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Examining the reading and writing performance of students with learning disabilities and students with low and high reading achievement *

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Abstract

In this study, the reading and writing performance of students with learning disabilities were compared to those of students with low and high reading achievement, and the distribution of achievement levels was examined. The study employed a correlational survey design, one of the quantitative research methods. Participants included 24 third- and fourth-grade students diagnosed with learning disabilities, along with 23 students demonstrating low reading achievement and 24 students demonstrating high reading achievement from the same classrooms as the students with learning disabilities. Measurements were conducted for variables including reading fluency, reading accuracy, reading comprehension, spelling, writing productivity, and content quality. The assessments utilized four tests from the Literacy Assessment Battery (Passage Reading Fluency Test, Passage Comprehension Test, Spelling Test, and Written Expression Test). The analysis revealed significant differences among the groups for all examined variables. Post-hoc test results indicated significant differences among all groups for reading fluency. For other variables, the learning disabilities and low reading achievement groups scored significantly lower than the high reading achievement group. However, no significant differences were found between the learning disabilities and low reading achievement groups. When group differences were analyzed based on z-scores, the gap between the learning disabilities group and the high reading achievement group ranged from 1 to 2 standard deviations across all variables. An analysis of the distribution of achievement levels showed that students in the learning disabilities and low reading achievement groups typically fell within very low and low levels for reading fluency and reading comprehension, while those in the high reading achievement group were mostly at moderate and high levels. For reading accuracy, the learning disabilities and low reading achievement groups were

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predominantly at the frustration level, whereas the high reading achievement group was at the independent level. Although the distribution patterns for spelling were less distinct than those for reading skills, students in the learning disabilities and low reading achievement groups tended to cluster at low and very low levels for writing productivity and content quality. In contrast, students in the high reading achievement group was predominantly at high levels. The findings were discussed in relation to previous research, and several recommendations were provided for future studies and practice.

Introduction

Reading and writing skills are among the most frequently used tools for accessing and sharing information in today's society. These skills not only enable individuals to be active and productive members of their communities but also form the foundation of academic success (Joshi, 2019). To achieve success across all subjects throughout their school lives, students must possess grade-level reading and writing skills (Rasinski et al., 2005). Research shows that students who fail to adequately develop these skills often experience academic failure (Boakye, 2017; Erbeli et al., 2020; Fatiloro et al., 2017; Jordan & Plakans, 2004; Miao et al., 2002). Academic failure, in turn, is frequently associated with low self-perception (Metsäpelto et al., 2020; Pullmann & Allik, 2008), social exclusion (Nowicki, 2003; Wentzel et al., 2021), problem behaviours (Bonifacci et al., 2008; Bub et al., 2007; Lugt, 2007; Metsäpelto et al., 2015) and school dropout (Beatriz Saraiva et al., 2011; Glennie et al., 2012). In addition, students with low academic achievement are more likely to secure low-status jobs in the future (Rothon et al., 2009). Given these potential negative outcomes, it is crucial to examine students' achievement levels in reading and writing skills to better understand and address these challenges.

Despite their critical importance for academic and social life, many students struggle with reading and writing skills due to their complex nature (Demirtaş & Ergül, 2019; Ergül, 2012; Ergül et al., 2022; Gao et al., 2018; Hooper et al., 1993; Jenkins et al., 2003; Lovett et al., 2000; Nascimento et al., 2011). According to a national assessment report published in the United States, one in three fourth-grade students performs significantly below grade level in reading and writing skills (National Assessment of Education Progress [NAEP], 2017). Similarly, a study conducted in Türkiye (Ergül et al., 2022) revealed that 34% of first-grade students exhibited low reading achievement by the end of the school year, and 66.9% of these students continued to exhibit low performance in the second grade. For some students, these difficulties may stem from various environmental disadvantages, such as limited learning opportunities, insufficient or unqualified teaching, and low socioeconomic status. However, in a significant number of students, these problems may be attributed to learning disabilities (Bear et al., 1998; Nazer & Hamid, 2017; Sanders et al., 2018; Semrud-Clikeman & Glass, 2008).

