

Characterization of reading processes in students with dyslexia and learning disabilities

Caracterização dos processos de leitura em escolares com dislexia e distúrbio de aprendizagem

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ABSTRACT

Purpose: To characterize and to compare the performance of students with dyslexia, learning disabilities, and students with good academic performance in the reading processes. **Methods:** Participants were 60 students of both genders attending first to fourth grades of public elementary schools, who were divided into three groups: GI – 20 students with interdisciplinary diagnosis of dyslexia; GII – 20 students with interdisciplinary diagnosis of learning disabilities; and GIII – 20 students with good academic performance, paired according to gender, age and schooling to GI and GII. Students were submitted to the application of the Brazilian adaptation of the Assessment of Reading Processes (PROLEC), which is composed by four blocks of processes: identification of letters, lexical, syntactic and semantic processes. **Results:** Students from GIII showed superior performance in the tasks, compared to the students from GI and GII. Differences were found in tasks of punctuation and clause and text comprehension, in which GII presented lower performance when compared to GI. Regarding the classification of the results, most GI students had normal performance on the identification of letters and great difficulty on the lexical process tasks, which impaired the other processes; GII showed great difficulty in all processes. **Conclusion:** Students with dyslexia and learning disabilities have lower performance in the reading processes tasks. Students with dyslexia present difficulties in the performance of lexical, syntactic and semantic processes, and students with learning disabilities show difficulties in all processes evaluated.

Keywords: Evaluation; Reading; Dyslexia; Learning disorders; Child behavior disorders; Language development

INTRODUCTION

Reading can occur through a process that involves phonological mediation (phonological route) or through direct visual process (lexical route). Reading by the phonological route depends on the use of the knowledge of conversion rules between grapheme and phoneme so that the construction

of the pronunciation of a word can be made. Reading by the lexical route depends on previous knowledge of a word and its memorization on the visual system of word recognition, and on the retrieval of the meaning and pronunciation of the words in this system through a direct addressing to the lexicon; this pronunciation is obtained as a whole. Both routes are complementary and used in different measures during reading⁽¹⁻⁶⁾.

Study developed at the Laboratory for the Investigation of Learning Disabilities, Department of Speech-Language Pathology and Audiology, School of Science and Philosophy, Universidade Estadual Paulista “Júlio de Mesquita Filho” – UNESP – Marília (SP), Brazil.

Conflict of interests: None

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The relation between the phonological ability and learning to read is of high significance to the beginner students, because if the phonological representation is not assimilated there can be difficulties in the learning of reading. Alterations in the phonological skills are found mainly in students with learning disorders that show slow and laborious reading, which puts in disadvantage all the tasks that require reading, especially in timed trials and tests⁽⁷⁻¹⁰⁾.

There are innumerable learning problems that can interfere in the child's school performance, among which are the learning disorders of academic origin and the specific learning disorders, such as developmental dyslexia and learning disorder⁽¹¹⁾. Dyslexia is a specific learning disorder of neurological origin, characterized by difficulty with correct fluency in reading and difficulty in the ability of decoding and spelling, arising from a phonological deficit in language⁽¹²⁾. Learning

disorder is a differential diagnosis both in relation to dyslexia and learning difficulty; it is a generic expression that refers to a group of alterations that manifest significant difficulties in the acquisition and use of hearing, speech, reading, writing, reasoning or mathematic abilities^(6,13-15).

Students with dyslexia have difficulty in the correct fluency of reading and in the decoding ability, alteration in the discrimination of sounds, phonological awareness, and limitation of short-term memory. They can also have problems with long-term memory, due to the difficulty of forming lexicon for storage, with consequent performance loss in reading irregular words, low frequency words, pseudowords, in the growth of vocabulary, and in the comprehension of the read material^(11,12,16). Students with learning disorder show altered characteristics in abilities such as the identification or decoding of words, pseudowords reading, reading comprehension and fluency, auditory comprehension, calculus, mathematic reasoning, spelling, growth of vocabulary, and oral and writing expression^(17,18).

In countries where the official language is Spanish, some researchers^(10,19-23) have been using the PROLEC⁽²⁴⁾ and the PROLEC – SE⁽²⁵⁾ to evaluate and define the reading processes of elementary and high school students, respectively. With these instruments, they seek to establish a consensus between the procedures used to define the profile of the students regarding the performance on reading processes and their predictors for literacy⁽²³⁾.

