

Cluster A maladaptive personality patterns in a non-clinical adolescent population

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Abstract

Background: The prevalence and expression of Cluster A personality disorders in adolescence is poorly analyzed and understood. The main goal was to analyze the rate of Cluster A traits and maladaptive personality patterns in adolescents. In addition, the underlying dimensional structure and the possible influence of sex and age in its phenotypic expression were examined. **Method:** The final sample was comprised of a total of 1,443 participants (M= 15.9 years, SD= 1.2). The instrument used was the Personality Diagnostic Questionnaire-4+ (PDQ-4+). **Results:** Cluster A maladaptive personality traits are common among adolescents. According to the PDQ-4+, 13.1% (n= 189) of the sample reported a Cluster A maladaptive personality pattern. Analysis of the internal structure yielded two interrelated factors, namely Paranoid and Schizotypal-Schizoid. Males, compared with females, obtained higher scores on the schizotypal subscale when the score was dimensional and on the schizotypal and schizoid subscales when items were dichotomized. **Conclusions:** These data yield new clues that improve the understanding of Cluster A traits in this sector of the population, and advance in early detection of adolescents at risk of personality disorders.

Keywords: schizotypy, schizotypal, schizoid, paranoid, personality, adolescents, PDQ-4+.

Resumen

Patrones desadaptativos de la personalidad del Cluster A en población adolescente no clínica. Antecedentes: la prevalencia y la expresión de los trastornos de la personalidad del Cluster A en la adolescencia se encuentra escasamente analizada y comprendida. El objetivo de esta investigación fue analizar la tasa de los rasgos y patrones desadaptativos de la personalidad del Cluster A en adolescentes. También se examinó la estructura dimensional subyacente y la influencia del sexo y la edad en su expresión fenotípica. **Método:** la muestra la formaron 1.443 participantes (M= 15,9 años; DT= 1,2). El instrumento de medida utilizado fue el Personality Diagnostic Questionnaire-4+ (PDQ-4+). **Resultados:** los rasgos de las personalidades del Cluster A son comunes entre la población adolescente. El 13,1% (n= 189) de la muestra presentaría, según el PDQ-4+, un patrón desadaptativo de la personalidad del Cluster A. La estructura dimensional subyacente arrojó dos factores interrelacionados, Paranoide y Esquizotípico-Esquizoide. Los varones presentaron, en comparación con las mujeres, mayores puntuaciones en la subescala esquizotípica cuando la puntuación era dimensional, y en las subescalas esquizotípica y esquizoide cuando la puntuación de los ítems era dicotomizada. **Conclusiones:** estos datos permiten avanzar en la comprensión de los rasgos del Cluster A y en la detección temprana de adolescentes con riesgo de desarrollar un trastorno de la personalidad.

Palabras clave: esquizotipia; esquizotípica; esquizoide; paranoide; personalidad; adolescentes; PDQ-4+.

The study of maladaptive personality traits and disorders in adolescence has recently increased, given the need to integrate within the same framework as the study a lifespan perspective and a personality dimensional model (De Clercq, De Fruyt, & Widiger, 2009; Krueger, 2005; Shiner, 2009; Tackett, Balsis, Oltmanns, & Krueger, 2009; Widiger & Lowe, 2008). Adolescence is a period in human development in which an ample variety of maladaptive characteristics can emerge, among which maladaptive personality patterns stand out (Cohen, Crawford, Johnson, & Kasen, 2005; Johnson, Bromley, Bornstein, & Sneed, 2006). Thus, many

personality disorders (PDs) that emerge during adulthood seem to originate and have their etiological roots in earlier stages of development (Cohen, 2008; De Clercq et al., 2009; Widiger, De Clercq, & De Fruyt, 2009). In fact, the *Diagnostic and statistical manual of mental disorders-text revision* ([DSM-IV-TR], American Psychiatric Association [APA], 2000) establishes that, in order to diagnose a PD, its onset must occur during adolescence or early adulthood. In this regard, adolescence is an interesting period for: a) the study of maladaptive personality traits; b) examination of the links established between adaptive and maladaptive personality traits; c) analysis of possible risk markers and protective factors; and d) establishment of detection and early intervention strategies (Fonseca-Pedrero, Lemos-Giráldez, Paino, & Muñiz, 2011).

The diagnosis of PD in adolescence is a controversial subject that is presently the object of an interesting debate. The DSM-IV-TR (APA, 2000) considers that PD can be diagnosed in individuals under 18 only as long as these are relatively rare cases in which

the maladaptive personality characteristics have a tendency to be pervasive, endure, and not be limited to a specific stage of development, and have a duration of at least one year. In this regard, there is a growing body of empirically validated knowledge that brings to light the need to assess maladaptive personality traits in adolescence (Cohen, 2008; Esterberg, Goulding, & Walker, 2010). PDs have been diagnosed in adolescents in the general population (Bernstein et al., 1993; Johnson, Cohen, Kasen, Skodol, & Oldham, 2008; Leung & Leung, 2009) as well as in clinical samples (Durrett & Westen, 2005; Feenstra, Busschbach, Verheul, & Hutsebaut, 2011; Grilo et al., 1998). The prevalence rates of PDs in nonclinical adolescents are high and range from 14.7% to 17% (Bernstein et al., 1993; Johnson et al., 2008; Johnson et al., 1999). Likewise, PD traits or disorders 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; Chen et al., 2009; Johnson, Cohen, Smailes et al., 2000; Skodol, Johnson, Cohen, Sneed, & Crawford, 2007).

