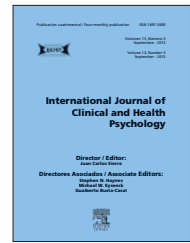




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## ORIGINAL ARTICLE

# Maladaptive personality traits in adolescence: Psychometric properties of the Personality Diagnostic Questionnaire-4+

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### KEYWORDS

Adolescents;  
PDQ-4;  
Validation;  
Personality Disorder;  
Instrumental study

**Abstract** The Personality Diagnostic Questionnaire-4+ (PDQ-4+) is a self-report used for the assessment of personality disorder traits, however, its psychometric characteristics have yet to be tested in community samples of adolescents. The main goal was to analyze the psychometric properties of the PDQ-4+ scores in a large sample of non-clinical adolescents ( $N = 1,443$ ;  $M = 15.9$  years;  $SD = 1.2$ ). The PDQ-4+ scores showed adequate psychometric properties. Reliability of the subscales, incorporating a Likert-type 5-point response format, ranged from .62 to .85. The study of the internal structure at item level revealed that the PDQ-4+ subscales were essentially one-dimensional. Analysis of the internal structure at the subscale level by means of exploratory factor analysis and exploratory structural equation modeling yielded a possible three-dimensional solution. The PDQ-4+ subscales correlated moderately with emotional and behavioural variables measured by the Strengths and Difficulties Questionnaire. The results have clear implications for the understanding of maladaptive personality traits in adolescents.

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### PALABRAS CLAVE

Adolescentes;  
PDQ-4;  
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Trastorno de la personalidad;  
Estudio instrumental

**Resumen** El *Personality Diagnostic Questionnaire-4+* (PDQ-4+) es un autoinforme ampliamente utilizado para la evaluación de los rasgos de los trastornos de la personalidad, sin embargo, sus características psicométricas aún no se han examinado en adolescentes. El principal objetivo fue examinar las propiedades métricas del PDQ-4+ en una muestra representativa de adolescentes no clínicos ( $N = 1.443$ ;  $M = 15,9$  años;  $DT = 1,2$ ). Los resultados mostraron que el PDQ-4+ presentó adecuadas propiedades psicométricas. La fiabilidad de las subescalas, que incorporó un formato de respuesta tipo Likert de 5 puntos, osciló entre 0,62 y 0,85. El análisis de la estructura dimensional a nivel de los ítems indicó que las subescalas del PDQ-4+ eran esencialmente unidimensionales. El análisis de la estructura interna a nivel de las subescalas, a través de análisis factoriales exploratorios y de modelos de ecuaciones estructurales exploratorios, arrojó una posible solución tridimensional como la más adecuada. Las subescalas del PDQ-4+

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correlacionaron de forma moderada con subescalas del Cuestionario de Capacidades y Dificultades. Los resultados tienen claras implicaciones para la comprensión de los rasgos desadaptativos de la personalidad en la adolescencia.

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The assessment and diagnosis of personality disorders (PDs) and maladaptive personality traits in adolescence are controversial issues about which there is currently an interesting debate (De Clercq, De Fruyt, & Widiger, 2009; Tackett, Balsis, Oltmanns, & Krueger, 2009). Adolescence is a critical period of human development in which a wide variety of psychopathological disorders and symptoms are quite common (Kessler et al., 2012), notable among these are maladaptive personality patterns. In this regard, adolescence is an interesting period for: a) the study of maladaptive personality traits; b) the examination of the links established between adaptive and maladaptive personality traits; c) the analysis of possible risk markers and protective factors; and d) the establishment of detection and early intervention strategies (Fonseca-Pedrero, Santarén-Rosell, Paino, & Lemos Giraldez, 2013; Fonseca-Pedrero, Sierra-Baigrie, Paino, Lemos-Giráldez, & Muñiz, 2011).

