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Maladaptive personality traits, anxiety and somatic symptoms in adolescence

Tratti maladattivi di personalità, ansia e sintomi somatici in adolescenza

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ABSTRACT

Few studies have explored the link between personality traits and somatic symptoms in adolescence. In contrast, the association between anxiety and somatic symptoms is well-established. This study aimed to evaluate the relationship between maladaptive personality trait domains, anxiety and somatic symptoms. A sample of 303 Italian adolescents (159 males) aged 14 to 17 years were recruited for this study. Participants completed the following self-report measures: the Personality Inventory for DSM-5 Brief Form, the Screen for Child Anxiety-Related Emotional Disorders, and the Children's Somatization Inventory-24. Significant positive correlations emerged between personality trait domains (except for disinhibition), anxiety and somatic symptoms. Hierarchical multiple regression analyses indicated that only psychoticism, among the personality domains, explained unique variance in somatic symptoms, once the role of anxiety and gender was taken into account.
This study provides evidence regarding the role of psychoticism, as well as anxiety, in predicting somatic symptoms among healthy adolescents. These findings have important implications for the prevention and clinical management of adolescents who report diverse somatic symptoms. Longitudinal studies are needed to better explore the relationships between these variables in adolescence.
Keywords: personality traits; anxiety; somatic symptoms; adolescence.

RIASSUNTO

Pochi studi hanno esplorato il legame tra tratti di personalità e sintomi somatici in adolescenza. Al contrario, l'associazione tra ansia e sintomi somatici è stata ben stabilita. L'obiettivo di questo studio è stato quello di indagare le relazioni tra i domini di tratto patologico della personalità, l'ansia e i sintomi somatici.
Un campione di 303 adolescenti italiani (159 maschi) di età compresa tra i 14 ei 17 anni ha preso parte a questo studio. I partecipanti hanno completato le seguenti misure di autovalutazione: il Personality Inventory for DSM-5 Brief Form, lo Screen for Child Anxiety-Related Emotional Disorders e il Children's Somatization Inventory-24.
Sono emerse correlazioni positive e significative tra i domini di tratto della personalità (eccetto la Disinibizione), l'ansia e i sintomi somatici. L'analisi di regressione multipla gerarchica ha mostrato che solo lo Psicotismo, tra i domini della personalità, spiega varianza unica nei sintomi somatici, una volta tenuto conto del ruolo dell'ansia e del genere.
Il presente studio evidenzia il ruolo dello psicoticismo e dell'ansia nel predire i sintomi somatici in adolescenti non clinici. I risultati hanno potenziali implicazioni per la prevenzione e il trattamento degli adolescenti che riferiscono diversi sintomi somatici. Sono necessari studi longitudinali per esplorare le relazioni tra queste variabili in adolescenza.
Parole chiave: tratti di personalità; ansia; sintomi somatici; adolescenza.

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Introduction

Research on somatic symptomatology has shown that headaches, excessive tiredness, low energy and stomachache are the most frequently self-reported somatic symptoms during adolescence (Cerutti et al., 2017; Essau et al., 2013; Romero-Acosta et al., 2013; Canals et al., 2013). Despite the fact that somatic symptoms are common among adolescents, it is important to underline that they may persist over time, with a negative impact on psychosocial functioning, including poor school attendance and achievement (Bakker et al., 2009; Cerutti et al., 2017b). Furthermore, in children and adolescents, somatic symptoms are frequently associated with anxiety and depressive symptomatology (Campo, 2012; Romero-Acosta et al., 2013; Saps et al., 2009) and predict hospital-based mental health care in adulthood (Bohman et al., 2018).

Egger and colleagues (Egger et al., 1999) revealed that somatic symptoms (e.g., stomachaches, headaches and musculo- skeletal pains) were more prevalent in patients with depression and/or anxiety disorder than in healthy control samples. A prospective cohort study examining the prevalence and impact of pediatric abdominal pain showed that approximately 72% of participants (N=237) reported at least one somatic symptom weekly, and 45% reported at least one gastrointestinal symptom (Saps et al., 2009). Other studies showed that adolescents described one or more somatic symptoms in the last two weeks with percentages ranging from 35 to 52% (Cerutti et al., 2017b; Romero-Acosta et al., 2013) and highlighting an age difference, with adolescents reporting more somatic symptoms than children (Romero-Acosta et al. 2013; Walker et al., 2009). Moreover, girls tend to report more somatic symptoms than boys (Essau et al., 2013; Romero-Acosta et al., 2013; Walker et al., 2009). In particular, Romero-Acosta and colleagues indicated that these gender differences started at 13 years of age and decreased at 15 years (Romero-Acosta et al., 2013).

