

Article

Learning and Well-Being in Multilingual Adolescents with Italian as L2: A Comparison with Monolingual Peers with and without a Learning Disorder

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Abstract: The current exploratory study aimed to offer a description of the learning skills and well-being of multilingual adolescents with Italian as L2, a population regarded as vulnerable with respect to their academic achievements and psychosocial profile. We compared the performance of L2 participants with that of their monolingual peers with and without Specific Learning Disorders on a range of tests and questionnaires to define their learning skills and well-being within the school context. Results confirm greater reading difficulties in the L2 group compared to monolingual peers with Specific Learning Disorders. This pilot study offers one of the first investigations into the learning skills and well-being of a scarcely studied population, namely L2 adolescents. Additionally, it discusses practices that can be implemented within the classroom to promote inclusion.

Keywords: L2 adolescents; reading skills; school climate; school inclusion



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1. Introduction

In the last decades, the educational systems of many countries have faced rapid growth in the number of students speaking a minority language (henceforth known as L2 students). The presence of these students in the classroom might engender consequences that must be acknowledged with earnest. For instance, there is evidence that, in some cases, speaking a minority language might impact language skills in the language of education and consequently affect the academic achievements of these students [1]. Additionally, the difficulties experienced with the majority of the language skills might represent an obstacle in the integration process for L2 students, especially in high school, since adolescence is a period characterized by heightened sensitivity to social stimuli and an increased need for peer interaction [2,3].

In the current pilot study, we aim to offer the first exploration of this population's linguistic, learning, and reading skills, comparing it with that of their monolingual peers with and without a Specific Learning Disorder. By doing so, we will also explore the relationship between their learning skills and their psychological well-being within the school context. The present work will thus evaluate the learning difficulties that might be found in bilingual students when compared to those of monolingual students with a learning disorder, and discuss their association with psychological well-being variables such as perceived school climate within the school context.

1.1. Vulnerability of L2 Students with an Immigrant Background: Insights from the Italian Context

Nowadays, Italian schools envision the presence of a plurality of languages. According to recent statistics, the number of students with migrant backgrounds born in Italy is constantly increasing. The National Institute of Statistics [4] observed that L2 students with migrant origins have higher dropout rates and lower attainment levels. Some studies have tried to identify the causes of such high failure rates in this population, showing that low proficiency in L2 verbal skills could negatively affect academic achievement, leading to learning difficulties [5]. For instance, Vernice and colleagues [6] reported that proficiency in sentence comprehension is a critical variable in the identification of L2 students at risk of school exclusion. Indeed, L2 students with low sentence comprehension scores were significantly less likely to feel psychological well-being in terms of being supported by the external context than their L1 monolingual peers. Overall, these results indicate that the possible occurrence of language difficulties in the language of education (i.e., L2) and social disadvantage might put L2 students in a significantly more vulnerable position of academic failure than monolingual students.

Before addressing the specific needs that might characterize L2 students within the school context, it is necessary to clarify the general verbal and learning difficulties that might be found in L2 students reported in the literature. In general, L2 children might report lower scores than their monolingual peers on language tests [7]. Phonological skills in L2 speakers appear adequate, while lexical and morphosyntactic areas are more vulnerable (e.g., [1,8–11]). For example, L2 speakers might eventually show significant receptive and expressive vocabulary gaps [9]. As for their vocabulary, most of the words known in their L1 are often related to everyday objects used in the home and childhood expressive and receptive vocabulary [12], while at school, they might show difficulties in lexical access, i.e., retrieving words in their L2 [13]. Therefore, a less rich expressive and receptive vocabulary appears to be a distinctive trait of bilinguals [14] and seems to be related to the fact that bilinguals specialize their lexicon in each language based on their language use. Indeed, the vocabulary gap in L2 is often compensated by a knowledge of words in their L1. Therefore, the number of known lexical items could be comparable to that of monolinguals if the two languages were considered together [1]. As for morphosyntactic competence, there is evidence of difficulties in verbal and nominal morphology [15] and clitic pronouns for L2 Italian speakers [11]. Deficits in this area are more common in sequential bilinguals, e.g., speakers with a well-established first language, L1, who are then exposed to an L2 [16,17], in comparison to simultaneous bilinguals, i.e., speakers who acquire two (or more) languages from birth [17]. Overall, performance on morphosyntactic tasks is significantly related to the amount of exposure to the second language and their proficiency. Typically, if exposure to the second language is adequate, these difficulties are easily overcome in sequential bilinguals as exposure and proficiency in the L2 language increases [18].