DSM-IV-TR (American Psychiatric Association [APA], 2000) states that adolescents as well as children can suffer from personality disorders. Many of the PDs that emerge in adulthood appear to be rooted in earlier stages of development (Cohen, 2008; Widiger, De Clercq, & De Fruyt, 2009). Also, PDs are not rare in the general adolescent population. Prevalence rates for PDs in non-clinical adolescents are high, and range from 14.4 to 17% (Bernstein et al., 1993; Johnson, Cohen, Kasen, Skodol, & Oldham, 2008; Johnson et al., 1999). Likewise, PD traits or PDs diagnosed during adolescence have a clear impact in adulthood at social, interpersonal and work levels as well as on physical and mental health (suicide attempts, substance abuse, etc.) (Cohen, Chen, Crawford, Brook, & Gordon, 2007; Skodol, Johnson, Cohen, Sneed, & Crawford, 2007). Therefore, it would be prudent to identify emerging personality pathologies before adulthood and to advance in the early detection of adolescents at risk for PDs.

A wide range of measuring instruments can be found for assessing maladaptive personality traits in both, adolescents and adults. Among them is the Personality Diagnostic Questionnaire-4+ (PDQ-4+) (Hyler, 1994), a self-report designed especially for the assessment of PDs based on the DSM-IV criteria (American Psychiatric Association [APA], 1994). Previous research has used the PDQ-4+ in epidemiological research, in both clinical and non-clinical samples of adolescents and adults, and its psychometric properties have been analyzed (Abdin et al., 2011; Bouvard, Vuachet, & Marchand, 2011; Chabrol, Rousseau, Callahan, & Hyler, 2007; Ling, Quian, & Yan, 2010; Wang et al., 2013). Nevertheless, several studies have questioned the utility of the PDQ-4+ in clinical practice (Reus, Berg, & Emmelkamp, in press), have found reliability levels below .70 (Abdin et al., 2011; Calvo et al., 2012), or have failed to examine its internal structure at the item level. Thus, with the aim of improving the reliability of PDQ-4+ subscale scores, it has

been proposed to incorporate a Likert-type response format (Hopwood, Thomas, Markon, Wright, & Krueger, 2012). As regards the study of the internal structure of the PDQ-4+ at the subscale level, the three-dimensional solution involving Clusters A, B and C proposed by the DSM-IV is the most widely replicated in adults (non clinical and patients) (Calvo et al., 2012; Ling et al., 2010; Yang, Bagby, Costa, Ryder, & Herbst, 2002) although other studies have not found this factorial structure (Calvo, Vives, Gutiérrez, & Torrubia, 2002; Chabrol et al., 2007).

As can be seen, previous works have called into question the psychometric quality of the PDQ-4+, while others have not analyzed issues of relevance to its metric adequacy (e.g., factorial analysis at item level), so that more research is needed. Within this paradigm, the main goal of this instrumental study (Hartley, 2012; Montero & León, 2007) was to analyze the psychometric properties of the PDQ-4+ scores in a large sample of non-clinical adolescents. Deriving from this general goal are the following specific objectives: a) to examine the reliability of the PDQ-4+ scores incorporating a 5-point Likert-type response format; b) to analyze the dimensional structure of the PDQ-4+ scores at the item and subscale levels; and c) to examine the relationship between the PDQ-4+ scores and emotional and behavioural variables.

## Method

### Participants

The selection of participants was conducted using stratified random sampling, by conglomerates, at the classroom level in a population of approximately thirty-six thousand students from the Autonomous Community of the Principality of Asturias (a region situated in northern Spain). The strata were created according to geographical area (Eastern, Western, Central and Mining) and educational stage (compulsory and post-compulsory). The probability of a school being selected was directly proportional to the corresponding number of students. The final sample was made up of a total of 1,443 students, 696 male (48.2%) and 747 female (51.8%), from 28 schools and 90 classrooms. Mean age was 15.91 years ( $SD = 1.18$ ) with a range of 14 to 18. Distribution of the sample by age was as follows: age 14 ( $n = 193$ ; 13.4%), age 15 ( $n = 354$ ; 24.5%), age 16 ( $n = 408$ ; 28.3%), age 17 ( $n = 353$ ; 24.5%) and age 18 ( $n = 135$ ; 9.4%). With the aim of conducting the statistical analyses, a cross-validation study was performed where the total sample was randomly split into two subsamples. The first sample consisted of 722 participants (344 boys) with a mean age of 15.89 years ( $SD = 1.18$ ) and the second sample consisted of 721 participants (352 boys) with a mean age of

15.94 years ( $SD = 1.18$ ). Neither age ( $t = -.912$ ;  $p > .05$ ) nor sex rates ( $\chi^2 = .20$ ;  $p > .05$ ) differed across subsamples.