Learning disabilities (LD) are characterized by difficulties in acquiring or developing skills such as listening, speaking, reading, writing, mathematics, and reasoning (National Joint Committee on Learning Disabilities [NJCLD], 2016). These difficulties are not caused by intellectual disabilities but arise from impairments in cognitive processes critical to children's learning (Swanson, 2010). Therefore, reading and writing difficulties arising from LD are not caused by conditions such as insufficient learning opportunities, general intelligence level, physical disabilities and emotional/behavioural disorders (Swanson, 2010). It is estimated that 5-15% of school-age children have LD (American Psychiatric Association [APA], 2013). Moreover, students with LD represent the largest subgroup among students with disabilities (National Centre for Education Statistics, 2023). Although the prevalence of LD in Türkiye remains significantly lower than the figures reported in developed countries, a rapid increase in the number of diagnosed LD cases has been observed, driven by growing social awareness and advancements in educational practices (Melekoğlu et al., 2009).

Students with LD generally experience difficulties in language development and literacy skills, with the most pronounced challenges occurring during the acquisition of reading skills. Indeed, 80-90% of these students are referred to special education services due to problems with reading (Bender, 2007; Kavale & Reese, 1992; Lyon et al., 2001). A closer examination of their reading difficulties reveals that a significant proportion struggle with decoding and word recognition skills (Karageorgos et al., 2020; Martínez-García et al., 2019) and fail to learn letter-sound correspondences (Shaywitz & Shaywitz, 2005; Vellutino et al., 2004), leading to frequent errors during reading (Lyon et al., 2003). Many of these students not only fail to develop decoding but also do not develop reading fluency. Even among those who learn to decode, some do not achieve fluency, and these students typically read at a slower pace than their grade-level peers (Arabacı, 2022; Aracı & Melekoğlu, 2023; Carpenter & Miller, 1982; Nascimento et al., 2011; Torppa et al., 2020). Research shows that students with LD are often 2-3 years or 1-2 standard deviations behind their typically developing peers in reading skills (Ferrer et al., 2015; Ferrer et al., 2023). Consequently, reading difficulties in students with LD can manifest at varying levels and types, presenting a heterogeneous profile. These variations in reading difficulties are addressed in theoretical approaches such as the double-deficit hypothesis and phonological processing (Norton & Wolf, 2012; Wolf & Bowers, 1999). These theoretical frameworks emphasize that the diverse manifestations of LD correspond to the variety of underlying causes.

Another key skill that students with LD often struggle with is reading comprehension (Hulme & Snowling, 2016). Reading comprehension is considered the ultimate goal of reading (Paris & Hamilton, 2009), and academic success is largely achieved through it (García-Madruga et al., 2014; Meneghetti et al., 2006). However, due to the complexity of the reading comprehension process and the multitude of skills it involves, students with LD face various challenges in this area (Sulaimon & Schaefer, 2023). These students encounter difficulties in understanding words/sentences, grasping the message conveyed by a sentence or paragraph, connecting with prior knowledge, and making inferences about information or messages not explicitly stated in the text (Borella et al., 2010; Watson et al., 2012). Such challenges intensify as students progress through grades and are required to read more difficult and complex texts and apply the knowledge gained from them (Richmond et al., 2023; Vaughn, Klingner vd., 2011). According to the Simple View of Reading model, reading comprehension primarily relies on decoding and language comprehension skills (Gough & Tunmer, 1986). The relative importance of these skills varies by grade level; during the early years of elementary school, decoding has a greater impact on reading comprehension, while in later years, language comprehension becomes more significant (Castles et al., 2018; Gentaz et al., 2015; Oslund et al., 2018). Accordingly, differences in reading comprehension performance among students in early elementary grades can often be attributed to their decoding performance, whereas in later years, differences are more strongly linked to their language comprehension skills (Catts et al., 2012; Oakhill et al., 2019). Students with LD face difficulties in one or both of these areas (Hulme & Snowling, 2016; Kida et al., 2016; Snowling et al., 2019), which leads to increasingly severe reading comprehension challenges as they progress through school. A longitudinal study by Snowling et al. (2020) found that students with reading difficulties lagged behind their typically developing peers in vocabulary knowledge, decoding, and reading comprehension in both second and third grade. Similar findings have been reported in studies involving middle school students with reading difficulties, showing deficits in decoding, oral language, and reading comprehension skills compared to their peers (Cirino et al., 2013; Kalindi & Chung, 2018; Richmond et al., 2023). In fact, a report from the United States indicated that 88% of students with LD perform below average in reading comprehension (Cortiella & Horowitz, 2014). Additionally, research has identified that reading comprehension problems in students with LD may stem from deficits in working memory, strategy use, and prior knowledge (Brandenburg et al., 2015; Cain & Oakhill, 2007; De Weerdt et al., 2013). Collectively, these findings indicate that reading comprehension problems in students with LD are both widespread and severe.

