




Phonological awareness and receptive vocabulary in cases of learning disabilities

Consciência fonológica e vocabulário receptivo em casos de transtorno de aprendizagem

Conciencia fonológica y vocabulario receptivo em casos de transtorno del aprendizaje

Jéssica Moreno Leite* 
Matheus Franco Alpes* 
Patrícia Pupin Mandrá* 

Abstract

Introduction: Oral language skills are predictors for reading and writing, suggesting a relationship between phonological awareness and emissive and receptive vocabulary for their development. **Purpose:** To verify the association between Writing Hypothesis (WH) and performance of children and adolescents with Learning Disorder (LD) in tasks of phonological awareness (PA) and receptive vocabulary (RV). **Methods:** Retrospective analysis of electronic medical records of children and adolescents diagnosed with ED attended between February 2014 and December 2016. The level of WH (Pre-Syllabic; Syllabic; Syllabic-Alphabetical and Alphabetical) and the evaluation of FC and VR. Fisher's exact tests were used, with significance level ($p \leq 0.05$). **Results:** The sample ($n = 34$) was divided into age groups: GI = 14 (6 to 8 years and 11 months), GII = 15 (9 to 11 years and 11 months) and GIII = 05 (12 to 18 years and 11 months); 10 female (GI = 06; GII = 04; GIII = 0) and 24 male (GI = 08; GII = 11; GIII = 05). 73.53% attended Elementary School, 23.53% Elementary II and 2.94% High School. 47.06% were at the pre-syllabic level, 11.76% syllabic, 23.53% syllabic-alphabetic and 17.65% alphabetic. A positive association was observed between WH and PA ($p = 0.001$) and RV ($p = 0.02$) tasks. **Conclusion:** There was an association between WH and PA and VR in the studied group, suggesting the importance of these skills for reading and writing.

Keywords: Diagnosis; Learning; Vocabulary; Child Language; Speech, Language and Hearing

* Faculdade de Medicina de Ribeirão Preto, Ribeirão Preto, SP, Brazil.

Authors' contributions:

JML: performed data collection and analysis and article writing.

MFA: participated in data analysis and article writing.

PPM: participated in all stages of the research and as the main research advisor.

Correspondence email address: Matheus Franco Alpes - matheus.alpes@usp.br

Received: 28/07/2021

Accepted: 23/09/2022

Sciences

Resumo

Introdução: As habilidades de linguagem oral são preditoras para a leitura e escrita, sugerindo relação entre a consciência fonológica e vocabulário emissivo e receptivo para o seu desenvolvimento. **Objetivo:** Verificar a associação entre Hipótese de Escrita (HE) e desempenho de crianças e adolescentes com Transtorno de Aprendizagem (TA) em tarefas de consciência fonológica (CF) e vocabulário receptivo (VR). **Métodos:** Análise retrospectiva de prontuários eletrônicos de crianças e adolescentes com diagnóstico de TA atendidos entre fevereiro de 2014 e dezembro de 2016. Foram analisados o nível da HE (Pré-Silábico; Silábico; Silábico-Alfabético e Alfabético) e a avaliação de CF e VR. Utilizou-se o teste Exato de Fisher, com nível de significância ($p \leq 0,05$). **Resultados:** A amostra ($n=34$) foi dividida em grupos etários: GI=14 (6 a 8 anos e 11 meses), GII=15 (9 a 11 anos e 11 meses) e GIII=05 (12 a 18 anos e 11 meses); 10 do sexo feminino (GI=06; GII=04; GIII=0) e 24 do sexo masculino (GI=08; GII=11; GIII=05). 73,53% frequentavam o ensino Fundamental I, 23,53% Fundamental II e 2,94% Ensino Médio. 47,06% encontravam-se no nível pré-silábico, 11,76% silábico, 23,53% silábico-alfabético e 17,65% alfabético. Observou-se associação positiva da HE com tarefas de CF ($p=0,001$) e VR ($p=0,02$). **Conclusão:** Houve associação entre a HE e CF e VR no grupo estudado, sugerindo a importância dessas habilidades para a leitura e escrita.

Palavras-chave: Diagnóstico; Aprendizagem; Vocabulário; Linguagem infantil; Fonoaudiologia.