Notably, the delay in bilinguals' linguistic skills seems to have consequences on the verbal domain and literacy skills [19]. For instance, studies investigating reading skills in Italian students have reported a lower accuracy in single word reading for bilinguals compared to monolinguals [5,20]. A disadvantage in word reading such as this might be related to a less developed lexical competence that might hinder the recognition and decoding of familiar words, which are instead more easily read by children with a richer expressive and receptive vocabulary, such as their monolingual peers [21,22]. Again, according to the literature, reading difficulties appear to decrease as competence in the L2 increases. In this light, evidence indicates that reading problems tend to disappear after a couple of years of adequate schooling exposure, thus suggesting that they were unrelated to a reading disorder [19].

1.2. Developmental Dyslexia: Differences and Similarities with L2 Speakers

Developmental dyslexia (henceforth DD) is defined as a persistent and specific disability in learning to read accurately and fluently despite average cognitive abilities and

adequate educational and sociocultural opportunities [23]. The prevalent etiology of DD points to a deficit in phonological processing [24,25]. In languages with shallow orthographies, such as Italian, DD is characterized by a marked reading speed deficit with relatively preserved accuracy [26]. In this regard, it is important to underline that the deficit in non-word reading speed is one of the most common manifestations of DD in both children and adults across orthographies [27–30].

According to the literature, L2 students might also show some difficulties in reading [30]. For example, a recent study [21] indicated that bilingual children showed more weaknesses in word, non-word, and text reading accuracy compared to their monolingual peers, while they did not differ in non-word reading speed. This result suggests that reading difficulties in L2 students might not necessarily be due to a learning disorder but instead to poor lexical skills [30,31]. Even though reading difficulties might be attributed to different causes—phonological impairment in DD on the one hand and poor lexical knowledge in L2 readers on the other—a reduced performance in other domains like reading comprehension and writing production tasks is found in both groups (L2: [32]; DD: [33]). For the reasons mentioned above, reading skills remain an area of vulnerability for L2 students that might impact their academic performance.

In the present exploratory study, we will investigate learning skills in adolescent L2 speakers. Most of the previous studies assessing learning and literacy skills in the bilingual population focus on the very early stage of literacy acquisition [30], while very few studies have investigated the reading skills of L2 adolescents [34]. Adolescence is a particularly critical period in which social and peer interactions become increasingly crucial for fostering a sense of belonging in students. Additionally, language and learning proficiency might represent an obstacle for L2 teenagers, who might feel more isolated and rejected by their peers and teachers if they cannot communicate well [6]. Since language, learning, and reading skills influence the student's social status, exerting effects on well-being, in the present study, not only do we plan to describe the literacy skills of L2 teenagers but also explore whether reading skills might be related to well-being within the school context.

1.3. Learning and Well-Being in the School Context in L2 Students: Difference between Monolingual Peers with a Learning Disorder

Beyond the learning difficulties reported in the literature associated with L2 students, it is essential to consider other critical aspects of school life. Indeed, schools are key sources for acquiring skills and competencies that support a student's ability to adapt successfully [35]. High school is critical in many ways, as adolescence is a period characterized by a high sensitivity to social stimuli and an increased need for peer interaction [2,3]. The literature has identified the notion of 'school climate' to reflect goals, values, interpersonal relationships, teaching and learning practices, and organizational structures [36]. A positive school climate can have a notable impact on students' academic, social, emotional, and behavioral outcomes [37], supporting students' engagement in school activities [38,39] and having substantial consequences on students' well-being [40]. The Program for International Student Assessment (PISA) emphasizes the relevance of addressing how school students, particularly the 15-year-old population, feel about their experience of well-being at school in order to promote changes that improve students' lives and academic outcomes and encourage inclusive school environments. According to some studies, school climate is associated with both higher student engagement and student well-being and, in turn, with greater academic achievement (e.g., [39,41–43]). Moreover, Ref. [38] has recently shown that when students with language and learning problems do not find an educational context that supports them, they experience adverse effects on their well-being, engagement, and school climate representations. These findings suggest an association between learning outcomes and psychosocial variables. Along this vein, some studies underline the influence of psychological (motivation, interest, and locus of control) and environmental variables (i.e., home language background and socioeconomic status) in determining the type of learning profile (in reading and comprehension) found in bilingual children with low SES [44,45].

Overall, these studies also emphasize that ecological and psychological characteristics may relate to students' cognitive reading profiles and, thereby, to their reading proficiency.