## Instruments

- The Personality Diagnostic Questionnaire-4+ (PDQ-4+) (Hyler, 1994) is a self-report developed for the assessment of PDs traits according to DSM-IV criteria (American Psychiatric Association [APA], 1994). The PDQ-4+ is composed of a total of 99 items distributed along 12 subscales, 10 subscales referring to the PD diagnostic categories included in Axis II and another two (passive aggressive and depressive) aimed at the assessment of PD categories included in Appendix B of the DSM-IV. Each item reflects a single DSM-IV diagnostic criterion. In this study, we focused on the 10 subscales of Axis II. A five-category Likert-response format was used (1= *completely disagree*; 5= *completely agree*). A Likert response format improves score reliability (Lozano, García-Cueto, & Muñiz, 2008). Likewise, continuous measurement of psychopathology is more reliable and valid (Markon, Chmielewski, & Miller, 2011). Only two items (98 and 99) of the PDQ-4+ that assessed impulsive and disruptive behaviours were presented in a dichotomous format. In the present study, we used the Spanish version adapted by Calvo et al. (2002). The psychometric properties of the Spanish version of the PDQ-4+ have previously been investigated ((Calvo et al., 2002, 2012).
- The Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) is a self-report widely used for the assessment of different social, emotional and behavioural problems related to mental health in children and adolescents. The SDQ is made up of a total of 25 statements distributed across 5 subscales (each with 5 items): *Emotional Symptoms*, *Conduct Problems*, *Hyperactivity*, *Peer Problems* and *Prosocial*. The first four subscales yield a "total score". In this study we used a Likert-type response format with 5 options (1 = *completely disagree*; 5= *completely agree*), so that the score on each subscale ranged from 5 to 25 points. The psychometric properties of the SDQ in its self-report version have been analyzed. In the present study we used the version adapted and translated into Spanish (García et al., 2000; Rodríguez-Hernández et al., 2012).
- The Oviedo Infrequency Scale (INF-OV) (Fonseca-Pedrero, Lemos-Giráldez, Paino, Villazón-García, & Muñiz, 2009) is a 12-item self-report instrument with a Likert-type response format using 5 categories (1 = *completely disagree*; 5= *completely agree*). Its objective is to detect those participants who respond to self-reports in a random, pseudo-random or dishonest fashion. Once the items have been dichotomized (values 1-3 were codified as "0" and values 4-5 as "1"), respondents who reply to more than two of these items incorrectly were eliminated. A total of 64 participants presented a score above two points on the INF-OV. No statistical differences were found between the group of participants who obtained more than two points on the INF-OV and the final sample.

## Procedure

The questionnaire was administered collectively, in groups of 10 to 35 students. For subjects under 18, parents were asked to provide written informed consent. Participants

were informed of the confidentiality of their responses and the voluntary nature of the study, and no incentive was provided for their collaboration. The administration took place under the supervision of the researchers. Participants did not receive any incentive for their participation. The study was approved by the research and ethics committees at the University of Oviedo and by the Department of Education of the Principality of Asturias.

## Data analyses

First, it was examined in the total sample of participants whether the dimensional structure underlying the PDQ-4+ subscales was essentially one-dimensional. With this aim, different exploratory factorial analyses (EFAs) at the item level were performed, from the polychoric correlation matrix and taking the subscales independently. In this manner, it can be tested whether the PDQ-4+ subscales have an empirical value. The method for factor extraction was Unweighted Least Squares (ULS) with Direct Oblimin rotation. The procedure employed for determining the number of factors was Optimal Implementation of Parallel Analysis (Timmerman & Lorenzo-Seva, 2011). Second, the descriptive statistics for both measuring instruments were examined. Third, the Pearson correlations between the ten subscales of the PDQ-4+ were analyzed. Fourth, we estimated the ordinal alpha for each subscale (Zumbo, Gadermann, & Zeisser, 2007).

