

The Contribution of Emergent Literacy Skills for Early Reading and Writing Achievement

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Abstract

Studies in the English language suggest that emergent literacy skills promote success in literacy. This longitudinal study investigated whether and which emergent literacy skills contribute to initial reading and writing performance in a sample of 34 Brazilian children from public schools. The participants underwent tests on phonological awareness, oral comprehension, vocabulary and knowledge of letters at the end of Early Childhood Education. The participants' skills in writing and reading words as well as reading comprehension were evaluated in the 1st year of elementary school. Data were analyzed using correlation and regression analysis. Results showed that emergent literacy skills presented significant positive correlations with reading and writing performance. Multiple regression analyses indicated significant and independent contributions of phonological awareness and knowledge of letters for writing, however, only phonological awareness significantly and independently contributed to reading of words and reading comprehension skills. It was concluded that emergent literacy skills related to the coding domain are the most important for literacy.

Keywords: Emergent literacy, literacy, phonological awareness, knowledge of letters, oral language.

Contribuição das Habilidades de Letramento Emergente para as Competências Iniciais de Leitura e Escrita

Resumo

Estudos em língua inglesa sugerem que as habilidades de letramento emergente favorecem o sucesso na alfabetização. Este estudo longitudinal investigou se e quais habilidades de letramento emergente contribuem para as competências iniciais de leitura e escrita de uma amostra de 34 crianças brasileiras, alunas da rede pública de ensino. Ao final da Educação Infantil, as crianças foram submetidas a testes de consciência fonológica, compreensão oral, vocabulário e conhecimento das letras. No 1º ano do Ensino Fundamental, foram avaliadas as competências de escrita e leitura de palavras, bem como de

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compreensão em leitura dos participantes. Os dados foram analisados através de técnicas correlacionais e de análise de regressão. Os resultados mostraram que todas as habilidades de letramento emergente avaliadas apresentaram correlações positivas significativas com o desempenho nos testes de leitura e escrita. Contudo, análises de regressão múltipla indicaram contribuição significativa e independente apenas da consciência fonológica e do conhecimento de letras para a escrita; para as habilidades de leitura de palavras e compreensão em leitura, somente a consciência fonológica contribuiu de forma significativa e independente. Conclui-se que as habilidades de letramento emergente relacionadas ao domínio do código são as mais importantes para a alfabetização.

Palavras-chave: Letramento emergente, alfabetização, consciência fonológica, conhecimento das letras, linguagem oral.

Contribución de las Habilidades de Alfabetización Temprana a las Competencias Iniciales de Lectura y Escritura

Resumen

Los estudios en inglés sugieren que las habilidades de alfabetización temprana favorecen el éxito en la alfabetización. Este estudio longitudinal investigó si y cuáles habilidades de alfabetización temprana contribuyen a las competencias iniciales de lectura y escritura de una muestra de 34 niños brasileños, alumnos de la red pública de enseñanza. Al final de la educación preescolar, los niños fueron sometidos a pruebas de conciencia fonológica, comprensión oral, vocabulario y conocimiento de las letras. En el primer año de la Enseñanza Fundamental, se evaluaron las competencias de escritura y lectura de palabras, así como de comprensión en lectura de los participantes. Los datos fueron analizados a través de técnicas correlacionales y de análisis de regresión. Los resultados mostraron que todas las habilidades de alfabetización temprana evaluadas presentaron correlaciones positivas significativas con el rendimiento en las pruebas de lectura y escritura. Sin embargo, los análisis de regresión múltiple indicaron una contribución significativa e independiente sólo de la conciencia fonológica y del conocimiento de letras para la escritura; para las habilidades de lectura y comprensión en lectura, solamente la conciencia fonológica contribuyó de forma significativa e independiente. Se concluye que las habilidades de alfabetización temprana relacionadas con el dominio del código son las más importantes para la alfabetización.

Palabras clave: Alfabetización temprana, alfabetización, conciencia fonológica, conocimiento de las letras, lenguaje oral.

Reading and writing are essential skills for the academic and professional trajectory, as well as for the exercise of full citizenship. In her discussion of the question of literacy methods, Soares (2016) stated that it is a consensus among scholars in the area that “correct and fluent coding and decoding skills are the foundation of the production and comprehension of written text and the use of written language in social practices that occur in different contexts of literate societies” (p. 334).

The analysis of the literature evidences an intense effort to obtain a better understanding of

the cognitive and linguistic processes underlying the learning of reading and writing. Several studies have also demonstrated the importance of considering, in the context of written language teaching, the precursory skills of literacy, known as emergent literacy skills (Gillen & Hall, 2013; Shanahan & Lonigan, 2010; Snowling & Hulme, 2013; Whitehurst & Lonigan, 2001).

Considering its use in the international literature, it can be stated that the term “*early literacy*” or “*emergent literacy*” was initially based on a Piagetian framework, with studies focused on how the child constructs knowledge

about reading and writing, even before formal schooling. The second framework used – Vygotskian – focused on the role of the social interaction between the adult and the child for the development of the initial reading and writing skills, emphasizing the role of language and the shared reading of stories (Sulzby & Teale, 1991). More recently, studies based on cognitive theories of Information Processing have also addressed the theme, including the relevance of cognitive and linguistic skills, such as “phonological awareness” and “working memory”, in studies on emergent literacy (Shanahan & Lonigan, 2010). Thus, according to the emergent literacy approach, it is possible to identify a set of skills, knowledge and attitudes that are precursors to reading and writing, beginning before formal education (Gillen & Hall, 2013). In this way, the concept of emergent literacy allows a bridge to be established between pre-reading/writing and reading/writing itself, highlighting the importance of developing skills that will be essential in the first years of schooling (Cruz et al., 2014). From this perspective, the development of linguistic and metalinguistic skills, that is, the ability to reflect on the language itself, is considered fundamental for the literacy process (Viana, Ribeiro, & Barrera, 2017).

