

The Construct of Effortful Control: An Approach to Borderline Personality Disorder Heterogeneity

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Key Words

Borderline personality disorder · Effortful control · Heterogeneity

Abstract

Background: The present study investigated the heterogeneity of DSM-IV borderline personality disorder (BPD) diagnosis as a function of the construct of effortful control. We hypothesized 3 subgroups of BPD patients based on effortful control, that would also differ in other areas of functioning, such as symptoms, interpersonal relations and personality organization. **Sampling and Methods:** Forty-seven clinically referred individuals were reliably diagnosed as meeting DSM-IV criteria for BPD using semistructured interviews. Effortful control, symptomatology, interpersonal functioning and personality organization were assessed using self-report questionnaires. **Results:** Cluster and profile analyses were performed and identified 3 subgroups. Subgroup 1, with high effortful control, exhibited the fewest problems in symptoms, interpersonal functioning and personality organization. Subgroup 3, with low ratings of effortful control, had the most problems in these areas, and sub-

group 2, a group high in some aspects of effortful control but low in others, ranged midway between groups 1 and 3. **Discussion:** The findings indicate a relationship between attentional mechanisms and the clinical expression of borderline personality pathology. Effortful control is a valuable construct for identifying subgroups of BPD patients, thus helping to understand the heterogeneity in BPD. Limitations of the study include the exclusive use on self-report of effortful control, as well as the small sample size. Future research should further investigate the associations of neurocognition and borderline pathology, as well as different approaches to treatment of the different BPD subgroups.

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In order to be diagnosed as having borderline personality disorder (BPD), a person has to meet any 5 out of 9 DSM-IV criteria [1], leading to high heterogeneity amongst this population. The identification of subgroups of BPD patients that share certain characteristics may contribute to our understanding of both borderline personality pathology and its treatment.

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As the child develops, neural systems grow, along with evolving cognitive and executive functions. One of these executive functions is effortful control, which is related to a specific executive attentional network that has been activated in imaging studies [2] and allows individuals to deal with conflict among stimulus dimensions. This capacity of inhibiting a predominant response in favor of a subdominant one is considered a form of behavioral self-control and, therefore, a mechanism of self-regulation. The critical role of effortful control in socialization is reflected in research showing that effortful control positively related to conscience development [3] and negatively related to the expression of aggression [4].

Previous work on the heterogeneity of BPD suggested 3 underlying dimensions [5]. Therefore, we hypothesized that we could identify 3 subgroups in our sample, based on 3 subscales of effortful control: 'inhibitory control' is the capacity to suppress positively toned impulses and resist inappropriate approach tendencies; 'activation control' describes the capacity to suppress negatively toned impulses and thereby resist inappropriate avoidance tendencies; 'attentional control' is the capacity to intentionally shift and focus attention [Evans and Rothbart, unpubl. data]. Second, we assumed that a group with low effortful control would exhibit increased hostility (aggression, irritability, rage, resentment), depression (dysphoric mood and affect, withdrawal from life, suicidal ideation, hopelessness), anxiety (nervousness, tension, terror, panic attacks) and psychoticism (ranging from isolated, withdrawn, schizoid lifestyle to first-rank symptoms of schizophrenia, such as thought control), while a subgroup with high effortful control would exhibit fewer problems in these symptom areas. We predicted that a subgroup with low effortful control would exhibit more problems in alienation (seeing self as victim, feeling mistreated and betrayed), social potency (being forceful, decisive, enjoying leadership) and social closeness (being sociable, warm, affectionate), whereas a subgroup with high effortful control would endorse fewer problems in these areas. We also hypothesized that a subgroup with high effortful control would exhibit less difficulties with identity diffusion (incoherent sense of self and others), primitive defenses (for example, projective identification or splitting) and reality testing (capacity to empathize with ordinary social criteria of reality) compared to the other subgroups.

Methodology

Participants

Participants were 47 clinically referred individuals who met criteria for DSM-IV BPD. Whereas all patients met criteria for BPD, they were heterogeneous in terms of coexisting personality disorders and axis I conditions. Forty-one subjects (87.2%) were female, and 6 (12.8%) were male. Thirty subjects (63.8%) were Caucasian, 6 (12.8%) were Hispanic, 5 (10.6%) were African American, 1 (2.1%) was Asian, 2 (4.3%) were mixed and 3 (6.4%) were of other origins. Four subjects (8.5%) were married. Three subjects (6.4%) had a high school degree or graduate education degree, 18 (38.3%) had some college, 4 (8.5%) had an associate degree, 15 (31.9%) had bachelor degrees, and 7 (14.9%) had a graduate degree. The subjects' mean age was 28.89 years ($SD = 6.92$).

