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More Than Words: Anxiety, Self-Esteem, and Behavioral Problems in Children and Adolescents With Dyslexia

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Abstract

This study focused on psycho-affective and behavioral problems in children and adolescents with dyslexia. It aims to define clinical psycho-affective and behavioral profiles of dyslexia beyond those found in existing descriptions of the cognitive, neural, and behavioral correlates. The study focused specifically on the understudied population of native Italian-speaking students. Characteristics of anxiety and self-esteem, as psycho-affective factors, and a variety of associated behavioral problems were studied in a sample of children and adolescents with dyslexia ($n = 22$) and compared to those of a group without learning disabilities ($n = 25$). The findings suggest the group of participants diagnosed with dyslexia exhibited psycho-affective symptoms, especially anxiety and low self-esteem in social and academic situations more frequently than the control group. These problems were related to reading measures. More research is needed to determine how they are related and their interaction. Overall, these findings are useful in clarifying the profile of psycho-affective symptoms in the development of academic difficulties in children and adolescents with dyslexia. In some cases, school personnel focus their interventions only on the academic difficulties and not the psycho-affective or behavioral problems. These findings could have implications regarding intervention for this population.

Keywords

learning disabilities, identification, reading, behavior management, assessment

The existing diagnostic criteria of dyslexia as a learning disability principally describe cognitive and behavioral difficulties *Diagnostic and Statistical Manual of Mental Disorders* (5th ed., *DSM-5*; American Psychological Association [APA], 2013) but include less focus on the psycho-affective consequences. Dyslexia-related difficulties can transcend the academic context, being associated to psychological discomfort due to the academic disadvantage and repeated failure (Arnold et al., 2005; Francis et al., 2019).

Previous studies have considered the adverse effects of dyslexia on life as secondary symptoms (Novita, 2016), often treated as bi-products of the academic challenges, and that they are expected to stop causing disturbances once people with dyslexia leave the school or any academic context. However, they can also become primary clinical characteristics and even associate with mental illness (Livingston et al., 2018). Some common examples of clinical-psycho-affective problems that can manifest themselves as primary clinical characteristics are frustration, emotional blockage, feelings of inferiority, isolation, low self-concept, and low self-esteem (Riddick, 2012). More severe characteristics involve anxiety, depression, and learned helplessness regarding all school-related activities (Novita, 2016). There are behavioral problems like a lack of discipline, defiant behavior, passive or aggressive attitudes, or school refusal to engage in or complete schoolwork that cannot be attributed to other social or developmental background variables (Heiervang et al., 2001). Some of these problems could lead to the avoidance of confrontation or potential success during school age and into adulthood (Arnold et al., 2005).

Anxiety is the main symptom among the clinical effects of dyslexia suggested by previous studies (Giovagnoli et al., 2020; Nelson & Harwood, 2011). Anxiety is an emotion characterized by feelings of tension, worried thoughts, and can lead to physical changes, such as increased blood pressure (APA, 2013). Nelson and Harwood (2011) showed that people with dyslexia can present clinically significant

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levels of anxiety and the symptoms were attributable to school anxiety in approximately 70% of the cases. The anxiety in the school context sometimes leads to avoidance of certain academic situations that then have negative impact on school performance (Giovagnoli et al., 2020). Anxiety can manifest itself in many forms later in life and continue to cause academic and emotional challenges for adults (Giovagnoli et al., 2020). Actually, many adults with dyslexia, like children and adolescents, tend to avoid new learning situations due to the anxiety created; by avoiding one context, which creates anxiety, new problems of anxiety emerge (Giovagnoli et al., 2020).

Other studies have shown that people with dyslexia can have low self-esteem (Karami et al., 2019; Lithari, 2019; Rosalina & Nasrullah, 2020). Low self-esteem causes students to feel different from others and leads to a diminished sense of personal well-being and worth (Metsäpelto et al., 2020). Some studies have suggested that self-esteem is the first element affected after repeated school failure during adolescence, and this can influence motivation for future learning (Rosalina & Nasrullah, 2020). Metsäpelto et al. (2020) found that low school grades contributed negatively to students' overall self-esteem and graded predicted an increase in behavioral problems from childhood to early adolescence.

Existing research has also suggested that dyslexia difficulties have been associated with an increase of behavioral problems in and out of school (Francis et al., 2019). Withdrawal, somatic complaints, anxiety, and depression (internalizing problems); aggression, delinquent behavior (externalizing problems); and problems socializing have been reported. As part of the internalization of problems, the main consequence is anxiety, especially in adolescents (Giovagnoli et al., 2020). Eissa (2010) highlighted problems with aggression, delinquent behavior, and cognitive processing in adolescents with dyslexia that, if untreated, can lead to larger problems as adults. Arnold et al. (2005) found that parents reported more delinquent behavior among adolescents with dyslexia. Externalizing problems such as delinquent behavior and aggression can eventually lead to encounters with the justice system (Arnold et al., 2005; Einat & Einat, 2008; Eissa, 2010; Kirk & Reid, 2001). Einat and Einat (2008) found a strong association between learning disabilities with criminal offenses and convictions. Finally, other studies have suggested an association between learning disabilities and serving time in prison (Talbot, 2008). Kirk and Reid (2001) found that 50% of the institutionalized young offenders presented learning difficulties, like dyslexia.

Research has also indicated the difficulty of systematically studying psycho-affective and behavioral aspects of dyslexia (Riddick, 2012). The most commonly used research methods have involved non-standardized measurement, qualitative questionnaires, personal narratives, and family reports (e.g., Ingesson, 2007). Although non-standardized measures provide important data points, they are also susceptible to self-reporting and conformation bias. Another difficulty in studying psycho-affective and behavioral aspects is that the variables themselves tend not to be stable constructs. Previous recent research had tried to go beyond these difficulties (i.e., Francis et al., 2019; Giovagnoli et al., 2020) but the characterization of some of the clinical consequences of dyslexia remains unclear (Riddick, 2012). A similar research gap exists regarding the nature of the relationships between psycho-affective and behavioral problems and dyslexia (Ingesson, 2007). Results from some studies suggested that the psycho-affective and behavioral symptoms that can emerge in association with dyslexia are predicted by risk factors such as contextual and individual characteristics that are associated with symptom severity (Giovagnoli et al., 2020). More research is needed in this regard (Novita, 2016; Riddick, 2012). There is a lack of studies with a broad perspective investigating the plethora of psycho-affective factors and behavioral problems in the same sample of children and adolescents at the same time. Most of the existing studies have focused on only one factor such anxiety (i.e., Nelson & Harwood, 2011) or self-esteem (i.e., Karami et al., 2019; Lithari, 2019), and they present only a narrow view. This study considered multiple factors concurrently and attempted to provide a broader view of the problems associated with dyslexia. Moreover, previous studies have investigated either children (i.e., Karami et al., 2019; Novita, 2016) or adolescents (i.e., Eissa, 2010; Ingesson, 2007). Finally, there is a lack of research focused on native participants who speak transparent languages that explores these psycho-affective and behavioral factors.