Fifth, a cross validation study splitting the total sample into two subsamples was conducted. In the first subsample, we analyzed the internal structure of the PDQ-4+ subscales by means of ULS with Direct Oblimin rotation. In the second subsample, we tested different hypothetical dimensional models using Exploratory Structural Equation Modeling (ESEM). The ESEM approach makes it possible to solve some of the problems associated with Confirmatory Factor Analysis (CFA), such as those cases in which there are no satisfactory goodness-of-fit indices or modifications are made to the hypothesized models (Asparohov & Muthén, 2009). In ESEM, all the factor loadings are estimated, whilst in CFA certain restrictions are placed on the parameters. The goodness-of-fit indices employed were: the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) and its confidence interval (90 percent), and the Weighted Root Mean Square Residual (WRMR). The values of CFI and TLI should be over .95 and the RMSEA values should be under .08 for a reasonable fit and under .05 for a good fit (Hu & Bentler, 1999). Finally, we examined the Pearson correlations between the subscales of the PDQ-4+ and the SDQ. SPSS 15.0 (Statistical Package for the Social Sciences, 2006), Mplus 5.0 (Muthén & Muthén, 1998-2007), and FACTOR 9.2 (Lorenzo-Seva & Ferrando, 2006) were used for data analysis.

## Results

### Dimensionality of the PDQ-4+ subscales at the item level

First of all, we tested whether the PDQ-4+ subscales were essentially one-dimensional, examining the percentage of

**Table 1** Dimensionality of the Personality Diagnostic Questionnaire-4+ (PDQ-4+) subscales at item level.

PDQ-4+ subscales	Numer of items	Eigenvalue	% of explained variance	Advised number of factors	GFI	RMSR
Paranoid	7	2.78	39.8	1	.99	.05
Schizoid	7	2.21	31.07	1	.99	.05
Schizotypal	9	3.61	45.15	1	.96	.10
Antisocial	8	2.80	34.99	1	.99	.04
Borderline	9	2.65	29.5	1	.98	.05
Histrionic	8	2.4	30.11	1	.97	.08
Narcissistic	9	3.21	35.65	1	.98	.06
Avoidant	7	3.04	43.53	1	.99	.05
Dependent	8	3.18	39.71	1	.99	.04
Obsessive-compulsive	8	2.11	26.35	1	.98	.05

Note. GFI= Goodness of Fit Index; RMSR= Root Mean Square of Residuals.

variance explained by the first factor. The results indicated that in all cases the variance explained by the first factor was higher than 26%, ranging from 26.35% to 45.15% (see Table 1). In the case of the procedure for determining the numbers of dimensions advised in only one subscale (*Histrionic*) two factors were extracted, however, it is true that the advised number of dimensions when the 95 percentile is considered was one. Also, GFI and RMSR values were acceptable for all subscales.

### Descriptive statistics of the subscales

Table 2 shows the descriptive statistics for the subscales of the two measurement instruments. As can be seen, in the majority of subscales the levels of asymmetry and kurtosis fall within the range of normality. Table 3 shows the Pearson correlations between the PDQ-4+ subscales in the total sample of participants. All the correlations were statistically significant, ranging from .13 to .64.

### Reliability of the PDQ-4+ subscales

Levels of internal consistency estimated for ordinal data ranged from .62 (*Obsessive-Compulsive*) to .85 (*Schizotypal*) (see Table 2).

### Internal structure of the PDQ-4+ subscales: Exploratory factor analysis and Exploratory Structural Equation Modeling

We next conducted an EFA at the subscale level of the PDQ-4+. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .88 and the Bartlett's statistic was 3245.5 ( $p \leq .001$ ). The factor analysis yielded a total of two eigenvalues greater than one, however, the procedure for determining the number of dimensions suggested the extraction of one factor. This factor explained 49.07% of the total variance. The resulting goodness-of-fit indices for the one-dimensional solution were:  $\chi^2 = 558.63$  ( $p \leq .001$ ); CFI= .84; GFI= .98; AGFI= .98; RMSR= .08. The factor loadings for the one-factor solution are shown in Table 3. Likewise, and as a function of the eigenvalues (the third value was close to

one), we examined a three-dimensional factorial solution. The goodness-of-fit indices for this three-factor solution were:  $\chi^2 = 133.3$  ( $p \leq .001$ ); CFI= .96; GFI= 1.00; AGFI= .99; RMSR= .03. The goodness-of-fit indices were slightly higher than those reported for the one-dimensional solution. The results referring to the estimated factor loadings, the eigenvalues and the percentage of explained variance are presented in Table 3. Factor loading of the Avoidant subscale was greater than one. The correlation between the factors ranged from .62 (FII-FIII) to .64 (FI-FIII). This factorial solution resembles those of Clusters A, B and C proposed by the DSM-IV, even if the Paranoid and Obsessive-Compulsive subscales saturated in the first two factors.