The National Early Literacy Panel (NELP) was created in 2002 in the United States to summarize the scientific evidence on the development of early literacy skills in order to contribute to educational policies and practices. The final report of the work was presented six years later (NELP, 2008). For this, the NELP specified two conditions for a skill to be considered emergent. First, the skill must be present before formal language teaching, and secondly, the skill must be related to or predictive of formal literacy. From the analysis of 300 articles on the subject, a set of predictor variables for reading and writing were identified, namely: knowledge of the alphabet, phonological awareness, rapid automatic naming of letters and numbers, automatic naming of objects and colors, writing of the name, concepts about printed material (writing conventions), vocabulary, phonological

memory and visual processing (discriminating symbols; NELP, 2008).

According to the summary of the NELP results, by Shanahan and Lonigan (2010), the meta-analysis of correlational studies indicated that emergent literacy skills were predictive of later literacy performance. In addition, the experimental and quasi-experimental studies analyzed also showed significant effects of interventions aimed at developing emergent literacy skills on performance measures related to literacy. Also in Brazil, the Final Report of the Working Group on “Children’s Literacy: The New Pathways” (*Câmara dos Deputados*, 2003), prepared by renowned national and foreign researchers, emphasized the importance of linguistic and metalinguistic skills, such as the development of phonemic awareness, vocabulary and oral comprehension, for the learning of the written language, including the comprehension of the material read.

Whitehurst and Lonigan (2001) proposed that the learning of the written language (emergent and conventional) derives from the interdependent competence of the skills in two domains: “outside-in” and “inside-out”. The first one (outside-in) refers to oral language skills related to the context of reading, in which vocabulary and oral comprehension skills stand out. The second (inside-out) refers to the skills related to the coding domain, which allow the passage of print into sound (decoding) and vice-versa, where the phonological awareness skills and the knowledge of letters stand out. Therefore, reading and writing will mainly depend on the following skills: phonological awareness, writing knowledge (involving knowledge of letters) and oral language (expressive and receptive vocabulary and oral comprehension). Taking into account the skills listed by Whitehurst and Lonigan (2001), which are also presented in the studies reviewed by the NELP (2008), this study aimed to investigate the following variables of emergent literacy: phonological awareness, knowledge of letters, vocabulary and oral comprehension.

Phonological awareness consists of the ability to consciously analyze and reflect on the

structure of oral language, involving the ability to deliberately isolate, manipulate, combine and segment phonological fragments of language (Soares, 2016). Intervention studies show that explicit instruction in phonological awareness helps to improve children's reading and writing performance (Melby-Lervag, Lyster, & Hulme, 2012; Santos & Barrera, 2017). Likewise, research suggests that deficits in this ability are related to difficulties in learning to read and write and can differentiate good and bad readers (NELP, 2008).

In the field of emergent literacy, knowledge of the letters of the alphabet refers to the familiarity of children with the forms and names of the letters and their corresponding sounds. Knowledge of the names and sounds of letters represents an important predictor of reading and writing skills (Barrera & Santos, 2016; Lerner & Lonigan, 2016; Whitehurst & Lonigan, 2001). Thus, preschool children with little knowledge of letters and their sounds are more likely to experience difficulties during the literacy process, with obstacles to spelling, vocabulary, comprehension and reading fluency (Torgesen, 2002). According to the meta-analysis carried out by the NELP (2008), knowledge of the letters is one of the best predictors of literacy, presenting significant correlations with reading and writing, since letter-sound correspondence is the basic construction of alphabetic writing.

Studies such as those of Cardoso-Martins (2013), Ehri (2013) and Frith (1985) have highlighted the role of acquiring the alphabetic principle, that is, the mastering of letter-sound correspondences by the child, as an essential skill for initial reading acquisition. Accordingly, the study by Cardoso-Martins and Batista (2005) also identified that Brazilian children attending Early Childhood Education used their knowledge of the names of the letters in their first attempts to make connections between speech and writing, since they more frequently wrote the first letter correctly for words such as *telephone* than for *tortoise*. In this way, when children comprehend that words consist of letters and that letters can map sounds, they achieve an important step for reading and writing (Morais, 2013; Piasta, 2014).

Learning the meanings of new words is also an essential component for the development of emergent literacy, as it will establish the basis of reading comprehension (Stahl & Nagy, 2006). The "expressive vocabulary" corresponds to the set of words that the child is able to pronounce, and can be evaluated by the number of words that the child can use to name pictures or objects, for example. The "receptive vocabulary" corresponds to the repertoire of words that the child is able to understand, and can be evaluated by the identification of pictures from hearing the words. It should be emphasized that the comprehension of spoken words tends to develop before the ability to produce them (Ferracini, Capovilla, Dias, & Capovilla, 2006).