Considering the importance of the psycho-affective and behavioral problems associated with dyslexia in children and adolescents, the main purpose of this study was to define clinical psycho-affective and behavioral profiles of dyslexia beyond those found in existing studies and typical descriptions of the cognitive, neural, and behavioral correlates of the learning disability. The study focused specifically on the psycho-affective aspects and behavioral problems of the understudied population of native Italian-speaking children and adolescents with dyslexia. Moreover, the current study included a wider sample with respect to age to observe whether differences can be found as a function of development and experience, showing the persistence of psycho-affective factors and behavioral problems across developmental stages in Italian-speaking children and adolescents. The study also included a control group of students without dyslexia. Another contribution is related to the challenges of individuals with dyslexia learning in transparent orthographies, such as Italian or Spanish, in which dyslexia have been considered less severe and marginalized in the scientific literature compared to people

Table 1. Demographic Information for Italian Study Participants in the Control and Dyslexia Groups.

	Dyslexia group												Control group												Total	
	Children						Adolescents						Children						Adolescents							
Characteristic	*M*			*SD*			*M*			*SD*			*M*			*SD*			*M*			*SD*			*M*	*SD*
Age	10.00			1.58			13.46			1.51			9.50			.85			14.46			1.99			12.28	2.67
Grade																										
Level	*2nd*	*3rd*	*4th*	*5th*	*6th*	*7th*	*8th*	*9th*	*10th*	*11th*	*12th*		*2nd*	*3rd*	*4th*	*5th*	*6th*	*7th*	*8th*	*9th*	*10th*	*11th*	*12th*			
n	3	1	1	1	3	4	1	5	1	1	1		3	1	1	2	3	4	3	5	1	1	1			
Sex																										
Female	7					4							5					7							24	
Male	2					9							5					8							23	
n	9					13							10					15							47	

Note. Grade levels 2nd to 6th correspond to primary school. Grade levels 7th–12th correspond to secondary school.

learning in more opaque languages (such as French or English; see Tressoldi et al., 2001, in Italian). Therefore, there is a lack of research in transparent orthographies, as mentioned, that lead to a lack of proposals for improving the conditions of people with dyslexia, either of academic nature or of psycho-affective nature. This study focuses on anxiety in several dimensions (i.e., harm avoidance, social anxiety, separation anxiety, and physical symptoms); self-esteem in different areas (i.e., interpersonal relations, competency, and corporal experience); and a variety of behavioral problems (internalizing, externalizing, and other problems) in the same sample of native Italian speaking children and adolescents. The specific aims were as follows:

1. To compare the psycho-affective and behavioral problems in children and adolescents with dyslexia with those of their peers without learning difficulties.
2. To study whether these psycho-affective and behavioral problems manifest differently in children with dyslexia compared to adolescents with dyslexia.
3. To study the relationship between psycho-affective and behavioral problems and reading skills in children and adolescents with dyslexia.

The hypotheses were as follows: (a) Children and adolescents with dyslexia will show higher anxiety and lower self-esteem than their school peers without dyslexia. (b) Children and adolescents with dyslexia will show more behavioral problems than children and adolescents without dyslexia. More severe problems and clinical manifestations may be expected in adolescents with dyslexia compared to children with dyslexia given that an extended negative experience with academic difficulties and school failure may impact adolescents negatively with regard to emotions however, it is also possible that adolescents may have developed better strategies due to their extended access to treatments in comparison to children, which may reduce the emotional consequences (Alexander-Passe, 2006). The second aim seeks to study one or the other view. Finally, (c) psycho-affective and behavioral problems will be correlated with poor reading skills in children and adolescents with dyslexia.

Delimiting a broad profile of psycho-affective and behavioral consequences of dyslexia would contribute to a better understanding of these difficulties and, in the long term, to the development of interventions to build a more stable emotional background for people with dyslexia and learning disabilities, encouraging the development of high self-efficacy beyond the school context (Zuppardo, 2017).

Method

Participants

Participants were 47 children and adolescents (age range 8-18 years old, $M_{Age} = 12.28$, $SD = 2.67$; 24 girls and 23 boys). They were students in 8 Italian primary and secondary school centers (4 primary schools and 2 secondary schools). Table 1 shows the demographic information.

Participants in primary school (2nd to 6th grades) were placed in the children group: 9 children with dyslexia ($M_{Age} = 10.00$, $SD = 1.58$; 7 girls and 2 boys) and 10 children without dyslexia ($M_{Age} = 9.50$, $SD = .85$; 5 girls and 5 boys). The remaining participants from secondary school were placed in the adolescents group: 13 adolescents with dyslexia ($M_{Age} = 13.46$, $SD = 1.61$; 4 girls and 9 boys) and 15 adolescents without dyslexia ($M_{Age} = 14.46$, $SD = 1.99$; 7 girls and 8 boys).

Twenty-two participants had a previous diagnosis of dyslexia ($M_{Age} = 12.05$, $SD = 2.34$; 11 girls and 11 boys) through testing by expert professionals using standardized assessment procedures and/or objective tests at the Pediatric

Neuropsychiatry Services (*Servizio di Neuropsichiatria Infantile*) in Siracuse and Caltagirone (Italy) (dyslexia group). Participants in the dyslexia group met the criteria for a specific learning difficulty with impairment in reading according to the *DSM-5* (APA, 2013): persistent difficulties in reading, like inaccurate and/or slow and effortful reading during formal years of schooling; current academic skills significantly below the average range of scores in culturally and linguistically appropriate tests of reading; reading difficulties not explained by developmental, neurological, sensory, or motor disorders; and difficulties significantly interfere with academic achievement, occupational performance, or activities of daily living (APA, 2013). Participants with dyslexia were recruited by the researchers in this study, in collaboration with the professionals in the Pediatric Neuropsychiatry Services and the information available in those services. From the primary school, the dyslexia group consisted of 3 second-grade children; 1 each in Grades 3, 4 and 5; and 3 sixth-grade children. From the secondary school, the dyslexia group consisted of 4 seventh-grade children; 1 eighth-grade child; 5 ninth-grade children; and 1 each in Grades 10, 11, and 12 (see Table 1).

The control group was selected from participants who were classmates of the individuals with dyslexia, matched in sex and age with them, and who had no learning difficulties. There were 25 participants in the control group (M_{Age} = 12.48, *SD* = 2.96; 12 girls and 13 boys). From the primary school, the control group consisted of 3 second-grade children, 1 child each from the third and fourth grades, 2 fifth-grade children, and 3 sixth-grade children. From the secondary school, the control group consisted of 4 seventh-grade participants, 3 eighth-grade children, 5 ninth-grade children, and 1 each in Grades 10, 11, and 12 (see Table 1).