Based on the aforementioned, this study had the aim to characterize and compare the performance of students with dyslexia, learning disabilities, and students with good academic performance in reading processes.

METHODS

This study was carried out after having been approved by the Research Ethics Committee of the Universidade Estadual Paulista “Júlio de Mesquita Filho” (UNESP), under protocol 0579/2008. Participants were 60 students of both genders, with ages between 8 years and 2 months to 10 years and 11 months, who attended first to fourth grades of public elementary school. Students were divided into three groups:

- Group I (GI): composed by 20 students, 17 (85%) male and three (15%) female, with interdisciplinary diagnosis of dyslexia – six (30%) from second grade, seven (35%) from third grade, and seven (35%) from fourth grade.
- Group II (GII): composed by 20 students, 13 (65%) male and seven (35%) female, with interdisciplinary diagnosis of learning disability – four (20%) from first grade, six (30%) from second grade, five (25%) from third grade, and five (25%) from fourth grade.
- Group III (GIII): composed by 20 students with good academic performance, indicated by teachers of a public school from Marília (SP), Brazil, based on satisfactory performance for two consecutive months in Portuguese and Mathematics tests. Students were paired up to the GI according to gender, age range and schooling.

The diagnosis of dyslexia and learning disabilities was carried out by an interdisciplinary team from the Laboratory

for the Investigation of Learning Disabilities and from the Ambulatory of Child Neurology of the same institution, including speech-language pathology, neurological, and neuropsychological assessments. Students from GI and GII were evaluated at the Laboratory for the Investigation of Learning Disabilities or at the Ambulatory of Child Neurology. Students from GIII were evaluated in a classroom provided by the coordination of the school, at a predetermined time by the teacher of each student. Assessment was carried out in two 30-minute sessions.

According to the resolution 196/96 of the National Health Council – CNS, prior to the evaluation, parents or caregivers signed the Free and Informed Consent Term on behalf of the children, authorizing their participation in the study. After that, students were submitted to the Brazilian adaptation of the Assessment of Reading Processes (PROLEC)⁽³⁾ for evaluation of the reading processes. This assessment consists of four blocks of tasks that are distributed to evaluate four reading processes, as it follows:

- 1st process: *Letter identification* – composed by two tasks with the aim to verify the student’s capacity of identifying the letters and their respective sounds. The task of letters and sounds identification has the aim to verify the student’s capacity of naming the letters and their representing sounds. The task of “same and different”, regarding words and pseudowords, aims to verify the student’s capacity of identifying, distinguishing and recognizing real and invented words as similar or different.
- 2nd process: *Lexical processes* – consisting of four tasks with the aim to confirm the functioning of the two routes of word recognition and its sub-processes. In the lexical decision task, the student must recognize only real words in a list of real and invented words, regardless his ability to read them. In the tasks of word reading, pseudoword reading, and word and pseudoword reading the aim is to compare the development of the word recognition routes, and the student must read real and invented words; the first task measures the capacity of reading real words, and the second, the capacity of reading invented words, with different syllabic complexity, divided into CCV, VC, CVC, CVV, CCVC and CVVC. The third task has the aim to analyze the level of development achieved by the student with the use of phonological and lexical routes in reading. For that, words and pseudowords of six categories were used: high frequency short words, high frequency long words, low frequency short words, low frequency long words, short pseudowords and long pseudowords.
- 3rd process: *Syntactic processes* – consisting of two tasks. The grammar structure task verifies the student’s capacity to process different types of grammar structure and to prove the difficulty that can be produced when different syntactic structures are used (active voice, passive voice and focused complement). The punctuation task verifies the student’s capacity to use punctuation marks in a short text.
- 4th process: *Semantic processes* – consisting of two tasks. In the clause comprehension task, the aim is to assess whether the student is able to extract the meaning of simple clauses. In the text comprehension task, the aim is to investigate if

the student is able to extract the meaning and integrate it to his knowledge.

Statistical analysis used the software SPSS (Statistical Package for Social Sciences), version 17.0, with significance level of 5% (0.05). The Kruskal-Wallis test was applied to verify the possible differences among the three groups, when concomitantly compared, for the variables of interest. The Mann-Whitney test, adjusted by Bonferroni correction, was used to identify which groups are different from the others when compared pairwise. The Likelihood Ratio test was used in order to verify possible differences among the three groups, when concomitantly compared, followed by adjustment (with Bonferroni correction), to identify the groups that were different from each other, when compared pairwise regarding the PROLEC classification.