Cluster A PDs includes paranoid, schizoid and schizotypal personality disorders. This conglomerate of syndromes is included in the so-called schizophrenia-spectrum disorders, and has a clear relationship with psychoses as indicated by the genetic studies conducted (Kendler et al., 2006; Kendler et al., 1993). According to the dimensional personality models and extended psychosis phenotype, PD traits, for example schizotypal traits, can be found in the general population without necessarily being associated to a psychopathological disorder. In this regard, PD traits would be considered as an extreme or maladaptive variation of normal personality functioning (Widiger, Livesley, & Clark, 2009; Widiger & Trull, 2007). Epidemiological studies conducted in adolescent and adult populations using instruments that assess schizotypal traits (or psychotic-like experiences), which is also the label utilized for items that measure paranoid ideation as well as schizoid aspects, follow this line of thinking (Fonseca-Pedrero, Santarén-Rosell et al., 2011; Nuevo et al., 2012; van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009; Wigman et al., 2011). When Cluster A PDs are examined in adolescents, a prevalence of 5.4%-7.3% is estimated (Johnson et al., 1999; Kasen, Cohen, Skodol, Johnson, & Brook, 1999). It is worth mentioning that adolescents with high scores on schizotypy or with schizotypal PD have a higher risk of transiting toward a schizophrenia-spectrum disorders (Domínguez, Wichers, Lieb, Wittchen, & van Os, 2011; Poulton et al., 2000; Welham et al., 2009; Woods et al., 2009). Similar findings are obtained when adolescents who present maladaptive personality traits or patterns are examined with a view to predicting PDs or psychopathological problems in adulthood (Crawford et al., 2008; Johnson, Cohen, Kasen, & Brook, 2005; Johnson et al., 2008).

As indicated in studies conducted in community adolescent and adult samples as well as in clinical populations, phenotypic expression of PDs and their traits seems to vary as a function of gender and/or age (Grilo et al., 1996; Paris, 2004; Samuels, 2011). Specifically in adult populations, it has been found that Cluster A PDs are more prevalent among men (Samuels et al., 2002; Torgersen, Kringlen, & Cramer, 2001); however, other studies do not find or do not report this association (Grilo et al., 1996; Kasen, et al., 1999) or find that paranoid PD is more common among women (Trull, Jahng, Tomko, Wood, & Sher, 2010). Regarding age, younger participants usually show higher scores on maladaptive

personality patterns (Jackson & Burgess, 2000) or in Cluster A PDs traits compared with older participants (Fonseca-Pedrero, Paino, Lemos-Giráldez, Sierra-Baigrie, & Muñiz, 2011; Fossati, Raine, Carretta, Leonardi, & Maffei, 2003; Grilo et al., 1998) as well as a decrease from adolescence to adulthood when these are examined longitudinally (Johnson, Cohen, Kasen et al., 2000).

To date, few studies of an empirical nature have been carried out to analyze and understand the prevalence and expression of Cluster A maladaptive personality traits in the general adolescent population. Within this research context, the purpose of the present investigation was to examine the prevalence of Cluster A maladaptive personality traits and patterns in a representative sample of adolescents from the Spanish general population by means of the Personality Diagnostic Questionnaire-4+ (PDQ-4+) (Hyler, 1994). In addition, the underlying dimensional structure of this group of traits was examined, as well as the possible influence of gender and age in the expression of pathological personality traits. The data that are obtained regarding the prevalence and dimensional structure of these traits in an adolescent population can likewise be of interest to advance in the early detection of adolescents at risk for the development of a PD or a schizophrenia-spectrum disorder.

Method

Participants

Participants selection 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 the geographical area (Eastern, Western, Central and Mining) and educational stage (compulsory and post-compulsory). The probability of a center being selected was directly proportional to the corresponding number of students. The students belonged to different types of secondary schools —public, grant-assisted private, private— and vocational/technical schools. The initial sample was composed of 1,628 students. However, those participants who presented the following were discarded: a) more than two points on the Oviedo Infrequency Response Scale ($n=64$); b) learning difficulties ($n=6$); c) were older than 18 ($n=35$); d) omission of demographical data or unanswered questions ($n=32$); and e) *outlier* scores ($n=48$). Thus, the final sample was composed of a total of 1,443 students, 696 boys (48.2%) and 747 girls (51.8%) from 28 schools and 90 classrooms. The mean age was 15.91 years ($SD=1.18$), ranging from 14 to 18 years. The distribution of the sample according to age was: 14 year-olds ($n=193$), 15 year-olds ($n=354$), 16 year-olds ($n=408$), 17 year-olds ($n=353$) and 18 year-olds ($n=135$).

Measures

Personality Diagnostic Questionnaire-4+ (PDQ-4+) (Hyler, 1994) is a self-report developed for the assessment of personality disorder traits according to DSM-IV (APA, 1994) criteria. The PDQ-4+ is composed of a total of 99 items distributed along 12 subscales, 10 referring to the diagnostic categories included in Axis II of the DSM-IV and another 2 aimed at the assessment of PD categories that appear in Appendix B. In this study, a 5-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, a dimensional score in psychopathology is more reliable and valid (Markon, Chmielewski, & Miller, 2011). For the present study, the 22 items assessed in the Schizoid, Paranoid and Schizotypal subscales were used. It must be mentioned that item 60 of the PDQ-4+ forms part of the Schizoid and Schizotypal subscales. The PDQ-4+ has been applied in a wide variety of epidemiological studies, has been utilized with adolescents (Cohen et al., 2005; Vito, Ladame, & Orlandini, 1999) and its properties have been amply studied (Chabrol, Rousseau, Callahan, & Hyler, 2007; Hopwood, Thomas, Markon, Wright, & Krueger, 2012; Huang, Ling, Yang, & Dou, 2007). In this study, a version adapted to Spanish by Calvo, Vives, Gutiérrez, and Torrubia (2002) for young adults was employed, which has also been used in psychiatric outpatients (Calvo et al., 2012) and in nonclinical adolescents (Fonseca-Pedrero, Lemos-Giráldez, Paino et al., 2011).