Personality and somatic symptoms

The Second Edition of the Psychodynamic Diagnostic Manual (PDM-2) is based on the convinction that "all people have personality styles" and includes the notion that "personality issues naturally co-occur with other presenting problems including anxiety, depression, somatic symptoms, addictions, phobias, self-harm, trauma and relationship problems" (Lingiardi & Mc Williams, 2017, p. 17). Research on the association between personality aspects and somatic symptoms is quite limited, specifically during adolescence (Cerutti et al., 2017b; Villanueva Badenes, Prado-Gasco, & Gonzales Barron, 2016). Cerutti and colleagues (2017b) demonstrated that greater difficulty in identifying feelings, a facet of the alexithymia construct, predicted greater functional impairment in children and adolescents through an increase in somatic symptoms. Villanueva Badenes and colleagues (2016) highlighted that higher levels of extraversion and openness and lower levels of consciousness were related to an increased number of somatic complaints in a population of Spanish children. Despite the fact that few studies have explored the link between personality traits and somatic symptoms in childhood and adolescence, a large body of research has explored this association in adults (Neeleman, Nijl, & Ormel, 2004). Specifically, Ode and Robinson (2007) demonstrated an interaction between agreeableness and neuroticsm in predicting somatic symptoms among undergraduate students. Specifically, the authors reported that agreeableness plays a significant role in the self-regulation of negative affect, highlighting that the association between neuroticism and somatic symptoms was strong at low levels of agreeableness and absent at high levels of agreeableness (Ode & Robinson, 2007). The findings of a recent longitudinal study (Klinger-König et al., 2018) pointed out interactions between difficulty in identifying feelings, neuroticism and extraversion in predicting physical health symptoms in an adult population. In particular, extraversion decreased the negative impact of neuroticism on somatic symptoms, whereas difficulty in identifying feelings increased it.

The Work Group for Personality and Personality Disorders of the DSM-5 included a proposal of a new model as an "alternative DSM-5 model for personality disorders" in Section III of DSM-5, the section referred to as "Emerging measures and models" (APA, 2013). Two criteria must be met for a personality disorder diagnosis: a) moderate or greater impairment in personality functioning and b) the presence of pathological personality traits. This model emphasizes dimensional personality traits organized into five trait domains, respectively, negative affectivity, detachment, antagonism, disinhibition and psychoticism. These trait domains significantly correlate with the Personality Psychopathology Five domains (Anderson et al., 2013) and with other measures of personality and

psychopathology (Anderson, Sellbom, & Salekin, 2018) and were used in the current study for interpreting our results. Previous research suggested that maladaptive personality traits as measured by the Personality Inventory for DSM-5-Brief Form (PID-5 – BF; APA, 2013) may be associated with emotion dysregulation (Pollock et al., 2016), preferred styles of humor (Zeigler-Hill et al., 2016) as well as persistent and problematic internet use (Gervasi et al., 2017) and opioid dependence (Massaldjieva et al., 2016).

Lugo and colleagues (2019) explored the validity of the DSM-5 personality traits among a Brazilian sample of psychiatric inpatients trought the PID-5 highlighting that it represents a valid instrument to discriminate people with severe psychopathological symptoms. In the Italian context, Amendola et al. (2018) investigated the role of a specific maladaptive personality trait (i.e., Psychoticism) in the association between depressive symptoms and internet addiction in a community sample of adolescents, confirming the validity of the alternative DSM-5 model for personality disorders in the examination of internalizing and externalizing symptomatology.

Anxiety and somatic symptoms

Previous research has indicated that adolescents' self-reported somatic symptoms are related to anxiety both in clinical (Ginsburg, Riddle, & Davies, 2006) and non-clinical samples (Kovacs & Borcsa, 2017; Lavigne, Saps, & Bryant, 2012; Tsao et al., 2009; Muris & Meesters, 2004). Kovacs and Borcsa (2017) showed that anxiety significantly increased the risk for somatic symptoms and restlessness, stomachaches, blushing, palpitations, muscle tension, sweating, and trembling/shaking are the most common symptoms reported in children and adolescents with anxiety disorders (Crawley et al. 2014; Ginsburg et al., 2006). Campo and colleagues (2004) highlighted that anxiety disorders generally preceded abdominal pain. Interestingly, 79% of children and adolescents with recurrent abdominal pain received a diagnosis of anxiety disorder (Campo et al., 2004).

