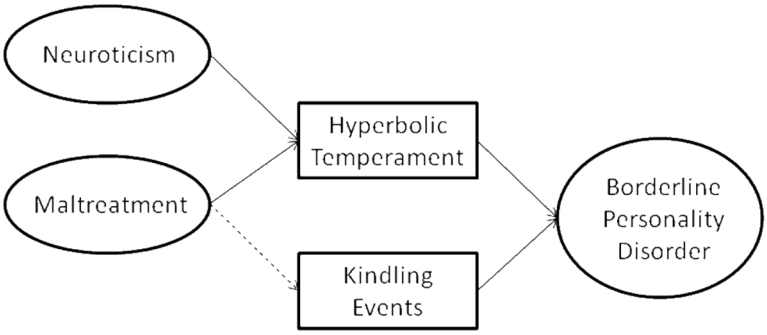

Figure 1.
Hyperbolic Temperament and Borderline Personality Disorder.