Additional studies investigating the relationship between school climate and reading and learning skills in L2 suggest that both L1 and L2 students struggling with reading and writing skills developed low motivation to improve their abilities, helpless behavior, and anxiety during school activities [46]. Moreover, Ref. [47] has shown that the presence of immigrant students impacts the school performance of L1 students, finding evidence of a significantly adverse academic effect, which increases with the level of segregation of immigrants, as evidenced by more consistent dropout rates. Since L2 students might experience double inequality in both reading skills and subjective well-being, experiencing an adverse school climate might increase a sense of frustration about their performance and, consequently, hamper their subsequent efforts. For example, a recent study exploring the effect of school climate on reading skills in immigrant students across many countries reported that a better classroom environment is significantly associated with better school reading performance in 53 of the 65 participating countries [48]. This finding further suggested that for L2 students, school climate also affects academic achievement and such an effect is generalizable across European and North American countries [49]. Even though the mutual association among experiencing a positive climate at school, learning skills, and student engagement is well-established in the literature, studies investigating this relationship in a specific context, such as Italian society, are needed for the development of appropriate teaching styles and strategies that might contribute to the creation of an educational environment that can support L2 students, with specific reference to Northern Italy, which is characterized by the highest number of foreign pupils with a migratory background. Additionally, national reports indicate that 30% of students with migratory backgrounds show an academic delay, especially in secondary schools [50].

The current pilot study had the main exploratory aim to offer a description of the strengths and weaknesses of the language and learning skills of L2 adolescents [34], which, as far as we know, have only been sporadically investigated in Italian adolescents. Moreover, the study will explore whether reading skills might be related to well-being within the school context in L2 students.

2. Materials and Methods

2.1. Participants

A total sample of 54 students attending upper secondary schools aged between 14 and 17 years (mean age in months = 188.93, SD = 6.191) participated in the study: (i) 18 monolingual Italian students with typical reading skills (L1-TD group, 15 females; mean age in months = 188.50, SD = 6.16 months); (ii) 18 monolingual Italian students with reading difficulties (L1-RD group, 8 females; mean age in months = 187.22, SD = 4.71 months); (iii) 18 bilingual students (L2 group, 15 females; mean age in months = 191.06, SD = 7.17 months). The three groups were matched for age ($p > 0.168$) and IQ ($p > 0.068$).

The schools involved in the study were located in three different provinces of Lombardy (Northern Italy), which is a northern Italian region with the highest absolute number of foreign students in Italy [50].

Students were recruited from three different school types: Science High School (Scientific Lyceum) (15%), Technical School (60%), and Vocational School (25%). To be eligible to participate, the inclusion criteria were: (i) no history of cognitive, neurological, or sensory disorders; (ii) cognitive level within the normal range (IQ \geq 25 percentile as assessed by the Raven Standard Progressive Matrices, [51]); (iii) all participants must have received their formal education exclusively in Italy.

The L1-TD group consisted of monolingual Italian native speakers whose performance on the learning and language tests fell within the normal range. As for the L1-RD group, the inclusion criteria were: (i) performance in literacy scores < 1.5 SD from the normative mean in at least two tests; or (ii) scores of 2 SD below the norm in at least 1 test of literacy skills assessment ('Test of word and non-word reading' drawn from 'Batteria

per la valutazione della dislessia evolutiva DDE-2' [52], Battery for the Assessment of Dyslexia and Developmental Dysorthography [2]). Additionally, seven students had a formal diagnosis of a Specific Learning Disorder formulated by experienced clinicians based on standard diagnostic criteria (ICD-10). Seven students were classified as having reading difficulties based on their actual performance on the reading tests described above. The criteria for including adolescents in the L2 group were: exposure to an L1 other than Italian (L2) within the family context from birth (N = 16) or before age 2 (N = 2), both parents speaking L1 at home, and continuous experience with Italian for at least 13 years. However, more importantly, all of them followed the national curriculum and were thus exposed to at least 10 years of formal education in Italian. All the children come from immigrant families who speak minority languages, and they are considered early bilinguals [53]. In the L2 group, the first languages of L2 students were Chinese (1), Arabic (7), Spanish (1), Albanian (1), Romanian (4), and Punjabi (4). The L2 group included bilingual students without any special language needs or a history of learning disorders. The Ethical Committee of the Catholic University of the Sacred Heart approved the experimental protocol. We obtained written informed consent from the parents of all participating students.