RESULTS

The results showed the comparison between students from GI (dyslexics), GII (learning disabilities), and GIII (students with good academic performance) in the PROLEC tasks (Tables 1 and 2). Differences were verified in all tasks of letter identification and lexical processes (Table 1) and in tasks of semantic and syntactic processes (Table 2). Students from GIII

showed superior performance when compared to the other groups, while students from GII showed lower performance, evidenced by greater response variability, that is, fewer accurate answers when compared to the other groups.

As differences were found for all comparisons made in Tables 1 and 2, it was applied the Mann-Whitney test adjusted by Bonferroni correction, which allowed the identification of which group differed from the others in a pairwise comparison. When groups GI and GII were compared, differences were found in the tasks of punctuation (PM), clauses comprehension (CC), and texts comprehension (TC). When the groups GI and GIII and GII and GIII were compared, differences were observed in all the tasks, except for GI and GIII in the tasks of same-different (SD) and punctuation (PM). These results evidenced the superior performance of the students from GIII in relation to the students from GI and GII (Table 3).

The comparison between the students from GI, GII and GIII regarding the classification on the PROLEC tasks (Tables 4 and 5) was conducted. With the application of the Likelihood Ratio test, with adjustment of Bonferroni correction, it was observed that a higher number of students from GI showed normal classification (N) on the letter identification process tasks, and great difficulty (GD) in the lexical processes tasks. GII showed classification between great (GD) and low diffi-

Table 1. Comparison of the groups regarding their performances in the letter identification and lexical process

Reading processes	Variable	Group	Mean	SD	Minimum	Maximum	Percentile 25	Median	Percentile 75	p-value	
Letters identification	LS	GI	17.35	3.31	8.00	20.00	16.25	18.00	20.00	<0.001*	
		GII	13.60	5.96	0.00	20.00	9.75	15.00	18.00		
		GIII	19.95	0.22	19.00	20.00	20.00	20.00	20.00		
	SD	GI	18.85	1.18	16.00	20.00	18.00	19.00	20.00	0.021*	
		GII	16.70	5.81	0.00	20.00	17.25	19.00	19.00		
		GIII	19.30	1.03	17.00	20.00	19.00	20.00	20.00		
Lexical process	LD	GI	21.40	7.38	5.00	30.00	16.50	22.00	28.00	0.001*	
		GII	20.05	9.05	0.00	29.00	17.00	23.50	26.00		
		GIII	27.70	1.69	25.00	30.00	26.25	27.00	29.00		
	WR	GI	16.95	9.27	0.00	28.00	9.00	20.00	24.75	<0.001*	
		GII	12.70	11.44	0.00	28.00	0.25	10.50	26.50		
		GIII	29.25	1.21	26.00	30.00	28.25	30.00	30.00		
	PWR	GI	14.20	8.26	0.00	27.00	7.00	18.00	19.00	<0.001*	
		GII	11.70	11.47	0.00	28.00	0.00	12.50	23.75		
		GIII	27.20	2.26	22.00	30.00	25.25	28.00	29.00		
	WR HF	WR HF	GI	14.05	6.47	0.00	20.00	9.25	16.50	18.75	<0.001*
			GII	9.10	8.19	0.00	20.00	0.00	8.50	18.00	
			GIII	19.90	0.31	19.00	20.00	20.00	20.00	20.00	
WR LF		GI	11.45	5.04	0.00	17.00	10.25	13.00	15.00	<0.001*	
		GII	7.25	7.41	0.00	20.00	0.00	3.50	14.75		
		GIII	18.75	1.45	15.00	20.00	18.00	19.00	20.00		
PWR	PWR	GI	9.85	4.91	0.00	15.00	7.25	12.00	13.75	<0.001*	
		GII	6.45	6.82	0.00	16.00	0.00	4.50	13.75		
		GIII	17.80	2.42	10.00	20.00	17.25	18.00	20.00		

* Significant values (p<0.05) – Kruskal-Wallis test

Note: LS = letter or sound; SD = same or different; LD = lexical decision; WR = word reading; PWR = pseudoword reading; WR HF = high frequency words reading; WR LF = low frequency word reading; SD = standard deviation

Table 2. Comparison of the groups regarding their performances on syntactic and semantic processes