In line with Campo and colleagues, it has been shown that children and adolescents with frequent somatic symptoms are more likely to be diagnosed with anxiety and depression disorders (Domenech-Llaberia et al., 2004; Jellesma et al., 2006). Furthermore, results from recent studies highlighted positive correlations between somatic symptom severity and anxiety disorder severity as well as the degree of the general impairment (Crawley et al., 2014; Sackl-Pammer et al., 2018).

Personality and anxiety

Research has largely examined whether personality traits as defined by the Big Five model (i.e. extraversion, agreeableness, neuroticism, conscientiousness, openness to experience) represent common predictors of internalizing problems, such as anxiety (Kotov et al., 2010) in adults. Kotov's study (2010) highlights that high neuroticism and low conscientiousness scores were the most powerful traits related to internalizing psychopathology, as well as low extraversion scores, while agreeableness and openness showed weak and equivocal associations (Kotov et al., 2010). Similarly, strong relationships between neuroticism and internalizing symptoms (e.g. depression and anxiety) were also found in adolescent samples, suggesting that these personality traits could reflect the core of internalizing psychopathology (Barbaranelli et al., 2003; Griffith et al., 2010). Furthermore, openness, conscientiousness and extraversion negatively correlated with internaziling symptoms (Barbaranelli et al., 2003).

Study Objectives

In light of the above considerations, there is reason to expect that anxiety plays an important role in the physical health of children and adolescents. It remains unclear whether maladaptive personality trait domains may explain unique variance in somatic symptoms beyond anxiety.

This study aims to explore the relationships between personality trait domains, anxiety and somatic symptoms in Italian schoolchildren. Specifically, we hypothesized that adolescents with higher levels of anxiety would report more somatic symptoms than non-anxious youth.

Furthermore, personality trait domains including negative affect, detachment and disinhibition are hypothesized to be positively related to somatic symptomatology. With regard to the associations between antagonism, psychoticism and somatic symptoms, we had an exploratory purpose. Finally, we expected that personality trait domains would explain additional variance over and above gender and anxiety.

To our knowledge, this is the first study to explore the relationships between personality trait domains as defined by the "Alternative DSM-5 model for personality disorders" and anxiety symptoms in predicting somatic symptoms among a healthy Italian adolescent sample.

Method

Participants

*T*hree hundred and three adolescents (159 males) aged 14-17 years (Mean age= 14.82, SD= 0.81) were involved in the present study. Participants were recruited in two secondary schools in Italy and all of them completed the entire questionnaire battery. Exclusion criteria for participation in this study were the presence of a diagnosed psychiatric illness, history of significant neurological illness or brain injury and history of recurrent somatic symptoms. All participants were Caucasian.
Informed consent was obtained from both participants and their parents before enrolment in the study and anonymity of participants was ensured.

This study was approved by the Ethics Committee of the Departement of Dynamic and Clinical Psychology, Sapienza University of Rome (Italy).

Measures

The Assessment schedule of adolescents' health: is a questionnaire designed for this study and assesses the health status of participants. Parents were asked to fill-in a questionnaire evaluating the physical and mental health status of their children.

The Personality Inventory for DSM-5 Brief Form (PID-5-BF; APA, 2013): is a 25-item self-report personality trait assessment scale. It assesses five maladaptive personality trait domains including negative affect, detachment, antagonism, disinhibition and psychoticism, with each trait domain including 5 items. The PID-5-BF was developed from the PID-5 (Krueger et al., 2012). Each item of the PID-5-BF asks the individual to rate how well the statement describes him or her generally. Each item on the measure is rated on a 4-point scale (i.e., 0=very false or often false; 1=sometimes or somewhat false; 2=sometimes or somewhat true; 3=very true or often true). Higher scores indicate a higher functioning impairment in the investigated domain. Findings from the Italian validation of the instrument suggest that the PID-5 has an adequate internal consistency (α = .83) and test-retest reliability (Fossati et al, 2015). Furthermore, the five-factor structure was confirmed. In the present study, the scale had a reliability of α = .89.

