An Investigation of the Biosocial Model of Borderline Personality Disorder

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Objectives: We sought to test the Biosocial Theory of borderline personality disorder (BPD) that posits that borderline traits are due to emotional dysregulation, caused by the interaction between childhood emotional vulnerability and invaliding parenting. Method: A total of 250 adults (76% female, median age = 32.06 years) from a nonclinical population completed self-report measures assessing current levels of borderline traits and emotional dysregulation. They also completed retrospective measures of childhood emotional vulnerability and parental invalidation. Results: Invalidating parenting and emotional vulnerability independently predicted emotion dysregulation, but an interaction effect was not found. Having experienced validating parenting was found to be a protective factor for developing borderline traits but was not significantly related to emotional dysregulation. Conclusion: Data in this sample did not support the underlying genesis of BPD proposed by the Biosocial Theory and a model that more parsimoniously explains the development of BPD is proposed.

Keywords: borderline personality disorder; biosocial theory; emotional dysregulation; invalidating parenting; DBT

Dialectical behavior therapy is a common treatment for borderline personality disorder (BPD). It is based upon the Biosocial Theory that posits that borderline traits are due to extensive emotion dysregulation, caused in turn by an interaction between an individual's innate emotional vulnerability and the experience of being raised in an emotionally invalidating environment (Linehan, 1993). While recent revisions of the model have hypothesized that childhood impulsivity may also play a role in the development of borderline traits (Crowell, Beauchaine, & Linehan, 2009), the main emphasis of the Biosocial Theory rests upon a strong interaction between childhood emotional vulnerability and invalidating parenting.

The Biosocial model has received some empirical support (Arens, Grabe, Spitzer, & Barnow, 2011), but the posited interaction between childhood emotional vulnerability and invaliding parenting has failed to predict emotion dysregulation in at least one study (Reeves, 2007) and borderline traits in another (Sauer & Baer, 2010). Unfortunately, both of these studies had methodologies that make it hard to draw firm conclusions about the effect of the proposed interaction – in the Reeves (2007) study, the measure used for childhood emotional vulnerability (General Emotional Dysregulation Measure; Newhill, Mulvey, & Pilkonis, 2007) does not focus upon the respondent’s childhood and contains some items that are almost identical to the those used in the measure of current emotional dysregulation (Difficulties in Emotion Regulation Scale [DERS]; Gratz & Roemer, 2004), thus confusing construct validity. The Sauer and Baer (2010) study did not incorporate a measure of emotion dysregulation, and so it was not possible to determine whether this construct mediated the effect of the childhood measures on current borderline traits.
The Present Study

The current study sought to test whether the best fitting model of the precursors to borderline traits would include a significant interaction effect between childhood emotional vulnerability and parental invalidation, leading to current emotional dysregulation and resulting in borderline traits.

Anecdotaly, this prediction is contrary to our clinical experience, where clients may possess borderline traits while reporting only a history of emotional vulnerability or of invalidating parenting. These anecdotal reports from clinicians, considered in conjunction with the findings of Reeves (2007) and Sauer and Baer (2010), lead to the hypothesis that an interaction effect would not play an important role in predicting either emotional dysregulation or borderline traits.

An argument could be mounted that the interaction that the Biosocial Theory posits is not a statistical interaction but rather a functional one, whereby an emotionally vulnerable child is likely to elicit invalidating responses from their environment, leading to further emotionality. The most recent incarnation of the Biosocial Theory suggests that this functional interaction occurs (Crowell et al., 2009). Consequently, if this interpretation of the Biosocial Theory is correct, then it would be expected that measures of emotional vulnerability and parental invalidation would be highly correlated and would share substantial covariance (as a causal cycle is posited to exist between the two factors). Further, it is possible that both functional and statistical interactions may be present. Although we sought to test both forms of interactions in the current study, based on emerging evidence, we hypothesized that neither would be present.

Method

Participants

The study was conducted online, with 150 subjects recruited from the general population. The sample was further supplemented by 100 first-year psychology students completing the study for course credit.

The final sample comprised of 250 participants (60 males, 190 females) with a mean age of 32.06 years (standard deviation $SD = 15.80$) and a mean number of years of education of 16.14 ($SD = 3.25$). Of the participants, 60% identified with an Australian background and the sample was predominately middle class (24% with a household income of $37,000 or less; 24% $37,001–80,000; and 52% over $80,000).