The Oviedo Infrequency Scale (Fonseca-Pedrero, Lemos-Giráldez, Paino, Villazón-García, & Muñiz, 2009) is a self-report composed of 12 items in Likert-type format using 5 categories (1 “completely disagree”; 5 “completely agree”) that has been developed following the guidelines for the construction of tests. Its objective is the detection of those participants who respond randomly, pseudo-randomly or dishonestly to self-reports (it includes items such as “the distance between Madrid and Barcelona is greater than between Madrid and New York”). This measurement instrument has been utilized in previous studies with adolescents (Fonseca-Pedrero, Paino et al., 2011). Once the items are dichotomized, those students that answer more than two of these items incorrectly are automatically from the study.

Procedure

The questionnaire was administered collectively, in groups of 10 to 35 students, during normal school time and in a classroom prepared for this purpose. The study was presented to participants as an investigation about the diverse characteristics of personality, assuring them of the confidentiality of their responses as well as the voluntary nature of their participation. Participants did not receive any incentive for their participation. The administration of the questionnaire was carried out at all times under the supervision of a collaborator. This study is part of a wider investigation on early detection and intervention of psychological disorders in adolescents. The study was approved by the Ethics Committee of the University of Oviedo and by the Department of Education of the Principality of Asturias.

Data analysis

First, the descriptive statistics relative to the mean and standard deviation for the items that made up the PDQ-4+ subscales were calculated. A 5-point Likert response format was used in this study as opposed to previous studies where a true/false dichotomous format was used. With the aim of comparing data with previous studies, descriptive statistics dichotomizing the responses to the items were also obtained, considering 1-3 values as “0” and 4-5 as “1”. Second, the internal structure of the 22 items that make up the three PDQ-4+ subscales was analyzed through an exploratory factor analysis. The unweighted least-squares method with Promin rotation was employed. Given the ordinal nature of the variables,

the factorial loads were estimated from the polychoric correlation matrix. The procedure to determine the number of dimensions was the optimal implementation of Parallel Analysis (Timmerman & Lorenzo-Seva, 2011). Third, the possible influence of gender and age on the expression of Cluster A personality disorder traits was examined. With this aim, a Multivariate Analysis of Variance (MANOVA) was conducted taking gender and age as the fixed factors and the subscales and the PDQ-4+ total scale in Cluster A as the dependant variables. Similar to the study at the item level, scores on the subscales were calculated considering the Likert nature of the variables, and dichotomizing the items. Wilks’ *Lambda* value was used to determine if there were significant differences in all the dependant variables taken as a whole. As an index of size effect, *eta* partial square (partial η^2) was employed. For data analysis, the SPSS 15.0 (Statistical Package for the Social Sciences, 2006) and the FACTOR 8.0 (Lorenzo-Seva & Ferrando, 2006) programs were used.

Results

Descriptive statistics

Table 1 shows the descriptive statistics for items in the Paranoid, Schizoid and Schizotypal subscales, for items in both their Likert and dichotomous formats. From the dichotomous items, if the value in the table is multiplied by 100, the percentage of participants of

Table 1
Descriptive statistics for items in the Paranoid, Schizoid and Schizotypal subscales of the Personality Diagnostic Questionnaire-4+

Items	Likert items		Dichotomized items	
	Mean	SD	Mean*	SD
1 (11)	2.48	1.32	0.26	0.44
2 (24)	2.68	1.29	0.31	0.46
3 (37)	1.79	1.04	0.08	0.27
4 (50)	1.93	1.15	0.12	0.32
5 (62)	2.76	1.30	0.29	0.46
6 (85)	2.70	1.28	0.27	0.44
7 (96)	2.33	1.27	0.20	0.40
8 (9)	1.38	0.84	0.04	0.20
9 (22)	2.17	1.17	0.14	0.35
10 (34)	1.79	1.02	0.06	0.23
11 (47)	2.02	1.12	0.11	0.32
12 (60)	1.34	0.78	0.03	0.18
13 (71)	3.02	1.37	0.38	0.48
14 (95)	2.07	1.06	0.10	0.30
15 (10)	1.50	0.96	0.07	0.25
16 (23)	1.88	1.16	0.12	0.32
17 (36)	1.56	0.99	0.07	0.26
18 (48)	2.06	1.15	0.14	0.34
19 (61)	2.44	1.29	0.23	0.42
20 (72)	1.95	1.13	0.11	0.31
21 (74)	1.58	0.99	0.07	0.25
22 (86)	1.86	1.09	0.11	0.31

* If this value is multiplied by 100, the percentage of students who responded affirmatively to each of the self-report statements is obtained

Note: The item number corresponding to the PDQ-4+ Spanish version is indicated in parentheses

the total sample that reported this trait affirmatively can be obtained. For example, 38% of the sample reported affirmatively to item 13 (71) whereas 31% responded affirmatively to item 2 (24).

According to the criteria of the PDQ-4+ manual, 13.1% ($n=189$) of the sample presented a Cluster A maladaptive personality pattern. Eleven point six percent of the sample ($n=168$) obtained a score of 4 or more points on the Paranoid subscale, whereas 1.3% ($n=19$) of the sample did on the Schizoid subscale. Two point five percent ($n=36$) of the participants scored 5 or more on the Schizotypal subscale. With respect to the number of possible personality disorders, 11% ($n=159$) of the sample obtained a positive score on a single disorder, 1.8% ($n=26$) on two, and 0.3% ($n=4$) of the participants on three.

Table 2 shows the Pearson correlations among the PDQ-4+ subscales in both response formats: a) items in Likert format; and b) items in dichotomous format. In the first case, the correlations among the subscales were high and statistically significant, and ranged between 0.38 and 0.53. In the second case, correlations ranged from 0.32 to 0.52, also being statistically significant. Likewise, the table does not allow us to see the degree of correlation among items in Likert and dichotomous format. The correlation among the total scores in both cases was of 0.82, indicating a high degree of association.

Internal consistency estimation

The Cronbach's alpha coefficient for 22 PDQ-4+ items –Likert format– which made up the total score was 0.82, being 0.68, 0.45 and 0.74 for the three subscales, Paranoid, Schizoid and Schizotypal, respectively. On its part, the Cronbach's Alpha value for the 22 PDQ-4+ items total score – dichotomous format – was 0.73, being 0.59, 0.30 and 0.61 for the subscales, respectively.