Resumen

Introducción: Las habilidades del lenguaje oral son predictores para la lectura y la escritura, sugiriendo una relación entre la conciencia fonológica y el vocabulario emisivo y receptivo para su desarrollo. **Objetivo:** Verificar la asociación entre la Hipótesis de la Escritura (HE) y el desempeño de niños y adolescentes con Trastorno del Aprendizaje (TA) en tareas de conciencia fonológica (CF) y vocabulario receptivo (RV). **Métodos:** Análisis retrospectivo de historias clínicas electrónicas de niños y adolescentes diagnosticados de TA atendidos entre febrero de 2014 y diciembre de 2016. El nivel de ES (Pre-Silábico; Silábico; Silábico-Alfabético y Alfabético) y la evaluación de CF y VR. Se utilizó la prueba exacta de Fisher, con nivel de significancia ($p \leq 0,05$). **Resultados:** La muestra ($n = 34$) se dividió en grupos de edad: GI = 14 (6 a 8 años y 11 meses), GII = 15 (9 a 11 años y 11 meses) y GIII = 05 (12 a 18 años y 11 meses); 10 mujeres (GI = 06; GII = 04; GIII = 0) y 24 hombres (GI = 08; GII = 11; GIII = 05). El 73,53% asistió a la escuela primaria, el 23,53% a la primaria II y el 2,94% a la secundaria. El 47,06% eran de nivel presilábico, el 11,76% silábico, el 23,53% silábico-alfabético y el 17,65% alfabético. Se observó una asociación positiva entre las tareas de HE y CF ($p = 0,001$) y VR ($p = 0,02$). **Conclusión:** Existió asociación entre HE y CF y VR en el grupo estudiado, sugiriendo la importancia de estas habilidades para la lectura y la escritura.

Palabras clave: Diagnóstico; Aprendizaje; Vocabulario; Lenguaje infantil; Fonoaudiología

Introduction

Learning to read and write is a complex process^{1,2}, especially in alphabetic writing like Portuguese³, and is related to linguistic, cognitive, perceptual, and psychosocial variables⁴, besides the motivational aspect¹. It requires formal and systematic teaching, without which the system is hardly learned⁵, which makes it one of the greatest challenges to children⁶. Despite the increase in recent years in investigations on writing, it is not as attractive to study writing as it is to study reading⁶.

There are indications that oral language skills are predictors of reading and writing^{3,5}. Studies point to the relationship between phonological awareness^{7,8} and productive and receptive vocabulary skills⁹ and the written language development process.

In the early phases, children gradually progress in learning to write. Various models try to explain the psycholinguistic processes involved in such learning⁵, with emphasis on constructivist and phonological perspectives⁶. The studies by Ferreiro and Teberosky (1985)¹⁰ stand out among constructivist authors. They helped broaden Piaget's framework, which describes three gradual writing development stages. In this process, children adopt and abandon different hypotheses about written language until the alphabetical principle is understood. In the first (presyllabic) stage, children do not understand yet that writing represents the sounds of oral language; hence, some hypotheses about written language are verified: the minimum amount principle, in that they believe a text must have some letters and that the letters used in words must be different from one another (variation hypothesis). The second (syllabic) stage is essential in these authors' writing development theory, as it is considered the children's first attempt to represent speech sounds in writing. After they have further experienced the written language, children realize the number of letters usually exceeds the number of syllables, thus shifting from syllabic to alphabetic writing (third stage). Hence, they understand that letters represent phonemes¹¹.

Learning to write Portuguese – an alphabetic language – depends on the initial grapheme/phoneme association¹², extending to the knowledge and use of preestablished rules that organize the complex orthographic system of the language¹³. Throughout the process, such construction is aided

by the ability to segment spoken language into different units and perceive that these units appear in other words as well¹⁴ – i.e., phonological awareness. In previous research, the level of writing was strongly related to phonological awareness and letters familiar to first graders (whose mean age was 6.09 years), verifying that greater mastery of these skills from the beginning of the school year helped them progress their writing by the end of the year¹. Phonological awareness not only helps children 3 years to 6 years and 11 months old begin learning to write⁷, but it is also important for them to learn spelling¹⁵. Authors who studied children with typical and atypical phonological development found that the more the children's misspellings, the worse their performance in syllabic and phonemic phonological awareness¹⁶.

Therefore, many researchers are increasingly interested in investigating the relationships between phonological processing skills and reading skills in alphabetic systems – particularly concerned with initial written language acquisition³ in children with and/or without learning disabilities (LD).