2.2. Materials

2.2.1. Standardized Tests

General cognitive, verbal, and literacy skills of all participants were evaluated through the following standardized tests, which are commonly used tests for the assessment of Specific Reading Disorders in Italy.

General Cognitive Measures

We assessed general cognitive ability using the non-verbal intelligence scale, 'Raven's Standard Progressive Matrices' (Raven's SPM, [51]). This test is designed for patients from childhood to adulthood and involves a low degree of cultural loading and linguistic demand. The Raven's SPM produces a single raw score corresponding to the total number of matrices completed correctly. We used this measure to identify participants whose cognitive non-verbal level was within the normal range (above the 25th percentile).

Verbal Assessment

Lexical comprehension was assessed through The Peabody Picture Vocabulary Test (PPVT, [54,55]). The primary aim of this test is to measure the receptive vocabulary for standard Italian. The examiner reads a word, and the participant has to choose the target picture among four alternatives. We analyzed raw scores since norms for the adolescent Italian population are not yet available.

Literacy Assessment

Reading decoding ability was assessed by speed and accuracy when reading a list of words and non-words (DDE-2, [52]). Reading speed for words and non-words was measured by the number of syllables per second; reading accuracy was measured as the number of errors produced when reading aloud. We computed speed and accuracy z-scores for word (4 lists of 28 words) and non-word reading (3 lists of 16 non-words) based on the norm for high school Italian students [52]. Reading comprehension was evaluated using a standardized text reading test ("Prove MT Avanzate-2-clinica" [Advanced MT 2], [56]). Students were presented with 10 multiple choice questions after reading the text silently. The score was the number of correct answers. Norms for high school students were based on the study by [57]. We assessed accuracy in spelling through a text dictation test [58]. The test required dictation at a constant rhythm of one word every 2 s. The score was the number of incorrectly written words. The z-scores were calculated based on the norms for high school students.

2.2.2. Questionnaires

School climate perception and language use and exposure information to the L2 were assessed by the following questionnaires. Notice that L2 use and exposure information were collected only in the L2 group.

School Climate Perception Questionnaire

The Georgia School Climate Survey (GSCS) allowed for an evaluation of the school climate. The survey was developed by the Georgia Department of Education (GADOE) Assessment and Accountability Division, the Georgia Department of Public Health, and Georgia State University. The questionnaire comprises 20 items related to the following areas: school connectedness, peer social support, adult social support, cultural acceptance, social/civic learning, physical environment, school safety, peer victimization, order, and discipline, and parental involvement. The reliability of the total scale is $\alpha = 0.80$, in line with the recent literature [59]. The questionnaire items were administered after being translated into Italian and back-translated by an English native speaker. Answers were given on a 4-point Likert scale from 1 = “strongly disagree” to 4 = “strongly agree.” The overall school climate score ranged from 1 to 4.

Language Use and Exposure

Only for the L2 sample, information about exposure to the L2, such as the age of first exposure to Italian, length of exposure, and type of language experience, was assessed by a preliminary Italian adaptation of the “Language and Social Background Questionnaire” (LSBQ, [60]). The questionnaire evaluates the degree of bilingualism with respect to the L1 language proficiency, use at home, and social language use. As norms are not yet available for the Italian context, we used the LSBQ raw scores to draw information about the age of first exposure and social use of L2 and L1.

2.2.3. Procedure

Qualified psychologists administered the tests during individual and collective sessions. The SPM, reading comprehension tests, dictation, and questionnaires (GSCS, LSBQ) were collectively administered in the classroom. Experimenters individually assessed the lexical skills and decoding abilities in reading (DDE-2) in a quiet room at school.

3. Results

3.1. Verbal and Literacy Skills

To evaluate the across-group differences in verbal and literacy skills, we performed a one-way ANOVA between groups (L1-TD vs L1-RD vs L2) on lexical comprehension skills, decoding ability (speed and accuracy in word and non-word reading), reading comprehension skills (passage reading comprehension), and spelling accuracy (dictation test). Results are presented in Table 1. The L2 group showed significantly lower performance scores than the L1-TD group in reading tasks, decoding, and comprehension (ps ranging between 0.013 and <0.002). The L1-RD had lower scores both in speed and accuracy in reading and dictation tasks (ps ranging between 0.022 and <0.001) compared to their typical monolingual peers, except for comprehension ($p > 0.847$). Intriguingly, the L2 group performed more poorly than L1-RD in reading comprehension tasks ($p < 0.044$), while the L2 group was slightly faster than L1-RD in non-word reading (marginal effect, $p = 0.054$). There was no significant difference between the L2 and L1-RD groups in all other reading tasks.