The Screen for Child Anxiety-Related Emotional Disorders (SCARED; Birmaher et al., 1999): is a self-report questionnaire assessing anxiety simptoms in children and adolescents. It consists of 41 items rated on a three-point Likert scale, from 0 "Not True or Hardly Ever True" to 2 "Very True or Often True". The questionnaire includes a scoring matrix in order to indicate the potential presence of general anxiety as well as other specific anxiety disorders. The SCARED was found to have good internal consistency (a coefficient value of approximately .90). Five factors emerged from the factor analysis: panic/somatic, generalized anxiety, separation anxiety, social phobia and school phobia (Birmaher et al., 1999). Additionally, the SCARED showed significant discriminant validity. A cut-off point of 25 is use to indicate the presence of severe anxiety symptomatology. The Italian version of the instrument showed good psychometric properties (Ogliari et al., 2006). In the present study, the SCARED had a reliability of α =.87.

The Children's Somatization Inventory-24 (CSI-24; Walker et al., 2009): a self-report questionnaire evaluating children and adolescents' perceptions of somatic symptoms. It consists of 24 items rated on a 5-point Likert scale, from 0 "Not at all" to 4 "A whole lot". The CSI-24 was translated into Italian using the translation-back-translation method, with the approval of the author (Cerutti et al., 2017). The total score is obtained by summing the scores given by all of the participant's answers and can vary from 0 to 96. Higher scores indicate greater somatic symptomatology. The scale has good internal consistency (α =.88) (Walker et al., 2009). Researchers report results relevant to a single somatization factor and significant correlations with depression, anxiety, functional disability and quality of life, thus corroborating construct validity (Lavigne et al., 2012). In the present study, the CSI-24 demonstrated good internal consistency (Cronbach's α of .87).

Data analysis. Descriptive statistics were performed to evaluate the characteristics of the sample. Analysis of univariate variance (ANOVA) was used to investigate the main differences in personality functioning and maladaptive personality trait domains, anxiety symptoms and somatic symptomatology according to gender.

Participants were divided into two groups, "Anxious group" and "Non-anxious group", according to the SCARED cut-off of 25 (Birmaher et al., 1999).

Preliminarily, an ANOVA was performed to examine personality and somatic symptom scores in the two different groups of adolescents (Anxious group versus Non-anxious group). Successively, the zero-order correlations between the study variables were calculated in order to analyze the relationships between the constructs explored in the current study.

Finally, a Hierarchical Multiple Regression Analysis was conducted to investigate if personality trait domains explain a statistically significant amount of variance in somatic symptoms (dependent variable) after accounting for all other variables (gender and anxiety). The first model (Model 1) included demographic information such as age. In the next step (Model 2), we added anxiety symptoms. In the final step (Model 3), maladaptive personality trait domains were included.

All data were analyzed using the Statistical Package for Social Science (SPSS) 25.0 for Windows. P values <.05 were considered statistically significant.

Results

Table 1 shows the descriptive statistics and differences according to gender.

Table 1 – One-way ANOVA on gender

	Males Mean (±SD)	Females Mean (±SD)	Total sample Mean (±SD)	F (1,301)	*p*-value
PID-5-BF	0.61 (±0.46)	0.67 (±0.39)	0.64 (±0.43)	1.26	0.262
Negativeaffect	0.70 (±0.59)	0.92 (±0.56)	0.81 (±0.58)	10.23	0.002**
Detachment	0.51 (±0.53)	0.60 (±0.51)	0.55 (±0.52)	1.99	0.159
Antagonism	0.44 (±0.47)	0.39 (±0.42)	0.41 (±0.45)	0.85	0.357
Disinhibition	0.75 (±0.66)	0.76 (±0.55)	0.75 (±0.61)	0.01	0.920
Psychoticism	0.65 (±0.59)	0.68 (±0.50)	0.66 (±0.55)	0.16	0.687
SCARED	15.28 (±9.06)	18.65 (±10.09)	16.88 (±9.69)	9.38	0.002**
CSI-24	11.33 (±9.59)	14.69 (±10.78)	12.93 (±10.30)	8.25	0.004**

*Note. ** p<.01;* PID-5-BF= Personality Inventory for DSM-5 Brief Form; SCARED= Screen for Child Anxiety-Related Emotional Disorders; CSI-24= Children's Somatization Inventory-24

According to the cut-off proposed by Birmaher (Birmaher et al., 1999), 20.1% (n=61) of adolescents reported a severe anxious symptomatology.

Differences between the Anxious group and Non-anxious group are presented in Table 2. Specifically, 26 males and 35 females constitute the Anxious group.