Students with LD also experience difficulties in writing, similar to their challenges in reading (Graham et al., 2021). Writing is one of the most frequently used skills in students' academic lives. As such, instruction in both reading and writing begins in the first year of elementary school, with the aim of developing students' handwriting and spelling skills. The ultimate goal of writing instruction is to enable students to effectively express their knowledge, emotions, thoughts, and experiences in written form and to communicate through writing (Tan & Miller, 2007). However, due to the reliance of reading and writing on similar cognitive resources (Graham, 2020), students with LD face significant difficulties in writing, just as they do in reading and reading comprehension (Afonso et al., 2020; Dickerson Mayes & Calhoun, 2007; Hebert et al., 2018; Suárez-Coalla et al., 2020). These students often struggle with acquiring handwriting skills, forming letters correctly, and spelling words accurately. Such challenges result in the production of illegible texts that are short in word count and poorly organized (Liberty & Conderman, 2018; Santangelo & Quint, 2008; Troia, 2006). Similar to reading skills, the difficulties experienced by these students increase as they progress to higher grade levels and face more complex writing tasks. Goldstand et al. (2018) reported that students with writing difficulties experience more handwriting challenges than their typically developing peers. Kalindi and Chung (2018) found that the spelling performance of typically developing students was twice as high as that of students with LD. García and Fidalgo (2008) observed that texts written by students with LD were inferior in content quality, organization, and structure compared to those of their typically developing peers.

The reading and writing difficulties experienced by students with LD typically emerge in first grade and intensify as they progress through elementary school. However, diagnostic and support processes often begin much later than the onset of these difficulties, further widening the gap between these students and their peers. Therefore, identifying the extent of reading and writing problems faced by students with LD in third and fourth grades, understanding the differences between them and their peers, determining intervention needs, and raising awareness about the importance of earlier interventions are deemed crucial. This information could serve as a guide for teachers, families, and policymakers in preventing these problems from escalating. Additionally, understanding the extent of differentiation in reading and writing skills at grades where these skills become tools for learning (such as third and fourth grade) can provide valuable insights into the effectiveness of special education services and inclusive practices offered to these students. Despite the frequent reporting of such findings in international literature, studies examining the extent of reading and writing difficulties faced by students with LD in Türkiye and the performance differences between them and their peers remain limited. Considering these aspects, there is a need to identify the specific difficulties and levels of challenges faced by students with LD and to examine the extent and areas of differentiation compared to their typically developing peers. Accordingly, this study aims to determine and comparatively examine the reading and writing skill levels of students with LD, as well as those with low reading achievement (LRA) and high reading achievement (HRA). To achieve this, the study seeks to address the following research questions:

1. Are there significant differences in reading fluency, reading accuracy, reading comprehension, spelling, and written expression performances among third- and fourth-grade students with LD, LRA, and HRA?
2. What are the distributions of performance levels in reading fluency, reading accuracy, reading comprehension, spelling, and written expression among third- and fourth-grade students with LD, LRA, and HRA?

Method

This study employed the correlational survey model, one of the quantitative research methods. Correlational survey studies examine the relationships between two or more variables without any intervention (Frankel et al., 2022).

Participants

The participants included 71 third- and fourth-grade students attending nine primary schools in Kırıkkale, comprising 24 students diagnosed with LD, 23 students with LRA, and 24 with HRA. The students with LD were selected from those registered with medical and educational diagnosis reports at the Kırıkkale Guidance and Research Center, and those with an IQ score below 85 or comorbid diagnoses were excluded. A total of 25 students with LD were initially identified, with one student selected from each class. Face-to-face meetings were held with the teachers of these students, who were asked to nominate one student with LRA and one with HRA from their classes, provided these students had no formal diagnoses. To confirm the suitability of the nominated students' reading levels for the study and to validate the diagnoses of the LD group, the Passage Reading Fluency Test from the Literacy Assessment Battery (LAB) was administered. Based on these evaluations, one student with moderate reading achievement from the LD group, two students with moderate reading achievement from the LRA group, and one student with low reading achievement from the HRA group were excluded. The final sample consisted of students aged between 101-124 months, with a mean age of 112 months for the LD group, 114 months for the LRA group, and 112 months for the HRA group. The LD group included 9 girls and 15 boys, the LRA group included 9 girls and 14 boys, and the HRA group included 14 girls and 10 boys. The distribution of the groups by grade level and reading levels is shown in Table 1.