Table 1. We report mean raw scores (for lexical comprehension) and mean z-scores (for WR accuracy, WR speed, NW accuracy, NW speed, reading comprehension, and text dictation). Standard deviation appears in parentheses. Subscript a indicates scores significantly lower than the L1-TD group on Tukey post-hoc tests set at $p < 0.05$. Subscript b indicates scores significantly lower than the Reading Disorder (RD) group on Tukey post-hoc tests set at $p < 0.05$.

	GROUPS			ANOVA		
	L1-TD M (SD)	L1-RD M (SD)	L2 M (SD)	F	<i>p</i>	η^2
Lexical comprehension	147.17 (25.99)	150.67 (18.18)	141.76 (19.99)	0.678	0.513	0.028
WR accuracy	0.42 (0.50)	−1.55 a (1.76)	−2.07 a (3.23)	6.84	<0.002	0.215
WR speed	0.22 (0.40)	−0.96 a (1.16)	−1.08 a (1.38)	8.23	<0.001	0.244
NW accuracy	0.80 (0.57)	−1.26 a (1.45)	−0.66 a (2.00)	9.33	<0.001	0.268
NW speed	0.32 (0.53)	−1.36 a (0.88)	−0.63 a,b (1.16)	15.91	<0.001	0.384
Reading comprehension	0.70 (0.65)	0.47 (0.71)	−0.06 a,b (0.53)	6.87	0.002	0.212
Text dictation	0.74 (0.47)	0.26 a (1.03)	0.34 (1.02)	5.72	0.006	0.183

In order to provide a description of the reading skills of the L2 group, we conducted an ANOVA with Task Reading (word reading vs. non-word reading) as a within-participants factor and Group (L1-TD, L1-RD, L2) as a between-participants factor, considering speed and accuracy as dependent variables. As for speed, the ANOVA indicated a significant group effect [$F(2,51) = 12.05$, $p < 0.001$, $\eta^2 = 0.321$]. The post-hoc results revealed a significantly lower performance in the L2 and L1-RD groups (L2: $M = -0.856$, $ES = 0.217$; L1-RD: $M = -1.161$, $ES = 0.217$) as compared to L1-TD ($M = 0.270$, $ES = 0.217$; $ps < 0.002$), whereas no difference was found between the L2 and L1-RD groups ($p > 0.974$). Moreover, the ANOVA revealed a significant Task Reading X Group interaction [$F(1,51) = 6.806$, $p = 0.002$, $\eta^2 = 0.211$]. Specifically, the L2 group was significantly slower in word reading ($M = -1.081$, $ES = 0.326$) in comparison with non-word reading tests ($M = -0.630$, $ES = 0.274$; $p = 0.016$), while in the L1-RD group there was an opposite pattern: non-word reading caused longer reading times ($M \text{ word} = -0.964$, $ES = 0.272$; $M \text{ non-word} = -1.357$, $ES = 0.206$; $p > 0.065$). As for L1-TD, no difference was found in reading speed between words and non-words ($M \text{ word} = 0.220$, $ES = 0.093$; $M \text{ non-word} = 0.319$, $ES = 0.126$; $p > 0.364$). Results are graphically presented in Figure 1, panel A.

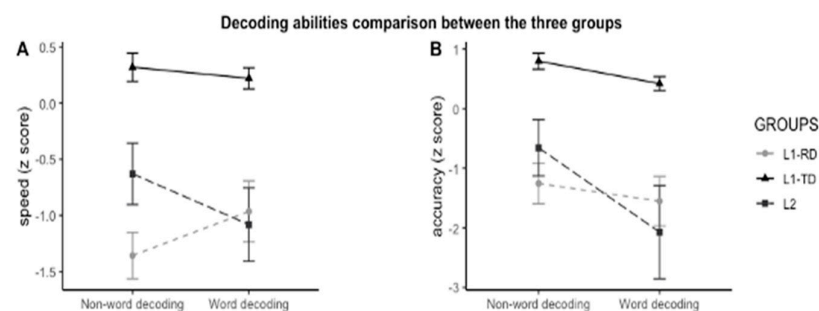


Figure 1. The two graphs show the mean and standard error of z-scores for speed (A) and accuracy (B) from the word and non-word reading tests for each group.