Procedures

As part of a larger study [6], we have assessed effortful control and other personality variables of these patients. Study procedures were explained, and informed consent was obtained. Inclusion/exclusion criteria were assessed with the International Personality Disorder Examination [7] and the Structured Clinical Interview for DSM-IV Axis I Diagnoses [8]. Effortful control was measured with the Adult Temperament Questionnaire [9], which consists of 118 items rated on a 7-point Likert scale. Based on earlier results [10; Evans and Rothbart, unpubl. data], the authors have developed this self-report questionnaire that includes general constructs of effortful control, negative affect, extraversion/surgency and orienting sensitivity. Posner [unpubl. manuscript] has found good reliability in a sample of 258 undergraduate students, with an alpha for negative affect of 0.72, effortful control 0.75, alpha for extraversion 0.67, alpha for affiliativeness 0.77 and for orienting sensitivity 0.77. We utilized the effortful control scale, with subscales of inhibitory control (consisting of 11 items), activation control (12 items) and attentional control (12 items), in our sample. In an adult sample of 35 borderline patients and 61 normal controls ($n = 96$), we found a correlation of -0.41 ($p < 0.01$) between the temperamental dimension of effortful control and the difficulty of controlling conflict as measured by the attention network task. The Brief Symptom Inventory [11] is a 53-item self-report questionnaire that assesses psychological symptoms with adequate internal consistency, test-retest reliability, convergent and construct validity. Based on our experience with borderline individuals, we a priori chose the symptom scales of depression, hostility, anxiety and psychoticism for data analysis. The Multidimensional Personality Questionnaire [12] is a factor-analytically developed 300-item self-report questionnaire with good to adequate internal consistencies and test-retest reliability. As indices of interpersonal problem areas, we selected the scales social potency, social closeness and alienation. Personality organization was assessed with the Inventory of Personality Organization [13], a self-report instrument with 155 items measuring identity diffusion, reality testing and primitive defenses as well as moral functioning and aggression. Adequate internal consistency for these scales and good test-retest reliability and convergent and discriminatory validity have been demonstrated. We selected the scales identity diffusion, primitive defenses and reality testing for data analysis.

Data Analysis

After analyzing descriptive statistics, all scores were transformed into z-scores, thus adjusting for differences in the range of scores on