Information processing in children with LD is different from that in peers with typical development⁸. This significantly impairs their school learning⁹ regarding what could be expected from their intelligence and opportunities⁸. Learning to write depends essentially on adequate phonological development and phonological information processing, which ensures grapheme/phoneme association – the initial stage in learning to spell correctly. The phonological component, categorized from auditory memory and linguistic experiences, enables children to write unknown words they hear or see¹⁰. Thus, LD difficulties appear in the process of graphically coding the sounds that correspond to isolated letters, syllables, and words – whether familiar ones or not. In other words, not mastering the rules of the mechanism that convert a sequence of phonemes into graphemes may hinder their writing progress toward alphabetic and consequently spelling mastery.

Given the above and considering that special attention must be given to the role of metacognitive skills in LD diagnosis and intervention⁸, it is relevant to investigate the influence of phonological awareness and receptive vocabulary in these schoolchildren's writing acquisition and development process.

Hence, the objective of this study was to verify the association between the writing hypothesis (WH) and the performance of children and adolescents in phonological awareness and receptive vocabulary tasks.

Methods

This study was approved by the Hospital das Clínicas of Ribeirão Preto Medical School (HCFM-RPUSP), under evaluation report no. 2.816.975. It was exempted from having parents/guardians sign an informed consent form because it is an analytical retrospective study, based on medical record data analysis. Medical records of patients treated at the Centro Integrado de Reabilitação de Ribeirão Preto (CIRHE-RP) public speech-language-hearing service, diagnosed with LD (with DSM-V criteria) between February 2014 and December 2016, were selected by convenience. The inclusion criteria were as follows: patients who finished the cognitive assessment (Wechsler Intelligence Scale for Children – WISC III)¹⁶ and speech-language-hearing assessment (oral and written language, phonological processing, and hearing).

Results were classified as either normal or abnormal regarding their performance in phono-

logical awareness (CONFIAS)¹⁷ and receptive vocabulary skills (record protocol of the USP Picture Vocabulary Test [TVFusp])¹⁸, besides the spontaneous writing sample collection. Fisher's Exact test was used to verify the association between study variables, WH levels, and performance in phonological awareness and receptive vocabulary tasks; the significance level was set at $p \leq 0.05$.

Results

Sample

The sample, comprising 34 medical records ($n = 34$) of participants with a mean age of 9.66 years, was divided into age groups, as follows: GI = 14 (6 years to 8 years and 11 months), GII = 15 (9 years to 11 years and 11 months), and GIII = 5 (12 years to 18 years and 11 months). A total of 70.59% of the sample were males; 73.53% attended elementary school (GI = 41.18%; GII = 29.41%; GIII = 2.94%) (Table 1). Elementary and middle school encompass nine grades; hence, it was expected that only GI children would be in elementary school.

Phonological awareness tasks were applied to 32 participants, whereas receptive vocabulary tasks were applied to 17 out of the 34 medical records analyzed, using the same tests as in this study.

Table 1. Characterization regarding sex and grade in school

	Mean age	Sex						Grade in school					
		Males		Females		Total		Elementary school (1st to 4th grade)		Middle school (5th to 9th grade)		High school (10th to 12th grade)	
		N	%	N	%	N	%	N	%	N	%	N	%
GI	7.83	8	23.53	6	17.65	14	41.18	14	41.18	0	0	0	0
GII	10.02	11	32.35	4	11.76	15	44.12	10	29.41	5	14.71	0	0
GIII	13.72	5	14.71	0	0	5	14.71	1	2.94	3	8.82	1	2.94
Total		24	70.59	10	29.41	34	100	25	73.53	8	23.53	1	2.94

As for WH (Table 2), only 17.65% of participants were in the alphabetical phase – i.e., mastered word writing. The presyllabic level predominated in the age groups (GI = 50.00%; GII = 46.67%; GIII = 40.00%).

Table 2. Writing Hypothesis in relation to age groups

WH	Age Groups							
	GI (N=14)		GII (N=15)		GIII (N=5)		Total (N = 34)	
	N	%	N	%	N	%	N	%
Presyllabic	7	50.00	7	46.67	2	40.00	16	47.06
Syllabic	3	21.43	1	6.67	0	0	4	11.76
Syllabic/alphabetical	3	21.43	3	20.00	2	40.00	8	23.53
Alphabetical	1	7.14	4	26.67	1	20.00	6	17.65

WH was positively associated with phonological awareness skills ($p = 0.001$) and receptive vocabulary ($p = 0.02$) (Table 3).