Validity evidence based on internal structure

Next, an exploratory factor analysis was performed using the 22 items that make up the three subscales. Barlett's Sphericity Index was 9450.1 ($p<0.001$) and the Kaiser Meyer Olkin value was 0.94. Table 3 presents the estimated factorial loadings, the eigenvalue, the percentage of explained variance for each factor and Chronbach's alpha. The optimal implementation of the parallel analysis recommended the extraction of two factors that explained 38.49% of the total variance. The Root of Mean Squared Residual index was 0.04, the Comparative Fit Index was 0.99, and

Bentler's Simplicity Index was 0.98, all these indicating a good fit of the model to the data. Moreover, the resulting factors have a clear psychological interpretation. The first factor involved items related to paranoid ideation; therefore, this factor was denominated *Paranoid*. The second factor gathered items related to schizotypy and schizoid traits, for which it was named *Schizotypal/Schizoid*. The correlation between the two factors was 0.67 ($p<0.01$).

Comparison of the mean scores of Cluster A subscales and the total PDQ-4+ score as a function of gender and age

In Table 4 the mean and standard deviations for the PDQ-4+ subscales and total scores are presented for both genders and five age groups. Considering the scores from the items in Likert format, Wilks' λ value revealed the presence of statistically significant differences as a function of gender (Wilks' $\lambda=0.986, p\leq 0.001$), and no differences as a function of age (Wilks' $\lambda=0.991, p=.330$). Regarding gender, statistically significant differences were found for the Schizotypal subscale ($F=8.697, p=.003$, partial $\eta^2=0.006$), with boys scoring higher than girls. No statistically significant interactions were found between gender and age. Taking the scores from the dichotomized items, Wilks' λ value revealed the presence of statistically significant differences for gender (Wilks' $\lambda=0.990, p=.003$), but not for age (Wilks' $\lambda=0.992, p=.483$).

Table 2
Pearson correlations among the Paranoid, Schizoid and Schizotypal subscales of the Personality Diagnostic Questionnaire-4+ (PDQ-4+)

PDQ-4+	1	2	3	4	5	6
Paranoid (1)	1					
Schizoid (2)	0.38*	1				
Schizotypal (3)	0.63*	0.53*	1			
Paranoid DIC (4)	0.84*	0.28*	0.47*	1		
Schizoid DIC (5)	0.28*	0.75*	0.37*	0.32*	1	
Schizotypal DIC (6)	0.52*	0.39*	0.82*	0.52*	0.43*	1

Note: DIC= Dichotomized items
* $p\leq 0.01$

Table 3
Exploratory factor analysis of the items in the Paranoid, Schizoid and Schizotypal subscales of the Personality Diagnostic Questionnaire-4+(PDQ-4+)

Items	Factors	
	I	II
1 (11)		0.62
2 (24)		0.59
3 (37)	0.39	0.38
4 (50)	0.31	0.39
5 (62)		0.45
6 (85)		0.39
7 (96)		0.32
8 (9)	0.76	
9 (22)	0.38	
10 (34)	0.57	
11 (47)	0.42	
12 (60)	0.77	
13 (71)	–	
14 (95)	0.46	
15 (10)	0.57	
16 (23)	0.35	
17 (36)	0.58	
18 (48)	0.39	
19 (61)		0.64
20 (72)	0.56	
21 (74)	0.69	
22 (86)	0.59	
Eigenvalue	6.90	1.57
% Explained variance	31.36	7.14
Cronbach's Alpha	0.88	0.72

Note: factorial loads below 0.30 have been omitted. The item number corresponding to the Spanish version of the PDQ-4+ is indicated in parentheses

Table 4

Comparisons of the mean scores on the Paranoid, Schizoid and Schizotypal subscales of the Personality Diagnostic Questionnaire-4+ (PDQ-4+) as a function of gender and age

PDQ-4+	Gender		Age				
	Male M (SD)	Female M (SD)	14 years old M (SD)	15 years old M (SD)	16 years old M (SD)	17 years old M (SD)	18 years old M (SD)
<i>Likert</i>							
Paranoid	16.50 (5.2)	16.81 (5.0)	16.88 (5.4)	16.31 (5.1)	16.96 (5.1)	16.49 (4.8)	16.86 (5.1)
Schizoid	13.81 (3.7)	13.76 (4.7)	13.74 (3.3)	13.71 (3.5)	13.79 (3.8)	13.80 (3.5)	13.97 (3.7)
Schizotypal	16.66 (5.8)	15.73 (5.1)	16.17 (5.4)	16.04 (5.4)	16.40 (5.6)	16.31 (5.4)	15.53 (5.4)
Total	46.98 (12.4)	46.30 (11.1)	46.80 (11.4)	46.06 (11.6)	46.15 (11.5)	46.61 (11.7)	46.35 (11.4)
<i>Dichotomized</i>							
Paranoid	1.46 (1.5)	1.58 (1.5)	1.55 (1.6)	1.46 (1.5)	1.62 (1.5)	1.44 (1.4)	1.60 (1.6)
Schizoid	0.92 (1.0)	0.81 (0.9)	0.82 (0.9)	0.82 (0.9)	0.85 (1.0)	0.89 (0.9)	0.97 (1.0)
Schizotypal	1.04 (1.4)	0.85 (1.2)	0.92 (1.4)	0.98 (1.3)	0.97 (1.4)	0.90 (1.3)	0.86 (1.3)
Total	3.42 (3.2)	3.24 (2.8)	3.31 (3.0)	3.27 (2.9)	3.44 (3.1)	3.23 (2.9)	3.44 (3.1)

Males obtained higher mean scores than females on the Schizoid ($F= 4.784$, $p \leq .05$, partial $\eta^2= 0.003$) and Schizotypal ($F= 6.287$, $p= .012$, partial $\eta^2= 0.004$) subscales. As in the previous case, no statistically significant interactions were found. Finally, when the influence of gender and/or age on the type or number of the maladaptive personality patterns presented was compared, the results did not indicate the existence of statistically significant differences.

