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Correlates between five factor model traits and the revised diagnostic interview for
borderlines dimensions in an adolescent clinical sample

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Abstract

Objective: Extensive evidence supports the association between Five Factor Model (FFM) traits involving high Neuroticism, low Agreeableness, and low Conscientious and Borderline Personality Disorder (BPD) characteristics, particularly among adults in community samples. However, studies supporting this link in adolescent samples are relatively limited and few studies have examined the links between FFM traits and specific dimensions of BPD, such as those distinguished by the Revised Diagnostic Interview for Borderlines (DIB-R). In this study we examined associations between FFM traits and BPD characteristics in a group of clinical and non-clinical adolescents.

Method: We evaluated the correlations between the FFM personality traits, as measured by the NEO-Five Factor Inventory (NEO-FFI) and BPD characteristics as measured by the DIB-R in a sample of adolescents ($N=164$).

Results: Consistent with previous research, BPD dimensions were highly associated with high Neuroticism, low Conscientiousness, low Agreeableness and to a somewhat lesser extent with low Extraversion. Specificity of associations between FFM traits and DIB-R section scores was limited, in part because of strong inter-correlations among DIB-R scores.

Discussion: These results imply that evidence about trait-BPD associations in adult samples generalizes well to adolescents. Clinical implications of these findings are discussed.

Keywords: borderline personality disorder; five-factor model; adolescents; DSM-5, DIB-R

Introduction

In clinical practice, Borderline Personality Disorder (BPD) has been understood as a psychiatric disorder category characterized by a pervasive and enduring pattern of instability and impulsivity that causes distress or impairment, as indicated by at least five of nine criteria in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition. ⁽¹⁾ Personality psychologists have demonstrated that this pattern of behavior is associated with a particular pattern of Five Factor Model traits (FFM: Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A) and Conscientiousness (C)). These findings provide some grounds for synthesizing clinical and quantitative approaches to personality pathology. Yet important questions remain; we aim to address two of them in this study. First, do these associations generalize to adolescents, where personality has been observed to be relatively more plastic and the diagnosis of personality disorder has been questioned? We examine associations between BPD and FFM traits in a mixed clinical/community adolescent sample to provide an initial answer to this question. Second, do trait and diagnostic models describe the well-known heterogeneity within the broad BPD construct in similar ways? We evaluate links between traits and four specific dimensions of BPD.

Associations between FFM and BPD

Meta-analytic work shows that BPD is positively associated with N and negatively associated with A and C in adult samples. ^(2,3) Longitudinal studies suggest, moreover, that changes in FFM traits can account for changes in BPD symptoms over the course of 16 years ⁽⁴⁾ and BPD has been shown to share all of its genetic variation with FFM traits. ⁽⁵⁾ Such findings have led to the general conclusion that ‘Even when clouds caused by sampling and measurement variability are removed from the picture, the correspondence between PD configurations and dimensions of normal personality are very strong’. ^(6, p340)

This empirical conclusion influenced the Alternative Model of Personality Disorders (AMPD) ⁽⁴⁾ as well as the Eleventh edition of the International Classification of Diseases (ICD-11) ⁽⁷⁾, in which personality disorders are re-conceptualized using trait dimensions in combination with functioning indices. At the same time, both of these models have retained a separate BPD category or specifier, which highlights the perceived value and potential added information of the BPD construct over and above personality dimensions. Thus, the clinical and research communities continue to struggle with how to integrate quantitative and clinical approaches to describing borderline behavior and problems. One important area of debate in both trait psychology and clinical diagnosis has involved questions about whether traits and BPD relate similarly in adolescents and adults.

There are at least four reasons to hypothesize that FFM traits and BPD would be related in the same way in adolescents as they are in adults. First, research in community adolescent samples tends to find similar associations between BPD and high N, low A, and low C. ^(8, 9, 10) The associations between high N and low A were corroborated in a clinical sample ⁽¹¹⁾, and the maladaptive extremes of this FFM-trait profile were related to BPD in mixed community/clinical samples. ^(12, 13) Second, there is considerable continuity in the structure of FFM traits from adolescence to adulthood. ^(8, 14, 15, 16, 17, 18) This indicates that the same set of personality variables are useful for describing individual differences in adolescents and adults. Thus, these variables are also likely to relate in similar ways to certain forms of suffering and dysfunction, such as those characterized under the rubric of BPD. Third, the rank-order stability of FFM traits is substantial during the transition from adolescence to adulthood. ^(19, 20, 21, 22) This suggests that those individuals who have FFM profiles that suggest risk for BPD symptoms in adolescence will continue to have at-risk profiles as adults. Fourth, despite some controversies surrounding the BPD diagnosis in adolescents, there is increasingly robust evidence for similar levels of reliability and validity