Table 3. Correlation between Writing Hypothesis and performance in phonological awareness and receptive vocabulary tasks

Tasks	Classification	WH								p-value (* $p \leq 0,05$)
		Presyllabic (N=16)		Syllabic (N=4)		Syllabic- alphabetical (N=8)		Alphabetical (N=6)		
		N	%	N	%	N	%	N	%	
Phonological awareness (N=32)	Abnormal	15	93.8	4	100	1	14.3	2	40	* 0.001
	Normal	1	6.2	0	0	6	85.7	3	60	
Receptive Vocabulary (N=17)	Abnormal	8	88.9	0	0	0	0	3	75	* 0.02
	Normal	1	11.1	2	100	2	100	1	25	

Discussion

The positive association between WH and the performance in receptive vocabulary ($p = 0.02$) and phonological awareness tasks ($p = 0.001$) in children and adolescents with LD reveals the strong influence of these skills in the process of acquiring and developing reading (decoding and comprehension) and writing in this disability. This means that the significant school learning impairment due to the various changes found in LD (including word identification and decoding and reading comprehension)¹⁹ could be minimized by early training in phonological awareness and receptive vocabulary skills in both schools and speech-language-hearing clinics. Speech-language-hearing therapy planning

for children with LD and reading comprehension problems, for instance, can include not only reading and writing activities but also metacognitive strategies that value uncontrolled activities, monitoring, and reflection on linguistic objects involved in reading²⁰. Hence, it is necessary to identify children, as early as preschool, with poor oral language development and preliminary reading and writing skills to help develop preventive intervention strategies and minimize future changes in learning²¹. In this context, it is essential to understand both the phonological and non-phonological characteristics of child writing and their relationship with later writing²².

The scientific productions addressed in a literature review also revealed the importance of



lexical development to the phonological acquisition and later written language²³; hence, it was pointed out as a pillar in the acquisition of reading and writing skills at school²⁵. Previous research found indications of the influence of receptive vocabulary on textual reading comprehension, especially in the question-and-answer method, in typical third, fourth, and fifth graders²⁶. Thus, the findings in this study reinforce that when children and adolescents with LD understand only smaller and poorer lexical repertoires (different types of linguistic structures), their processing of the meaning of spoken, heard, written, and read words is negatively affected. This results in failures in acquiring essential strategies toward proficient reading and writing. These include limited use of inference, which is a necessary strategy to adequately interpret both oral and written statements, especially when there is lexical or syntactic ambiguity. Deficits resulting from this mechanism in other formal aspects of oral language (such as syntax and narrative) also affect the complex written language system – which was confirmed by the positive association between the variables in this study.

In a previous study²⁷, for example, strategies related to reading comprehension used by third to seventh graders with LD, aged 8 to 13 years, were classified below the expected for their age and grade in school. It was verified that 90% of them had a deficient strategy performance in reading meanings and self-correction, while 100% did not use phonological skills and intonation in word reading.

The great effort in LD to process letter sequences, identify unfamiliar words, and access the representation of language structural knowledge (such as word order) can impair the development of metacognitive skills that would make text comprehension easier²⁸.

A positive correlation was found between receptive vocabulary and text reading comprehension in schoolers without indications of changes in reading and writing. This showed the relevance of knowing words and their meaning to proficient text reading comprehension^{16,25}. Reading comprehension was also correlated with phonological awareness and especially word recognition skills in third and fifth graders¹⁴.

Thus, children and adolescents in this study did not benefit from acquiring receptive vocabulary and phonological awareness skills for proficient

reading and writing. The findings showed that children and adolescents in all age groups regularly attended elementary school and that there was a greater percentage of the presyllabic WH level in GI, GII, and GIII. Some authors pointed out that the vocabulary favors visual word recognition (assessed with irregular word reading), as these words depend on accessing previous knowledge (mental lexicon) and using the lexical reading route²⁶. Lexical development directly influences writing because writing a word requires searching it in the mental lexicon²⁷. Hence, orthographic and phonological processing is essential to find this lexical representation, as both types of information are present in word representation²⁷. Fourth graders, with better vocabulary, wrote the best stories in all composition analysis categories. This reinforces the importance of lexical acquisition and development to linguistic processing of writing, in the domains of spelling, morphosyntax, semantics, working memory, and lexical access. Phonological awareness and rapid serial naming, in their turn, seemingly predicted the performance in syntactic and grammar structure of the written text²⁷.