All participants were native Italian speakers and belonged to the same race (European-Caucasian). Students with noncorrected visual problems, other sensory impairments, cognitive or neurological disorders, and an intelligence quotient (IQ) less than 80 were excluded from participation.

Instruments

The Multidimensional Anxiety Scale for Children (MASC; March et al., 1997) was used to measure anxiety. It is a 39-item 4-point Likert-type self-report questionnaire (scale ranging from 0 "never true" to 3 "often true") about feelings, behavior and thoughts, that explores the following dimensions: physical symptoms (restless and somatic/autonomic symptoms) (e.g., I have pains in my chest/*Ho dolori al petto*); avoidance, perfectionism and coping (e.g., I check to make sure things are safe/*Controllo tutto prima di fare le cose*); total score for social anxiety, humiliation/rejection and fear of public performance (e.g., I get nervous if I have to perform in public/*Divento ansioso se devo esibirmi in pubblico*); and total score for separation anxiety and separation/panic (e.g., I get scared when my parents go away/*Quando I miei genitori escono di casa ho paura*). The MASC also includes a total anxiety score and the anxiety disorder index, which measures whether a child has a pathological condition according to the *DSM*. It tests population ages 9 to 19 years old and it shows adequate reliability ($\alpha > 0.90$, from 0.74 to 0.85 in the subscales; test–retest $\alpha > 0.88$) and validity (0.65) indexes.

The Italian version of Bracken's Multidimensional Self-Esteem Assessment Test (TMA; Bracken, 1993) was used to measure self-esteem. It consists of 150 items that are arranged on a Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) and explores self-esteem through the following six scales or dimensions: interpersonal relationships (e.g., I often feel left out/*Spesso mi sento lasciato fuori*), emotiveness (e.g., I feel loved/*Mi sento amato*), competency/control over the environment (e.g., I don't seem to have any control of my life/*Non mi sembra di avere alcun controllo sulla mia vita*), school success (e.g., I'm proud of my school work/*Sono fiero del mio lavoro scolastico*), family life (e.g., I would like to exchange my family with that of another person/*Vorrei cambiare la mia famiglia con quella di qualeem altro*), and corporal experience (e.g., I would change my appearance if I could/*Cambierei il mio estaspetto se pot*). The measure also includes a scale testing general self-esteem. Application age is from 8 to 19 years old. This test shows adequate reliability ($\alpha > 0.96$, from 0.60 to 0.90 in the subscales; Test–retest $\alpha > 0.90$) and validity (0.7) indexes.

The Parent-report version of the Child Behavior Checklist (CBCL; Achenbach, 1991) was administered to obtain parent ratings of several behavioral subscales. It consists of 113 items, rated as Not True (0), Somewhat or Sometimes True (1), or Very True or Often True (2), covering internalizing problems (withdrawn, somatic complaints, anxiety/depression, e.g., afraid to try new things/*Paura di provare cose nuove*), externalizing problems (delinquent behavior and aggressive behavior, e.g., gets in many fights/*È coinvolto spesso in zuffe e liti*), and other problems (social problems, attention problems, and thought problems, e.g., easily jealous/*Si ingelosisce facilmente, invidioso*). Each symptom listed for each item was rated on a three-point scale ("never" "sometimes" and "often"). It tests population ages 6 to 18 years old and it shows adequate reliability ($\alpha > .90$, from 0.72 to 0.97 in the subscales) and validity (0.95) indexes.

Raven's Progressive Matrices–General Scale (RAVEN-SPM; Raven, 2008) was used to test participants' nonverbal intelligence, considering that their independence of language and reading and writing skills would allow to equalize the testing procedure in all participants (dyslexia and control). It consists of 60 items, listed in order of increasing difficulty, in which the participant is asked to identify the

missing element that completes a pattern or a matrix. The test scores ranged from 0 to 60 points. Standard measure of IQ was calculated.

The Developmental Dyslexia and Dysorthographia Testing Battery-2 (Batteria per la Valutazione della Dislessia e della Disortografia Evolutiva-2/DDE-2; Sartori et al., 2007) was used to test reading skills in participants with dyslexia. Three of the eight DDE-2 subtests were administered, namely *lettura di parole*/word reading, *lettura di non-parole*/nonword reading and *comprensione di frasi con omofoni*/sentence comprehension with homophones; four measures were taken: word reading speed, nonword reading speed, text reading speed and accuracy in reading comprehension (number of correct answers). Speed measures were chosen because reading speed problems have been identified as more useful in the detection of dyslexia in transparent orthographies, such as Italian (Tressoldi et al., 2001). Moreover, reading comprehension was measured considering that the lack of comprehension would influence psycho-affective problems such as self-esteem (Rosalina & Nasrullah, 2020).

Procedure

Ethical approval for this study was obtained from the institutional review board of University of Catania. For the selection of the experimental dyslexia group, contact was initiated with the Pediatric Neuropsychiatry Services in Siracuse and Caltagirone to provide information about the study goals and procedure. The board agreed to participate, and possible participants who matched the inclusion/exclusion criteria were selected. All participants and their families were informed about the study, and the families signed consent forms for participation. The selection of children in the control group was performed at the school by giving information about the study to the school board and families. All participants and their families received complete information about the study, and the families signed consent forms for participation. Participation was voluntary, and children and their families were informed about their right to withdraw at any moment and without any inconvenience. The testing sessions took place in the Pediatric Neuropsychiatry Services for the participants with dyslexia and at the local school for the participants in the control group. There were two testing sessions for each participant and each session lasted approximately 40 to -50 min. All tests in all participants were administered by researchers in this study, who were trained psychologists with prior experience in assessing literacy, psycho-affective and behavioral skills. Each participant was tested individually in the MASC and TMA tests. The questions of MASC and TMA tests were read aloud to all participants preventing any influence of reading difficulties in the reading performance. The participants' parents completed the CBCL. In this case, the test was a self-reported assessment, although the parents were assisted in the comprehension of the instructions prior to the assessment by an expert familiar with the test, thus ensuring the best conditions for testing. The DDE-2 was administered by researchers of this study with extensive experience with dyslexia testing. This test was not applied to participants in the control group, as they had no reading problems and a ceiling effect was expected. As the DDE-2 measure is specifically developed to differentiate reading skills of children in the last percentile range, it has limited ability to discriminate between children with moderate and high reading skills. The researchers considered it inconvenient to remove the participants from their classes and cause them to spend less time learning to engage in the testing. This approach was also endorsed by teachers, the school board and the families.