Reading processes	Variable	Group	Mean	SD	Minimum	Maximum	Percentile 25	Median	Percentile 75	p-value
Syntactic process	GS	GI	7.90	4.06	0.00	13.00	5.50	8.50	11.00	<0.001*
		GII	4.75	4.69	0.00	14.00	0.00	4.00	8.00	
		GIII	12.05	1.47	10.00	15.00	11.00	12.00	13.00	
	AV	GI	3.25	1.62	0.00	5.00	2.25	4.00	4.00	<0.001*
		GII	2.00	1.97	0.00	6.00	0.00	2.00	3.75	
		GIII	4.50	0.61	3.00	5.00	4.00	5.00	5.00	
	PV	GI	2.35	1.57	0.00	5.00	1.00	3.00	3.75	<0.001*
		GII	1.60	1.60	0.00	4.00	0.00	1.00	3.00	
		GIII	4.10	0.79	3.00	5.00	3.25	4.00	5.00	
	FC	GI	1.75	1.45	0.00	4.00	1.00	1.00	3.00	<0.001*
		GII	1.25	1.45	0.00	4.00	0.00	1.00	2.75	
		GIII	3.20	1.01	2.00	5.00	2.00	3.00	4.00	
PM	GI	7.80	5.86	0.00	16.00	1.00	8.00	13.75	<0.001*	
	GII	0.90	1.41	0.00	4.00	0.00	0.00	1.00		
	GIII	10.60	1.73	8.00	15.00	9.25	10.00	12.00		
Semantic process	CC	GI	7.45	3.91	0.00	12.00	6.00	8.50	11.00	<0.001*
		GII	3.95	3.99	0.00	11.00	0.00	3.00	8.00	
		GIII	11.85	0.37	11.00	12.00	12.00	12.00	12.00	
	TC	GI	5.65	4.04	0.00	12.00	2.25	6.00	9.50	<0.001*
		GII	2.15	2.80	0.00	8.00	0.00	1.50	3.00	
		GIII	13.55	2.11	9.00	16.00	13.00	14.00	15.00	

* Significant values ($p < 0.05$) – Kruskal-Wallis test

Note: GS = grammar structure; AV = active voice; PV = passive voice; FC = focused complement; PM = punctuation marks; CC = clauses comprehension; TC = text comprehension; SD = standard deviation

culty (LD) in letter identification tasks, and great difficulty (GD) in lexical processes tasks. GIII presented normal classification (N) in all the tasks. When GI and GII students were compared, there were differences only in the tasks of letter or sound (LS), same-different (SD), and lexical decision (LD), and in the comparison between GI and GIII and GII and GIII differences were observed in all the tasks (Table 4).

In all syntactic processes tasks there were differences in the comparison between groups (GI x GII, GI x GIII and GII x GIII). In the grammar structure task (GS), GI and GII showed higher number of students classified with great difficulty (GD), and the students from GIII showed normal classification (N). In the punctuation task (PM), the students from GI and GIII showed normal classification (N), and the students from GII were classified with great difficulty (GD). Regarding the semantic processes tasks, differences occurred in the comparisons between GI x GIII and GII x GIII; in the clauses comprehension task (CC) and in the text comprehension task (TC), a higher number of students from GI and GII were classified with great difficulty (GD), while those from GIII showed normal classification (N) (Table 5).

DISCUSSION

The results of this study showed that, when students from GI (dyslexia) and GII (learning disability) were compared

Table 3. Comparison of the groups regarding their performances in the reading processes, compared pairwise

Reading processes	Variable	Pair of groups		
		GI X GII	GI X GIII	GII X GIII
Letter identification	LS	0.024	<0.001*	<0.001*
	SD	0.144	0.155	0.007*
Lexical process	LD	0.635	0.006*	<0.001*
	WR	0.260	<0.001*	<0.001*
	PWR	0.486	<0.001*	<0.001*
	WR HF	0.064	<0.001*	<0.001*
	WR LF	0.116	<0.001*	<0.001*
	PWR	0.170	<0.001*	<0.001*
Syntactic process	GS	0.025	<0.001*	<0.001*
	AV	0.026	0.004*	<0.001*
	PV	0.160	<0.001*	<0.001*
	FC	0.199	0.002*	<0.001*
Semantic process	PM	<0.001*	0.182	<0.001*
	CC	0.012*	<0.001*	<0.001*
	TC	0.005*	<0.001*	<0.001*