According to Nagy (2005), the relationship between vocabulary and reading comprehension is bidirectional, since a broad vocabulary contributes to reading and this contributes to increase the vocabulary (Nagy, 2005). The knowledge of a word to be read helps the child to recover the phonological form of the word more quickly, facilitating the extraction of meaning (Viana, 2009). For this, the shared reading of books constitutes an excellent activity to promote vocabulary learning (Garcia, Vaz, & Schmidt, 2016).

Oral comprehension is a fundamental skill not only for social interaction but also for literacy and can be defined as the ability to hear, understand and interpret a spoken discourse (Gondim, 2008). Oral comprehension requires focused attention to process a large amount of linguistic information. It requires going beyond the meaning of individual words and phrases to make a connection between ideas (Kim & Phillips, 2014). Studies indicate that oral comprehension skills in preschool predict the ability to comprehend reading in later school years (Lepola, Lynch, Laakkonen, Silvén, & Niemi, 2012; Storch & Whitehurst, 2002).

Cognitive models for learning to read and write portray the progression of the basic processes and skills that emerge, change, and evolve as these capacities develop (Ehri, 2013). According to Frith's (1985) model, both reading and writing go through three qualitatively

different steps. In the first step, word recognition occurs through the logographic strategy, where the child treats the word as a drawing, performing a reading through overall visual recognition, using contextual clues. In the second step, called alphabetic, children begin to use a phonological strategy, based on the correspondences between letters and phonemes. They use, therefore, processes of decoding in the reading (to convert letters into sounds) and of coding in the writing (to convert sounds into graphemes). In this step, which is dependent on formal instruction, the reader is able to read and write new words and pseudowords. In the third stage, called orthographic, by virtue of their reading experiences, readers constitute a mental orthographic lexicon, becoming able to read familiar words through direct recognition, without the need to resort to phonological conversion.

For Ehri (2013), there are four stages in the development of word recognition skills. In the pre-alphabetical phase, reading does not yet involve letter-sound relationships and recognition is based on visual clues. In the partial alphabetic phase, some letter-sound relations are already known, however, the reader is still not skilled in the decoding process. Readers use some letters (usually first and last), with their sounds, to achieve word recognition, the mapping is partial, and they can still use visual cues. The full alphabetic phase is characterized by the effective development of the decoding ability. Finally, in the consolidated alphabetic phase, readers can perform the reading with orthographic patterns, indicating the point at which the word recognition skills become automated.

Frith (1985) highlighted that there is a certain dissociation between the processes used to read and write during the initial period of this acquisition. According to this author, children tend to use phonological strategies for writing before applying them in reading. In agreement with Frith (1985), Ehri (2013) considered that writing, rather than reading, would be responsible for the emergence of the partial alphabetic phase.

Furthermore, in order to arrive at comprehension, the aim of reading, it is necessary to relate the phonological representations of the written words to the semantic representations associated with them. According to theoretical models that attempt to explain reading comprehension (Gough & Tunmer, 1986; Kintsch, 1998), this skill requires several cognitive processes that are related. For good reading comprehension, it is necessary to develop basic reading processes, such as decoding and extraction of the meaning of the words (vocabulary), allied to the most complex cognitive processes, such as to draw inferences.

According to the Simple View of Reading model (Gough & Tunmer, 1986) reading comprehension results from the interaction of decoding skills and oral comprehension skills. However, the weight or importance of these skills tends to vary as children advance in schooling. From the 3rd year of formal schooling, word reading (decoding) tends to become automated, with a small variation among most students in relation to this basic skill, however, the importance of oral comprehension tends to increase (Tilstra, McMaster, Van den Broek, Kendeou, & Rapp, 2009).

Although several studies indicate evidence of the importance of the emergent literacy skills as facilitators of formal learning of reading and writing, studies on the theme performed according to longitudinal methodology that investigate the transition from Early Childhood Education to the 1st year of Elementary Education were not found in the literature, particularly in the national literature. Studies that simultaneously include skills related to oral language and those related to the mastery of the alphabetic code are also rare. Thus, starting from the classification proposed by Whitehurst and Lonigan (2001) regarding emergent literacy skills related to oral language (outside-in) and those related to coding (inside-out), the general aim of the present study was to investigate the contribution of the skills of phonological awareness, knowledge of letters, vocabulary and oral comprehension, developed at the end of Early Childhood Education, for

the performance in reading and writing words and reading comprehension in the 1st year of Elementary Education.

Metod

Participants

A total of 41 children aged 5 to 6 years ($M=5.84$, $SD=0.32$) participated in the first stage of the study, these being students of the final year of Early Childhood Education of a public school located in the central region of a city in the state of São Paulo. After 10 months, the second stage of the research was carried out, when the children were in the second semester of the 1st year of elementary education. A total of 34 children aged 6 to 7 years ($M=6.68$, $SD=0.3$) participated in this stage. The seven losses were due to school transfer, whereby the students were not located. The sample was selected by convenience. As the criteria for participation in the study, the children needed to have regular attendance at school and not have perceptual or cognitive deficits.

Instruments

Raven's Colored Progressive Matrices Test (Angelini, Alves, Custódio, Duarte, & Duarte, 1999). This is a non-verbal intelligence test intended for children ages 5 to 11 years. The test is standardized for the Brazilian population. The instrument presents a Cronbach's alpha coefficient of 0.89. This test was applied to control for cognitive deficits in the sample.