The factorial structure of the PDQ-4+ subscales was examined in the second subsample through ESEM. Three possible dimensional models were analyzed: a) a general factor; b) two factors; and c) three factors. The goodness-of-fit indices for the general factor model were:  $\chi^2 = 566.12$ ;  $df = 35$ ; CFI = .82; TLI= .77; RMSEA= .15 (.14-.16); WRMR= .07. The goodness-of-fit indices for the two-factor model were:  $\chi^2 = 408.09$ ;  $df = 26$ ; CFI = .87; TLI= .77; RMSEA= .14 (.13-.16); WRMR= .05. The goodness-of-fit indices for the three-factor model were:  $\chi^2 = 128.21$ ;  $df = 18$ ; CFI = .96; TLI= .91; RMSEA= .09 (.08-.11); WRMR= .03. The estimated factor loadings for the three-factor model are presented in Table 5. For this factorial solution the correlation between factors ranged from .40 (FI-FIII) to .64 (FI-FII). Factor weight of the *Histrionic* subscale was greater than one. As can be observed, the factorial structure is similar to that obtained in the exploratory factor analysis. Factor I matches up with Cluster A, Factor II with Cluster B and Factor III with Cluster C. The *Paranoid* subscale presented cross-loading between FI and FIII and the *Dependent* subscale between factors II and III. The *Obsessive-Compulsive* subscale did not saturate in factor III (Cluster C).

### Validity evidence based on relationships with other variables

Table 6 shows the Pearson correlations between the subscales of the PDQ-4+ and the SDQ. As can be seen, the majority of the PDQ-4+ subscales correlated positively with

**Table 2** Descriptive statistics for the subscales of the Personality Diagnostic Questionnaire-4+ (PDQ-4+) and the Strengths and Difficulties Questionnaire (SDQ).

	Mean	SD	Asymmetry	Kurtosis	Range	Alpha*
<i>PDQ-4+</i>						
Paranoid	16.67	5.09	0.35	-0.34	7-34	.79
Schizoid	13.79	3.60	0.68	1.40	7-34	.69
Schizotypal	16.18	5.46	0.84	0.43	9-39	.85
Antisocial	14.51	4.88	0.66	0.07	7-31	.76
Borderline	18.47	5.34	0.65	0.21	8-37	.73
Histrionic	18.33	4.60	0.37	-0.02	8-36	.73
Narcissistic	20.07	5.52	0.33	-0.12	9-42	.79
Avoidant	16.52	5.10	0.38	-0.15	7-35	.80
Dependent	16.49	5.24	0.60	0.18	8-35	.80
Obsessive-compulsive	21.27	4.86	-0.17	-0.32	8-34	.62
<i>SDQ</i>						
Emotional	12.14	3.94	0.46	-0.17	5-25	.71
Conduct Problems	10.31	3.07	0.73	0.77	5-25	.58
Hyperactivity	14.31	3.80	0.13	-0.18	5-25	.67
Peer Problems	9.23	2.83	1.11	1.74	5-24	.56
Prosocial	20.37	2.67	-0.52	0.26	10-25	.65
Total score	45.98	8.88	0.29	0.20	22-86	.74

Note. SD = standard deviation.

\*Likert score was used in this study.

**Table 3** Pearson correlations between subscales of the Personality Diagnostic Questionnaire-4+ (PDQ-4+).

PDQ-4+ subscales	1	2	3	4	5	6	7	8	9	10
Paranoid (1)										
Schizoid (2)	.38									
Schizotypal (3)	.63	.53								
Antisocial (4)	.41	.24	.31							
Borderline (5)	.60	.31	.57	.50						
Histrionic (6)	.44	.14	.37	.42	.48					
Narcissistic (7)	.59	.33	.53	.47	.51	.63				
Avoidant (8)	.51	.30	.54	.13	.51	.33	.41			
Dependent (9)	.48	.21	.48	.31	.54	.52	.50	.64		
Obsessive-compulsive (10)	.54	.32	.51	.28	.45	.43	.52	.44	.42	

Note. All correlations are statistically significant ( $p \leq .01$ ).

the SDQ subscales, with the exception of the prosocial subscale, which correlated negatively. As can be observed, the Conduct Problems and Hyperactivity SDQ subscales showed a strong correlation with Cluster B subscales (Antisocial and Borderline). The SDQ emotional symptoms subscale was positively correlated with most of the PDQ-4+ subscales.

