

Relationship between Schizotypal and Borderline Traits in College Students

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The main objective of the present investigation was to analyze the relationship between self-reported schizotypal and borderline personality traits in a sample of 759 college students ($M = 19.63$ years; $SD = 2.03$). For this purpose, the Schizotypal Personality Questionnaire-Brief (SPQ-B; Raine and Benishay, 1995) and Borderline Personality Questionnaire (BPQ; Poreh et al., 2006) were administered. The results showed that schizotypal and borderline features are partially related at subclinical level. The exploratory factor analysis conducted on the subscales revealed a three-factor solution comprised of the following factors: Identity/Interpersonal, Lack of Control and Schizotypal. The canonical correlation analysis showed that schizotypal features and borderline personality traits shared 34.8 % of the variance. The data highlight the overlap between schizotypal and borderline personality traits in nonclinical young adults. Future studies should continue to examine the relationship and the degree of overlap between these traits in community samples. *Keywords: schizotypy, borderline, comorbidity, overlap, traits, schizotypal.*

El principal objetivo de esta investigación fue analizar el grado de asociación entre los rasgos de la personalidad esquizotípica y de la personalidad borderline en una muestra de 759 estudiantes universitarios ($M = 19,63$ años; $DT = 2,03$). Para este propósito el *Schizotypal Personality Questionnaire-Brief* (SPQ-B; Raine and Benishay, 1995) y el *Borderline Personality Questionnaire* (BPQ; Poreh et al., 2006) fueron administrados. Los resultados mostraron que los rasgos esquizotípicos y borderline de la personalidad se encontraban parcialmente asociados a nivel subclínico. El análisis factorial exploratorio llevado a cabo a partir de las subescalas de ambos autoinformes reveló una solución factorial tridimensional concretada en los factores: Identidad/Interpersonal, Falta de control y Esquizotípico. El análisis de correlación canónica mostró que los rasgos esquizotípicos y borderline de la personalidad compartían el 34,8% de la varianza total. Los datos destacan la superposición entre la personalidad esquizotípica y la personalidad borderline en jóvenes adultos. Futuros estudios deberían continuar examinando la relación y el grado de superposición entre este conjunto de rasgos de la personalidad en muestras comunitarias.

Palabras clave: esquizotipia, límite, comorbilidad, superposición, rasgos, esquizotípica.

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Personality disorders are characterized by a pattern of inflexible and maladaptive traits, which usually starts during childhood or adolescence and remains stable in time, causing clinically significant impairment in functioning as well as a serious impact on the individual's quality of life (American Psychiatric Association [APA], 2000). Schizotypal Personality Disorder (SPD) and Borderline Personality Disorder (BPD) were born together as "borderline states" in the Danish Adoption Study (Gunderson & Singer, 1975; Spitzer, Endicott, & Gibbon, 1979) and were separated as independent entities in the DSM-III (APA, 1980). Whereas the SPD is characterized by a general pattern of social deficit associated to perceptual distortions and odd behavior and Speech, BPD consists of a general pattern of instability in personal relationships, identity disturbance and impulsivity (APA, 2000). Both personality disorders are frequent in clinical as well as in ambulatory and community populations (Crawford et al., 2005; Ekselius, Tillfors, Furmark, & Fredrikson, 2001; Korzekwa, Dell, Links, Thabane, & Webb, 2008; Lenzenweger, Lane, Loranger, & Kessler, 2007; Torgersen, Kringle, & Cramer, 2001).