of BPD diagnoses in adolescents and in adults. ⁽²³⁾ Effective early-detection and early-intervention strategies have been identified for youths who struggle with BPD, further suggesting the value of early diagnosis. ^(24, 25, 26)

BPD as a Heterogeneous Construct

A significant challenge for conceptualizing BPD has to do with its being a broad and heterogeneous cluster of problems. ^(27, 28, 29) This heterogeneity can be understood both in terms of different configurations of FFM traits ^(4, 30) or different constellations of BPD symptoms. ^(23, 31, 32) For instance, FFM trait domains could be used to distinguish an adolescent with BPD who is anxious, overly compliant, and impulsive (i.e., high in N and A and low in C) from a one who is angry, mistrustful, and explosive (i.e., high in N and low in A and C) in a way that would be useful for treatment planning. Conversely, particular BPD symptoms can be used to distinguish an adolescent with BPD whose primary problems are in the area of abandonment concerns and identity problems from one whose problems are more related to anger and impulsive behavior. The Revised Diagnostic Interview for Borderlines (DIB-R) ⁽³³⁾ is one of the few measures of BPD that explicitly assesses clinically-relevant clusters of symptoms. ^(34, 35) It specifically distinguishes between affective (e.g., depression, anxiety), cognitive (e.g., paranoia, unusual perceptions), impulsive (e.g., substance use, promiscuity), and interpersonal (e.g., dependency, demandingness) symptoms.

Associations between FFM dimensions and the four symptom sections of the DIB-R have not been examined empirically. This raises the question whether these two models would provide similar information about heterogeneity among adolescents diagnosed with BPD. A close correspondence between FFM traits and DIB-R sections would suggest that these models provide similar kinds of information about both the overall diagnosis but also the specific constellation of presenting problems. The content of the two models suggests that

this is possible. For instance, there would appear to be a correspondence between FFM N and DIB-R affective symptoms, low FFM C and DIB-R impulsive symptoms, and low FFM A and DIB-R interpersonal symptoms. ⁽³⁶⁾ Conversely, a lack of correspondence might suggest that these two models provide different kinds of information, and thus would be mutually informative for describing heterogeneity among individuals diagnosed with BPD.

This Study

The aim of the current study was to examine the associations of BPD dimensions with FFM traits in mixed clinical/community sample of adolescents. Our first hypothesis was that BPD would be positively associated with N and negatively associated with A, and C, consistent with evidence from adult samples. Our second and more exploratory hypothesis was that there would be some level of correspondence between specific FFM traits and specific DIB-R sections, such that higher N would be linked to affective symptoms, lower A to interpersonal symptoms, and lower C to impulsive symptoms.

Method

Participants

Participants were 162 adolescents (90.1% female; $M_{\text{age}} = 15.31$, $SD = 1.37$, range 13-17, 68.5% white), 102 of whom were sampled from a psychiatric setting and 60 of whom were healthy comparison subjects.

Measures

The Revised Diagnostic Interview for Borderlines (DIB-R) ⁽³³⁾ is a 97-item semi-structured interview that assesses affective (18 items), cognitive (27 items), impulsive (17 items), and interpersonal symptoms (32 items) of BPD within 22 subcategories, three items are not used to make these categories. Items do not cross-load across scales or categories. The internal

consistency of the four sector scores in the current study were: Affect (Cronbach's alpha = .86), Cognition (.55), Impulsivity (.80), and Interpersonal Relationships (.79). The relatively lower value for the Cognition score reflects that it is the most complex sector of the DIB-R. *The NEO Five Factor Inventory* (NEO-FFI) ⁽³⁷⁾ is a 60-item questionnaire with internal consistency in the current study as follows: Neuroticism (.90), Extraversion (.80), Openness to Experience (.71), Agreeableness (.79), and Conscientiousness (.88).