On the other hand, other findings⁴ in the analysis of the relationship between phonological awareness and vocabulary when learning to read and write in early grades in school revealed a strong influence of phonological awareness alone, which can be a factor to help acquire reading and writing. Speech sound manipulation and segmentation skills are essential to this development⁸. Children with greater mastery of phonological awareness and knowledge of letter names from the beginning of the school year progressed significantly in their writing by the end of the year¹. Also, significant positive correlations were found between logical operations, phonological awareness, and knowledge of letters⁵.

Phonological awareness and rapid serial naming also helped preschoolers and first graders in their initial learning to read and write. This reveals the importance of stimulating these skills before they begin to learn to read and write, as they can not only help them but also point out possible learning problems earlier⁷.

The correlation between phonological awareness and text reading comprehension in fourth graders with and without indications of changes in reading and writing also demonstrates the impor-



tance of metaphonological skills to consolidate both proficient reading and reading comprehension¹⁰.

Likewise, more skillful narrative text readers performed better in identifying and handling minimal sound units, demonstrated in initial phoneme identification tasks, phoneme substitution, rapid automatized naming (objects), and monitoring. These helped them master grapheme/phoneme correspondence and thus led to better text reading processing than in less skillful ones²⁸. These results suggest that phonemic awareness skills and rapid automatized naming are important to reading comprehension – in terms of knowing characters, developing the story, plot, objectives, and end of the narrative, and understanding its structure, functioning, and sequence of events related to the topic. They are associated with reading fluency development, furnishing cognitive resources to effectively carry out high-level skills²⁸.

In this study, difficulties in specific activities involving the grapheme/phoneme relationship were an obstacle not only to schoolchildren with LD but also to those with no learning difficulties – which corroborates data already demonstrated in the specialized literature²⁹.

Working memory and especially phonological awareness skills are impaired in children with school difficulties while learning to read and write. Moreover, these skills contributed the most to the initial reading and writing performance of 50 public-school third graders³⁰.

Conclusion

According to the findings in this study, WH was associated with phonological awareness and receptive vocabulary skills in children and adolescents with LD.

Therefore, the results confirm the importance of receptive vocabulary and phonological awareness to potentialize the process of acquiring and developing the complex written language system. Hence, they must be emphasized in school and speech-language-hearing clinics for patients with LD.

References

1. Barbosa MR, Medeiros LBO, Valle APS. Relação entre os níveis de escrita, consciência fonológica e conhecimento de letras. *Estud. psicol. (Campinas)*. 2016; 33(4): 667-76.

2. Donicht G, Ceron MI, Keske-Soares M. Erros ortográficos e habilidades de consciência fonológica em crianças com desenvolvimento fonológico típico e atípico. *CoDAS*. 2019; 31(1): 1-8.

3. Pazeto TCB, León CBR, Seabra AG. Avaliação de habilidades preliminares de leitura e escrita no início da alfabetização. *Rev. Psicopedagogia*. 2017; 34(104): 137-47.

4. Guaresi R, Oliveira J, Oliveira E, Teixeira L. A consciência fonológica e o vocabulário no aprendizado da leitura e da escrita na alfabetização. *Rev. (Con) Textos Linguísticos*. 2017; 11(18): 97-109.

5. Santos MJ, Barrera SD. Impacto do treino em habilidades de consciência fonológica na escrita de pré-escolares. *Psicol. Esc. Educ.* 2017; 21(1): 93-102.

6. Pollo TC, Treiman R, Kessler B. Uma revisão crítica de três perspectivas sobre o desenvolvimento da escrita. *Estud. psicol. (Campinas)*. 2015; 32(3) : 449-59.

7. Rosal AGC, Cordeiro AAA, Silva ACF, Silva RL, Queiroga BAM. Contribuições da consciência fonológica e nomeação seriada rápida para a aprendizagem inicial da escrita. *Rev. CEFAC*. 2016; 18(1): 74-85.

8. Santos IMS, Melo MRA, Roazzi A. Consciência fonológica e alfabetização em crianças brasileiras: como esta relação tem evoluído?. *Iniciação Científica CESUMAR*. 2016; 18(2): 211-21.

9. Bandini HHM, Bandini CSM, Ranciaro NA. Reading, vocabulary, phonological awareness. *Paidéia*. 2017; 27(68): 314-23.

10. Ferreiro E, Teberosky A. *Psicogênese da língua escrita*. Porto Alegre: Artes Médicas; 1985.

11. Cármió MS, Vosgrau JS, Soares AJ. O papel da consciência fonológica na compreensão leitora. *Rev. CEFAC*. 2017; 19(5): 590-600.