Design and Data Analysis

Data analysis was performed using Statistical Package for the Social Sciences (SPSS) software, version 20 (IBM Corp., Armonk, NY). To evaluate the differences in anxiety, self-esteem, and behavioral problems in children and adolescents with and without dyslexia, an ex post facto causal-comparative study was carried out. This kind of research design is appropriate when true random assignment to groups is not possible (Montero & León, 2007). The independent variable was group with two levels: dyslexia group and control group. The dependent variables were (a) anxiety, which included physical symptoms (tense/restless, somatic/autonomic, and total), harm avoidance (perfectionism, anxious/coping, and total), social anxiety (humiliation/rejection, public performance/fear, and total), separation anxiety (separation/panic and total), and the anxiety disorder index; (b) self-esteem, which included competency, emotivity, corporal experience, school success, family life, and total; and (c) behavioral problems, which included internalizing problems (withdrawn, somatic complaints, anxious/depressed, and total), externalizing problems (delinquent behavior, aggressive behavior, and total), and other problems (social problems, thought problems, attention problems, and total).

First, to ensure that groups were similar regarding demographics (age and sex) as well as intelligence, independent samples *t* tests to compare both mean age and intelligence between groups were carried out (Field, 2009). A chi-square test to compare sex distribution between groups was carried out (Field, 2009). For the first study aim, a multivariate analysis of covariance (MANCOVA) to assess the differences between the dyslexia and control groups on the dependent variables (anxiety, self-esteem and behavioral problems) was carried out; differences were presented as percentages and 95% confidence intervals (Field, 2009). The variable age (children *vs.* adolescents) was considered

a covariate. The rationale was to perform an omnibus analysis to be able to have a broad perspective investigating the plethora of two psycho-affective factors, anxiety and self-esteem, and behavioral problems, taken as multidimensional constructs; like that, all their dimensions would be studied in the same sample of children and adolescents at the same time (Field, 2009). For the second aim, a multivariate analysis of variance (MANOVA) to assess differences between the dyslexia and control groups on the dependent variables (Field, 2009) was carried out within the group of children and within the group of adolescents, separately. The rationale was to study whether differences can be found as a function of development and experience, going beyond some previous research studying either children (i.e., Karami et al., 2019; Novita, 2016) or adolescents (i.e., Eissa, 2010; Ingesson, 2007). For the third study aim, Pearson's correlation coefficients were calculated to identify statistically significant correlations (Field, 2009). The rationale was to exploratory analyze the relationship of different components of these multidimensional constructs and the performance in reading in dyslexia. This would help to preliminary study which dimension would be more related with the difficulties in reading.

Results

First, results are presented considering the whole sample, comparing the group of participants with dyslexia versus the control group without learning difficulties. Second, results of the comparison dyslexia versus the control groups are presented for children and adolescents separately to test whether psycho-affective and behavioral problems manifest differently in children than in adolescents with dyslexia. Finally, results regarding the relationship among anxiety, self-esteem, and behavioral problems and reading skills in students with dyslexia are presented. There were no significant differences between the dyslexia and control groups as a function of age, $t(45) = -.55$, $p = .58$, and intelligence, $t(45) = .77$, $p = .44$. There were no statistically significant differences as a function of sex, $\chi^2(1) = .02$, $p = .89$.

Comparison of Dyslexia vs. *Control Groups for Anxiety, Self-Esteem, and Behavioral Problems in the Whole Sample (Children and Adolescents)*

A MANCOVA comparing the data of participants with dyslexia (dyslexia group) and without dyslexia (control group) with respect to anxiety, self-esteem and behavioral problems was carried out. The variable age (children *vs.* adolescents) was considered a covariate.

Regarding the measure anxiety, results showed statistically significant differences between participants with dyslexia and their peers without them on the measure anxiety $F(1, 45) = 4.52$, $p < .001$, $\eta^2 = .62$, *po.* $= .99$, with higher scores in the dyslexia group than in the control group.

There were statistically significant differences between the dyslexia and control groups in all categories related to social anxiety, namely, humiliation/rejection ($p = .04$), public performance/fear ($p < .001$), and total social anxiety ($p < .001$), with higher scores in the dyslexia group than in the control group. There were statistically significant differences between the dyslexia and control groups in the category of separation/panic ($p = .02$), which was part of the category of separation anxiety. Dyslexia group showed higher scores than the control group (see Table 2). No statistically significant differences were found between the two groups for the rest of the anxiety categories: total symptoms ($p = .56$), tense/restless ($p = .25$), somatic/autonomic ($p = .61$), total harm avoidance ($p = .34$), perfectionism ($p = .69$), anxious/coping ($p = .22$), and total separation anxiety ($p = .09$). The effect of age as a covariate was not statistically significant, $F(1, 45) = 1.94$, $p = .07$, $\eta^2 = .41$, *po.* $= .80$.

Regarding the measure of self-esteem, results showed statistically significant differences between the two groups for total self-esteem ($p > .001$) and in all self-esteem categories: interpersonal relationships ($p > .001$), competency ($p > .001$), emotivity ($p > .001$), corporal experience ($p > .001$), school success ($p > .001$), and family life ($p > .001$). The dyslexia group showed lower scores than the control group in the total self-esteem and in all the categories (see Table 2). The effect of age as a covariate was not statistically significant, $F(1, 45) = 2.02$, $p = .08$, $\eta^2 = .27$, *po.* $= .70$.

Regarding the measure of behavioral problems, results showed statistically significant differences between the two groups for the measure of behavioral problems ($p < .001$), with higher scores in the dyslexia group than in the control group (see Table 3). Regarding internalizing problems, statistically significant differences between the dyslexia and control groups were found in withdrawn *(*$p < .001$), somatic complaints ($p = .01$), and anxious/depressed ($p = .01$), as well as in the total internalizing problems category ($p < .001$). There were higher scores in the dyslexia group than in the control group. Regarding externalizing problems, statistically significant differences between the dyslexia and control groups were found in aggressive behavior ($p = .01$), and in the total externalizing problems category ($p = .04$). There were higher scores in the dyslexia group than in the control group. The differences in delinquent behavior did not reach significant values ($p = .05$). Regarding other problems, statistically significant differences between the dyslexia group and the control group were found in social problems ($p < .001$), thought problems ($p = .01$), and attention problems ($p > .001$), as well as in the total other problems category ($p = .01$). Scores

Table 2. Mean Differences and Standard Deviations in Anxiety and Self-Esteem in Dyslexia Group and Control Group and Multivariate Analyses of the Differences in the Whole Sample.