From a dimensional point of view, it is considered that both the schizotypal and borderline personality traits are not necessarily associated to a psychological disorder, but rather they can be present in the general population distributed along a psychopathological continuum of severity, where the clinical state would be situated at its extreme end (Trull, 1995; Trull, Widiger, & Guthrie, 1990). In this regard, personality traits could be potentially connected with a personality disorder (e.g., SPD) and/or with a psychopathological condition (e.g., schizophrenia; Raine, 2006). However, although individuals with schizotypal or borderline personality features are not clinically diagnosed with a personality disorder, they usually show qualitatively similar symptoms, but of a lesser degree, to those present in patients with BPD or SPD. In the case of schizotypal traits, individuals with high scores on self-reports (*psychometric high risk paradigm*) display emotional, motor, behavioral, cognitive and neuropsychological deficits (Cella, Cooper, Dymond, & Reed, 2008; Fonseca-Pedrero, Lemos-Giráldez, Paino, Sierra-Baigrie et al., 2009; Fonseca-Pedrero, Paino, Lemos-Giráldez, Sierra-Baigrie, Ordoñez-Cambor et al., 2011; Horan, Blanchard, Clark, & Green, 2008; Kwapil, Barrantes Vidal, & Silvia, 2008; Raine, 2006) similar to those found in clinical samples, as well as are at increased risk of future clinical psychotic disorder (Gooding, Tallent, & Matts, 2005; Poulton et al., 2000; Welham et al., 2009). On their part, borderline personality traits have also been associated to greater depressive symptoms, negative affect, distress, emotional dysregulation, psychopathological symptoms and a formal BPD diagnosis (Fonseca-Pedrero, Paino, Lemos-Giráldez, Sierra-Baigrie, García-Portilla González, et al., 2011; Gardner & Qualter, 2009; Korfine & Hooley, 2009; Rosenberger & Miller, 1989; Trull, 1995).

The relationship between the schizotypal and borderline personality traits has been extensively analyzed in clinical samples within comorbidity studies (Becker, Grilo, Edell, & McGlashan, 2000; Critchfield, Clarkin, Levy, & Kernberg, 2008; Kavoussi & Siever, 1992; McGlashan et al., 2000). For example, McGlashan et al. (2000) found that of a total of 86 patients diagnosed with SPD, 29.1% also presented BPD. On their part, Becker et al. (2000), using a sample of out-patient adolescents, found that 12% of the patients diagnosed with BPD also presented SPD. On the other hand, the links between both groups of traits in nonclinical populations have also been examined (Claridge et al., 1996; Lipp, Arnold, & Siddle, 1994; McCreery & Claridge, 2002; Rosenberger & Miller, 1989; Watson & Sinha, 1998). In this regard, it has been found that borderline traits seems to be grouped within the positive dimension of schizotypy (Lipp et al., 1994; Muntaner, García-Sevilla, Fernández, & Torrubia, 1988), although other studies also find it associated to the Disorganization or Asocial behavior (Impulsive Non-conformity) dimensions (Claridge et al., 1996; Mason, 1995; McCreery & Claridge, 2002). It is also noteworthy that self-reports for the assessment of schizotypal personality such as the Combined Schizotypal Traits Questionnaire (CSTQ; Bentall, Claridge & Slade, 1989) have been constructed based on the items in the Borderline Personality Scale (STB; Claridge & Broks, 1984). However, most studies that analyze the relationship between schizotypal or borderline personality traits have employed the STB scale, with very few studies having empirically analyzed the relationship between these sets of traits in young adults with other self-reports and which make reference to current diagnostic criteria (e. g., DSM-IV).

Within this frame of research, the main purpose of this study was to analyze the relationship between schizotypal and borderline traits in a sample of nonclinical young adults. This objective is important because it allows us: a) to empirically examine the relationship established between schizotypal and borderline traits without the confounding factors frequently associated to patients with personality disorders (e. g., medication, stigmatization, hospitalization); b) to delimit and clearly define which facets overlap in both groups of traits in non clinical population; and c) to understand personality traits within dimensional models.

Method

Participants

The sample studied was composed of 759 participants enrolled in 8 different disciplines at the University of Oviedo: Law, Psychology, Education, Philology, Philosophy, Tourism, Mathematics & Speech Therapy. Of the total sample 227 were males (29.1%) and 532 females (70.1%). The mean age of the participants was 19.6 years ($SD = 2.03$). The average years of education was 15.9 ($SD = 2.1$).