Table 2 - Differences between Anxious and Non-anxious groups

	Anxious Group (n=61) Mean (±SD)	**Non-anxious group** (n=242) Mean (±SD)	*F*-value (1,301)	*P*-value
PID-5-BF	0.79 (±0.39)	0.60 (±0.43)	9.59	< 0.01
Negative affect	1.06 (±0.59)	0.74 (±0.56)	14.62	< 0.001
Detachment	0.76 (±0.53)	0.50 (±0.51)	13.43	< 0.001
Antagonism	0.50 (±0.45)	0.39 (±0.45)	2.68	0.103
Disinhibition	0.78 (±0.57)	0.75 (±0.62)	0.13	0.714
Psychoticism	0.84 (±0.57)	0.62 (±0.54)	7.59	< 0.01
CSI-24	19.46 (±12.90)	11.28 (±8.82)	34.07	< 0.001

Note. PID-5-BF= Personality Inventory for DSM-5 Brief Form; CSI-24= Children's Somatization Inventory-24.

Table 3 shows the Pearson correlations among personality functioning and personality trait domains, anxiety and somatic symptoms.

Table 3 – Correlational matrix

	1	2	3	4	5	6	7	8
1. PID-5-BF	1.00	0.76***	0.85***	0.68***	0.79***	0.84***	0.26***	0.30***
2. Negative affect		1.00	0.63***	0.31***	0.46***	0.52***	0.32***	0.24***
3. Detachment			1.00	0.49***	0.55***	0.66***	0.28***	0.30***
4. Antagonism				1.00	0.43***	0.54***	0.12*	0.16**
5. Disinhibition					1.00	0.57***	0.06	0.16**
6. Psychoticism						1.00	0.24***	0.31***
7. SCARED							1.00	0.39***
8. CSI-24								1.00

Note. * p<.05; ** p<.01; *** p<.001. PID-5-BF= Personality Inventory for DSM-5 BriefForm; SCARED= Screen for Child Anxiety-Related Emotional Disorders; CSI-24= Children's Somatization Inventory-24

Anxiety and maladaptive personality trait domains as predictors of somatic symptoms

In Table 4, the hierarchical regression analysis with somatic symptoms as dependent variable is presented. In the first step (Model 1), female gender positively predicted somatic symptoms (b=0.163, p=0.004). The second step (Model 2) indicated that anxiety is a significant predictor of somatic symptoms and, simultaneously, gender resulted non-significant.

Analysis of Model 3 confirmed the importance of anxiety in predicting somatic symptoms and showed that the psychoticism personality domain explained unique variance in somatic symptoms (b=0.197, p=0.011). Furthermore, gender revealed a tendency towards significance (b=0.102, p=0.055).

Table 4 – Hierarchical Multiple Regression Analysis of Predictiors of Somatic Symptoms

Predictor variables	*Model 1*	*Model 2*	*Model 3*
Gender			
Female	0.16 **	0.09	0.10
Anxiety		0.38***	0.31***
SCARED			
Personality trait domains			
Negativeaffect			-0.39
Detachment			0.10
Antagonism			-0.01
Disinhibition			-0.01
Psychoticism			0.20*
R2	0.03	0.16	0.22
R2 change	0.03	0.14	0.06
F change	8.25**	49.41***	4.21**

Note. * p<.05; ** p<.01; *** p<.001. SCARED= Screen for Child Anxiety-Related Emotional Disorders

Discussion and conclusions

The primary purpose of this study was to extend our knowledge on the association between anxiety, somatic symptoms and personality trait domains in a sample of Italian adolescents. It has been widely observed that anxious symptoms, together with somatic and depressive symptoms, inevitably interfere with the functioning of adolescents and their adaptive capacities, with negative repercussions on both social and educational benefits, self-esteem and self-efficacy (Mahrer, Montano, & Gold, 2012, Stevanovic, 2012). Anxiety represents one of the most common psychological disorders in childhood and adolescence (Fliek et al., 2019). According to Birmaher's cut-off (Birmaher, et al., 1999), 20.1% of adolescents (n=61) participating in the current study reported a severe anxious symptomatology and fell into the "Anxious Group". An ANOVA analysis showed significant differences between the "Anxious Group" and "Non Anxious Group" in specific personality trait domains (e.g. Negative affect, Detachment and Psychoticism) with the "Anxious Group" scoring higher than "Non Anxious Group". This result is in line with previous research on adult samples, underlining that anxiety plays an important role in mental health (Sadaghiani, 2011; Fielding et al, 2016; Kovacs & Borcsa, 2017).