	Dyslexia group		Control group					
Behavior/measure	*M*	*SD*	*M*	*SD*	*F*	*p*	η^2	*po.*
Anxiety								
Physical symptoms								
Total	49.45	7.72	48.12	7.83	0.34	.56	.01	.09
Tense/Restless	50.95	10.51	48.00	6.77	1.34	.25	.03	.21
Somatic/Autonomic	47.50	6.37	48.60	8.19	0.26	.61	.01	.08
Harm avoidance								
Total	41.36	8.68	43.88	9.16	0.93	.34	.02	.55
Perfectionism	43.77	10.63	44.84	7.92	0.15	.69	.01	.07
Anxious/Coping	41.68	6.78	44.64	9.28	1.52	.22	.03	.23
Social anxiety								
Total	58.27	10.96	48.56	7.96	12.30	.001**	.22	.93
Humiliation/Rejection	55.41	12.97	48.72	8.32	4.53	.04*	.09	.55
Public Performance/Fear	59.86	11.09	48.76	7.04	17.20	.001**	.28	.98
Separation anxiety								
Total	52.36	11.19	47.40	8.70	2.92	.09	.06	.39
Separation/Panic	58.68	13.48	50.72	8.10	6.19	.02*	.12	.39
Self-esteem								
Anxiety Index	47.59	11.82	45.20	7.83	0.68	.41	.02	.13
Interpersonal Relations	77.05	14.22	105.52	10.99	59.72	.001**	.57	1
Competency	78.05	14.31	108.28	12.12	61.51	.001**	.58	1
Emotivity	81.32	16.87	103.04	10.14	29.41	.001**	.40	1
Corporal Experience	83.86	14.58	106.44	10.78	36.99	.001**	.45	1
School Success	80.23	11.95	108.20	10.79	71.12	.001**	.61	1
Family Life	90.82	9.49	108.24	14.43	23.21	.001**	.34	.99
Total Self-esteem	80.22	11.95	108.20	10.80	71.12	.001**	.61	1

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

were higher in the dyslexia group than in the control group (see Table 3). The effect of age as a covariate was not statistically significant, $F(1, 45) = 2.01, p = .06, \eta^2 = .42, po. = .82$.

Comparison of Dyslexia vs. Control Groups for Anxiety, Self-Esteem, and Behavioral Problems in Children and in Adolescents Separately

Although the covariate age was not statistically significant in the global analysis before, data for anxiety, self-esteem, and behavioral problems were analyzed in the two age groups (children and adolescents) separately to study whether these psycho-affective and behavioral problems manifest differently in children and in adolescents.

Comparison of dyslexia vs. control groups in anxiety, self-esteem and behavioral problems in children. Regarding the measure anxiety, results showed statistically significant differences between the two groups, $F(6, 12) = 8.94, p = .01, \eta^2 = .95, po. = .97$, with higher scores in the dyslexia group than in the control group. Regarding the anxiety categories, results showed statistically significant differences in social anxiety public performance/fear ($p < .001$), total social anxiety ($p < .01$), and separation/panic ($p < .03$), with higher scores in the dyslexia than in the control group (see Table 4). There were no statistically significant differences in the other categories: tense/restless ($p = .25$), somatic/autonomic ($p = .81$), total physical symptoms ($p = .37$), perfectionism ($p = .80$), anxious/coping ($p = .85$), total harm avoidance ($p = .89$), humiliation/rejection ($p = .07$), total measure of separation anxiety ($p = .06$), and in the Anxiety Disorder Index ($p = .19$).

There were statistically significant differences between the two groups in the measure of self-esteem, $F(7, 11) = 4.94, p = .01, \eta^2 = .76, po. = .92$, with higher scores in the control group than in the dyslexia group (see Table 4). Regarding the self-esteem categories, there were statistically significant differences between the two groups in all categories: interpersonal relations ($p < .001$), competency ($p < .001$), emotivity ($p = .01$), corporal experience ($p < .001$),

Table 3. Mean Differences and Standard Deviations in Behavioral Problems in Dyslexia Group and Control Group and Multivariate Analyses of the Differences in the Whole Sample.

	Dyslexia group		Control group					
Behavior problem by type	*M*	*SD*	*M*	*SD*	*F*	*p*	η^2	*po.*
Internalizing problems								
Withdrawn	65.45	10.41	55.08	6.63	17.02	.001**	.27	.98
Somatic Complaints	61.82	10.75	55.60	4.80	6.83	.01*	.13	.73
Anxious/Depressed	64.27	9.78	56.20	6.46	11.40	.01*	.20	.91
Total IP	65.27	11.48	53.72	9.40	14.38	.001**	.24	.96
Externalizing problems								
Delinquent Behavior	57.68	6.74	54.40	4.37	4.02	.05	.08	.50
Aggressive Behavior	59.64	7.26	55.00	4.41	7.20	.01*	.14	.75
Total EP	57.73	8.70	52.80	7.58	4.31	.04*	.09	.53
Other problems								
Social Problems	66.68	7.79	56.08	5.42	29.88	.001**	.40	1
Thought Problems	59.45	9.05	53.48	4.28	8.70	.01*	.16	.82
Attention Problems	65.32	9.36	56.00	5.44	17.92	.001**	.28	.98
Total OP	7.77	5.69	3.80	1.12	10.55	.01*	.19	.89
Total behavioral problems	65.41	11.62	52.80	10.13	15.79	.001**	.26	.97

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

school success ($p < .001$), family life ($p < .001$), and total self-esteem ($p < .001$). In all categories scores were lower in the dyslexia than in the control group (see Table 4).

Regarding the measure behavioral problems, there were no statistically significant differences in the overall measure ($p = .35$). However, regarding the different categories and subcategories, there were statistically significant differences in withdrawn ($p = .01$), somatic complaints ($p < .03$), anxious/depressed ($p = .01$), the total internalizing problems ($p < .001$), aggressive behavior as part of externalizing problems ($p = .04$), in social problems ($p = .01$), thought problems ($p = .02$), attention problems ($p = .01$), and the total other problems ($p = .01$). In all these categories, there were higher scores in the dyslexia group than in the control group (see Table 5). There were no statistically significant differences in delinquent behavior ($p = .12$) and in total externalizing problems ($p = .09$).

Comparison of dyslexia vs. control groups in anxiety, self-esteem and behavioral problems in adolescents.. Regarding the measure anxiety, results showed statistically significant differences between the two groups, $F(12,15) = 3.76$, $p = .01$, $\eta^2 = .75$, $p = .94$, with higher scores in the dyslexia group than in the control group. Regarding the anxiety categories, there were no statistically significant differences in any of the categories in the adolescent group: tense/restless ($p = .65$), somatic/autonomic ($p = .35$) and total physical symptoms ($p = .90$); perfectionism ($p = .77$), anxious/coping ($p = .09$), and total harm avoidance ($p = .27$); humiliation/rejection ($p = .28$), performance/fear ($p = .09$) and total social anxiety ($p = .09$); separation/panic ($p = .21$) and total separation anxiety ($p = .60$); and the Anxiety Disorder Index ($p = .96$) (see Table 6).

There were statistically significant differences in self-esteem, $F(7, 20) = 13.53$, $p < .001$, $\eta^2 = .83$, $po. = 1$, with higher scores in the control group than in the dyslexia group. Regarding the self-esteem categories, there were statistically significant differences between the two groups in all categories: interpersonal relations ($p < .001$), competency ($p < .001$), emotivity ($p < .001$), corporal experience ($p < .001$), school success ($p < .001$), family life ($p = .01$) and total ($p < .001$). In all categories there were higher scores in the control group than in the dyslexia group (see Table 6).