Child Naming Test - Reduced Version (Seabra, Trevisan, & Capovilla, 2012). This test was developed from the Boston Naming Test (Kaplan, Goodglass, & Weintraub, 1983, apud Dias, Tortella, & Seabra, 2012) and aims to assess the individual's ability to name pictures. The test enables the evaluation of expressive language (expressive vocabulary) and the access to long-term memory, in which the names of objects are stored. The instrument presents studies of validity, reliability and standardization for the Brazilian population, and can be applied to the age group between 3 and 14 years. The reliability of the test was verified

through Cronbach's Alpha, with a coefficient of 0.97 being obtained. In the present study the result of this test was considered to be indicative of the "vocabulary" variable.

Phonological Awareness Test: Sequential Assessment - CONFIAS (Moojen et al., 2003). This instrument consists of trials of synthesis, segmentation, identification, production, exclusion and transposition of segments of the speech. Forty trials are proposed for the assessment of syllables and other segments of speech awareness, such as rimes and alliterations, and 30 trials are specific for the assessment of phonemic awareness. This instrument is suitable for children from 4 years of age.

Auditory Comprehension and Reading Contrastive Test - TCCAL (Capovilla & Seabra, 2013). The TCCAL consists of two subtests: the Comprehension of Spoken Sentences subtest, which evaluates the receptive vocabulary and oral comprehension and the Comprehension of Written Sentences subtest, which assesses reading comprehension. It presents validity and reliability data (Cronbach's alpha of 0.87 and 0.97, respectively) with standards that allow its application for the age group of 6 to 11 years.

Letters' Knowledge Task. This task was developed specifically for this study. The aim was to check the child's knowledge in naming letters or saying their sounds. The letters of the alphabet, including vowels and consonants, were presented in a black Arial font, size 72, on a white page, separated by spaces between them. The order of arrangement of the letters on the page was random and the same sequence was maintained for all the children. The researcher pointed to each letter and asked the children to say the name. The score could vary from 0 to 26 points, considering both the verbalization of the names and the sounds of letters. It should be highlighted that, as this task was developed specifically for the present study, there are no expected standards for the level of Early Childhood Education.

Writing under Dictation Test - Reduced Version (Seabra, Dias, & Capovilla, 2013). This test evaluates writing from dictation and can be applied with the 6 to 11 years age group. The test

result is obtained by means of the frequency of errors. For the classification of the subjects, the frequency of errors is converted into a standard score according to age. The writing test presents precision and validity indices for the Brazilian population with a Cronbach's alpha coefficient of 0.99.

Single Words/Pseudowords Reading Task - LPI (Salles, Piccolo, Zamo, & Toazza, 2013). This task evaluates the accuracy in the oral reading of single words. The task can be applied with children from the 1st year to the 7th year of Elementary Education. The test has validation studies and independent standardization data for Brazilian students in the public and private schools networks.

Data Collection Procedures

Data collection took place in two stages, one at the end of Early Childhood Education and another in the 1st year of Elementary Education, with an interval of 10 months between the collections. In each stage of the study, the tests were administered in individual sessions, lasting approximately 30 minutes each, with the exception of the Writing under Dictation Test, the application of which occurred in groups of four to six children. At the end of the Early Childhood Education the tests applied were Raven, CONFIAS, Child Naming Test and the TCCAL – Comprehension of Spoken Sentences and Letters' Knowledge Task. In the 1st year of Elementary Education the tests applied were Writing under Dictation, Single Words/Pseudowords Reading Task and the TCCAL – Comprehension of Written Sentences. The data collection sessions were carried out in the school environment, during the academic period and in a quiet room, which was made available to the researcher.

Data Analysis Procedures

The data were analyzed through correlational tests and multiple regression analyses using the Statistical Package for the Social Sciences, version 17.0, for Windows software (SPSS Inc., Chicago, IL).

Ethical Procedures

This study was approved by the Research Ethics Committee (CAAE number: 49081315.3.00005407). The parents or legal guardians of all the participants signed the consent form for the first and second stages of the study, with the children's agreement to voluntarily participate in the study also taken into account.

Results

Table 1 presents the correlation matrix obtained between the variables studied. Spearman's nonparametric test (ρ) was used to calculate the correlations, since the data of the knowledge of letters, reading, writing and comprehension in reading variables, deviated significantly from the normal distribution, according to the results of the application of the Shapiro-Wilk Test, in which p values of less than 0.05 were obtained for these variables.

From these results, multiple regression analyses were performed to verify the contribution of the predictor variables (phonological awareness, knowledge of letters, vocabulary and oral comprehension), evaluated at the end of the Early Childhood Education, regarding the performance in the reading and writing of words and the comprehension in the reading of sentences, evaluated 10 months later when the children were in the second semester of the 1st Year of Elementary School. It should be noted that the assumptions for performing multiple regression analyses (minimum number of participants, linearity, absence of multicollinearity, homoscedasticity and normality of residue distribution) were satisfied (Hair, Anderson, Tatham, & Black, 2005).