12. Godoy DMA, Pinheiro MV, Citoler D. Initial literacy: Influence of phonemic awareness and teaching method. *Psicologia: Teoria e Prática*. 2017; 19(3): 226-41.

13. Gonçalves-Guedim TF, Capelatto LV, Salgado-Azoni CA, Ciasca SM, Crenitte PAP. Desempenho do processamento fonológico, leitura e escrita em escolares com transtorno de déficit de atenção e hiperatividade. *Rev. CEFAC*. 2017; 19(2): 242-52.

14. Mendes GG, Barrera SD. Phonological Processing and Literacy. *Paidéia*. 2017; 27(68): 298-305.

15. Santos AAA, Ferraz AS. Avaliação de habilidades relacionadas à compreensão de leitura no ensino fundamental. *Psico (Porto Alegre)*, 2017; 48(1): 21-30.

16. Wechsler D. *WISC-III: Escala de Inteligência Wechsler para Crianças: Manual*. 3ª ed.; São Paulo: Casa do Psicólogo; 2002. 309 p.

17. Moojen S, Lamprecht RR, Santos RM, Freitas GM, Brodacz R, Siqueira M, et al. *CONFIAS: Consciência Fonológica: instrumento de avaliação sequencial*. São Paulo: Casa do Psicólogo; 2003.

18. Capovilla FC (organizador). *Teste de vocabulário por figuras USP - TVfusp: Normatização para avaliar compreensão auditiva de palavras dos 7 aos 10 anos*. São Paulo: Memnon; 2011.

19. Ferraz IPR, Viana FLP, Pocinho MMFDD. Operações lógicas, consciência fonológica e conhecimento das letras na educação pré-escolar. *Calidoscópio*. 2018; 16(1): 4-15.



20. Colombo RC, Cárnio MS. Compreensão de leitura e vocabulário receptivo em escolares típicos do ensino fundamental I. *CoDAS*. 2018; 30(4): e201700145.
21. Nicolielo-Carrilho AP, Hage SRV. Estratégias metacognitivas de leitura de crianças com distúrbio de aprendizagem. *CoDAS*. 2017; 29(3): e20160091.
22. Machado AC, Capellini SA. Caracterização do desempenho de crianças com distúrbio de aprendizagem em estratégias de compreensão leitora. *Rev. Psicopedagogia*. 2011; 28(86): 126-32.
23. Arnaut MA, Hackerott MMS, Bueno GJ, Nepomuceno PF, Ávila CRB. Erros de base fonológica na escrita: codificação de surdas e sonoras, segmentação e juntura vocabular. *Audiol Commun Res*. 2014; 19(3): 264-71.
24. Pedrosa BAC, Dourado JS, Lemos SMA. Desenvolvimento lexical, alterações fonoaudiológicas e desempenho escolar: revisão de literatura. *Rev. CEFAC*. 2015; 17(5): 1633-42.
25. Nalom AFO, Soares AJC, Cárnio MS. The relevance of receptive vocabulary in reading comprehension. *CoDAS*. 2015; 27(4): 333-8.
26. Piccolo LR, Salles JF. Vocabulário e memória de trabalho predizem desempenho em leitura de crianças. *Revista Psicologia: Teoria e Prática*. 2013; 15(2),180-91.
27. Santos MTM, Befi-Lopes DM. Vocabulary, phonological awareness and rapid naming: contributions for spelling and written production. *J. Soc. Bras. Fonoaudiol*. 2012; 24(3): 269-75.
28. Coelho CLG, Correa J. Compreensão de leitura: Habilidades cognitivas e tipos de texto. *Psico (Porto Alegre)*. 2017; 48(1): 40-9.
29. Silva C, Capellini SA. Desempenho de escolares com e sem transtorno de aprendizagem em leitura, escrita, consciência fonológica, velocidade de processamento e memória de trabalho fonológica. *Rev. Psicopedagogia*. 2013; 30(91): 3-11.
30. Granzotti RBG, Furlan SA, DOMENIS DR, Fukuda MTH. Memória de trabalho fonológica e consciência fonológica em crianças com dificuldade de aprendizagem. *Distúrb Comum*. 2013; 25(2): 241-52.