Finally, the ANOVA on the accuracy showed a Task Reading effect [$F(1,50) = 7.158$, $p = 0.010$, $\eta^2 = 0.125$]: overall, participants were significantly less accurate in word reading compared to non-word reading (word reading: $M = 1.068$, $ES = 0.291$; non word reading: $M = -0.353$, $ES = 0.203$). There was a main effect of Group [$F(2,50) = 9.807$, $p < 0.001$, $\eta^2 = 0.282$]. Again, the L2 and L1-RD groups were less accurate in reading skills (L2: $M = -1.336$, $ES = 0.374$; L1-RD: $M = -1.404$, $ES = 3.63$) in comparison to the L1-TD group ($M = 0.608$; $ES = 0.363$; $p < 0.001$). The Task Reading X Group interaction did not reach significance ($p > 0.15$). Descriptive statistics are graphically presented in Figure 1, panel B.

3.2. School Climate

To examine the student perception of school climate, we conducted a one-way ANOVA between groups (L1-TD vs. L1-RD vs. L2) on the total GSGS questionnaire score. The ANOVA revealed that L1-RD perceived a significantly more negative school climate ($M = 2.62$, $SD = 0.30$) than the L2 ($M = 2.78$, $SD = 0.32$) and L1-TD groups ($M = 3.01$, $SD = 0.03$), [$F(2,52) = 7.77$, $p < 0.001$, $\eta^2 = 0.047$]. No other across-group differences were found.

3.3. Correlation Analysis

First, we conducted Spearman correlations between each group regarding verbal (e.g., lexical comprehension) and literacy skills. However, none of the groups showed a significant correlation between receptive vocabulary skills and literacy. We will discuss these (null) findings further in the next section. Second, we performed the correlation analysis between the total GSGS score and literacy skills for the whole sample. The analysis revealed a significant positive correlation between the total score of the GSGS questionnaire and dictation ($r = 0.313$, $p = 0.023$), word and non-word reading accuracy (word: $r = 0.339$, $p = 0.014$; non-word: $r = 0.325$, $p = 0.017$), and speed (word: $r = 0.429$, $p = 0.001$; non-word: $r = 0.431$, $p = 0.001$). Correlation analyses were run considering the three groups separately to further explore the relationship between well-being within the school context and literacy skills. In the L2 group only, there was a positive correlation between the total score of the GSGS questionnaire, reading comprehension skills ($r = 0.516$, $p = 0.028$) and word reading speed ($r = 0.603$, $p = 0.008$), as graphically presented in Figure 2. The findings suggest that L2 students reporting a positive school climate perception were characterized by better reading comprehension (MT-2, [56]) and higher scores on decoding tests (word reading test, DDE2, [52]). No significant correlations were found in the L1-TD and L1-RD groups ($ps > 0.106$).

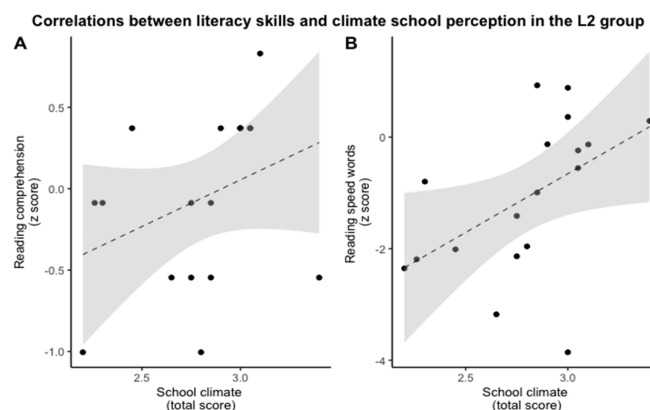


Figure 2. The scatter plots represent the correlation between school climate perception and (A) reading comprehension and (B) word reading speed in the L2 group.

4. Discussion

In the current study we observed the verbal and learning abilities of groups of bilingual (L2), monolingual (L1-TD), and monolingual adolescents with learning disorders (L1-RD). Regarding verbal skills, results showed that L2 students did not differ compared to L1-RD and L1-TD, providing evidence that L2 adolescents who received adequate exposure to the L2 (recall that all our participants were early bilinguals, [53]) might reach the monolingual standard of receptive vocabulary. These findings are consistent with studies indicating that the lexical disadvantage in childhood might dissipate over time as exposure and competence in the target language increase [18]. Another possible explanation for the lack of differences in lexical comprehension skills between L2 and L1-TD/L1-RD might arise from our choice to administer the Peabody test. Indeed, the Peabody test did not provide age-specific standardized data for an Italian adolescent normative sample, and results