The Backward methodology was used in the regression analysis, starting the construction of the explanatory models with the inclusion of all the predictor variables that significantly correlated with the dependent variables. Then, the variables that did not meet the significance level for the model were successively excluded. The significance level of 5% was defined for the

Table 1
Correlation Matrix (Spearman's) between the Studied Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Writing of Words (1)	1						
Reading of Words (2)	-.883***	1					
Reading Comprehension (3)	-.862***	.919***	1				
Phonological Awareness (4)	-.886***	.793***	.819***	1			
Knowledge of Letters (5)	-.863***	.678***	.709***	.771***	1		
Vocabulary (Naming) (6)	-.537**	.475*	.499**	.654***	.402**	1	
Oral Comprehension (7)	-.506**	.518**	.488**	.570***	.332*	.638***	1

*** $p < .001$; ** $p < .01$; * $p < .05$.

maintenance of the variables in the regression model.

To explain the variability in writing performance, regression analysis was started considering all predictor variables significantly correlated with performance in the writing test: phonological awareness, knowledge of letters, vocabulary and oral comprehension (Table 1).

Table 2 demonstrates that, using all the variables predictive of writing performance, an adjusted coefficient of explanation (R^2) of 0.815 was obtained for Model 1. Therefore, it is possible to conclude that the phonological awareness, knowledge of letters, vocabulary

and oral comprehension variables, together, explained 81.5% of the variation in writing. However, since only two variables presented significant contributions in this model, another analysis was performed for this skill, excluding the vocabulary and oral comprehension variables from the model, as they did not achieve the level of significance. It was concluded that Model 2 (Table 2) presented greater explanatory power when compared to Model 1, since only two variables together (phonological awareness and knowledge of letters) explained 82.3% of the variability in writing performance.

Table 2
Result of the Backward Regression Analysis for the "Writing"

Predictor Variables	Writing					
	Beta	<i>t</i>	Sig.	R^2	R^2 Adjusted	<i>F</i>
Model 1.	Phonological Awareness	-.531	-3.652	.001		
	Knowledge of Letters	-.399	-3.365	.002		
	Vocabulary (Naming)	-.029	-0.278	.783		
	Oral Comprehension	-.051	-0.463	.647		
					.837	.815
						37.239***
Model 2.	Phonological Awareness	-.596	-5.360	.000		
	Knowledge of Letters	-.375	-3.374	.002		
					.834	.823
						77.908***

*** $p < .001$.

To perform the regression analysis, in order to identify which cognitive skills most contributed to explaining the variability in word reading performance, all the predictor variables (phonological awareness, knowledge of letters, vocabulary and oral comprehension) were also included in the multivariate model since all had

significant correlation with reading ($p < .05$). From this, the variables that, in the analyses, did not present statistical significance (knowledge of letters, vocabulary and oral comprehension) were excluded from the model, obtaining Model 2, presented in Table 3, which includes only the variable phonological awareness which explained 56.4% of the variation in reading.

Table 3
Result of the Backward Regression Analysis for the “Reading of Words”

Predictor Variables	Reading of Words					
	Beta	<i>t</i>	Sig.	<i>R</i> ²	<i>R</i> ² Adjusted	<i>F</i>
Model 1. Phonological Awareness	.707	3.073	.005			
Knowledge of Letters	.099	0.529	.601			
Vocabulary (Naming)	.096	0.576	.569			
Oral Comprehension	-.127	-0.725	.474			
				.592	.535	10.505***
Model 2. Phonological Awareness	.760	6.611	.000			
				.577	.564	43.708***

*** $p < .001$.

The same analysis was performed to identify the predictor variables that best explained the reading comprehension performance of the sample studied. Regression analyses were initiated with all predictor variables that were significantly correlated with this skill (phonological awareness, knowledge of letters, vocabulary and reading comprehension) and, subsequently, the variables that did not present statistical significance in the composition of the regression model were excluded. Thus, the regression model that best explained reading comprehension performance only included the phonological awareness variable (Model 2), which explained 60.8% of the variability of this skill (Table 4).

Discussion

This study, in general, aimed to analyze the impact of different emergent literacy skills,

evaluated in the final year of Early Childhood Education, on the performance in reading, writing and reading comprehension tasks in the 1st year of Elementary Education. The results allow the conclusion that, for this sample, all emergent literacy skills (phonological awareness, knowledge of letters, vocabulary and oral comprehension) were significantly correlated with the dependent variables (writing, reading of words and reading comprehension), although the observed correlations between the independent variables related to the coding domain (phonological awareness and knowledge of letters) and reading and writing skills were greater than the correlations obtained between these skills and the variables related to the oral language domain (vocabulary and oral comprehension).

With regard to the contribution of each predictor variable studied to the performance in reading and writing, greater and independent

Table 4
Result of the Backward Regression Analysis for the “Reading Comprehension”

Predictor Variables	Reading Comprehension					
	Beta	<i>t</i>	Sig.	<i>R</i> ²	<i>R</i> ² Adjusted	<i>F</i>
Model 1. Phonological Awareness	.717	3.248	.003			
Knowledge of Letters	.077	0.426	.673			
Vocabulary (Naming)	.071	0.443	.661			
Oral Comprehension	-.046	-0.272	.787			
				.625	.573	12.064***
Model 2. Phonological Awareness	.787	7.220	.000			
				.620	.608	52.125***

****p*<.001.

contributions of phonological awareness and of knowledge of letters were verified for writing, with these two variables jointly explaining, about 82% of the variability in the writing performance of the sample studied. In the case of reading skills, only phonological awareness showed a significant and independent contribution to the participants' performance, explaining about 56% of the variability observed in word reading and approximately 61% in reading comprehension performance.