Table 1. Distribution of Groups by Grade Level and Reading Levels

	Groups					
	LD		**LRA**		**HRA**	
	n	**%**	**n**	**%**	**n**	**%**
Grade Level						
Grade 3	11	45.8	10	43.5	12	50.0
Grade 4	13	54.2	13	56.5	12	50.0
Reading Level						
Very Low	21	87.5	15	65.2	0	0
Low	3	12.5	8	34.8	0	0
Moderate	0	0	0	0	11	45.8
High	0	0	0	0	11	45.8
Very High	0	0	0	0	2	8.3

Data Collection Instruments

Literacy Assessment Battery

LAB is a test battery developed to evaluate the reading, reading comprehension, and writing skills of students from first to fourth grade (Ergül et al., 2021). The battery includes four tests for assessing reading (Word Recognition Test, Word Decoding Test, Phonetic Analysis Test, and Passage Reading Fluency Test), three tests for reading comprehension (Passage Comprehension Test, Semantic Processing Test, and Cloze Test), and three tests for writing (Spelling Test, Copying Test, and Written Expression Test). Most tests are time-based, measuring the number of words read/written or items answered correctly within a specified time frame (e.g., 60-90 seconds). Each test has two forms, A and B. Based on the assessment results, student performance can be classified as very low, low, moderate, high, or very high, according to the cut-off scores and intervals defined by LAB. The battery is administered only by specialists trained in its application.

The validity and reliability of LAB have been thoroughly tested. For discriminative validity, significant differences were found between upper and lower groups (η2=.53-.71). Criterion validity demonstrated significant correlations (r=.10-.44) between LAB scores and skills such as phonological awareness, working memory, rapid naming, letter knowledge, oral language, and vocabulary. Cronbach's alpha coefficients for internal consistency ranged from .67 to .85, test-retest correlation coefficients ranged from .86 to .96, and equivalence correlation coefficients between A and B forms ranged from .82 to .96.

Within the scope of this study, four tests of the LAB, namely the Passage Reading Fluency Test, Passage Comprehension Test, Spelling Test, and Written Expression Test, were used. The tests used are briefly explained in the following section.

Passage Reading Fluency Test. This test measures students' reading fluency, evaluating the number of correctly read words in one minute. Student performance is assessed using two passages—one narrative and one informational. In this study, students read passages prepared in 14-point font size, aligned with their grade level, aloud, and the number of correct words read within one minute was recorded.

Passage Comprehension Test. Developed to assess students' reading comprehension, this test uses the same passages as the Passage Reading Fluency Test. After reading the passages aloud, students are asked to silently re-read them and then answer six factual and three inferential questions verbally. Correct answers to these questions are recorded as the performance score.

Spelling Test. Designed to evaluate writing accuracy and fluency, this test requires students to write the dictated words correctly and quickly within 90 seconds. Each word is dictated twice in a clear and sequential manner. The number of correctly written words within the 90-second limit constitutes the performance score.

Written Expression Test. This test assesses written expression skills. Students are asked to write a story based on images depicting an event, including the setup, conflict, and resolution. They are given 30 seconds to plan by observing the images before starting to write. The images remain visible throughout the writing process, which has no time limit. The written stories are evaluated separately for the total number of correct words and for readability and content quality using rubrics. In this study, the students' stories were assessed based on the total number of correct words (writing productivity) and content quality using the respective rubric.

Data Collection Process

The data of this study were collected within the scope of the approval obtained from the Ethics Committee of Kırıkkale University with the decision dated 18/06/2022 and numbered 06 and the permissions obtained from the provincial directorate of national education. Consent forms were collected from the parents of all participating students. Assessments were conducted in a quiet environment within the schools, free from distractions. Prior to the assessments, students were engaged in brief conversations to help them feel comfortable and adapt to the evaluator, and they were provided with information about the assessment process. Each assessment was conducted in a single session lasting 25-30 minutes. The data collection process was completed over a period of one and a half months, during May and June.

Inter-Rater Reliability

Inter-rater reliability was calculated for the assessments conducted with the participants. To this end, the evaluation forms of 22 students (30% of the sample), randomly selected from the 71 participants, were re-scored by a doctoral student specializing in Turkish Education. Inter-rater reliability was determined to be 90% for the Passage Reading Fluency Test, 95% for the Passage Comprehension Test, 90% for the Spelling Test, 95% for the Written Expression Test, and 86% for the Content Quality Rubric. Inter-rater reliability was calculated using the formula "Agreement / (Agreement + Disagreement) x 100" (Tekin-İftar & Kırcaali-İftar, 2013).