Instruments

Schizotypal Personality Questionnaire-Brief Form (SPQ-B; Raine & Benishay, 1995) is a 22-item self-report based on the SPQ (Raine, 1991) and designed for measuring schizotypal personality traits according to the DSM-III-R (APA, 1987). In this study, a Spanish version which was previously validated in college students (Mata, Mataix-Cols, & Peralta, 2005) and adolescents was used (Fonseca-Pedrero, Lemos-Giráldez, Paíno-Piñeiro, Villazón-García, & Muñiz, 2010), with a 5-point Likert-type response format (1 = *completely disagree*; 5 = *completely agree*). The final total score ranges from 22 to 110 but a score can also be obtained for the different subscales: Cognitive-Perceptual (ideas of reference, magical thinking, suspiciousness, and unusual perceptual experiences), Disorganized (odd speech and behaviour), and Interpersonal (constricted affect, no close friends, and social anxiety). The SPQ-B has been used in first-order relatives of patients with schizophrenia-spectrum disorders (Compton, Chien, & Bollini, 2007), non-clinical adolescents (Fonseca-Pedrero, Lemos-Giráldez, Paíno, Villazón-García, & Muñiz, 2009) and adolescent outpatients (Axelrod, Grilo, Sanislow, & McGlashan, 2001). The psychometric properties of the SPQ-B have been widely investigated obtaining internal reliabilities for the total score of .75 to .83 and test-retest reliabilities of .70 to .95 (Fonseca-Pedrero et al., 2008). In Spanish populations, the levels of internal consistency for the SPQ-B subscales range from .61 to .69, whereas for the total score, they range from .81 to .88 (Fonseca-Pedrero, Lemos-Giráldez et al., 2010; Fonseca-Pedrero, Lemos-Giráldez, Paino, Villazón-García et al., 2009).

Borderline Personality Questionnaire (BPQ; Poreh et al., 2006) is a self-report composed of 80 statements in a dichotomous-response format (True/False) and has been developed for the assessment of borderline personality based on DSM-IV criteria (APA, 1994). It comprises a total of 9 subscales: Impulsivity, Affective Instability, Abandonment, Relationship, Self-Image, Suicide/Self-Mutilation, Emptiness, Intense Anger, and Quasi-Psychotic States. The levels of internal consistency ranged from .51 to .89 for the subscales, and from .92 to .94 for the total score. In addition, it has shown adequate levels of sensitivity (.68), specificity (.90), positive (.65) and negative (.91) predictive values, diagnostic precision, test-retest reliability (.92), and its specific use for the detection of BPD has been verified in nonclinical juvenile populations (Chanen et al., 2008; Poreh et al., 2006). The translation and adaptation into Spanish of the BPQ was carried out using the back translation procedure following international guidelines (Hambleton, Merenda, & Spielberger, 2005). The levels of internal consistency for the Spanish version of the BPQ subscales ranged from .78 to .93 (Fonseca-Pedrero, Paino, Lemos-Giráldez, Sierra-Baigrie, García-Portilla González, et al., 2011).

Procedure

The administration of the questionnaire was conducted in a collective manner in groups of 15-40 participants. They were at all times reminded of the confidentiality of their answers and of the voluntary character of their participation. Written informed consent to participate in the study was obtained from the subjects. Participants did not receive any type of incentive for their participation in the study. The application took place under the supervision of the researchers, with a view to minimizing errors. This study is part of a broader research on the early detection of psychological disorders in adolescence and young adults.

Data analysis

First, the descriptive statistics were examined in relation to the mean, standard deviation, asymmetry, kurtosis and score range for the SPQ-B and the BPQ subscales. Second, the Pearson correlations between the SPQ-B and the BPQ subscales were analyzed. Third, and with the aim of examining the underlying structure of the subscales of both self-reports, an exploratory factor analysis was conducted using the Unweighted Least Squares method with Promin rotation. The number of factors to be extracted was determined by the Kaiser criterion, the percentage of explained variance, the interpretability of the obtained factors and Parallel Analysis (Horn, 1965). Fourth, canonical correlation analysis was conducted. This multivariate technique permits the examination of the degree of relationship between two sets of variables. The squared canonical correlation is the simple square of the canonical correlation. It represents the proportion of variance shared by 2 synthetic variables. The contribution of each variable to the canonical correlation was carried out using the standardized canonical weights. For statistical analyses, SPSS 15.0 and the FACTOR (Lorenzo-Seva & Ferrando, 2006) were used for data analysis.