Discussion and conclusions

The prevalence and expression of Cluster A personality disorders (PDs) traits in adolescence have been scarcely analyzed and understood. The main goal of this research study was the analysis of self-reported Cluster A maladaptive personality patterns and traits in nonclinical adolescents. In addition, the underlying dimensional structure and the possible influence of gender and age on its phenotypic expression were examined. The measurement instrument utilized was the Personality Diagnostic Questionnaire-4+ (PDQ-4+) (Hyler, 1994). These objectives intend to reveal new empirical evidence regarding the distribution and expression of Cluster A maladaptive personality traits in the general adolescent population, which also allows us to advance in the early detection of at-risk adolescents for the development of a PD or a schizophrenia-spectrum disorder.

The results showed that Cluster A maladaptive personality traits are common among adolescents. Thirteen point one percent ($n= 189$) of the sample would present, according to the PDQ-4+, a Cluster A maladaptive personality pattern ranging between 1.3% and 11.6% for specific syndromes. Moreover, 2.1% of the sample would present more than one of these maladaptive patterns according to the PDQ-4+ manual (Hyler, 1994). In relation to this result, it must be noted that the diagnosis of a PD cannot be exclusively based on the results of a single self-report. It is a brief questionnaire that provides the interviewer rapid information regarding which maladaptive personality traits might be present and, subsequently, a more exhaustive assessment allows a diagnosis to be made. On the other hand, paranoid ideation traits were higher than the other traits assessed, which is clearly indicative of the high frequency of these characteristics in this developmental period. The rate of

maladaptive traits found in the present study is similar to that found in previous research, as indicated by studies that examine schizotypal traits or psychotic-like experiences in nonclinical adolescents and adults (Fonseca-Pedrero, Santarén-Rosell et al., 2011; Nuevo et al., 2012; van Os et al., 2009; Wigman et al., 2011). For example, Fonseca-Pedrero, Santarén-Rosell et al. (2011), using a sample of 1,438 adolescents, found that approximately 43% of participants reported some symptoms related to magical thinking, ideas of reference and/or deliriant or hallucinatory experiences, and 8.9% reported 4 or more of these schizotypal experiences. Also, these data reveal how maladaptive personality traits can be found in the general population (Widiger, Livesley et al., 2009; Widiger & Trull, 2007).

On the other hand, the possible maladaptive personality patterns found in the present study are similar to those reported in previous studies in adolescent populations (Bernstein et al., 1993; Johnson et al., 2008; Johnson et al., 1999) as well as in adults (Samuels et al., 2002; Torgersen et al., 2001; Trull et al., 2010). In fact, the prevalence rates of maladaptive personality patterns in nonclinical adolescents range from 14.4% to 17%, being the estimated prevalence for those of Cluster A being around 5.4%-7.3% (Johnson et al., 1999; Kasen et al., 1999). As can be observed, a high percentage of adolescents can present these maladaptive traits possibly making a clear impact, not only on their personal, academic, familial and social lives, but also at economic and healthcare levels (Cohen et al., 2007; Chen et al., 2009; Johnson, Cohen, Smailes et al., 2000; Skodol et al., 2007). Moreover, many mental disorders have their onset during childhood and/or adolescence —approximately 50% start before the age of 15— and, in many cases, these maladaptive characteristics remain stable until adulthood (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Johnson et al., 2008; Kim-Cohen et al., 2003; Widiger, De Clercq et al., 2009). Likewise, it must be taken into account that the presence of these traits at an early age increases the risk of subsequently developing a severe mental disorder (Cohen et al., 2005; Crawford et al., 2008; Domínguez et al., 2011; Welham et al., 2009). Without a doubt, these data emphasize the need for early assessment of these psychopathological constructs in young populations with the aim of preventing the transition to a clinical disorder.

The analysis of the underlying dimensional structure of the items in the Paranoid, Schizotypal and Schizoid subscales revealed a possible factorial solution specified in the Paranoid and Schizotypal/Schizoid factors. This result is difficult to compare with previous studies due to the nature of the measurement instrument used. If this factorial structure is compared with data obtained in studies on schizotypy in adolescent populations, studies reporting a Paranoid dimension and a Reality Distortion dimension can be found (Fonseca-Pedrero, Lemos-Giráldez et al., 2011; Wigman et al., 2011). On the other hand, it must be mentioned that the reliability of the PDQ-4+ scores substantially improved using the 5-point Likert type response format; therefore, in accordance with previous studies (Lozano et al., 2008), the use of this format is recommended as well as the construction of dimensional scores in psychopathology measures (Markon et al., 2011).

Gender had an influence in the expression of PDs traits, although, it did not have an influence in PDs as syndromes. Regarding gender, males presented comparatively higher mean scores than females in the schizotypal subscale when the score was dimensional and in the schizotypal and schizoid subscales when the item scores were dichotomized. As shown in studies conducted both in community adolescent and adult samples and in clinical samples, the phenotypic expression of PDs and their traits seems to vary as a function of gender and/or age (Grilo et al., 1996; Paris, 2004; Samuels, 2011). Specifically, it has been found that Cluster A disorders are more frequent among males than females in adult populations (Samuels et al., 2002; Torgersen et al., 2001); however, other studies have found that Paranoid PD is more common among women (Trull et al., 2010). On the other hand, no differences were found among the mean scores of the five age groups assessed. The absence of statistically significant differences may be due to the short age intervals used in this study. Previous studies have found that younger participants usually present a greater frequency of diagnosed PDs (Jackson & Burgess, 2000) or Cluster A PDs traits, mainly schizotypy and paranoid traits, in comparison to older participants (Fonseca-Pedrero, Paino et al., 2011; Fossati et al., 2003; Grilo et al., 1998). Likewise, the frequency of PD traits tends to diminish from adolescence to adulthood when examined longitudinally (Johnson, Cohen, Kasen et al., 2000). The lack of congruency among studies is possibly determined by the heterogeneity of the samples and the measurement instruments employed, and by the criteria used to consider PD. In this regard,

the role gender and age played in maladaptive personality traits in this population sector must continue to be examined.