In the case of the “writing” dependent variable, this study corroborates studies that indicate phonological awareness and knowledge of letters as the main predictors of this skill (Cardoso-Martins & Batista, 2005; Morais, Leite, & Kolinsky, 2013; NELP, 2008; Piasta, 2014). However, greater contributions were also expected from the knowledge of letters skills for word reading performance. In this respect, the result obtained is in line with Frith's theory (1985), which presupposes a dissociation between the processes used to read and write during the initial period of acquisition of these skills. According to this author, logographic reading is not analytical and does not involve the letters, whereas invented writing draws attention to the letters and their respective sounds, favoring the beginning of “phonetic writing”. In their studies, Bradley and Bryant

(1979) had already observed that children in the initial periods of reading and writing acquisition were able to invent semiphonetic spellings of words, however, were unable to read their own spellings, indicating that they did not use the same strategies for reading and writing.

This difference in the “strategies” used by children in the initial process of learning to read and write helps to understand why, in the present study, the phonological awareness and the knowledge of letters skills were more relevant for writing performance while only phonological awareness proved to be important for reading performance. Thus, some children, even knowing certain letters, may not have used this knowledge in their attempts to read, although the knowledge of the letters may have assisted them in the writing test. These results may indicate, therefore, that for the phase of learning to read and write, which was the situation for the majority of the studied group, the writing ability would be more developed when compared to the reading ability. It is therefore considered that some children, although already beginning to use phonological strategies for writing, could still have been using predominantly logographic strategies for reading. In fact, according to Ehri's theory (2013), pre-alphabetic reading does not involve the knowledge of letters, knowledge that is beginning to be necessary for the production

of partially alphabetic writing (and reading).

Similar results were found in the studies of Souza and Maluf (2004), where the authors sought to investigate the relationship between reading and writing abilities in a group of Brazilian children at the beginning of schooling (1st and 2nd years of Elementary Education). The result of the comparison between reading and writing performance for the 1st year showed a statistically significant difference, with an advantage for writing. Whereas, among children with more advanced levels of literacy, a statistically significant difference was found with an advantage for reading. Thus, this study also indicates a dissociation in the development of reading and writing in the early stages of this learning, and these differences seem to tend to be favorable to writing at the beginning of literacy, and favorable to reading in the slightly more advanced stages of this process.

For the dependent variable “reading comprehension”, a greater contributions of vocabulary skills and oral comprehension of sentences was expected, as they are more directly related to the oral language domain. However, this hypothesis was not confirmed, since the regression model that best explained the variability of reading comprehension only included the phonological awareness variable. This result can be explained through the “Simple View of Reading” theory (Gough & Tunmer, 1986), where reading comprehension is seen as the result of the relationship between word recognition (decoding) and oral language comprehension (which includes vocabulary and oral comprehension), neither of these two processes alone being sufficient for reading comprehension.

According to the simple view of reading theory (Gough & Tunmer, 1986), for beginner readers, word recognition contributes most strongly to comprehension and, while they automate the grapheme-phoneme relationships, oral language comprehension becomes more important for this process. The results obtained are, therefore, in agreement with this theory, since the data show that the majority of the children that participated in this study still had not mastered

the decoding process, presenting great difficulty in the reading of words and, consequently, in the reading comprehension. This would explain why there was no greater contribution of vocabulary and oral comprehension skills in the regression analysis performed to explain the performance of the sample in reading comprehension, as these skills become more important for reading comprehension after the automation of the decoding process, as demonstrated by Tilstra et al. (2009). Morais et al. (2013) also highlighted that children in the literacy process generally have impaired reading comprehension, since their attention is focused on grapheme-phoneme conversion and that, from the automation of this process, attention can shift to decoding for access to the meaning, favoring comprehension.

Conclusion

The results of this study contribute to the comprehension of the cognitive and linguistic processes involved in the literacy process. It is considered that the results obtained, especially due to the study being longitudinal, support the hypothesis of the importance of emergent literacy skills for the learning of the writing system. They also indicate the importance of the development of pedagogical proposals aimed at the development of these skills, from preschool.

We believe that future research could overcome the limitations of this study, which are briefly presented below. Although the number of participants was adequate for the regression analysis (Hair et al., 2005), the sample size was close to the minimum number required. Therefore, in future studies, it would be interesting to investigate these skills in a larger number of participants. Another limitation of this study concerns the evaluation of children prior to the end of the 1st year of Elementary Education, which may have prevented the measurement of the further development of reading and writing skills in the sample studied. Future studies could investigate these same skills over a longer period of time, perhaps re-evaluating students during the 2nd year of Elementary Education, in order to more accurately identify the impact of these

emergent literacy skills on initial learning of reading and writing skills. Finally, the deeper comprehension of written language learning in children can contribute to successful literacy.