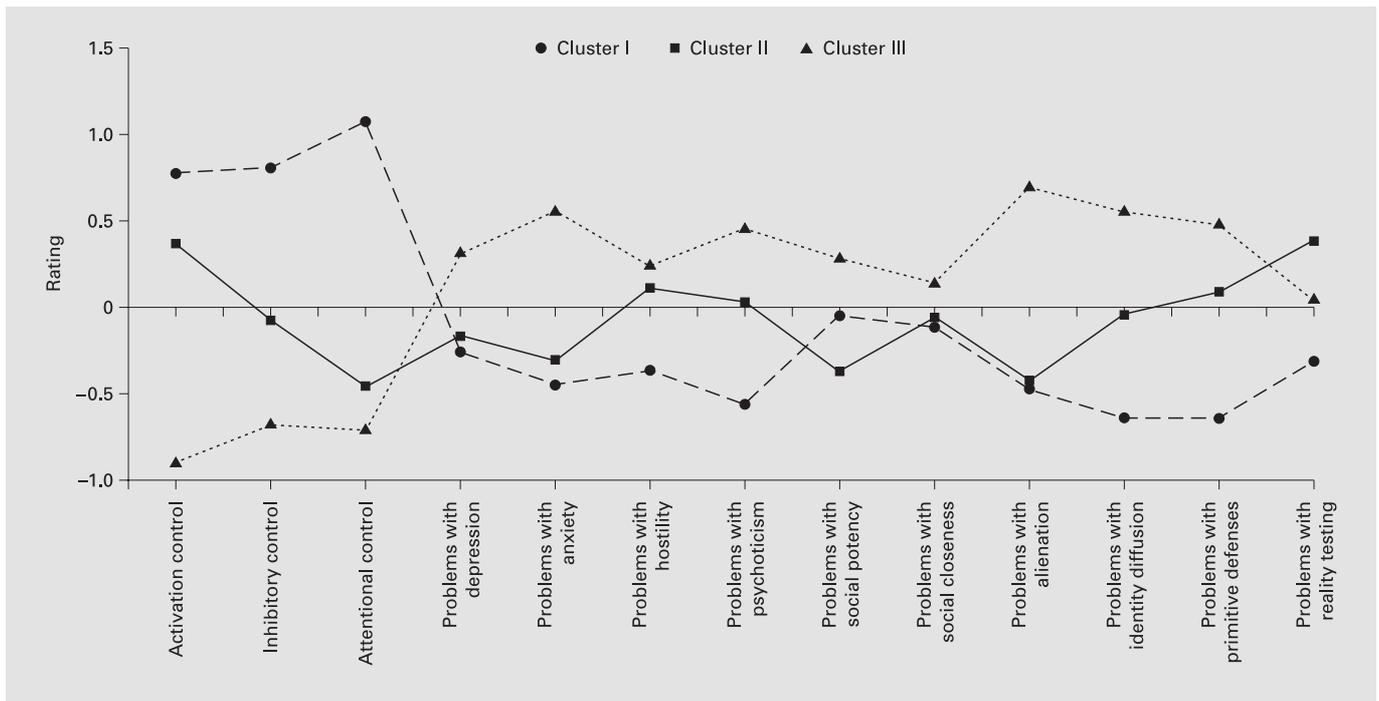


Fig. 1. Three clusters based on effortful control, and their ratings in symptomatology, interpersonal difficulties and personality organization.

the instruments. Then, a k-means cluster analysis was performed in order to identify subgroups based on the 3 subscales of effortful control, with 3 clusters specified in advance. Subsequently, profile analyses [14] were performed, investigating differences between the 3 subgroups in their symptomatology, interpersonal problem areas and personality organization, by using multivariate analyses of variance (MANOVAs). Clusters were entered as the between-subjects variable and scores on the dependent measures as a repeated measures or within-subjects factor. Separate analyses were carried out for the different domains of interest. The MANOVA provided for multivariate tests of differences between groups in terms of shape (whether group profiles are parallel), mean level and flatness (significant increase or decrease in profiles). Univariate analyses of variance were carried out for each dependent variable, with significance of differences between the clusters on single scales examined using Tukey's LSD post hoc test.

Results

Preliminary analyses showed no gender differences in the variables used in this analysis. Cluster I ($n = 17$) consisted of subjects high in all 3 subscales of effortful control, while cluster III ($n = 19$) contained subjects low on these scales. Cluster II ($n = 11$) contained subjects low on attentional control ($F = 45.55$, $d.f. = 44$, $p < 0.001$), mod-

erate on inhibitory control ($F = 16.48$, $d.f. = 44$, $p < 0.001$) and high on activation control ($F = 30.61$, $d.f. = 44$, $p < 0.001$; fig. 1). Means and standard deviations are shown in table 1.

In the area of symptomatology, shape differences were not significant (Pillai's trace = 0.17, $p < 0.3$), nor were differences in flatness (Pillai's trace = 0.03, $p < 0.99$). Significant level differences between clusters were identified ($F_{2, 43} = 5.23$; $p < 0.01$). Subsequent univariate analysis indicated significant differences between the 3 clusters in anxiety ($p < 0.01$) and psychoticism ($p < 0.01$), but not in hostility and depression. A post-hoc analysis using Tukey's LSD exhibited significant differences in anxiety between cluster I and cluster III ($p < 0.01$), as well as between cluster II and cluster III ($p < 0.05$). Clusters I and II did not significantly differ from one another on the anxiety scale. The same post-hoc analysis obtained a significant difference in psychoticism between cluster I and cluster III ($p < 0.91$). Cluster II did not differ significantly from cluster I nor from cluster III. In the area of interpersonal problems, shape differences were not significant (Pillai's trace = 0.16, $p < 0.13$), nor were differences in flatness (Pillai's trace = 0.002; $p < 0.06$). Level differences were significant ($F_{2, 43} = 5.49$; $p < 0.01$), accounted for by