The results obtained in the present study must be interpreted in light of the following limitations. First, adolescence is a stage in which the personality is still developing, thus, the results must be framed in the developmental changes that occur during this period. Moreover, many traits that can be considered normal during this developmental stage can be pathological in another (e.g., emotional instability). Second, there are problems inherent to the application of any type of self-report, with the well-known over-diagnosis, the possible lack of understanding of the items or the scarce capacity of introspection on the part of the students, for which the use of external informants via hetero-reports or structured interviews would have been interesting. Likewise, and in relation to the measurement instrument utilized, the PDQ-4+ has not been scaled in adolescents and the referral for possible PDs is determined by the cut-off scores recommended by the manual for its use in adults, hence, the obtained scores must be taken as approximations. Third, we must not lose sight of the transversal nature of this research, for which it is not possible to establish any cause-effect inferences.

These data reveal new clues that allow us to improve our comprehension of Cluster A PDs traits in this population sector. The study of PDs prevalence rates and their traits permits a greater understanding of child-adolescent psychopathology and enables the improvement of the public health system at the early detection and intervention levels, as well as treatment and resource management. Future studies should use measurement instruments that take into account the preoccupation, conviction and stress associated to these experiences and not only their frequency. Likewise, it would be interesting to establish specific cut-off points for this sector of the population, as well as the longitudinal follow-up of those participants with high scores on these types of self-reports with a view to obtaining sensitivity and specificity values.

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References

- American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorder (4th ed.)*. Washington DC: Author.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders (4th ed. revised)* Washington, DC: Author.
- Bernstein, D.P., Cohen, P., Velez, C.N., Schwab-Stone, M., Siever, L.J., & Shinsato, L. (1993). Prevalence and stability of the DSM-III-R personality disorders in a community-based survey of adolescents. *American Journal of Psychiatry*, *150*(8), 1237-1243.
- Calvo, N., Gutiérrez, F., Andión, O., Caseras, X., Torrubia, R., & Casas, M. (2012). Psychometric properties of the Spanish version of the self-report Personality Diagnostic Questionnaire-4+ (PDQ-4+) in psychiatric outpatients. *Psicothema*, *24*, 156-160.
- Calvo, N., Vives, X.C., Gutiérrez, F., & Torrubia, R. (2002). Adaptación española del Personality Diagnostic Questionnaire-4+ [Spanish adaptation of the Personality Diagnostic Questionnaire-4+]. *Actas Españolas de Psiquiatría*, *30*, 7-13.
- Cohen, P. (2008). Child development and personality disorder. *Psychiatric Clinics of North America*, *31*, 477-493.
- Cohen, P., Crawford, T.N., Johnson, J.G., & Kasen, S. (2005). The children in the community study of developmental course of personality disorder. *Journal of Personality Disorders*, *19*, 466-486.
- Cohen, P., Chen, H., Crawford, T.N., Brook, J.S., & Gordon, K. (2007). Personality disorders in early adolescence and the development of later substance use disorders in the general population. *Drug and Alcohol Dependence*, *88*, Suppl. 1: S71-84.
- Costello, E.J., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry*, *60*, 837-844.