References

- Angelini, A. L., Alves, I. C. B., Custódio, E. M., Duarte, W. F., & Duarte, J. L. M. (1999). *Matrizes Progressivas Coloridas de Raven: Escala Especial*. São Paulo, SP: Centro Editor de Testes e Pesquisas em Psicologia.
- Barrera, S. D., & Santos, M. J. (2016). Conhecimento do nome das letras e habilidades iniciais em escrita. *Boletim - Academia Paulista de Psicologia*, 36(90), 1-15. Retrieved from http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1415711X2016000100002
- Bradley, L., & Bryant, P. E. (1979). Independence of reading and spelling in backward and normal readers. *Developmental Medicine & Child Neurology*, 21(4), 504-514. doi: 10.1111/j.1469-8749.1979.tb01655.x
- Câmara dos Deputados, Comissão de Educação e Cultura. (2003). *Relatório Final do Grupo de Trabalho Alfabetização Infantil: Os novos caminhos*. Retrieved from http://www2.camara.leg.br/atividade-legislativa/comissoes/comissoes-permanentes/ce/documentos-1/relatorio-de-atividades/Relat_Final.pdf
- Capovilla, F. C., & Seabra, A. G. (2013). Teste Contrastivo de Compreensão Auditiva e de Leitura. In A. G. Seabra, N. M. Dias, & F. C. Capovilla (Eds.), *Avaliação neuropsicológica cognitiva: Leitura, escrita e aritmética* (Vol. 3, pp. 29-53). São Paulo, SP: Memnon.
- Cardoso-Martins, C. (2013). Existe um estágio silábico no desenvolvimento da escrita em português? Evidências de três estudos longitudinais. In M. R. Maluf & C. Martins-Cardoso (Eds.), *Alfabetização no século XXI: Como se aprende a ler e a escrever*. Porto Alegre, RS: Penso.
- Cardoso-Martins, C., & Batista, A. (2005). O conhecimento do nome das letras e o desenvolvimento da escrita: Evidência de crianças falantes do português. *Psicologia: Reflexão e Crítica*, 18, 330-336. Retrieved from <http://www.scielo.br/pdf/prc/v18n3/a06v18n3.pdf>
- Cruz, J. S., Almeida, M., Pinto, P., Constante, P., Macedo, A., Amaral, J., ...Ferreira, C. (2014). Contribuição da literacia emergente para o desempenho em leitura no final do 1.º CEB. *Análise Psicológica*, 32(3), 245-257. doi: 10.14417/ap.749
- Dias, N. M., Tortella, G., & Seabra, A. G. (2012). Evidências de validade e de fidedignidade do Teste Infantil de Nomeação. In A. G. Seabra & N. M. Dias (Eds.), *Avaliação neuropsicológica cognitiva: Linguagem oral* (Vol. 2, pp. 43-50). São Paulo, SP: Memnon.
- Ehri, L. C. (2013). O desenvolvimento da leitura imediata de palavras: Fases e estudos. In M. J. Snowling & C. Hulme (Eds.), *A ciência da leitura* (pp. 153-172). Porto Alegre, RS: Penso.
- Ferracini, F., Capovilla, A. G. S., Dias, N. M., & Capovilla, F. C. (2006). Avaliação de vocabulário expressivo e receptivo na educação infantil. *Revista Psicopedagogia*, 23(71), 124-133.
- Frith, U. (1985). Beneath the surface of developmental dyslexia. In K. Patterson, J. Marshall, & M. Coltheart (Eds.), *Surface dyslexia: Neurological and cognitive studies of phonological reading* (pp. 301-330). Hillsdale, NJ: Lawrence Erlbaum.
- Garcia, F. P., Vaz, A. M., & Schmidt, A. (2016). Leitura compartilhada de livros e aprendizagem de palavras em crianças pré-escolares. *Temas em Psicologia*, 24(4), 1437-1449. doi: 10.9788/TP2016.4-14Pt
- Gillen, J., & Hall, N. (2013). The emergence of early childhood literacy. In J. Marsh, J. Larson, & N. Hall (Eds.), *The Handbook of Early Childhood Literacy* (Vol.2, pp. 3-17). London: Sage.
- Gondim, M. L. S. F. (2008). *Um novo olhar sobre a compreensão oral: Os mecanismos subjacentes ao ensino da compreensão oral segundo o enfoque da abordagem comunicativa* (Master's thesis, Universidade de Brasília, DF, Brazil). Retrieved from http://pgla.unb.br/wpcontent/uploads/2008/10/Maria_Luciene_de_Souza_Freitas_Gondim.pdf
- Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, 7(1), 6-10. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.905.7606&rep=rep1&type=pdf>
- Hair, J. F., Jr., Anderson, R. E., Tatham, R. L., & Black, W. C. (2005). *Análise multivariada de dados* (5th ed.). Porto Alegre, RS: Bookman.