Measures

Emotion dysregulation. The issue of what constitutes emotional dysregulation was considered before the commencement of the study, given that the definition varies across theorists. For the purposes of this study, emotional dysregulation was conceptualized as having a mal-adaptive reaction to an emotion rather than having a high level of intensity of the emotion itself, a distinction made by previous researchers examining emotional dysregulation (e.g., Gratz & Roemer, 2008; Mennin, Heimberg, Turk, & Fresco, 2005). With regard to the Biosocial model, while this distinction differs from the definition utilized in the most recent description of the model (Crowell et al., 2009), a similar construct is identified further down the model, before the emergence of borderline traits (albeit with the label of “Reactions to emotional situations”).

DERS (Gratz & Roemer, 2004). The DERS was selected with these considerations in mind, with its items focusing upon the second-order responses to emotions (rather than the intensity of emotions themselves). DERS was developed with consideration of Linehan’s theory and comprises six facets of emotion dysregulation. It has demonstrated good internal consistency ($\alpha = .93 - .94$), test-retest reliability ($r_t = .88, p < .01$) and predictive power in relation to the anticipated behavioral outcomes of emotional dysregulation (Gratz & Roemer, 2004, 2008). Further, it is a significant predictor of BPD (Gratz, Tull, Baruch, Bornovalova, & Lejuez, 2008).
Borderline Traits

Borderline Personality Questionnaire (BPQ; Poreh et al., 2006). The BPQ is a self-report measure that has been previously used with nonclinical populations as a dimensional measure of borderline traits (Fonseca-Pedrero et al., 2011). It contains nine subscales, one for each of the facets of BPD as per the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition Text Revision (DSM-IV-TR; American Psychiatric Association [APA], 2000). The subscales demonstrate adequate-excellent internal consistency ($\alpha = .78 - .93$; Fonseca-Pedrero et al., 2011), and the measure has performed favourably when compared with other measures of BPD in the screening of outpatient youth for the disorder (Chanen et al., 2008).

Childhood Invalidation

Recalled Childhood Socialization of Emotion Scale (RCSES; Krause, Mendelson, & Lynch, 2003). The RCSES is a self-report measure retrospectively rating the levels of validation and invalidation experienced as a child, by assessing the manner in which the respondent’s primary caregiver would respond to a series of common scenarios experienced during childhood (e.g., a child becoming upset at losing a prized possession). It has previously been used in a number of studies to assess perceived levels of parental invalidation (e.g., Sauer & Baer, 2010; Thomas, DiLillo, Walsh, & Polusny, 2011), having significantly predicted borderline symptoms and having shown a modest relationship to parent’s self-report of their parenting (Sauer & Baer, 2010).

In this study, the measure used did not include all the questions, but instead removed the scenarios identified as being redundant by Sauer and Baer (2010), with such refinements having previously resulted in highly internally consistent measures of parental validation and invalidation ($\alpha = .88 - .95$). In this study, the RCSES scales were reversed (cascading from left to right) to keep the meaning of a high score consistent with the other measures used. Both invalidation and validation scales were used in this study to determine (a) whether they differ as risk and protective factors and (b) whether one construct is merely the inverse of the other.

Childhood Emotional Vulnerability

Emotional Vulnerability–Child Scale (EV-Child; Sauer & Baer, 2010). The EV-Child is a self-report measure that not only retrospectively rates emotional vulnerability, based upon the Affective Intensity Measure (AIM; Bryant, Yarnold, & Grimm, 1996), but also incorporates some items relating to Linehan’s conceptualization of emotional vulnerability involving a slow return to baseline from emotional arousal. It has high levels of internal consistency ($\alpha = .91$) and enjoys a modest convergence with retrospective parental ratings of childhood vulnerability (Sauer & Baer, 2010).

Results

Calculating Scores

The standard manner of establishing the total score on the BPQ was considered inappropriate for this study, as it involves summing all the scores despite each subscale having a variable number of items that may be endorsed at differing rates. This creates the potential for some of the subscales to have a greater influence on the overall score, whereas the DSM-IV-TR (APA, 2000) does not give primacy to any of the traits. Consequently, the scoring of the BPQ was completed by transforming the mean level of endorsement of each of the subscores into a z-score before the creation of an overall mean score, thus not favoring one facet of BPD over the others. A similar issue existed for the DERS and so the same solution was applied (i.e., the mean of each subscale was transformed into a z-score before an average score was determined).