- Crawford, T.N., Cohen, P., First, M.B., Skodol, A.E., Johnson, J.G., & Kasen, S. (2008). Comorbid Axis I and Axis II disorders in early adolescence: Outcomes 20 years later. *Archives of General Psychiatry*, *65*, 641-648.
- Chabrol, H., Rousseau, A., Callahan, S., & Hyler, S.E. (2007). Frequency and structure of DSM-IV personality disorder traits in college students. *Personality and Individual Differences*, *43*, 1767-1776.
- Chen, H., Cohen, P., Crawford, T.N., Kasen, S., Guan, B., & Gorden, K. (2009). Impact of early adolescent psychiatric and personality disorder on long-term physical health: A 20-year longitudinal follow-up study. *Psychological Medicine*, *39*, 865-874.
- De Clercq, B., De Fruyt, F., & Widiger, T.A. (2009). Integrating a developmental perspective in dimensional models of personality disorders. *Clinical Psychology Review*, *29*, 154-162.
- Domínguez, M.G., Wichers, M., Lieb, R., Wittchen, H.-U., & van Os, J. (2011). Evidence that onset of clinical psychosis is an outcome of progressively more persistent subclinical psychotic experiences: An 8-Year Cohort Study. *Schizophrenia Bulletin*, *37*, 84-93.
- Durrett, C., & Westen, D. (2005). The structure of axis II disorders in adolescents: A cluster- and factor-analytic investigation of DSM-IV categories and criteria. *Journal of Personality Disorders*, *19*, 440-461.
- Esterberg, M.L., Goulding, S.M., & Walker, E.F. (2010). Cluster A personality disorders: Schizotypal, schizoid and paranoid personality disorders in childhood and adolescence. *Journal of Psychopathology and Behavioral Assessment*, *32*, 515-528.
- Feenstra, D.J., Busschbach, J.J., Verheul, R., & Hutsebaut, J. (2011). Prevalence and comorbidity of axis I and axis II disorders among treatment refractory adolescents admitted for specialized psychotherapy. *Journal of Personality Disorders*, *25*, 842-850.
- Fonseca-Pedrero, E., Lemos-Giráldez, S., Paino, M., & Muñiz, J. (2011). Schizotypy, emotional-behavioural problems and personality disorder traits in a non-clinical adolescent population. *Psychiatry Research*, *190*, 316-321.
- Fonseca-Pedrero, E., Lemos-Giráldez, S., Paino, M., Sierra-Baigrie, S., Santarén-Rosell, M., & Muñiz, J. (2011). Internal structure and reliability of the Oviedo Schizotypy Assessment Questionnaire (ESQUIZO-Q). *International Journal of Clinical and Health Psychology*, *11*, 385-402.
- Fonseca-Pedrero, E., Lemos-Giráldez, S., Paino, M., Villazón-García, U., & Muñiz, J. (2009). Validation of the Schizotypal Personality Questionnaire Brief Form in adolescents. *Schizophrenia Research*, *111*, 53-60.
- Fonseca-Pedrero, E., Paino, M., Lemos-Giráldez, S., Sierra-Baigrie, S., Ordóñez, N., & Muñiz, J. (2011). Early psychopathological features in Spanish adolescents. *Psicothema*, *23*, 87-93.
- Fonseca-Pedrero, E., Paino, M., Lemos-Giráldez, S., Sierra-Baigrie, S., & Muñiz, J. (2011). Measurement invariance of the Schizotypal Personality Questionnaire-Brief across gender and age. *Psychiatry Research*, *190*, 309-315.
- Fonseca-Pedrero, E., Santarén-Rosell, M., Lemos-Giráldez, S., Paino, M., Sierra-Baigrie, S., & Muñiz, J. (2011). Síntomas psicóticos subclínicos en población general adolescente [Psychotic-like experiences in the adolescent general population]. *Actas Españolas de Psiquiatría*, *39*, 155-162.
- Fossati, A., Raine, A., Carretta, I., Leonardi, B., & Maffei, C. (2003). The three-factor model of schizotypal personality: Invariance across age and gender. *Personality and Individual Differences*, *35*(5), 1007-1019.
- Grilo, C.M., Becker, D.F., Fehon, D.C., Walker, M.L., Edell, W.S., & McGlashan, T.H. (1996). Gender differences in personality disorders in psychiatrically hospitalized adolescents. *American Journal of Psychiatry*, *153*, 1089-1091.
- Grilo, C.M., McGlashan, T.H., Quinlan, D.M., Walker, M.L., Greenfield, D., & Edell, W.S. (1998). Frequency of personality disorders in two age cohorts of psychiatric inpatients. *American Journal of Psychiatry*, *155*, 140-142.
- Hopwood, C.J., Thomas, K.M., Markon, K.E., Wright, A.G., & Krueger, R.F. (2012). DSM-5 personality traits and DSM-IV personality disorders. *Journal of Abnormal Psychology*, *121*, 424-432.
- Huang, X., Ling, H., Yang, B., & Dou, G. (2007). Screening of personality disorders among Chinese college students by Personality Diagnostic Questionnaire-4+. *Journal of Personality Disorders*, *21*, 448-454.
- Hyler, S.E. (1994). *The Personality Diagnostic Questionnaire 4+*. New York: New York State Psychiatric Institute.
- Jackson, H.J., & Burgess, P.M. (2000). Personality disorders in the community: A report from the Australian National Survey of Mental Health and Wellbeing. *Social Psychiatry and Psychiatric Epidemiology*, *35*, 531-538.
- Johnson, J.G., Bromley, E., Bornstein, R.F., & Sneed, J.R. (2006). Adolescent personality disorders. In D.A. Wolfe & E.J. Mash (Eds.), *Behavioral and emotional disorders in children and adolescents: Nature, assessment, and treatment* (pp. 463-484). New York: Guilford Press.
- Johnson, J.G., Cohen, P., Kasen, S., & Brook, J. (2005). Personality disorder traits associated with risk for unipolar depression during middle adulthood. *Psychiatry Research*, *136*, 113-121.
- Johnson, J.G., Cohen, P., Kasen, S., Skodol, A.E., Hamagami, F., & Brook, J.S. (2000). Age-related change in personality disorder trait levels between early adolescence and adulthood: A community-based longitudinal investigation. *Acta Psychiatrica Scandinavica*, *102*, 265-275.
- Johnson, J.G., Cohen, P., Kasen, S., Skodol, A.E., & Oldham, J.M. (2008). Cumulative prevalence of personality disorders between adolescence and adulthood. *Acta Psychiatrica Scandinavica*, *118*, 410-413.
- Johnson, J.G., Cohen, P., Skodol, A.E., Oldham, J.M., Kasen, S., & Brook, J.S. (1999). Personality disorders in adolescence and risk of major mental disorders and suicidality during adulthood. *Archives of General Psychiatry*, *56*, 805-811.
- Johnson, J.G., Cohen, P., Smailes, E., Kasen, S., Oldham, J.M., Skodol, A.E., & Brook, J.S. (2000). Adolescent personality disorders associated with violence and criminal behavior during adolescence and early adulthood. *American Journal of Psychiatry*, *157*, 1406-1412.
- Kasen, S., Cohen, P., Skodol, A.E., Johnson, J.G., & Brook, J.S. (1999). Influence of child and adolescent psychiatric disorders on young adult personality disorder. *American Journal of Psychiatry*, *156*, 1529-1535.
- Kendler, K.S., Czajkowski, N., Tambs, K., Torgersen, S., Aggen, S.H., Neale, M.C., & Reichborn-Kjennerud, T. (2006). Dimensional representations of DSM-IV Cluster A personality disorders in a population-based sample of Norwegian twins: A multivariate study. *Psychological Medicine*, *36*, 1583-1591.
- Kendler, K.S., McGuire, M., Gruenberg, A.M., O' Hare, A., Spellman, M., & Walsh, D. (1993). The Roscommon Family Study: III. Schizophrenia-related personality disorders in relatives. *Archives of General Psychiatry*, *50*, 781-788.
- Kim-Cohen, J., Caspi, A., Moffitt, T.E., Harrington, H., Milne, B.J., & Poulton, R. (2003). Prior juvenile diagnoses in adults with mental disorder: Developmental follow-back of a prospective-longitudinal cohort. *Archives of General Psychiatry*, *60*, 709-717.
- Krueger, R.F. (2005). Continuity of Axes I and II: Toward a unified model of personality, personality disorders, and clinical disorders. *Journal of Personality Disorders*, *19*, 233-261.
- Leung, S.-W., & Leung, F. (2009). Construct validity and prevalence rate of borderline personality among Chinese adolescents. *Journal of Personality Disorders*, *23*, 494-513.
- Lorenzo-Seva, U., & Ferrando, P.J. (2006). FACTOR: A computer program to fit the exploratory factor analysis model. *Behavior Research Methods, Instruments and Computers*, *38*, 88-91.
- Lozano, L.M., García-Cueto, E., & Muñiz, J. (2008). Effect of the number of response categories on the reliability and validity of rating scales. *Methodology*, *4*, 73-79.
- Markon, K.E., Chmielewski, M., & Miller, C.J. (2011). The reliability and validity of discrete and continuous measures of psychopathology: A quantitative review. *Psychological Bulletin*, *137*, 856-879.
- Nuevo, R., Chatterji, S., Verdes, E., Naidoo, N., Arango, C., & Ayuso-Mateos, J.L. (2012). The continuum of psychotic symptoms in the general population: A cross-national study. *Schizophrenia Bulletin*, *38*, 475-485.
- Paris, J. (2004). Gender differences in personality traits and disorders. *Current Psychiatry Reports*, *6*, 71-74.
- Poulton, R., Caspi, A., Moffitt, T.E., Cannon, M., Murray, R., & Harrington, H. (2000). Children's self-reported psychotic symptoms and adult schizophreniform disorder: A 15-year longitudinal study. *Archives of General Psychiatry*, *57*, 1053-1058.
- Samuels, J. (2011). Personality disorders: Epidemiology and public health issues. *International Review of Psychiatry*, *23*, 223-233.
- Samuels, J., Eaton, W.W., Bienvenu, O.J., Brown, C.H., Costa, P.T., & Nestadt, G. (2002). Prevalence and correlates of personality disorders in a community sample. *British Journal of Psychiatry*, *180*, 536-542.