Results

Descriptive statistics

Table 1 shows the descriptive statistics, namely, the mean, standard deviation, asymmetry, kurtosis and score range for the BPQ and the SPQ-B subscales. Next, the results indicated that the Pearson correlations among the subscales of the SPQ-B and the BPQ were statistically significant, ranging from .19 (Interpersonal-Impulsivity) to .51 (Interpersonal-Emptiness), with the exception of the correlation between the Interpersonal subscale of the SPQ-B and the Impulsivity subscale of the BPQ, which was not statistically significant. The SPQ-B Cognitive-Perceptual subscale showed a high correlation with the BPQ Quasi-Psychotic States and

Emptiness subscales. On its part, the SPQ-B Interpersonal subscale correlated strongly with the BPQ Emptiness and Self-Image subscales. Similarly, the Disorganized subscale of SPQ-B was also strongly correlated with the BPQ Emptiness and Self-Image subscales. The correlation between the total scores on both self-reports was .54.

Exploratory factor analysis of the SPQ-B and the BPQ subscales

An exploratory factor analysis was performed using the Pearson correlations matrix of the SPQ-B and the BPQ subscales. The estimation method employed was Unweighted Least Squares method with subsequent Promin rotation. The measure of sampling adequacy was 2913.3 ($p < .001$) and the KMO was .85. Based on the Parallel Analysis, the number of suggested factors to be retained was three. The factorial weights as well as the communalities of the exploratory factor analysis are shown in Table 3. As can be observed, the first factor explained 36.92% of the total variance and comprised the BPQ subscales of Abandonment, Relationship, Self-Image, Suicide and Emptiness and the Interpersonal subscale of the SPQ-B; this first factor was named Identity/Interpersonal. The second factor explained 10.55% of the total variance,

and comprised the Affective Instability, Intense Anger and Impulsivity BPQ subscales; this factor was denominated Deficit of control. The third factor explained 9.69% of the total variance comprising the Cognitive-Perceptual, Interpersonal and Disorganized subscales of the SPQ-B and the Quasi-Psychotic States subscale of the BPQ, and it was named Schizotypal. The correlation between the first and second factors was .50, between the first and third factors 0.49, and between the second and the third factors .38. The Root Mean Square Residuals (RMSR) for this three-factor solution was .03, Bentler's index .98 and the goodness-of-fit Statistics were: $\chi^2 = 220.29$ ($p < .001$), Non-Normed Fit Index (NNFI) = .87, Comparative Fit Index (CFI) = .93, Goodness-of-Fit Index (GFI) = .99 and Adjusted Goodness-of-Fit Index (AGFI) = .99.

Canonical correlation analysis

The canonical correlation coefficient between SPQ-B and BPQ scales was .59, which represents 34.8 % of variance shared. The subscales standardized coefficients for the canonical correlation are shown in Table 4. In the case of schizotypal traits measured with the SPQ-B, the two subscales with the greatest coefficients were

Table 1

Descriptive statistics for the Schizotypal Personality Questionnaire-Brief Form and the Borderline Personality Questionnaire subscales

Subscales	Mean	SD	Asymmetry	Kurtosis	Range
Positive	14.13	5.08	0.96	0.40	8-31
Interpersonal	18.83	6.30	0.36	-0.39	8-38
Disorganization	11.70	4.57	0.78	0.09	6-27
Impulsivity	2.39	1.48	0.81	0.78	0-9
Affective Instability	4.03	2.78	0.40	-0.84	0-10
Abandonment	1.51	1.42	1.22	2.05	0-9
Relationships	2.08	2.09	1.08	0.36	0-8
Self Image	1.31	1.85	1.97	3.58	0-9
Suicide	0.34	0.90	3.33	12.36	0-6
Emptiness	1.93	2.15	1.24	0.96	0-10
Intense Anger	2.92	2.28	0.82	-0.10	0-10
Quasi-Psychotic States	0.73	1.09	1.82	3.87	0-7

Table 2

Pearson correlations between the Schizotypal Personality Questionnaire-Brief and the Borderline Personality Questionnaire subscales