Data Analysis

Descriptive statistics were initially examined for participants' scores in reading fluency, reading accuracy, reading comprehension, spelling, writing productivity, and content quality. Outliers were checked, and normality tests were conducted. For the first research question, group comparisons were performed using one-way analysis of variance (ANOVA). Since normal distribution could not be achieved for the Spelling Test scores of students with HRA (Skewness: -1.420; Kurtosis: 3.48) (George & Mallery, 2010), ANOVA with bootstrapping was employed. Post-hoc analysis was conducted to identify which groups differed significantly. Effect sizes were interpreted based on thresholds of .01, .06, and .14 for small, medium, and large effects, respectively (Büyüköztürk, 2018).

For the second research question, the distribution of students' performance levels on the relevant variables was examined across five levels (very low, low, moderate, high, very high) based on LAB cut-off scores and evaluation intervals. Reading accuracy performance was calculated as the ratio of the number of correct words read per minute to the total number of words read, and distributions were determined across three levels (below 89% as "frustration," 90-94% as "instruction," and 95% and above as "independent"; Rasinski & Hoffman, 2003).

Findings

In this study, which aimed to compare the performance of students with LD, LRA, and HRA in terms of reading fluency, reading accuracy, reading comprehension, spelling, writing productivity, and content quality, the analyses began with an examination of the descriptive statistics for the groups. Subsequently, to address the first research question, ANOVA was used to test whether there were significant differences between the groups' performance on the relevant variables and, if significant differences were found, post-hoc tests were conducted and the effect sizes were calculated. The mean scores, standard deviations, and ANOVA results are summarized in Table 2.

Table 2. Mean Scores, Standard Deviations, and ANOVA Results of Groups in Target Variables

Variable	Group	n	$\bar{X}$	SD	F	p	Post-Hoc	η2
Reading Fluency	LD	24	52.58	17.93	104.86	.000	LD-HRA	.75
	LRA	23	63.63	12.82			LD-LRA	
	HRA	24	110.83	12.91			LRA-HRA	
Reading	LD	24	81.79	5.31	65.71	.000	LD-HRA	.65
Accuracy	LRA	23	83.87	6.14			LRA-HRA	
	HRA	24	96.41	1.71				
Reading	LD	24	4.52	1.25	20.16	.000	LD-HRA	.37
Comprehension	LRA	23	5.06	1.81			LRA-HRA	
	HRA	24	7.06	1.24				
Spelling	LD	24	18.54	6.22	12.81	.000	LD-HRA	.27
	LRA	23	20.74	3.30			LRA-HRA	
	HRA	24	24.96	3.09				
Writing	LD	24	25.25	11.36	26.95	.000	LD-HRA	.44
Productivity	LRA	23	31.57	11.23			LRA-HRA	
	HRA	24	53.96	18.64				
Content Quality	LD	24	9.67	2.31	31.92	.000	LD-HRA	.48
	LRA	23	10.48	2.29			LRA-HRA	
	HRA	24	15.13	2.96				

As seen in Table 2, the LD group had the lowest mean scores across all variables, followed by the LRA group with slightly higher scores, while the HRA group had the highest mean scores. Significant differences ($p < .05$) were found among the groups for all variables related to reading and writing. These differences demonstrated a very large effect size in all cases ($\eta 2 > .14$). Post-hoc test results (Tukey) indicated that, for reading fluency, significant differences were present among all three groups. For the remaining variables, the LD and LRA groups scored significantly lower than the HRA group, but no significant differences were found between the LD and LRA groups. For a visual analysis of group differences, the group means were standardized as z-scores and presented in Figure 1.

Figure 1. Visual Analysis of Groups' Performance in Target Variables Based on Z-Scores

Figure 1, which clearly illustrates the differences among the groups, shows that the performance scores of the groups differ significantly from one another. Specifically, students with LD demonstrated differences exceeding 1 standard deviation compared to students with HRA across all variables. Among these variables, reading fluency showed the most pronounced difference, with LD students scoring up to two standard deviations lower than HRA students. A similarly notable difference, approximately two standard deviations, was observed in reading accuracy. For variables such as reading comprehension, spelling, writing productivity, and content quality, differences of up to 1.5 standard deviations were observed. Among these, spelling exhibited the smallest difference relative to the other variables. When comparing LRA and HRA students, the differences exceeded 1 standard deviation across all variables except spelling. For reading fluency and accuracy, the differences were approximately 1.5 standard deviations, while the difference in spelling was close to 1 standard deviation.

For the second research question, the analysis descriptively examined the distribution of the groups' performance levels across the relevant variables. The LAB tests were categorized into five levels: very low, low, moderate, high, and very high, while reading accuracy was analyzed at three levels: frustration, instructional, and independent. The results are presented in Tables 3 and 4.