- Shiner, R.L. (2009). The development of personality disorders: Perspectives from normal personality development in childhood and adolescence. *Development and Psychopathology*, *21*, 715-734.
- Skodol, A., Johnson, J.G., Cohen, P., Sneed, J., & Crawford, T.N. (2007). Personality disorder and impaired functioning from adolescence to adulthood. *British Journal of Psychiatry*, *190*, 415-420.
- Statistical Package for the Social Sciences (2006). *SPSS Base 15.0 User's Guide*. Chicago, IL: SPSS.
- Tackett, J.L., Balsis, S., Oltmanns, T.F., & Krueger, R.F. (2009). A unifying perspective on personality pathology across the life span: Developmental considerations for the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders. *Development and Psychopathology*, *21*, 687-713.
- Timmerman, M.E., & Lorenzo-Seva, U. (2011). Dimensionality assessment of ordered polytomous items with parallel analysis. *Psychological Methods*, *16*, 209-220.
- Torgersen, S., Kringlen, E., & Cramer, V. (2001). The prevalence of personality disorders in a community sample. *Archives of General Psychiatry*, *58*, 590-596.
- Trull, T.J., Jahng, S., Tomko, R.L., Wood, P.K., & Sher, K.J. (2010). Revised NESARC personality disorder diagnoses: Gender, prevalence, and comorbidity with substance dependence disorders. *Journal of Personality Disorders*, *24*, 412-426.
- van Os, J., Linscott, R.J., Myin-Germeys, I., Delespaul, P., & Krabbendam, L. (2009). A systematic review and meta-analysis of the psychosis continuum: Evidence for a psychosis proneness-persistence-impairment model of psychotic disorder. *Psychological Medicine*, *39*, 179-195.
- Vito, E., Ladame, F., & Orlandini, A. (1999). Adolescence and personality disorders: Current perspectives on a controversial problem. In J. Derksen, C. Maffei & H. Groen (Eds.), *Treatment of personality disorders* (pp. 77-95). New York: Kluwer Academic/Plenum.
- Welham, J., Scott, J., Williams, G., Najman, J., Bor, W., O'Callaghan, M., & McGrath, J. (2009). Emotional and behavioural antecedents of young adults who screen positive for non-affective psychosis: A 21-year birth cohort study. *Psychological Medicine*, *39*, 625-634.
- Widiger, T.A., De Clercq, B., & De Fruyt, F. (2009). Childhood antecedents of personality disorder: An alternative perspective. *Development and Psychopathology*, *21*, 771-791.
- Widiger, T.A., Livesley, W.J., & Clark, L.A. (2009). An integrative dimensional classification of personality disorder. *Psychological Assessment*, *21*, 243-255.
- Widiger, T.A., & Lowe, J. (2008). A dimensional model of personality disorder: Proposal for DSM-V. *Psychiatric Clinics of North America*, *31*, 363-378.
- Widiger, T.A., & Trull, T.J. (2007). Plate tectonics in the classification of personality disorder. *American Psychologist*, *62*, 71-83.
- Wigman, J.T., Vollebergh, W.A., Raaijmakers, Q.A., Iedema, J., van Dorsselaer, S., Ormel, J., Verhulst, F.C., & van Os, J. (2011). The structure of the extended psychosis phenotype in early adolescence—A cross-sample replication. *Schizophrenia Bulletin*, *37*, 850-860.
- Woods, S.W., Addington, J., Cadenhead, K.S., Cannon, T.D., Cornblatt, B.A., Heinssen, R., Perkins, D.O., Seidman, L.J., Tsuang, M.T., Walker, E.F., & McGlashan, T.H. (2009). Validity of the prodromal risk syndrome for first psychosis: Findings from the north american prodrome longitudinal study. *Schizophrenia Bulletin*, *35*(5), 894-908.