* Significant values ($p < 0.05$) – Mann-Whitney test, adjustment of Bonferroni correction (alfa Bonferroni = 0,016952)

Note: LS = letter or sound; SD = same or different; LD = lexical decision; WR = word reading; PWR = pseudoword reading; WR HF = high frequency words reading; WR LF = low frequency word reading; GS = grammar structure; AV = active voice; PV = passive voice; FC = focused complement; PM = punctuation marks; CC = clauses comprehension; TC = text comprehension

Table 4. Comparison between groups regarding the classifications normal (N), low difficulty (LD) and great difficulty (GD) on the tasks of letter identification and lexical processes of PROLEC

Reading processes	Classification	Group			p-value		
		GI	GII	GIII	GI x GII	GI x GIII	GII x GIII
Letters identification	LS.N	9	4	20			
	LS.LD	3	2	0	0.002*	<0.001*	<0.001*
	SL.GD	8	14	0			
	SD.N	14	7	17			
	SD.LD	5	10	2	<0.001*	<0.001*	<0.001*
	SD.GD	1	3	1			
Lexical process	LD.N	8	4	18			
	LD.LD	1	7	2	0.002*	<0.001*	<0.001*
	LD.GD	11	9	0			
	WR.N	0	1	19			
	WR.LD	3	5	0	0.150	<0.001*	<0.001*
	WR.GD	17	14	1			
	PWR.N	1	2	19			
	PWR.LD	2	2	0	0.052	<0.001*	<0.001*
	PWR.GD	17	16	1			
	WR HF.N	5	1	20			
	WR HF.LD	4	5	0	0.035	<0.001*	<0.001*
	WR HF.GD	11	14	0			
	WR LF.N	0	1	19			
	WR LF.LD	5	4	0	0.132	<0.001*	<0.001*
	WR LF.GD	15	15	1			
PWR.N	0	0	16				
PWR.LD	0	3	2	0.050	<0.001*	<0.001*	
PWR.GD	20	17	2				

* Significant values ($p < 0.05$) – Likelihood ratio test, with the adjustment of Bonferroni correction

Note: LS= letter or sound; SD = same or different; LD = lexical decision; WR = word reading; PWR = pseudoword reading; WR HF = high frequency words reading; WR LF = low frequency word reading; N = normal; LD = low difficulty; GD = great difficulty

to students from GIII (good academic performance), it was observed a superior performance of GIII. That is because the phonological processing (phonological awareness, phonological working memory, and access to phonological information stored in long-term memory) is important to the acquisition of reading. Phonological awareness is an aspect to be integrated in word recognition, and alterations in this ability are usually identified in students with learning problems^(4,10,19,21,23,26,27).

When GI and GII were compared, it was observed that students from GI presented difficulties accomplishing the tasks of lexical, syntactic and semantic processes, and students from GII, the tasks of letter identification, lexical, syntactic and semantic processes. Differences were found in the tasks regarding punctuation (syntactical process), clauses comprehension and text comprehension (semantic process), with lower performance of students with learning disabilities when compared those with dyslexia. That may be because, besides the speech perception difficulty in phoneme level (present in students from GI and GII), the students with dyslexia need more effort to obtain reading achievements, mainly those that require sublexical processing^(28,29), while students with learning

disabilities show difficulties in coding, decoding and in the organization of single words and texts^(17,18).

Regarding the classification in the PROLEC tasks, GI showed higher number of students with normal performance in the letter identification process. In the letter or sound identification tasks, the students could choose between naming letters or sound. All students from all groups chose only to say the letter's name, which could have benefited the performance of students from GI in these tasks. According to the literature, students with dyslexia have difficulties in the decoding ability and in sound discrimination, while students with learning disabilities show difficulties in the identification and decoding of the word^(17,18).

Regarding the lexical processes, it was observed that students from GI were classified with great difficulty (GD) in these tasks, which corroborates studies that claim that students with dyslexia do not show good performance in reading words, irregular words, low frequency words and pseudowords, sound discrimination and verbal memory, due to their weak phonological awareness, that is, difficulty in the grapheme-phoneme conversion^(16,27,29). Due to the low performance in these tasks, the other processes – syntactic and semantic – were compromised.