Table 3. Distribution of Groups' Performances in Target Variables Across Achievement Levels

Reading Level	Group	Reading Fluency		Reading Comprehension		Spelling		Writing Productivity		Content Quality	
		n	%	n	%	n	%	n	%	n	%
Very Low	LD	21	87.5	22	91.6	12	50	1	4.1	10	41.6
	LRA	15	65.2	16	69.5	5	21.7	0	0	7	30.4
	HRA	0	0	6	25	1	4.1	0	0	1	4.1
Low	LD	3	12.5	2	8.3	1	4.1	13	54.1	12	50
	LRA	8	34.7	4	17.3	6	26	10	43.4	11	47.8
	HRA	0	0	1	4.1	0	0	1	4.1	5	20.8
Moderate	LD	0	0	0	0	10	41.6	10	41.6	2	8.3
	LRA	0	0	0	0	9	39.1	12	52.1	5	21.7
	HRA	11	45.8	15	62.5	16	66.6	5	20.8	8	33.3
High	LD	0	0	0	0	0	0	0	0	0	0
	LRA	0	0	1	4.3	0	0	1	4.3	0	0
	HRA	11	45.8	2	8.3	6	25	13	54.1	10	41.6
Very High	LD	0	0	0	0	1	4.16	0	0	0	0
	LRA	0	0	0	0	3	13.0	0	0	0	0
	HRA	2	8.3	0	0	1	4.1	5	20.8	0	0

As shown in Table 3, it is evident that the intended distribution in reading fluency was achieved, as the students' reading levels were used as the basis for forming the research groups. Accordingly, students with LD and those with LRA were exclusively categorized at the very low and low levels for reading fluency, while students with HRA were concentrated at the moderate and high levels. For other variables, similar distributions to reading fluency were observed in reading comprehension and content quality. Students with LD and those with LRA were predominantly concentrated at the very low and low levels in both variables, while students with HRA were mostly concentrated at the moderate level for reading comprehension and at the moderate and high levels for content quality. In writing productivity, students with LD and LRA were mostly concentrated at the low and moderate levels, whereas students with HRA were concentrated at the moderate and high levels. Lastly, the distribution for spelling showed a broader spread. Students with LD were predominantly concentrated at the very low and moderate levels, students with LRA were spread across the very low, low, and moderate levels, and students with HRA were more concentrated at the moderate and high levels.

Table 4. Distribution of Groups' Reading Accuracy Performances by Accuracy Levels

Level	Group	Reading Accuracy	
		n	%
Frustration	LD	23	95.8
	LRA	18	78.2
	HRA	0	0
Instruction	LD	1	4.1
	LRA	4	17.3
	HRA	3	12.5
Independent	LD	0	0
	LRA	1	4.3
	HRA	21	87.5

As presented in Table 4, it was observed that 23 of the students with LD, except for one, were at the frustration level in terms of reading accuracy. Among the students with LRA, 18 were at the frustration level, while 4 were at the instruction level. On the other hand, among the students with HRA, 21 were at the independent level, while 3 were at the instruction level.

Conclusion and Discussion

This study compared the performance of students with LD, LRA, and HRA in reading fluency, reading accuracy, reading comprehension, spelling, and written expression skills, and examined the distribution of their achievement levels. The results of the group comparisons for the first research question indicated significant differences among the groups across all variables. According to the post-hoc test results, the LD and LRA groups scored significantly lower than the HRA group, while no significant differences were found between the LD and LRA groups in skills other than reading fluency. For the second research question, the analysis of achievement level distributions revealed that in reading fluency and reading comprehension, the LD and LRA groups were primarily at very low and low levels, whereas the HRA group was concentrated at moderate and high levels. In reading accuracy, the LD and LRA groups were predominantly at the "frustration" level, while the HRA group was at the "independent" level. Although the distributions in spelling were less pronounced compared to reading, the LD and LRA groups were concentrated at low and very low levels in word production and content quality, while the HRA group was concentrated at high levels. The findings were discussed in detail with a focus on group performances.