- Kim, Y. S., & Phillips, B. (2014). Cognitive correlates of listening comprehension. *Reading Research Quarterly, 49*, 269-281. Retrieved from http://purl.flvc.org/fsu/fd/FSU_libsubv1_scholarship_submission_1453746379
- Kintsch, W. (1998). *Comprehension: A paradigm for cognition*. Cambridge, UK: Cambridge University Press
- Lepola, J., Lynch, J., Laakkonen, E., Silvén, M., & Niemi, P. (2012). The role of inference making and other language skills in the development of narrative listening comprehension in 4–6-year-old children. *Reading Research Quarterly, 47*(3), 259-282. Retrieved from <http://psycnet.apa.org/record/2012-17947-004>
- Lerner, M. D., & Lonigan, C. J. (2016). Bidirectional relations between phonological awareness and letter knowledge in preschool revisited: A growth curve analysis of the relation between two code-related skills. *Journal of Experimental Child Psychology, 144*, 166-183. doi: 10.1016/j.jecp.2015.09.023
- Melby-Lervag, M., Lyster, S. A., & Hulme, C. (2012). Phonological skills and their role in learning to read: A meta-analytic review. *Psychological Bulletin, 138*(2), 322-352. doi: 10.1037/a0026744
- Moojen, S., Lamprecht, R. R., Santos, R. M., Freitas, G. M., Brodacz, R., Siqueira, M., ...Guarda, E. (2003). *CONFIAS - Consciência Fonológica: Instrumento de Avaliação Sequencial*. São Paulo, SP: Casa do Psicólogo.
- Morais, J. (2013). *Criar leitores – Para professores e educadores*. São Paulo, SP: Manole.
- Morais, J., Leite, I., & Kolinsky, R. (2013). Entre a pré-leitura e a leitura hábil: Condições e patamares da aprendizagem. In M. R. Maluf & C. Cardoso-Martins (Eds.), *Alfabetização no século XXI: Como se aprende a ler e escrever* (pp. 17-48). Porto Alegre, RS: Penso.
- Nagy, W. E. (2005). Why instruction needs to be long-term and comprehensive. In E. H. Hiebert & M. L. Kamil (Eds.), *Teaching and learning vocabulary: Bringing research to practice* (pp. 27-44). Chicago, IL: Routledge.
- National Early Literacy Panel. (2008). *Developing early literacy: Report of the National Early Literacy Panel*. Washington, DC: Author. Retrieved from <https://lincs.ed.gov/publications/pdf/NELPReport09.pdf>
- Piasta, S. B. (2014). Moving to Assessment-guided differentiated instruction to support alphabet knowledge. *The Reading Teacher, 68*(3), 202-211. doi: 10.1002/trtr.1316
- Salles, J. F., Piccolo, L. R., Zamo, R. S., & Toazza, R. (2013). Normas de desempenho em tarefa de leitura de palavras/pseudopalavras isoladas (LPI) para crianças de 1º ano a 7º ano. *Estudos e Pesquisa em Psicologia, 13*(2), 397-419. Retrieved from <http://pepsic.bvsalud.org/pdf/epp/v13n2/v13n2a02.pdf>
- Santos, M. J., & Barrera, S. D. (2017). Impacto do treino em habilidades de consciência fonológica na escrita de pré-escolares. *Psicologia Escolar e Educacional, 21*(1), 93-102. doi: 10.1590/2175-3539201702111080
- Seabra, A. G., Dias, N., & Capovilla, F. C. (2013). Prova de Escrita sob Ditado (versão reduzida). In A. G. Seabra & N. M. Dias (Eds.), *Avaliação neuropsicológica cognitiva: Leitura, escrita e aritmética* (Vol. 3, pp. 54-59). São Paulo, SP: Memnon.
- Seabra, A. G., Trevisan, B. T., & Capovilla, F. C. (2012). Teste Infantil de Nomeação. In A. G. Seabra & N. M. Dias (Eds.), *Avaliação neuropsicológica cognitiva: Linguagem oral* (Vol. 2, pp. 54-86). São Paulo, SP: Memnon.
- Shanahan, T., & Lonigan, C. J. (2010). The National Early Literacy Panel: A summary of the process and the report. *Educational Researcher, 39*(4), 279-285. Retrieved from <http://www.shanahanonliteracy.com/upload/publications/52/pdf/0013189x10369172.pdf>
- Snowling, M. J., & Hulme, C. (2013). *A ciência da leitura*. Porto Alegre, RS: Penso.
- Soares, M. (2016). *Alfabetização: A questão dos métodos*. São Paulo, SP: Contexto.
- Souza, E. O., & Maluf, M. R. (2004). Habilidades de leitura e escrita no início da alfabetização. *Psicologia da Educação, 19*, 55-72. Retrieved from <http://pepsic.bvsalud.org/pdf/psie/n19/n19a04.pdf>
- Stahl, S., & Nagy, W. (2006). *Teaching Word Meanings*. Mahwah, NJ: Lawrence Erlbaum.
- Storch, S. A., & Whitehurst, G. J. (2002). Oral language and code-related precursors to reading: Evidence from a longitudinal structural model. *Developmental Psychology, 38*(6), 934-947. doi: 10.1037/0012-1649.38.6.934

- Sulzby, E., & Teale, W. H. (1991). Emergent literacy. In R. Barr (Ed.), *Handbook of Reading Research* (Vol. 2, pp. 727-757). New York: Longman.
- Tilstra, J., McMaster, K., Van den Broek, P., Kendeou, P., & Rapp, D. (2009). Simple but complex: Components of the simple view of reading across grade levels. *Journal of Research in Reading*, 32(4), 383-401.
- Torgesen, J. K. (2002). The prevention of reading difficulties. *Journal of School Psychology*, 40(1), 7-26. doi: 10.1016/S0022-4405(01)00092-9
- Viana, F. L. (2009). *O ensino da leitura: A avaliação*. Lisboa: Ministério da Educação, Direção Geral de Inovação e de Desenvolvimento Curricular.
- Viana, F. L., Ribeiro, I., & Barrera, S. D. (2017). *Decole – Desenvolvendo Competências de Letramento Emergente: Propostas integradoras para a pré-escola*. Porto Alegre, RS: Penso.
- Whitehurst, G. J., & Lonigan, C. J. (2001). Emergent literacy: Development from prereaders to readers. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of Early Literacy Research* (pp. 11-29). New York: Guildford.

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