Anxious as well as somatic and depressive manifestations can be traced back to difficulties in affect regulation since unpleasant affective states are expressed through internalizing behaviours, with negative repercussions on the youth's academic and social adaptation, instead of being adequately managed and contained (Parr et al., 2016).

Consistent with earlier cross-sectional studies that have shown how anxiety is associated with an increase risk for somatic symptomatolgy (David, 2014; Kovacs & Borsca, 2017), our findings suggested higher levels of somatic symptoms in the "Anxious Group" and demonstrated higher degrees of somatic symptomatology in anxious adolescents. A possible explanation may be that anxious youth are more likely than non anxious youth to believe that negative social events happen to them (Halldorsson & Creswell, 2017) and tend to have negative thoughts about themselves. Given that anxious children and adolescents have a higher chance of perceiving and interpreting situations as dangerous, our research findings confirm that severely anxious thoughts activate the body, leading to reactions involving somatic symptoms.

As predicted by our hypothesis, correlational analyses revealed that the total score of the SCARED questionnaire was related to psychological distress, strengthening the notion that higher levels of anxiety are associated with greater somatic symptomatology as well as impairment in personality trait domains. This is in accordance with Liu and colleagues' study (Liu et al., 2018) in which the power of the association between personality, somatic symptoms and psychological distress was explored by using two samples of Australian and Chinese adolescents. Furthermore, our results indicate that only the Disinihibition personality trait was not significantly related to anxiety symptomatology. The Disinihibition personality trait domain of the PID-5 may be interpreted in terms of low conscientiousness, involving irresponsible, impulsive and risk taking behaviors. These features are in contrast with those of anxiety, essentially anxious children and adolescents are more self-conscious, confirming our principal research purpose and supporting the notion that highly self-conscious adolescents are at risk for a variety of internalizing problems, including anxiety (Bowker & Rubin, 2009). Nevertheless, the finding that the Disinibihition personality trait was positively related to somatic symptomalogy highlights that risky behaviors are related to physical activation which result in somatic symptomatology.

With respect to the relationship between personality trait domains as defined by the alternative DSM-5 model for personality disorders and anxiety symptoms in predicting somatic symptomatology, our findings emphasized that both anxiety and the Psychoticism personality trait significantly predicted the emergence of somatic symptoms. Psychoticism can be descibed as a personality trait that involves eccentricity, perceptual problems, mispercetion of social cues and odd behavior or unusual experiences in behavior (Hopwood et al., 2013). It regards the integration of different functions (e.g., memory, perception) that allow the construction of representations of the external reality. The dysfunctional beliefs that characterize this pathological trait may predispose to the experience of the abnormal thoughts, feelings and behaviors of somatic symptoms. Our results are in keeping with other studies that have demonstrated an association between personality traits and somatic symptoms (Compton et al., 2008; Garcia-Torres et al., 2016, Liu et al., 2018). Interestingly, Liu and colleagues (Li uet al., 2018) found that Psychoticism was related to Australian adolescents' somatic and psychological distress but this link was not significant among Chinese adolescents, indicating that there were significant cross-cultural differences in the association between Psychoticism and somatic distress. Our findings give new contributions to the existing knowledge on the link between maladaptive personality traits and somatic symptoms in adolescence.

Despite the fact that our hyphotesis were confirmed by the study's findings, more research is needed to further explore the role of anxiety and psychoticism in predicting somatic symptoms during adolescence, in order to provide useful information for planning preventive interventions for youth.

Overall, important limitations warrant consideration in interpreting our results. First, our sample comprised healthy adolescents, so it is unclear if these findings may be generalized to other populations. Second, this was a cross-sectional study and, consequently, the conclusions drawn should be considered with caution. Third, we used only self-report measures rather than objective assessment which may be less affected by respondent bias. Finally, it is important to note that the effect of Psychoticism other than significant is of modest entity as it explains about only 6% of total variability of somatic complaints. Probably this may be due to the extreme heterogeneity of somatic complaints with respect to Psychoticism manifestation.

In conclusion, the findings of this study highlight that anxiety symptomatology is an important clinical phenomenon in school-age children. The developmental course of anxiety symptoms warrants better understanding in order to increase the possibility of early detection and thus, allow appropriate and adequate interventions that may prevent serious problems in adulthood.

Author Contributions
All authors contributed equally to this work.

Compliance with Ethical Standards

Conflict of interest
The authors declare that they have no competing interests.

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Ethical approval
All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent
Informed consent was obtained from all participants included in the study

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