### Discussion and conclusions

Adolescence is an interesting developmental stage for the assessment of maladaptive personality traits and the detection of those participants at risk of developing a personality disorder (PD) in the future. The main goal of this research was to analyze the psychometric properties of

the Personality Diagnostic Questionnaire-4+ (PDQ-4+) (Hyler, 1994) scores in a large sample of non-clinical adolescents. With this aim, the dimensional structure of maladaptive personality traits was examined by means of the PDQ-4+. In addition, the reliability of the PDQ-4+ scores and its relationship with emotional and behavioural variables were analyzed. The PDQ-4+ scores showed adequate psychometric properties in this sample. In this regard, the PDQ4+ could be used as a screening tool for the detection of maladaptive personality patterns in non-clinical adolescent populations.

Reliability of the PDQ-4+ scores, incorporating a 5-point Likert-type response format, ranged from .62 to .85 (only two subscales yielded values below .70). These internal consistency values can be considered adequate, especially

**Table 4** Exploratory factor analysis for the Personality Diagnostic Questionnaire-4+ (PDQ-4+) subscales (subsample 1).

PDQ-4+ subscales	One-dimensional		Three-dimensional		
	I		I	II	III
Paranoid	.77		.40	.40	.07
Schizoid	.43		-.07	.71	-.10
Schizotypal	.73		.04	.77	.07
Antisocial	.48		.75	.04	-.29
Borderline	.74		.50	.15	.17
Histrionic	.65		.75	-.16	.13
Narcissistic	.73		.63	.19	-.00
Avoidant	.65		-.24	.09	1.03
Dependent	.68		.37	.16	.60
Obsessive-compulsive	.63		.31	.32	.07
Eigenvalues	4.9		4.91	1.07	0.97
% explained variance	49.		49.1	10.69	9.69

**Table 5** Exploratory structural equation modeling for the Personality Diagnostic Questionnaire-4+ (PDQ-4+) subscales (subsample 2).

PDQ-4+ subscales	Three-dimensional		
	I	II	III
Paranoid	.40	.46	-.00
Schizoid	.72	.00	-.20
Schizotypal	.65	.25	-.00
Antisocial	.00	.70	-.27
Borderline	.25	.53	.05
Histrionic	-.42	1.02	-.00
Narcissistic	.00	.85	-.08
Avoidant	.36	.00	.75
Dependent	.00	.51	.40
Obsessive-compulsive	.22	.46	.07

**Table 6** Pearson correlations between the subscales of the Personality Diagnostic Questionnaire-4+ and the Strengths and Difficulties Questionnaire.

Subscales	Emotional	Conduct Problems	Hyperactivity	Peer Problems	Prosocial
Paranoid	.40*	.33*	.17*	.35*	-.06*
Schizoid	.16*	.19*	-.01	.38*	-.14*
Schizotypal	.38*	.28*	.13*	.46*	-.11*
Antisocial	.10*	.61*	.41*	.12*	-.31*
Borderline	.51*	.45*	.34*	.31*	-.11*
Histrionic	.25*	.32*	.28*	.08*	-.10*
Narcissistic	.25*	.37*	.18*	.25*	-.17*
Avoidant	.54*	.11*	.08*	.33*	-.01
Dependent	.41*	.25*	.22*	.21*	-.11*
Obsessive-compulsive	.34*	.19*	.08*	.27*	-.01

\*  $p \leq .01$ .

by comparison with those found in previous studies (Abdin et al., 2011; Calvo et al., 2012). For example, Ling et al. (2010), in a sample of university students and using a dichotomous response format, found internal consistency values above .70; however, other studies have obtained reliability levels around .60 (Abdin et al., 2011; Calvo et al., 2012). In this regard, Hopwood et al. (2012), in a sample of university students and incorporating a Likert-type response format, found reliability levels that ranged from .49 to .75 ( $Mdn = .64$ ). As can be observed, the reliability levels of the PDQ-4+, with the exception of those obtained in Ling et al. (2010), are low. Therefore, with a view to improving the internal consistency levels, it would be useful to incorporate a Likert-type response format in dimensional measures of psychopathology and personality (Lozano et al., 2008; Markon et al., 2011).