The results of the analyses aligned with previous research findings on students with LD. These findings indicate that students with LD demonstrated the lowest performance among the groups in reading and writing. In terms of achievement levels, they were concentrated at very low and low levels in reading fluency, reading comprehension, and content quality; very low and moderate levels in spelling; low and moderate levels in writing productivity; and at the "frustration" level in reading accuracy. These findings are consistent with prior studies investigating the reading and writing skills of students with LD (Alves et al., 2014; Arabacı, 2022; Aracı & Melekoğlu, 2023; Chung et al., 2011; Cirino et al., 2013; Graham et al., 2017; Kalindi & Chung, 2018; Lin et al., 2020; Mather et al., 1991; Richmond et al., 2023; Snowling et al., 2020; Toledo Piza et al., 2014; Torppa et al., 2020). For example, a study by Lin et al. (2020) found that students with LD performed significantly lower in reading fluency and reading comprehension compared to their typically developing peers. Similarly, Graham et al. (2017) reported that students with LD scored one standard deviation lower in content quality compared to their peers. These findings, consistent with previous research, clearly highlight the low performance of students with LD in reading and writing and the significant differences in their abilities compared to grade-level expectations.

The findings regarding group differences revealed significant differences across all skills between students with LD and those with HRA. Specifically, in reading, HRA students read an average of 110 words per minute, while LD students read only 52 words, demonstrating that LD students achieved less than half the reading fluency of the HRA group. Furthermore, the reading fluency of LD students in third and fourth grades corresponds to the performance level of students in the second semester of first grade, according to the LAB standards. Similarly, in writing, HRA students produced an average of 53 words while writing a narrative text, compared to only 25 words produced by LD students. This performance indicates that LD students achieved less than half the writing output of the HRA group, corresponding to the performance level of students in the second semester of second grade, based on LAB standards. These results suggest that LD students are 2-3 years behind in reading fluency and 1-2 years behind in writing productivity for written expression relative to their grade level. When the test scores were standardized as z-scores, the differences were approximately 2 standard deviations for reading fluency and reading accuracy, 1.5-1.6 standard deviations for written expression skills, and 1-1.5 standard deviations for reading comprehension and spelling. Similarly, numerous studies in the literature have found that students with LD are 1-3 years behind their peers or demonstrate performance that is 1-2 standard deviations lower in reading and writing (Ferrer et al., 2015; Ferrer et al., 2023; Graham et al., 2017).

These findings, consistent with previous research, warrant careful consideration from multiple perspectives regarding students with LD. First, the significant performance gap observed between students with LD and those with HRA highlights the urgent need for interventions and preventive measures. Prior studies indicate that such performance gaps are likely to widen over time (Ergül et al., 2023; Prochnow et al., 2015), potentially leading to broader academic failure and more complex challenges. For instance, one study identified low reading performance in third grade as a strong predictor of high school dropout (Alexander et al., 2001), while another study reported that approximately 75% of high school dropouts had reading difficulties (Sweet, 2004). Based on these findings, it is highly likely that the low performance levels observed in LD students in third and fourth grades will persist and intensify, potentially evolving into different problems if not addressed with timely and appropriate interventions. In the Turkish education system, students identified with LD are educated in general education classrooms but can receive up to 40% of their weekly instruction time in resource rooms (Özel Eğitim Hizmetleri Yönetmeliği, 2018) or up to three hours of support per week in private special education and rehabilitation centers (Milli Eğitim Bakanlığı Özel Eğitim Kurumları Yönetmeliği, 2012). While the extent of additional support received by the students in this study was not determined, the findings clearly indicate that the current support services are insufficient for bringing students to grade-level performance. Based on these results, it is evident that support services for LD students in Türkiye need to be expanded, and schools must plan more intensive, long-term interventions for these students. Research shows that high-quality interventions targeting reading and writing skills are highly effective in preventing these difficulties and improving the reading and writing abilities of LD students (Chard et al., 2002; Datchuk et al., 2020; Donegan & Wanzek, 2021; Graham & Kelly, 2018; Horne, 2017; Jeffes, 2016; Johnston, 2002; Roberts et al., 2015; Rosário et al., 2019; Vaughn, Wexler vd., 2011; Vellutino et al., 2004). Therefore, selecting and implementing appropriate methods and techniques in intervention programs is likely to be effective in mitigating the challenges faced by these students.

Secondly, the findings regarding the low performance of students with LD provide valuable insights for planning interventions targeting these students. Primarily, the significantly lower performance of LD students in reading fluency and reading accuracy compared to their peers highlights a critical need for intensive support in these areas. Although reading difficulties are more prominent in LD, the study's findings also demonstrate that these students lag significantly behind their peers in writing skills, such as spelling and written expression. Therefore, interventions for students with LD should adopt a multidimensional approach, focusing not only on reading skills but also on other competencies, such as spelling and written expression. Such a comprehensive intervention plan could contribute significantly to mitigating the challenges these students face. Moreover, considering the potential differences in individual needs among students, it is evident that tailoring intervention content to address these specific needs will be crucial in enhancing their effectiveness.