Finally, results showed statistically significant differences between the two groups in the measure of behavioral problems, $F(12, 15) = 2.81$, $p = .03$, $\eta^2 = .69$, $po. = .84$, with higher scores in the dyslexia group than in the control group. Regarding the different categories and subcategories, there were statistically significant differences in withdrawn ($p = .02$), as part of internalizing problems. There were statistically significant differences in social problems ($p < .001$), attention problems ($p = .01$), and the total measure of other problems ($p = .02$). In all categories, there were higher scores in the dyslexia group than in the control group (see Table 7). There were no statistically significant differences in somatic complaints ($p = .14$), anxiety/depression ($p = .13$), the total category of internalizing symptoms ($p = .08$), aggressive behavior ($p = .11$), delinquent behavior ($p = .25$), and total externalizing symptoms ($p = .23$).

Table 4. Mean Differences and Standard Deviations in Anxiety and Self-Esteem in Dyslexia Group and Control Group and Multivariate Analyses of the Differences in Children.

	Dyslexia group		Control group					
Behavior/measure	*M*	*SD*	*M*	*SD*	*F*	*p*	η^2	*po.*
Anxiety								
Physical symptoms								
Total	50.00	9.30	46.20	8.59	0.86	.37	.05	.14
Tense/ Restless	51.00	12.44	45.80	5.94	1.40	.25	.08	.20
Somatic/Autonomic	48.55	6.02	47.60	10.03	0.06	.81	.01	.06
Harm avoidance								
Total	39.44	8.25	40.00	8.65	0.02	.89	.01	.05
Perfectionism	40.22	10.32	41.30	8.29	0.06	.80	.01	.06
Anxious/Coping	41.89	6.75	41.20	8.82	0.03	.85	.01	.05
Social anxiety								
Total	59.55	11.95	44.90	6.03	11.77	.01*	.41	.90
Humiliation/Rejection	56.00	14.11	46.00	7.82	3.76	.07	.18	.45
Public Performance/Fear	62.33	8.25	44.90	2.85	39.67	.001**	.70	1
Separation anxiety								
Total	59.55	11.94	44.90	6.02	4.16	.06	.24	.60
Separation/Panic	61.55	14.69	49.70	5.98	5.52	.03*	.24	.60
Self-esteem								
Anxiety Index	48	12.06	42.30	5.51	1.82	.19	.10	.25
Interpersonal Relations	82.89	10.97	105.30	9.43	22.94	.001**	.57	.99
Competency	83.56	11.96	111.40	12.05	25.48	.001**	.60	1
Emotivity	86.11	14.73	107.60	11.02	13.14	.01*	.44	.93
Corporal Experience	87.67	11.58	109.50	7.12	25.11	.001**	.60	1
School Success	76.44	11.35	107.90	14.58	27.07	.001**	.61	1
Family Life	92.89	11.87	116.80	6.39	30.81	.001**	.64	1
Total self-esteem	83.89	10.54	110.80	8.32	38.56	.001**	.69	1

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

Finally, there were no statistically significant differences in thought problems ($p = .19$) as a part of other problems.

Correlations Among Anxiety, Self-Esteem, and Behavioral Problems and Reading Skills in Children and Adolescents With Dyslexia

To study the relationship among psycho-affective and behavioral problems and reading skills in children and adolescents with dyslexia, Pearson's correlation analysis was performed. Results showed statistically significant correlations with negative values between reading skills and some of the categories of anxiety and self-esteem. A summary of the statistically significant correlations is shown in Table 8. Regarding anxiety, there was a statistically significant correlation with a negative value between the anxiety categories: somatic/autonomic problems, as part of physical symptoms, $r(22) = -.44$, and separation/panic, as part of social anxiety, $r(22) = -.53$, and comprehension. There was a statistically significant correlation with a negative value between public performance/fear, as part of social anxiety, $r(22) = -.49$, and word reading speed. Public performance/fear as part of social anxiety was also statistically correlated with nonword reading speed, $r(22) = -.45$, and with text reading speed, $r(22) = -.49$, with a negative value. Regarding self-esteem, there was a statistically significant correlation between interpersonal relations and text reading speed, $r(22) = -.47$, with a negative value.

Discussion

This study explored anxiety, self-esteem and behavioral problems as clinical manifestations that could be associated with dyslexia. Overall, the findings support previous research (e.g., Francis et al., 2019; Giovagnoli et al., 2020; Livingston et al., 2018; Novita, 2016), and they show the manifestation of anxiety, poor self-esteem, and behavioral problems in Italian speakers with dyslexia, compared to their peers. A more broad view of this learning difficulty was provided by analyzing several of these problems in the

Table 5. Mean Differences and Standard Deviations in Behavioral Problems in Dyslexia Group and Control Group and Multivariate Analyses of the Differences in Children.

	Dyslexia group		Control group					
Behavior problem by type	*M*	*SD*	*M*	*SD*	*F*	*P*	η^2	*po.*
Internalizing problems								
Withdrawn	68.22	10.17	55.30	5.94	11.74	.01*	.41	.90
Somatic Complaints	62.11	8.99	54.50	4.48	5.64	.03*	.25	.61
Anxious/Depressed	67.00	9.19	54.60	5.37	13.22	.01*	.44	.93
Total IP	69.44	8.09	52.30	9.38	17.98	.001**	.51	.98
Externalizing problems								
Delinquent Behavior	60.33	8.86	55.10	4.51	2.72	.12	.14	.34
Aggressive Behavior	62.22	8.41	55.60	4.83	4.55	.04*	.21	.52
Total EP	60.78	8.63	54.40	6.75	3.26	.09	.16	.40
Other problems								
Social Problems	68.00	8.24	56.10	5.74	13.56	.01*	.44	.93
Thought Problems	63.67	10.14	54.10	4.98	7.04	.02*	.29	.71
Attention Problems	67.89	10.10	56.10	3.63	11.96	.01*	.41	.90
Total OP	11.44	5.68	4.70	2.06	12.36	.01*	.42	.91
Total behavioral problems	69.33	8.44	54.20	9.22	13.81	.01*	.45	.94

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

same study and studying different aspects of the problems within a population of both children and adolescents. In this regard, the study contributes to the research in dyslexia in transparent languages like Italian, highlighting the relevance of dyslexia difficulties in these orthographies, both from the academic and the socioemotional perspective.

Students with dyslexia showed higher levels of anxiety, lower levels of self-esteem, and more behavioral problems than their classmates without learning difficulties. These findings, which support the first hypothesis, were found when considering the sample as a whole but also when children or adolescents were compared to their peers, separately.

The findings align with previous research (e.g., Eissa, 2010; Mugnaini et al., 2009; Nelson & Harwood, 2011) that suggested that children and adolescents with dyslexia show a plethora of serious symptoms beyond the typically noted academic difficulties with reading and writing. In addition, the findings challenge certain previous contradictory results that indicated that students with reading difficulties did not always develop anxiety or negative self-esteem (Lindeblad et al., 2015). They also go beyond the findings of previous studies (i.e., Giovagnoli et al., 2020; Mugnaini et al., 2009), which focused only on one of these problems (i.e., internalizing problems, Giovagnoli et al., 2020; self-esteem and anxiety, Novita, 2016) and only in children (i.e., Karami et al., 2019; Novita, 2016) or in adolescents (i.e., Eissa, 2010; Ingesson, 2007).