Table 5. Comparison between groups regarding the classifications normal (N), low difficulty (LD) and great difficulty (GD) on the tests of syntactic and semantic processes of PROLEC

Reading processes	Classification	Group			p-value		
		GI	GII	GIII	GI x GII	GI x GIII	GII x GIII
Syntactic process	GS.N	7	3	20			
	GS.LD	3	3	0	0.013*	<0.001*	<0.001*
	GS.GD	10	14	0			
	PM.N	15	0	20			
	PM.LD	0	2	0	<0.001*	<0.001*	<0.001*
	PM.GD	5	18	0			
Semantic process	CC.N	5	1	20			
	CC.LD	1	3	0	0.031	<0.001*	<0.001*
	CC.GD	14	16	0			
	TC.N	3	2	17			
	TC.LD	3	1	2	0.129	<0.001*	<0.001*
	TC.GD	14	17	1			

* Significant values – Likelihood ratio test, with the adjustment of Bonferroni correction

Note: GS = grammar structure; PM = punctuation marks; CC = clauses comprehension; TC = text comprehension; N = normal classification; LD = low difficulty; GD = great difficulty

Our findings regarding the GI corroborate studies performed in other countries that have Spanish as official language^(10,19,21,23), which used the PROLEC⁽²⁴⁾ to evaluate the reading processes of students with dyslexia. Difficulties were identified in tasks that require the use of phonological abilities, which are necessary for reading.

The students from GII were classified with great difficulty (GD) in all the processes. That may be because students with learning disabilities show difficulties in the acquisition and the use of the abilities necessary to the learning of reading and writing^(6,14,15). Alterations can be cited regarding sounds discrimination, phonological awareness, word identification and decoding, short-term and long-term memory, oral and reading comprehension^(11,16-18).

This study showed that the alteration in the visual identification ability in students with learning disabilities, obvious in letter identification tasks, interfered in the performance of this group. This alteration, along with other altered abilities, hinders the learning of reading. As for the students with dyslexia, they showed alterations due to phonological deficit, which make it difficult to use the letter-sound mechanism re-

quired for the reading process, especially for irregular words, low frequency words and pseudowords, compromising the comprehension of the read material.

CONCLUSION

Students with learning disabilities presented lower performance when compared to students with dyslexia. Students with dyslexia presented lower performance regarding lexical, syntactic and semantic processes. Students with learning disabilities showed lower performance in letter identification, lexical, syntactic and semantic processes, due to the altered visual identification ability that interferes, along with the other altered abilities, in the learning process.

Further studies with a greater number of students are necessary to better define whether the reading profile found in learning disabilities in this study remains the same. This will favor more clinical and educational information for differential diagnoses and in the planning of clinical and educational interventions.

RESUMO

Objetivo: Caracterizar e comparar o desempenho de escolares com dislexia, distúrbio de aprendizagem e bom desempenho acadêmico nos processos de leitura. **Métodos:** Participaram 60 escolares de ambos os gêneros, de primeira a quarta série do ensino fundamental de uma cidade no interior de São Paulo, que foram divididos em: GI – 20 escolares com diagnóstico interdisciplinar de dislexia; GII – 20 escolares com diagnóstico interdisciplinar de distúrbio de aprendizagem; e GIII – 20 escolares com bom desempenho acadêmico, pareados por gênero, faixa etária e escolaridade com o GI e GII. Os escolares foram submetidos à aplicação da adaptação brasileira da Avaliação dos Processos de Leitura – PROLEC, composta por quatro blocos: identificação de letras, processos léxicos, sintáticos e semânticos. **Resultados:** Os escolares de GIII apresentaram desempenho superior em relação ao GI e ao GII. Foram encontradas diferenças nas provas referentes aos sinais de pontuação e compreensão de orações e textos, em que foi evidenciado desempenho inferior do GII em relação ao GI. Quanto à classificação dos resultados, a maior parte dos escolares do GI apresentou desempenho normal no processo de identificação de letras e dificuldade grande no processo léxico, comprometendo os demais processos, e o GII apresentou dificuldade grande em todos os processos. **Conclusão:** Os escolares com dislexia e distúrbio de aprendizagem apresentam desempenho inferior nas provas dos processos de leitura. Os escolares com dislexia apresentam dificuldades no domínio dos processos léxico, sintático e semântico e os escolares com distúrbio de aprendizagem apresentam dificuldades em todos os processos avaliados.

Descritores: Avaliação; Leitura; Dislexia; Transtornos de aprendizagem; Transtornos do comportamento infantil; Desenvolvimento da linguagem

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