Subscales	Impulsivity	Affective Instability	Abandonment	Relationships	Self Image	Suicide	Emptiness	Intense Anger	Quasi-Psychotic States
Positive	.19*	.31*	.27*	.27*	.22*	.20*	.35*	.20*	.42*
Interpersonal	.04	.32*	.35*	.39*	.41*	.20*	.51*	.23*	.17*
Disorganization	.22*	.29*	.27*	.32*	.37*	.20*	.47*	.25*	.28*

* $p < .01$

Table 3

Factor analysis of the Schizotypal Personality Questionnaire-Brief Form and the Borderline Personality Questionnaire subscales

Subscales	Factors			Communalities
	FI	FII	FIII	
Affectivity Instability	.12	.46	.09	.33
Abandonment	.50	.23	.01	.41
Relationship	.47	.26	.03	.43
Self Image	.80	-.06	-.03	.57
Suicide	.23	.21	.06	.17
Emptiness	.81	-.01	.09	.73
Intense Anger	.11	.66	-.04	.50
Quasi-Psychotic States	-.06	.22	.36	.21
Impulsivity	-.09	.34	.14	.14
Positive (SPQ)	-.12	.08	.84	.67
Interpersonal (SPQ)	.43	-.17	.50	.54
Disorganization (SPQ)	.20	-.08	.70	.62
Eigenvalue	4.43	1.13	1.16	
% Explained variance	36.92	10.55	9.69	

Table 4

Standardized coefficients for the canonical correlation analysis of the Schizotypal Personality Questionnaire-Brief and Borderline Personality Questionnaire subscales

Set 1: SPQ-B subscales		Set 2: BPQ subscales	
Positive	-.33	Impulsivity	-.07
Interpersonal	-.48	Affectivity Instability	-.13
Disorganization	-.37	Abandonment	-.06
		Relationship	-.19
		Self Image	-.08
		Suicide	-.03
		Emptiness	-.57
		Intense Anger	.01
		Quasi-Psychotic States	-.28

Canonical correlation: .59

Interpersonal (-.48) and Disorganized (-.37). In the case of the BPQ, these were the Emptiness (-.57) and Quasi-Psychotic States (-.28) subscales.

Discussion and Conclusions

The main goal of the present study was the analysis and comprehension of the relation between schizotypal personality and borderline personality traits in a sample of nonclinical young adults using the Schizotypal Personality Questionnaire (SPQ-B; Raine & Benishay, 1995) and the Borderline Personality Questionnaire (BPQ; Poreh et al., 2006). In accordance with previous studies in clinical and community samples (Becker et al., 2000; Critchfield et al.,

2008; Ekselius et al., 2001; McGlashan et al., 2000; Rosenberger & Miller, 1989), the results obtained in this study point toward an overlap between these sets of traits in samples of nonclinical young adults.

The correlations found between the SPQ-B and the BPQ subscales were statistically significant providing data regarding the convergent-discriminant validity between both groups of traits. Positive traits of schizotypal personality were correlated with the Quasi-Psychotic States of the BPQ, whereas the Interpersonal and Disorganized traits of the SPQ-B were associated to the Emptiness feature of the BPQ. Although most of the previous studies have used the total score on the STB (Claridge & Broks, 1984), strong and statistically significant correlations have been found with other schizotypal or psychosis proneness self-reports

reaching values of .67 (Lipp et al., 1994; Muntaner et al., 1988). Similar results were obtained by Rosenberg and Miller (1989) when they examined the relationship between borderline personality and schizotypal personality traits as a function of the DSM-III in a sample of 106 university students who selected based on their scores being higher than the 90th percentile on different subscales.