The higher levels of anxiety for the dyslexia group were found in social anxiety. Within this type of anxiety, performance in public and humiliation or rejection were the strongest factors, especially in children, with high effect sizes. The findings agree with previous research showing that students with difficulties may show these symptoms as a way of responding to feeling devalued or a lack of social recognition by their peers (Riddick, 2012). These feelings could result from school activities that require social interaction such as reading or making a presentation in front of classmates (Sako, 2016). These feelings were especially strong in children considering the high effect sizes. Accordingly, social anxiety was related with reading speed and reading comprehension, which constitute crucial reading skills in the school context (Tressoldi et al., 2001). Low performance in those skills is related to high social anxiety (i.e., Giovagnoli et al., 2020; Mugnaini et al., 2009), as measured by fear, feelings of humiliation, and rejection of public performance can arise especially in school activities that require reading aloud or reading passages within a time limit or social activities that require reading. Dyslexia deficits in the Italian language are more evident in speed measures (Tressoldi et al., 2001) and slow reading speed is related to low comprehension (Tressoldi et al., 2001). It was expected that difficulties with reading speed and comprehension were related to psycho-affective symptoms. Thus, as suggested by previous research, anxiety is not limited to academic tasks but rather extends to certain social situations (Eissa, 2010; Mugnaini et al., 2009).

Self-esteem was affected in all categories in children and adolescents with dyslexia (Karami et al., 2019; Metsäpelto et al., 2020), reaching high effect size in school-related aspects, like school success and competency, but

Table 6. Mean Differences and Standard Deviations in Anxiety and Self-Esteem in Dyslexia Group and Control Group and Multivariate Analyses of the Differences in Adolescents.

	Dyslexia group		Control group					
Behavior/measure	*M*	*SD*	*M*	*SD*	*F*	*p*	η^2	*po.*
Anxiety								
Physical symptoms								
Total	49.08	6.80	49.40	7.30	0.01	.90	.01	.05
Tense/ Restless	50.92	9.50	49.47	7.07	0.21	.65	.01	.07
Somatic/Autonomic	46.77	6.73	49.26	7.00	0.92	.35	.03	.15
Harm avoidance								
Total	42.69	9.04	46.46	8.81	1.25	.27	.05	.19
Perfectionism	46.23	10.53	47.20	6.96	0.08	.77	.01	.06
Anxious/Coping	41.53	7.07	46.93	9.14	2.98	.09	.10	.38
Social anxiety								
Total	57.38	10.62	51.00	8.30	3.18	.09	.11	.40
Humiliation/Rejection	55.00	12.70	50.53	8.40	1.24	.28	.04	.19
Public Performance/Fear	58.15	12.74	51.33	7.88	2.99	.09	.10	.38
Separation anxiety								
Total	51.46	9.90	49.47	9.94	0.28	.60	.01	.08
Separation/Panic	56.69	12.79	51.40	9.38	1.59	.22	.06	.23
Self-esteem								
Anxiety Index	47.31	12.14	47.13	8.69	0.01	.96	.01	.05
Interpersonal Relations	73.00	15.18	105.67	12.25	39.71	.001**	.60	1
Competency	74.23	14.98	106.20	12.11	38.95	.001**	.60	1
Emotivity	78.00	18.01	100.00	8.58	17.80	.001**	.41	.98
Corporal Experience	81.23	16.26	104.40	12.45	18.17	.001**	.41	.98
School Success	71.15	14.22	112.40	10.16	79.53	.001**	.75	1
Life	89.38	7.63	102.53	15.60	7.63	.01*	.23	.76
Total Self-esteem	77.69	12.60	106.47	12.12	37.82	.001**	.59	1

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

also outside of school, in social situations like interpersonal relations (Novita, 2016). The finding would suggest that dyslexia difficulties may transcend the academic context, and impact the social lives of these students with dyslexia (Arnold et al., 2005; Francis et al., 2019).

Finally, students with dyslexia showed more behavioral problems than their peers, as suggested by previous research (i.e., Eissa, 2010; Giovagnoli et al., 2020). Findings add the value of parental observation as worthwhile for studying these manifestations. Increased rates of behavioral difficulties can arise from the stress caused by academic situations as students with dyslexia struggle to complete school and plan for the future (Eissa, 2010; Heiervang et al., 2001). However, these findings should be considered preliminarily, as an exploration for future research with a wider sample that can add power to the study.

Findings also suggest some differences in the manifestation of the problems in children compared to adolescents with dyslexia, especially when considering the diverse categories defining anxiety and behavioral problems. However, these findings are not exactly as expected in the second hypothesis, because they did not support more severe problems for adolescents with dyslexia compared to children.

In children, when the variety of anxiety and behavioral problem manifestations is observed in more detail, the profile appears more clearly defined than in adolescents. Regarding anxiety, social anxiety and separation anxiety appear to be more pronounced in the case of children, considering the mentioned high effect sizes. Social anxiety seems to be closely linked to school context and activities, more concretely regarding reading speed problems as found in the correlation study. Social anxiety seems to manifest itself in fear of public performance, which could be related to situations in which students have to read aloud in front of the class, thus revealing their slow reading speed among other reading problems. In addition, humiliation or rejection could be experienced by students with dyslexia when reading aloud in front of classmates. Separation anxiety was a statistically significant problem in children but not in adolescents, which may be explained by a higher dependency on their parents by children than by adolescents (Sako, 2016). This finding raises the specter that parents might act

Table 7. Mean Differences and Standard Deviations in Behavioral Problems in Dyslexia Group and Control Group and Multivariate Analyses of the Differences in Adolescents.

	Dyslexia group		Control group					
Behavior problem by type	*M*	*SD*	*M*	*SD*	*F*	*p*	η^2	*po.*
Internalizing problems								
Withdrawn	63.54	10.54	54.93	7.24	6.49	.02*	.20	.69
Somatic Complaints	61.61	12.18	56.33	5.01	2.37	.14	.08	.32
Anxious/Depressed	62.38	10.08	57.27	7.06	2.47	.13	.09	.33
Total IP	62.38	12.84	54.67	9.61	3.30	.08	.11	.42
Externalizing problems								
Delinquent Behavior	55.85	4.26	53.93	4.37	1.37	.25	.50	.20
Aggressive Behavior	57.85	6.05	54.60	4.22	2.77	.11	.10	.36
Total EP	55.61	8.43	51.73	8.13	1.53	.23	.06	.22
Other problems								
Social Problems	65.77	7.66	56.07	5.40	15.31	.001**	.37	.96
Thought Problems	56.54	7.22	53.07	3.88	2.61	.12	.09	.34
Attention Problems	63.54	8.77	55.93	6.50	6.92	.01*	.21	.72
Total OP	5.23	4.24	3.20	2.01	2.74	.11	.10	.36
Total behavioral problems	62.69	13.01	51.87	10.90	5.74	.02*	.18	3

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

Table 8. Statistically Significant Correlations Among Anxiety and Self-Esteem and Reading Skills.