Both the RCSES-Invalidation and the RCSES-Validation were calculated with regard to the refinements suggested in previous research (Sauer & Baer, 2010) to deliver a two-factor solution.
Table 1
Descriptive Statistics and Internal Reliability (N = 250)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>Crombach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV-Child</td>
<td>3.11</td>
<td>.83</td>
<td>.94</td>
</tr>
<tr>
<td>RCSES-Validation</td>
<td>3.99</td>
<td>1.39</td>
<td>.95</td>
</tr>
<tr>
<td>RCSES-Invalidation</td>
<td>2.79</td>
<td>1.31</td>
<td>.93</td>
</tr>
<tr>
<td>(prior to transformation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DERS (mean of z-scores)</td>
<td>0</td>
<td>.71</td>
<td>.81</td>
</tr>
<tr>
<td>DERS,NA</td>
<td>2.28</td>
<td>.96</td>
<td>.91</td>
</tr>
<tr>
<td>DERS,GDB</td>
<td>2.96</td>
<td>.98</td>
<td>.88</td>
</tr>
<tr>
<td>DERS,ICD</td>
<td>1.95</td>
<td>.82</td>
<td>.88</td>
</tr>
<tr>
<td>DERS,LEA</td>
<td>2.40</td>
<td>.76</td>
<td>.81</td>
</tr>
<tr>
<td>DERS,LS</td>
<td>2.15</td>
<td>.90</td>
<td>.92</td>
</tr>
<tr>
<td>DERS,LEC</td>
<td>2.18</td>
<td>.74</td>
<td>.84</td>
</tr>
<tr>
<td>BPQ (mean of z-scores)</td>
<td>0</td>
<td>.72</td>
<td>.89</td>
</tr>
<tr>
<td>BPQ,Impulsivity</td>
<td>.18</td>
<td>.20</td>
<td>.68</td>
</tr>
<tr>
<td>BPQ,Affective,Instability</td>
<td>.35</td>
<td>.31</td>
<td>.87</td>
</tr>
<tr>
<td>BPQ,Abandonment</td>
<td>.18</td>
<td>.20</td>
<td>.74</td>
</tr>
<tr>
<td>BPQ,Relationships</td>
<td>.32</td>
<td>.31</td>
<td>.82</td>
</tr>
<tr>
<td>BPQ,Self,Image</td>
<td>.30</td>
<td>.29</td>
<td>.82</td>
</tr>
<tr>
<td>BPQ,Suicide/Self-Mutilation</td>
<td>.16</td>
<td>.23</td>
<td>.78</td>
</tr>
<tr>
<td>BPQ,Emptiness</td>
<td>.26</td>
<td>.28</td>
<td>.84</td>
</tr>
<tr>
<td>BPQ,Intense_Anger</td>
<td>.26</td>
<td>.28</td>
<td>.86</td>
</tr>
<tr>
<td>BPQ,Quasi-Psychotic States</td>
<td>.19</td>
<td>.21</td>
<td>.62</td>
</tr>
</tbody>
</table>

Note. EV-Child = Emotional Vulnerability–Child Scale; RCSES = Recalled Childhood Socialization of Emotion Scale; DERS = Difficulties in Emotion Regulation Scale; BPQ = Borderline Personality Questionnaire; NA = Nonacceptance of Emotional Responses; GDB = Difficulties in Goal-Directed Behaviour; ICD = Impulse Control Difficulties; LEA = Lack of Emotional of Emotional Awareness; LS = Limited Access to Emotion Regulation Strategies; LEC = Lack of Emotional Clarity.

Data Transformation and Internal Consistency

Because data normality was found to be an issue for RCSES-Invalidation scores, a logarithmic transformation was used to resolve this issue (the transformed variable was used for all subsequent analysis).

Internal consistency for each of the measures was found to be adequate to excellent for all the scales, other than the Quasi-Psychotic States subscale of the BPQ, which was marginal (see Table 1).

Model Comparisons

The EV-Child, RCSES-Invalidation, and RCSES-Validation scores were converted to z-scores to allow for the calculation of interaction effects (obtained by multiplying the standardized scores together and generating the variables EV*Invalid and EV*Valid). The demographics variables were recoded into dichotomous or ordinal variables for analysis. The model used composite rather than latent variables because of the large number of parameters.