Another noteworthy finding from the analyses conducted for the research questions relates to the performance of students with LRA. The results indicate that the differences between LRA students and those with LD were not significant in skills other than reading fluency. Similarly, in terms of achievement levels, LRA students were predominantly concentrated at very low and low levels in reading fluency, reading comprehension, and content quality; at low and moderate levels in spelling and writing productivity for written expression; and at the "frustration" level in reading accuracy. These findings suggest that there are many students who, despite not having a formal diagnosis, demonstrate performance as low as that of students with LD in reading and writing. Similar findings have been reported in previous studies (e.g., Ergül, 2012; Ergül et al., 2022; Hooper et al., 1993; Jenkins et al., 2003; Lovett et al., 2000; Nascimento et al., 2011; Seçkin Yılmaz & Baydık, 2017). These results highlight the need for careful evaluation of Türkiye's diagnostic system. Students without a formal diagnosis but with low reading and writing performance may be experiencing undiagnosed learning disabilities. However, the lack of recognition of these difficulties points to certain issues within the diagnostic system in Türkiye. Studies on the diagnostic process in Türkiye reveal several challenges. For instance, experts and teachers involved in the initial identification process often lack sufficient knowledge (Çakmak,

2017; Fırat & Koçak, 2020; Öğülmüş et al., 2021), while very short durations were allocated for the evaluation process (Çağlayan, 2022). The tools used for assessment are also found to be limited and inadequate (Çağlayan, 2022; Yanık & Gürgür, 2017), and there is a shortage of trained professionals involved in the diagnostic process (Doğan & Türkkal, 2019; Ekim, 2015). Furthermore, effective collaboration among specialists and institutions involved in the diagnostic process is often lacking (Çakmak, 2017; Doğan & Türkkal, 2019; Dayı et al., 2022; Öğülmüş, 2021; Yılmaz & Doğan, 2023), and families are not sufficiently included in the process (Avcıoğlu, 2012; Dayı et al., 2022; Yanık & Gürgür, 2017). Considering all these findings and results, it is evident that problems within Türkiye's diagnostic system play a significant role in the failure to recognize reading and writing difficulties, accurately assess the severity of these challenges, and properly diagnose students with LD.

In conclusion, the findings of this study demonstrate that the performance of students with LD is significantly lower not only compared to their peers with HRA but also relative to their grade level. To prevent this pronounced performance gap from widening further, it is suggested that expanding support education services and developing intensive, long-term intervention programs targeting reading and writing skills would be beneficial. Additionally, the observation that students with LRA exhibited similar performance levels to those with LD is a notable finding, raising concerns that some students with LD may remain undiagnosed. Therefore, these results underline the critical importance of implementing high-quality interventions and improving diagnostic processes to enhance the performance of both LD and LRA students.

Limitations and Recommendations

When interpreting the results of this study, it is essential to consider its limitations. First, the study was conducted with 24 students diagnosed with LD, 23 students with LRA, and 24 students with HRA, all of whom were enrolled in schools in Kırıkkale. To strengthen the generalizability of the findings, future research is recommended to involve larger student groups from different regions. Second, the data analysis was limited to between-group comparisons. Future studies could employ different statistical methods to identify the variables that explain the reading and writing performance of these groups. Additionally, longitudinal studies could be conducted to explore questions such as how differences in reading and writing skills between LD, LRA, and HRA students evolve over time, whether LRA students eventually receive an LD diagnosis, or how many continue their education without being diagnosed. Third, this study focused on reading and writing skills, specifically reading fluency, reading accuracy, reading comprehension, spelling, and written expression. Future research could include other skills, such as word decoding, word identification, or copying, to investigate differences across a broader range of reading and writing abilities. Lastly, this study was limited to third- and fourth-grade students. Future research could extend these comparisons to students in earlier elementary grades or later grades, such as middle school, to provide valuable insights into how the reading and writing skills of LD students differ from their typically developing peers across various educational stages.

Based on the results of this study, several practical recommendations can be made. First, efforts should be undertaken to improve the quality of special education services, and teachers working with students with LD should receive training on reading and writing interventions. This is considered crucial for enhancing the low performance of LD students and narrowing the gap between them and their peers. Second, to effectively identify students who have not been formally diagnosed but exhibit similar challenges to those with LD, it is recommended to improve the effectiveness of the diagnostic system and adopt evidence-based approaches such as response-to-intervention models. Implementing more effective diagnostic approaches could significantly contribute to reducing the potential long-term negative outcomes for all students experiencing reading and writing difficulties.

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