obtained on receptive vocabulary skills may reflect poor measurement sensitivity for this age group. Moreover, receptive vocabulary knowledge tested by the PPVT extends beyond lexical knowledge [61], focusing on everyday life words rather than academic receptive vocabulary [62]. In contrast, the reading data showed an entirely different pattern than the lexical comprehension data. Reading tasks revealed weaknesses in reading decoding and comprehension in the L2 and L1-RD groups: both groups performed consistently worse than L1-TD in word and non-word reading tests. The reading skills of L2 adolescents share some features with the profile of students with a learning disorder, although with some peculiarities. In fact, we found an opposite pattern of results in reading decoding skills: the L2 group was markedly slower reading words compared to non-words, while the L1-RD group showed worse performance on non-word reading tests. This pattern of results is consistent with previous studies investigating reading skills in L2 children, which reported lower performances in the word reading than non-word reading tests of L2 speakers compared to their monolingual peers [5,63]. Our results thus allow for an extension of previous findings to also include Italian L2 adolescents. The difficulties in word processing might be related to the reading strategy adopted by L2 speakers when approaching a text. In fact, decoding regular and irregular words depends on access to the lexical route, which operates at the whole-word level, providing a link between the phonological string and the orthographic representation of the lexical entry previously memorized. Conversely, non-word decoding relies on the sublexical route, which depends upon a set of grapheme–phoneme conversion rules [64]. It should be noted that in the non-word reading tasks, L2 speakers showed the same pattern of errors as the monolingual groups, such as phoneme omission and phoneme substitution, and inaccuracy was not related to foreign accents. It is possible that L2 speakers rely to a greater extent on the sublexical route to decode both words and non-words, and this might cause a slowdown in the word reading task. This interpretation is in line with recent findings by [33], showing that phonological decoding skills strongly predict reading abilities in L2 Italian speakers attending primary school. The results in the dictation test suggested that the performance in all groups fell within the normal range, indicating that spelling skills are overall preserved. Consequently, the pattern of findings in the dictation test did not allow detection of eventual L2 adolescent weaknesses in phoneme-to-grapheme sequential mapping and/or lexical access when compared to the reading tests. Regarding reading comprehension skills, L2 exhibited a weaker performance than both monolingual groups, confirming the results obtained in previous studies indicating an achievement gap in reading comprehension in bilinguals [65]. These results further suggest that when approaching a text, bilinguals tend to use sublexical instead of lexical processing since the sublexical route allows a basic decoding process that does not imply access to lexical knowledge. In addition, the weakness in lexical decoding skills, as confirmed by the z-scores obtained from the word-reading task, might negatively affect the development of lexical and semantic knowledge, a pivotal competence in reading comprehension (e.g., [66,67]).

We are aware that the results of the reading tasks in the bilingual sample can be accounted for not only through a theory that only considers the cognitive processes underlying reading [64], but also by means of a different account [45]. For instance, the Componential Model of Reading assumes a predictive relationship between the psychological domain (including components such as motivation, interest, locus of control, and other social–emotional characteristics) and the ecological domain (including the linguistic, socioeconomic, and schooling contexts in which students develop language and learn to read) on reading outcomes. In other words, when evaluating the heterogeneous reading skills of a student coming from a bilingual background, one might not exclude that several factors are at play beyond basic cognitive processes typically involved in reading. According to this view, the complexity of components that define the academic skills of bilingual students makes them unique and, consequently, not directly comparable with their monolingual peers. In this light, we emphasize the importance of assessing all the

components (cognitive, psychological, and social) that may contribute to determining a bilingual student's academic outcome when assessing his/her learning skills.