A model was designed using AMOS 7.0, whereby all of the demographic variables, EV-Child, RCSES-Invalidation, RCSES-Validation, EV*Invalid, and EV*Valid were entered as independent variables with direct effects upon emotional dysregulation (DERS; the mediating variable). All possible covariances between the independent variables were estimated. Borderline traits (BPQ total score) was then entered as the dependent variable, with all variables (including DERS) identified as having a direct effect upon this measure.

Because the model had many paths and covariances, a large number of which were not significantly different from zero, the model was simplified by removing nonsignificant paths.
Correlational Data

Significant but weak correlations existed between childhood emotional vulnerability and perceived parenting (see Table 2).
Table 2
Correlation Between Measures of Emotional Vulnerability and Parenting Environment

<table>
<thead>
<tr>
<th></th>
<th>EV-Child</th>
<th>RCSES-Validation</th>
<th>RCSES-Invalidation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV-Child</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RCSES-Validation</td>
<td>-.15*</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>RCSES-Invalidation</td>
<td>.26**</td>
<td>-.53**</td>
<td>1</td>
</tr>
</tbody>
</table>

Note. EV-Child = Emotional Vulnerability–Child Scale; RCSES = Recalled Childhood Socialization of Emotion Scale.
*p < .05. **p < .01.

Discussion

In line with the Biosocial Theory, and as expected, emotional dysregulation significantly predicted borderline personality traits. However, contrary to the Biosocial Theory (Crowell et al., 2009), the hypothesis that emotional vulnerability and invalidating parenting would individually predict emotional dysregulation but have a limited interaction with each other was supported. In addition, both the correlation and covariance between invalidating parenting and emotional vulnerability, although significant, was not strong, a finding at odds with the contention that the interaction between these two constructs is of a functional, rather than statistical, nature. These findings suggested that both emotional vulnerability and invalidating parenting independently exert their effects upon borderline traits. This has clinical implications, particularly in the case of patients with emerging borderline traits, in which both aspects should be assessed and may be targets for intervention.

It is noteworthy that there was a strong relationship between borderline traits and emotional dysregulation, which was operationalized in this study as an individual’s reaction to the experience of emotion, rather than the strength of the emotion itself. Despite this strong relationship, the items contained in the emotion dysregulation measure do not appear to encompass the same constructs as the measure of borderline traits that are more behaviorally based. Together these findings support the notion that an individual’s reaction to emotions, rather than the intensity of the emotions they feel, is more fundamental to the development of borderline traits.

An unanticipated finding was that perceived parental validation correlated significantly and negatively with borderline traits, but not with emotional dysregulation, suggesting that it might exert a protective effect against the development of borderline traits. This is a significant finding, as it suggests that emotion validation is not merely the opposite of emotion invalidation, given the differing roles they occupy in the model. Rather, based on the items in the measure, it involves being taught how to respond to emotional challenges in a constructive and helpful manner. This finding is also of note as it highlights that not all borderline aetiology is mediated via emotion dysregulation.

Further Research

It should be noted that this study used retrospective self-report measures, cross-sectional rather than longitudinal data to explore the dynamics between the various factors, and a nonclinical sample to examine a clinical construct. Future studies would benefit from replicating this study in a clinical sample. Longitudinal studies are also indicated; however, to follow a sufficiently large sample from early childhood to the development of BPD would be costly.

It would also be of interest to establish whether the narrow focus on invalidating parenting may be misguided. It is plausible that invalidating parenting per se may not be of particular importance, but rather the measure of invalidating parenting may be tapping into a broader factor of generally harmful parenting (which may include a wide range of behaviors). It is possible that other types of poor parenting beyond emotionally invalidating parenting may also influence the development of borderline traits. Consequently, including a measure assessing various types of poor parenting would assist to clarify this situation.
Similarly, it could be argued that the construct of an emotionally vulnerable child may be indistinguishable from the broader construct of neuroticism, a construct that correlates with not only borderline traits (Distel et al., 2009) but also a range of other physical and mental health conditions (Claridge & Davis, 2001). Consequently, if the measure of emotional vulnerability substantially measures neuroticism, its inclusion in a model for BPD, while accounting for variation in the associated measures, may not possess the capacity to explain why an individual develops BPD (as opposed to another disorder).

Finally, it would also be of interest to ascertain whether poor parenting exerts an effect in a nonlinear fashion. The classification of BPD as a form of complex posttraumatic stress disorder has previously been postulated (e.g., Driessen et al., 2002). This would suggest that negative childhood events may have to reach a threshold of stress to induce a trauma response, with poor parenting (up until a point) not exerting a significant effect upon longer term behavior.

References