Procedure

The group of clinical adolescents were recruited from four units at McLean Hospital and one unit at the Ichan School of Medicine at Mount Sinai between the dates of August 2007 and September 2012. Adolescents without a history of any psychiatric disorder were concurrently recruited using online advertisements. No participants dropped out of the study as data-collection was cross-sectional. All participants had an IQ of 71 or higher, were fluent in English and had never met criteria for schizophrenia, schizoaffective disorder, bipolar I disorder, or been diagnosed with a serious organic condition that could cause psychiatric symptoms (e.g., multiple sclerosis, systemic lupus erythematosus). Parents provided consent and adolescents provided assent. Bachelor and master-level research assistants conducted the interviews. They were trained by dr. Zanarini, who is the developer of the DIB-R. Following the administration of the measures, basic global assessment of functioning (GAF) scores were assigned to all participants by lab members including the interviewer who administered the DIB-R and the site PI. GAF scores ranged from 24-91 ($M = 49.32$, $SD = 19.41$) for the total sample.

Statistical Analyses

We first calculated inter-correlations among the FFM and DIB-R scales. To test hypothesis 1, we correlated NEO-FFI traits with DIB-R section scores. To test hypothesis 2,

we used a dependent correlations z test to examine differences between DIB-R section scores and NEO-FFI trait scores, one trait at a time. SPSS Statistics 25 was used for all analyses.

Results

Inter-correlations among FFM scales ranged from -.023 to -.475** and among DIB-R scales they ranged from .764** to .953**. Correlations between FFM traits and BPD section scores are shown in Table 1. All DIB-R domains showed statistically significant correlations with all FFM-traits. However, consistent with our predictions and previous research, correlations were strongest for high N, low A, and low C. Moderate correlations were also observed for low E, and small correlations were observed for high O.

We used tests of dependent correlations with a Type I error rate of .01 to examine our second hypothesis. The correlations between N and the DIB-R affect and interpersonal symptoms were significantly stronger than the correlation between N and the impulsive symptoms. There was no significant difference in strengths of the correlations between E, O, A and C and the four DIB-R sectors of psychopathology. These results are mostly inconsistent with our expectations and do not suggest a particularly strong similarity between the FFM and DIB-R at the level of underlying components. However, their interpretation is also conditioned on the strong intercorrelations among DIB-R sections scores, which makes discriminant patterns of external correlation unlikely.

Table 1 & 2 here.

Discussion

The goals of this study were to test a) whether associations between BPD and FFM traits identified in mixed adult samples and non-clinical adolescent samples extend to a mixed

adolescent sample and b) whether there are specific associations between FFM traits and BPD symptom clusters. In general, results confirmed the first hypothesis but not our second.

Our results strongly support the connection between BPD and basic traits, and in particular an FFM profile of high N and low A and C, and extend this link to a clinical sample of adolescents. These associations appear to be robust, indicating that FFM traits can be used to depict, identify, and predict BPD across the lifespan. Indeed, correlations were very strong in this study (e.g., stronger than meta-analytic correlations from adult samples^{2,3}), particularly given that the FFM measure was a self-report questionnaire whereas the BPD measure was a semi-structured interview.

The association between BPD symptoms and N was especially strong. This finding is consistent with several theories that posit constructs such as neuroticism⁽³⁸⁾, hyperbolic temperament^(39,40), or emotion dysregulation⁽⁴¹⁾ as the core underlying feature of BPD. It suggests that the most prominent personality feature of the disorder among adolescents has to do with affective dysregulation. The association between low E and BPD, although previously observed^(2,4) has not been consistently identified in the literature, and is worth further consideration.

It is worth noting that a personality trait profile involving high N, low A, and low C may not be specific to BPD.⁽³⁰⁾ Indeed, a similar profile has been identified for other personality disorders as well.^(2,42,43) This profile has also been linked to a “p” factor that may represent a general disposition for maladaptive personality and mental health problems, as opposed to a specific psychiatric disorder.^(40,44) Future research should explore the link between normal range personality traits, BPD symptoms, and a general dimension of psychopathology in both adolescent and adult samples.

In contrast, results did not support a particularly specific correspondence between FFM traits and DIB-R symptom sections among adolescents. A similar result was obtained

when examining DIB-R temperamental and acute symptoms in an adult sample, ⁽⁴⁰⁾ although associations between DIB-R sections and FFM domains have not been examined in adults. The most likely explanation for this finding was the strong inter-correlations among DIB-R scores, which make it difficult to find discriminant correlations between those scores and FFM traits. Specific links might have also been more likely if we had used specific maladaptive trait facets rather than broad, normal range traits.