	Reading skills			
Psycho-affective factors	Reading comprehension	Word reading speed	Nonword reading speed	Text reading speed
Anxiety				
Physical symptoms (somatic/autonomic problems)	–.44*			
Social anxiety (separation/panic)	–.53*			
Social anxiety (public performance/fear)		–.49*	–.45*	–.49*
Self-esteem				
Interpersonal relations				–.47*

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

as a coping mechanism for children more so than adolescents. In this study, separation anxiety was measured in relation to separation with parents as significant others.

Adolescents with dyslexia exhibited problems with overall anxiety more than their peers in the control group, but not in any specific category. The explanation for these differences in the manifestation of anxiety between children and adolescents with dyslexia may be related to less experience that children have with classroom activities, which would lead to less developed compensatory strategies (Alexander-Passe, 2006) for facing situations regarding social anxiety. Another explanation might be due to the greater psycho-affective dependence of children on their parents (Sako, 2016) than by adolescents regarding separation anxiety. This explanation would agree with the second hypothesis. It is possible that adolescents have had access to longer interventions for dyslexia and/or received more school or familial support than children, due to their older age. The influence of duration of interventions may have helped them to develop better strategies for reducing or compensating for the psycho-affective or behavioral consequences. More specific research is needed in this area with respect to compensatory strategies and the mediation of emotional factors.

Behavioral problems seem to manifest themselves in greater detail in children with dyslexia compared to adolescents or with peers in the control group. This finding suggests that children with dyslexia exhibited problems related to internalizing and externalizing, whereas adolescents with dyslexia exhibited problems related only to internalizing. As described previously, the wider experience with the consequences of dyslexia by adolescents may have helped them

cope with some of the negative effects more effectively than children (Sainio et al., 2019). Some studies have shown that the development of compensatory strategies centered on coping with psycho-affective and psycho-social factors is a better predictor of better emotional adjustment and success in adulthood (Łockiewicz et al., 2014). Moreover, adolescents could have benefited from more time with treatment or support, from the family, the school, or both, which could have mediated the manifestation of these psycho-affective and behavioral factors. Once more, this point requires more studies for clarification.

Nevertheless, the differences between adolescents and children should not be taken as indicators that adolescents show fewer problems than children with dyslexia. For example, both groups appear to be affected by self-esteem issues in similar ways (Novita, 2016). Lower levels of self-esteem affect not only the academic achievement of students with dyslexia but also the family context and their emotional well-being in general. It may be that children's general adjustment regarding psycho-affective and behavioral factors seems to be worse than in adolescents, which might explain why some problems (e.g., externalizing problems, different types of anxiety) are not as pronounced in the sample of adolescents. However, more research is needed to study these points because the sample in this study was small once the children were separated from the adolescents, and the findings should be taken as preliminary.

Some of the psycho-affective and behavioral problems were significantly related to reading measures, suggesting that they can interfere with reading. The findings validate the third hypothesis and align with previous findings (Morente et al., 2017). As noted above, high levels of anxiety have been found to relate to slower speed in reading and lower results in comprehension. In particular, anxiety is more closely related to school activities involving performance in public, which is part of social anxiety. Reading difficulties can also be negatively related with the interpersonal relations of students with dyslexia, which also relate to social situations or interactions at school. Once again, these findings are considered preliminary and more studies with a wider sample is required.

Limitations

One already mentioned limitation is the sample size, which makes that the findings should be taken preliminarily and especially in the case of the second and third aim, as an exploration for future research with a wider sample. This limitation is especially affecting after separating the groups into children and adolescents. Further investigation with a larger sample would contribute to a better characterization of the studied factors and would allow correlational analyses to be performed separately for children and adolescents with dyslexia. Another limitation is that reading measures were not extensively tested in the control sample; the lack of extensive testing may have limited the identification of differences or relationships that might exist in the control group that may not necessarily be unique to students with dyslexia. Teachers stated that extensive testing would be counterproductive by taking time away from school-related tasks for children and adolescents without dyslexia, whose reading performance was expected to be near the ceiling of achievement. Although the teachers' experience about possible reading problems in this control sample was considered, future investigation should include more extensive testing of control-group student reading. Another possible limitation was the use of different measures for self-esteem and anxiety, measured by clinicians, and behavioral instruments reported by parents. The parents in this study were not trained clinicians and self-reported results are open to bias. Finally, there is a limitation related to not having controlled for the time or experience with intervention or support in the manifested difficulties, from the family, the school, or both. This could have influenced the psycho-affective and behavioral results and the differences between the age groups.

Implications for Future Research

More research is needed on the impact of learning problems on psycho-affective symptoms. It would be important to follow up on the development of these symptoms, as the studied factors are known not to be constant constructs. Introducing the study of other covariate variables in addition to age; studying the aspects in different contexts (i.e., presence of treatment/school support, different types of treatment, different types of dyslexia, age of diagnosis); and investigating how intervention in reading and writing could help to improve the variables might yield additional findings. Finally, it is important to study the transcendence of the clinical manifestations of dyslexia and whether they disappear once the main cause of academic problems is treated. Further research is planned about how these factors can be improved through a specific intervention program in literacy skills (Zuppardo, 2017), extending this line of research beyond previous attempts (e.g., Haddadian et al., 2012; Mafirja et al., 2018).

Implications for Practice

The findings could help researchers rethink interventions for children and adolescents with dyslexia (Reid & Green, 2007). The psycho-affective profile of students with dyslexia should be considered simultaneously with their learning difficulties because the stories of school failure often compromise not only school performance but also personality development and social adjustment (Mazher, 2020). Practitioners in this topic can contribute to improve these

conditions by facilitating a positive sense of self in pupils with dyslexia (Humphrey, 2003) or developing intervention plans considering these difficulties together (Reid & Green, 2007). Interventions that promote positive emotions may be the foundation for adequate development in the different aspects of life, including personal, academic, social, emotional, and family, and they might play a crucial role in the development of persons with dyslexia (Mazher, 2020). Moreover, the collaboration of school peers and the family is also relevant for providing both emotional and educational support (Leitão et al., 2017)

In conclusion, a more complete profile for characterizing dyslexia at several age and school levels, both in children in primary school and in adolescents in secondary school, can be drawn from the results of this study. Studying the psycho-affective aspects is useful to understand their role in the evolution of the clinical picture of the academic difficulties associated with dyslexia. This paper highlights the need for further study of these psycho-affective aspects at different ages using standardized instruments rather than qualitative reports, which were generally the source of previous data.

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