The internal structure of the PDQ-4+ items indicated that the PDQ-4+ subscales displayed an essentially one-dimensional structure. This is an interesting result that offers empirical support to the use of the PDQ-4+ subscales in clinical research and practice. The analysis of the internal structure, through EFA and ESEM, showed the presence of three possible factors quite similar to the Clusters proposed by the DSM-IV (American Psychiatric Association [APA], 1994). However, these results must be analyzed in more depth. First, the EFA indicated the possible presence of a general factor. This result may be in part due to the fact that all the correlations among the PDQ-4+ scales are inflated by the operation of acquiescent responding. Second, the *Paranoid* and *Dependent* subscales presented elevated factor loadings in two factors. The *Paranoid* subscale was grouped with Clusters A and B, whereas the *Dependent* subscale was grouped with Clusters B and C. Third, the *Obsessive-Compulsive* subscale was not grouped into Cluster C. This fact may be due to its scarce consistency and the content of items. Calvo et al. (2012) reached similar results using the PDQ-4+ in a sample of Spanish patients. Fourth, in the ESEM model of three factors, the *Avoidant* subscale was grouped into Cluster A. Previous studies indicate that avoidant personality holds a certain relationship with schizophrenia-spectrum disorders (Gooding, Tallet, & Matts, 2007). The results obtained in this study converge with factorial analyses conducted with the PDQ-4+ (Calvo et al., 2012; Ling et al., 2010; Wang et al., 2013; Yang et al., 2002), although it is true that the three cluster model has not always been replicated (Calvo et al., 2002; Chabrol et al., 2007). For example, Ling et al. (2010), in a sample of university students, found a dimensional structure of three factors fairly similar to the one reported in the present study. It is worth mentioning that the three cluster model has also been found in adolescent populations (Durrett & Westen, 2005); however, it is equally true that the model proposed by the DSM-IV (American Psychiatric Association [APA], 1994) has been questioned for its lack of empirical support (Sheets & Craighead, 2007).

The PDQ-4+ subscales correlated moderately with the emotional and behavioural variables measured by means of the Strengths and Difficulties Questionnaire. These data are indicative of the close relationship and high overlap between emotional and behavioural symptoms and maladaptive personality traits at the non-clinical level.

Likewise, previous studies have found a high degree of overlap between personality disorder traits and affective, behavioural and interpersonal problems, in both non-clinical (Cohen, 2008; Crawford et al., 2005, 2008) and clinical samples (Links & Eynan, 2013; McGlashan et al., 2000). These data are also consistent with the high levels of comorbidity found not only among patients with PDs, but also between PDs and Axis I disorders (Feenstra, Busschbach, Verheul, & Hutsebaut, 2011; Links & Eynan, 2013; McGlashan et al., 2000). The co-occurrence and persistence of disorders from both diagnostic axes during adolescence is of great interest, since it affects impairment in adulthood (Crawford et al., 2008) and also increases the risk of mood disorders and disruptive behaviour problems in adult life (Johnson et al., 1999). The presence of these associations at a subclinical level are consistent with dimensional models which postulate that maladaptive personality traits are distributed along a continuum in the general population (Widiger, Livesley, & Clark, 2009).

The results of the present study should be interpreted in the light of the following limitations. First, age is a relevant factor to take into account in the phenomenological expression of these traits and symptoms. Furthermore, many traits considered normal in one developmental period may be pathological in another (e.g., emotional instability). Second, we must take into account the problems inherent to the application of any type of self-report for the assessment of maladaptive personality traits, including over-diagnosis, possible lack of understanding of the items and scarce capacity for introspection on the part of adolescents. The diagnosis of a PD cannot be uniquely based on a measurement instrument. Third, in the present study a Likert-type response format was used, an aspect which must be taken into account when making comparisons of the results.

Future studies should analyze the relationship between DSM-IV personality patterns and those proposed by the DSM-V, both in clinical samples and in the general population, as well as determine the predictive validity of this type of measurement instruments in independent longitudinal studies. Likewise, it would be interesting to incorporate the advances in the study of personality within The Research Domain Criteria Framework.

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