Future studies should focus on addressing some of the limitations of this study and replicating the results. The use of cross-sectional data limited our ability to examine developmental processes that are important to consider for understanding the use of traits to depict BPD in young people. Our relatively small sample constrained our ability to examine differences between clinical and non-clinical participants. Furthermore, we were not able to investigate connections between FFM traits and BPD using more sophisticated (e.g., item-level) covariance models and high intercorrelations among DIB-R scales make this challenging. It is possible that organizing DIB-R symptoms differently would give different results, as there is evidence of differential stability and FFM correlates with more and less stable BPD symptoms. ⁽⁴⁰⁾ The use of a personality model that captures variation at the level of lower-level facets could provide a more nuanced picture of the association between the FFM and BPD with potentially a different correlation pattern across scales. ^(2, 27, 36) Finally, the absence of criterion variables (e.g., psychosocial functioning or treatment response) limited our ability to compare these two schemes in terms of clinical utility.

In conclusion, the current results suggest a strong general correspondence between an FFM trait profile involving high N, low A, and low C and BPD symptoms in a mixed adolescent sample, but weak correspondence between specific FFM traits and specific BPD symptom clusters. These results support the conclusion that associations between trait dimensions and BPD commonly observed in adults extend to adolescents.

Conflict of interest

All authors declare that they have no conflict of interest.

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Table 1. *Correlations between FFM traits and DIB-R dimensions*

	Affect	Cognition	Impulse Action	Interpersonal Relations	Total Score
Neuroticism	.780**	.725**	.667**	.746**	.786**
Extraversion	-.397**	-.370**	-.332**	-.329**	-.379**
Openness	.255**	.221**	.193*	.215**	.237**
Agreeableness	-.439**	-.396**	-.451**	-.453**	-.472**
Conscientiousness	-.435**	-.368**	-.471**	-.408**	-.454**

* $p < .05$ ** $p < .01$

Table 2. *P-values for differences in correlations*

	A vs. C	A vs. IA	A vs. IR	C vs. IA	C vs. IR	IA vs. IR
Neuroticism	.032	<.001	.087	.050	.270	.007
Extraversion	.270	.058	.036	.216	.209	.473
Openness	.233	.077	.156	.291	.455	.319
Agreeableness	.160	.381	.349	.119	.121	.481
Conscientiousness	.062	.181	.231	.011	.210	.070

* A = Affect, C = Cognition, IA = Impulse Action, IR = Interpersonal Relations

Supplementary Material

Table 1. *Intercorrelations NEO-FFI*

	N	E	O	A	C
Neuroticism	1	-.475**	.334**	-.397**	-.435**
Extraversion		1	-.099	.214**	.354**
Openness			1	.051	-.023
Agreeableness				1	.407**
Conscientiousness					1

Table 2. *Intercorrelations DIB-R*

	Affect	Cognition	Impulse Action	Interp. Relations	Total
Affect	1	.816**	.841**	.868**	.953**
Cognition		1	.785**	.764**	.871**
Impulse Action			1	.817**	.922**
Interp. Relations				1	.953**
Total					1

Table 3. *Correlations between FFM and DIB-R domains for the clinical group (N=102)*

	Affect	Cognition	Impulse Action	Interpersonal Relations	Total Score
Neuroticism	.347**	.275**	-.098	.267**	.327**
Extraversion	.021	-.034	.168	.094	.126
Openness	.247*	.098	.020	.040	.143
Agreeableness	.096	-.002	-.040	-.122	-.064
Conscientiousness	.060	-.012	-.139	-.006	-.042

Table 4. *Correlations between FFM and DIB-R domains for the non-clinical group (N=60)*

	Affect	Cognition	Impulse Action	Interpersonal Relations	Total Score
Neuroticism	.364**	.376**	.304*	.309*	.434**
Extraversion	-.140	-.126	-.141	.091	-.087
Openness	.077	.103	.054	.199	.147
Agreeableness	-.298*	-.148	-.293*	-.085	-.264*
Conscientiousness	-.166	.088	-.151	.050	-.065