The study of the underlying dimensionality of the SPQ-B and the BPQ subscales found that the most parsimonious solution was that which considered the existence of three correlated factors, namely: Identity/Interpersonal, Deficit of control and Schizotypal. The Interpersonal facet of schizotypal personality was grouped into both the Identity/Interpersonal factor and the Schizotypal factor. On the other hand, the Quasi-Psychotic States facet of the BPQ was grouped into the Schizotypal factor. These data indicate on the one hand, that the borderline personality traits are composed of two factors which are closely related to the schizotypal personality traits, and, on the other hand, that the SPD Interpersonal facet and the Quasi-Psychotic States facet overlap. This overlap could respond to different pathophysiological mechanisms. For example, while the interpersonal aspects of SPD are related with blunted affect, incapacity to experience pleasure and social withdrawal, in BPD affective and impulsive interpersonal relationships, and feelings of abandonment may be more important. Despite the fact that the comparison between investigations may be hindered by the heterogeneity of the samples and self-reports used, previous studies that have used the STB self-report (Claridge & Broks, 1984) have found that borderline personality traits seem to be grouped within the positive dimension of schizotypy (Lipp et al., 1994; Muntaner et al., 1988); however, other studies have found a closer relation to the Disorganization or Impulsive Non-conformity dimensions (Claridge et al., 1996; Mason, 1995; McCreery & Claridge, 2002). Likewise, it is worth mentioning that in this study the three factors proposed by Raine et al. (1994) in the Disorganized model of schizotypal personality (Positive, Interpersonal and Disorganized) were not found, which, on the one hand, may be due to the nature of the measurement instrument (SPQ-B) as it is a brief instrument that does not include all the SPD facets, and on the other hand, to the overrepresentation of the BPQ subscales in comparison to the SPQ-B. As it could not be any other way, the nature of the measures used in studies of dimensionality as well as the characteristics of the samples affect the obtained dimensional structure.

Canonical correlation study revealed that the SPQ-B and the BPQ share 34.8% of the total variance. The subscales that mostly contributed to the relationship were those measuring the Interpersonal and Disorganized dimensions of the SPQ-B and the Emptiness and Quasi-Psychotic States facets of the BPQ. Comorbidity studies conducted in clinical samples have also found a high association between SPD and BPD traits (Becker et al., 2000; Critchfield et al., 2008; Kavoussi & Siever, 1992;

McGlashan et al., 2000). Therefore, the data, both clinical and nonclinical, are consistent with a high degree of overlapping between schizotypal and borderline personality traits; however, it must be kept present that these two constructs appear as a joint entity named "borderline states" that have been subsequently separated within the DSM-III (APA, 1980) and successive editions, thus, the comprehension of the relationship between both diagnostic categories goes beyond the comorbidity studies reaching its validity as independent clinical diagnoses.

The studies which examine the underlying structure of personality disorders in nonclinical samples are relevant given that they allow us to: a) reduce symptomatic heterogeneity observed in this group of symptoms and traits; b) delimit the frontiers and observe which facets are overlapping; and c) examine the construct validity of these entities within dimensional models. Based on the results obtained in this study and consistent with previous studies, it appears that schizotypal and borderline personality traits, far from being mutually exclusive and independent categories, can be closely related, coexisting in the normal population and distributed along a continuum (Claridge, 1997; Trull, 1995; Trull et al., 1990) which can doubtfully be due to mere chance (Kavoussi & Siever, 1992) calling into question the conceptual validity of the DSM clusters (American Psychiatric Association, 2000). Similarly, this is also consistent with the frequent finding in clinical settings of individuals presenting traits of both disorders which highlights once again the problems of having diagnostic categories as distinct entities, and even more so in the case of personality disorders.

The resulting data in the study are not free from limitations which should be kept in mind for their interpretation. First, a sample of college students was used, mainly composed by females; therefore, we must be cautious when generalizing the results to other studies. Second, self-report type measures have been exclusively used; there is no doubt that the utilization of hetero-reports or semi-structured interviews would have been interesting. Third, no data was gathered regarding the personal or familial psychiatric history of the participants (Moreno et al., 2011). Fourth, the SPQ-B is a self-report that does not include the anhedonia dimension, which has shown its role as a risk marker for schizophrenia (Fonseca-Pedrero, Paino et al., 2009). Finally, an infrequency scale with the aim of eliminating participants who answered randomly or dishonestly has not been included.

Future studies should continue to examine the relationship between personality disorders in nonclinical populations using other self-reports (Fonseca-Pedrero, Paino, Lemos-Giráldez, Sierra-Baigrie, & Muñiz, 2010) within the dimensional models, as well as at high-risk individuals for the development clinical disorders. Another line of research of great interest would be to elucidate whether there are different subtypes of patients within BPD or SPD.

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