The second aim of the current study regarded the exploration of the well-being of L2 students within the school context and whether learning and reading skills are related to well-being. A somewhat unexpected finding was that only L1-RD as a group perceived an adverse school climate when compared with L1-TD and L2. In the L2 group, in contrast, there was only a significant positive correlation between reading scores and measures of inclusion. The findings of the L1-RD group appear in line with recent evidence suggesting that adolescent reading difficulties have a negative effect not only on academic achievement, but also on social status recognition within the classroom group [64], well-being, and school engagement [68,69]. For example, students with learning difficulties often experience distrust in their abilities, low motivation, and low self-esteem. Additionally, they are afraid to participate in activities because they anticipate failure. This finding has several important implications. First, it suggests that monolingual students with learning difficulties are more prone to manifesting socially vulnerable conditions in the classroom setting, and this also occurs in adolescence, a particularly critical period of development. Second, it emphasizes the need to rise to the challenge of supporting students with learning difficulties in higher-order schools and promote inclusive practices targeted at this population. The lack of differences in school perception between L2 and L1-TD is probably due to the heterogeneity of the L2 group. Indeed, previous studies have shown that perceptions of school climates vary across ethnic groups [70]. Our findings could thus be regarded as the result of different cultural values and responsive strategies influencing students' tendency to perceive a positive school climate [70]. For example, Asian and Hispanic students reported more positive perceptions of school climate compared to other ethnic groups. Indeed, both ethnic groups share values such as respect for authority, education as self-development and achievement, and collectivism [70–72], contributing to the promotion of positive perceptions of school climate. However, since our L2 group was strongly heterogeneous (6% Asian, 39% Arabic, 6% Hispanic/Latinx, 28% Eastern Europe, and 22% Indian students), we could not test climate perception by aggregating data from different ethnic groups. Indeed, the low number of participants might not allow for an evaluation of the differences in school expectations and experiences. Further studies are needed to examine the impact of cultural diversity on students' school experience to identify specific, culturally responsive strategies to develop and maintain a positive school climate for all students.

The correlational analysis based on the collapsed data (i.e., including the three groups) revealed a significant positive association between well-being within the school context and reading comprehension and fluency, thus suggesting a relation between well-being and learning competence irrespective of student identity. The single correlations conducted on the different samples revealed a significant effect only in the L2 group. That is, only in the L2 group, the level of psychological well-being within the classroom, though overlapping with that of their L1 peers, was significantly correlated with their reading and writing measures, thus indicating a relation between learning skills and well-being at school. This finding is in line with the remarks made earlier regarding the Componential Model of Reading [46], indicating that weakness in reading skills might be a critical variable strictly connected to a vulnerability in psychosocial skills.

Along this vein, reading problems in L2 students might intensify feelings of inadequacy caused by the linguistic barrier that reduces interest in learning and participating in the educational context [73]. Additionally, our correlational analysis suggests once more that proficiency in reading skills might act as a protective factor in promoting a sense of belonging and inclusion in the classroom and peer groups [6]. In general, these findings suggest the crucial role that schools can play in promoting well-being in L2 students. As indicated by recent studies [74], educational activities should aim at supporting language and learning skills in the majority language while maintaining students' first language

across the school curriculum. L2 students should be provided with high-quality language interactions in all grades of school [74].

The study was limited in several ways. First, the sample size of the present exploratory study is limited due to the restricted criteria adopted to ensure the homogeneity of the L2 group. As a consequence, we are aware of the fact the current results may not be generalizable to the entire population. Therefore, current data need to be carefully considered to increase the sample size and thus, finally be able to provide a full characterization of the linguistic and learning skills of adolescents with Italian L2. This research may be considered a first step toward achieving this aim. Second, since social ties and sensitivities are relevant for adolescents, further study should consider aspects like cultural identity or group affiliation, i.e., whether L2 adolescents identify themselves as culturally alike to their surroundings with people from similar linguistic backgrounds. Lastly, as we already reported above, there was a reduced number of participants with a somewhat mixed ethnic background, though the group was homogeneous in terms of length of exposure. Consequently, the current pilot study might offer only an initial contribution to the study of the language and learning skills of L2 adolescents. In future work, we plan to enlarge our sample size, ideally involving a consistent number of participants with more homogenous L1 backgrounds. Doing so would make it possible to investigate cultural differences between subgroups.

A second issue refers to the inclusion of a receptive vocabulary measure that was neither adapted to Italian nor normed within the Italian population. To date in Italy, a measure of receptive vocabulary for the adult population is not yet available except for verbal tasks involved in intelligence and aphasiology batteries. Therefore, as previously suggested, we are aware that the lack of difference in lexical skills between L2 and L1 groups could be an artifact resulting from the use of a non-standardized test. Therefore, we recommend considering results about receptive vocabulary with caution.

As a final remark, our study highlights the need to support the development of language and reading skills during high school in a population such as L2 students. Indeed, even though the L2 participants of our sample had lived in Italy since birth, they still represent a population at risk for school exclusion, revealing difficulties in reading that may hinder the possibility of experiencing positive interactions with teachers and their peers within the school context. Including targeted linguistic/reading-based interventions aimed at monitoring and improving language and learning skills in the school program might positively promote social inclusion in the classroom.

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