Table 1. Means in each domain by cluster

	Cluster 1			Cluster 2			Cluster 3		
	n	mean	SD	n	mean	SD	n	mean	SD
Depression	16	2.07	1.09	11	2.06	0.99	19	2.6	0.99
Anxiety	16	1.5	0.78	11	1.6	0.082	19	2.39	0.79
Hostility	16	1.28	0.89	11	1.72	0.76	19	2.39	1.07
Psychoticism	16	1.23	0.68	11	1.56	0.78	19	1.96	0.63
Alienation	17	5.00	3.92	11	5.27	2.90	18	11.33	5.79
Social potency	17	11.59	6.2	11	13.36	5.95	18	9.72	4.75
Social closeness	17	13.24	4.07	11	13.00	4.31	18	12.11	5.37
Identity diffusion	16	54.01	11.36	11	61.82	10.81	19	69.63	11.79
Primitive defenses	16	36.88	10.20	11	44.73	10.68	19	49.00	8.49
Reality testing	16	32.19	11.92	11	41.91	15.50	19	37.32	13.74

increased alienation in cluster III subjects. Differences in interpersonal problem scores were significant for alienation ($p < 0.001$), but not for social closeness or social potency. Tukey's LSD obtained significant differences in alienation between cluster I and cluster III ($p < 0.001$), and cluster II and cluster III ($p < 0.01$). In the area of personality organization, shape differences were significant (Pillai's trace = 0.27158, $p < 0.02$), accounted for by increased identity diffusion ($p < 0.005$) and primitive defenses ($p < 0.005$) in cluster III subjects. A post-hoc analysis (Tukey's LSD) obtained significant differences between clusters I and III ($p < 0.002$ and $p < 0.004$) in both of these variables. Cluster II was midway between clusters I and III, with scores not significantly different from either one of the other clusters. There were no significant differences among clusters in problems with reality testing, even though cluster II scored highest in this area.

Discussion

We used the construct of effortful control to investigate an adult population with borderline personality pathology. Cluster and profile analyses identified one subgroup with high effortful control that exhibited low anxiety, psychoticism and alienation, and low identity diffusion and primitive defenses. A second subgroup was high in activation control, but low in inhibitory and attentional control, and exhibited low anxiety and medium psychoticism, low ratings of alienation, and medium level of identity diffusion and primitive defenses, thus ranging midway between groups 1 and 3. The third group exhibited low self-ratings of effortful control on all subscales, with high anxiety

and psychoticism, high alienation as well as high self-reported identity diffusion and primitive defenses.

Our findings are relatively consistent with the existing literature, in which effortful control was related to interpersonal behaviors as well as to the expression of aggression [3, 4], and they indicate a relationship between executive functions and clinically important aspects of personality pathology (symptoms, personality organization and interpersonal functioning). Furthermore, one can conclude that, in our BPD sample, 3 different levels of pathology can be differentiated, with the group with high effortful control exhibiting the least, and the group with low effortful control exhibiting the most problems in different areas of functioning. This seems to be particularly relevant given the heterogeneity inherent to the DSM-IV definition of BPD. Investigation of the development of attentional mechanisms in children, and its relationship to clinically relevant areas across time, may provide powerful insights relevant to etiology, prevention and treatment of BPD. Implications of the present findings also pertain to clinical issues in the treatment of this serious mental disorder and raise questions about how cluster memberships potentially influence treatment compliance and in-therapy behavior. Since, for now, one can only speculate about the different ways in which the 3 effortful-control groups may behave in and respond to treatment, more research is needed in this area.

Among the limitations of this study are the small sample size and the lack of a control group. Furthermore, it is an open question whether effortful control moderates borderline symptomatology or whether it reflects a level of current symptom severity. It is important to note that this was an exploratory effort, and that the 3 clusters were

derived by a k-means cluster analysis, specifying 3 clusters in advance. It is not an empirically derived cluster solution, but rather it was the solution that we were best able to interpret. The presence of comorbid axis I disorders, such as anxiety disorders, attention deficit/hyperactivity disorder or even general affective instability, might be related to effortful control but was not specifically

assessed in this study. We have depended upon self-report measures in order to assess effortful control, symptomatology, interpersonal functioning and personality, thus tapping into the subjective experience of these patients, which varies from person to person. Since this study was a preliminary, exploratory attempt, we hope that future research will address these limitations.

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