

# The effects of the RELATo-BRAZIL Intervention Program in early-grade readers: outcomes of a pilot study

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## ABSTRACT

**Purpose:** to carry out a pilot study applying the Reading and Language Together - Brazil program (RELATo-Brazil), targeting the development of reading and oral language abilities, aiming to improve phonological awareness skills and vocabulary knowledge in the school context.

**Methods:** 9 children of both genders, aged between 8 and 10, enrolled in the second year of elementary school at a private school in the city of Florianópolis, SC, Brazil, joined in the study. The program was applied within three phases: Phase 1 - pre-intervention, with reading and vocabulary assessment tests; Phase 2 - intervention with sessions of different types, A, B, C and Phase 3 - post-intervention, which consisted of the subjects' reassessment, using the same tests applied in Phase 1. The data were stored in Microsoft Excel spreadsheets and exported for statistical analysis in the IBM SPSS software, the 25<sup>th</sup> version. The significance level considered was  $p \leq 0.05$ .

**Results:** following 21 intervention sessions, a better performance among the participants was observed when comparing the results of the pre-intervention and post-intervention phases. There is a statistically considerable difference in the percentage distributions of the conceptual vocabulary fields for Furniture and utensils ( $p=0.028$ ), Places ( $p=0.009$ ) and Shapes and colors ( $p=0.047$ ). The reading rate did not show a statistical difference, but the children performed better in reading time and accuracy after the intervention.

**Conclusion:** the data suggest that training in phoneme awareness and oral language and linking them in the context of authentic book reading are effective strategies for improving both reading and oral language skills.

**Keywords:** Reading; Education; Early Intervention, Educational; Speech, Language and Hearing Sciences

A study conducted at the Federal University of Santa Catarina, Florianópolis, Santa Catarina, Brazil.

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## INTRODUCTION

Intervention programs in oral and written language, structured and made up of multi components, act as a factor that generates change, providing positive results and, as such, have been mentioned in the literature based on the description of scientific studies<sup>1-4</sup>. In compliance with this premise, the intervention program *Reading and Language Together - Brazil* (hereinafter RELATo-Brazil) was designed as attested by the principles derived from the research of Hatcher et al.<sup>2</sup>, which showed that the most effective intervention for poor readers involves linking phonological awareness with knowledge of letters, within the context of reading children's literature books. In this way, RELATo-Brazil was planned to work and integrate oral language with reading, incorporating phonological awareness training activities, word recognition, vocabulary development, while promoting the reading of children's books, previously selected for use in the second year of elementary school.

This is a program that aims to promote reading skills with children who speak Brazilian Portuguese, intervening in the learning process and developing the fundamentals to master both the alphabetic principle and fluent and effective reading. Therefore, by integrating phonology and reading, the program is effective in promoting basic reading competence and brings the difference of integrating the training of precursor learning aptitude to reading within motivating contexts of children's literature.

It is conceivable that both teachers and speech and language therapists need to be attentive to the development of children's expressive and receptive language at the beginning of literacy, as there is scientific evidence that the development of cognitive-linguistic expertise in the first years of school is indispensable for successful learning<sup>3,4</sup>.

Reading is a complex capacity. Through reading, one is able to recognize words in order to achieve fluency and understanding of a language code created by the human being to communicate. Evidence indicates that mastering this competence contributes to later academic success throughout basic education<sup>4,5</sup>.

This paper describes the intervention experience with children from the second year of elementary school, between 7 and 10 years old, which seeks to promote the improvement of oral language and skills that underlie the reading development. The principles of the program were built based on the "simple view of reading" by Gough and Tunmer<sup>6</sup>, which proposes that

reading comprehension results from the product of two aptitudes: decoding and linguistic comprehension. In addition to this vision, the assumptions of the program, now under study, were designed observing results from longitudinal studies that denote causal relationships of language as the foundation of the reading learning process, mediated by word recognition and phonological awareness, as well as the direct effect of mastery in oral language on reading comprehension.

Vocabulary is an integral part of oral language skills, and, as such, its assessment reveals an important indicator of language problems, as well as performance in reading and text comprehension<sup>7</sup>. According to Biemiller<sup>8</sup>, around second grade, 95% of children can read aloud more words than they can understand, inferring that vocabulary, in addition to word identification, is one of the limiting factors regarding reading comprehension. Tunmer and Chapman<sup>9</sup>, in a study with children in the second and third year of primary school in New Zealand, concluded that vocabulary contributes significantly to text comprehension, both for word recognition in reading and for oral comprehension.

Just like the RELATo-Brazil program, there are other early intervention studies, with varied audiences (children at the beginning of the literacy acquisition process, children with learning disorders or children at risk for reading difficulties, dyslexics, among others)<sup>3,6,8</sup> that resulted positively in the development of important and needful skills for the process of learning to read in the early years of literacy. Hatcher and his team of research<sup>10</sup>, in 2014, for example, in a revised and updated edition, developed a phonological training program, explaining the incorporation of the program into reading intervention, as well as the application of a standardized phonological awareness test and the use of a methodology for classifying children's reading books.

In line with this approach, in the intervention sessions implemented in this RELATo-Brazil program, the training of phonological awareness was proposed through playful activities, which aimed at recognizing, identifying and producing rhymes, syllables and phonemes, in the context of reading previously leveled children's literature books, following the strategies of the program already established in the United Kingdom<sup>11</sup>, together with a focus on reading comprehension, in which narrative and vocabulary skills are used, followed by reading strategies. The aforementioned program advocates that phonological awareness training should be linked to the explicit teaching of letter-sound

correspondence, spelling words and reading. Ergo, activities with an emphasis on this relationship were included in the program. The components of phonology considered in this study were phonological awareness, identification and production of rhymes, and manipulation of syllables and phonemes.

It is worth noting that shared reading of storybooks is an important context for learning and often constitutes children's first encounter with the printed word. Therefore, the quality of shared reading interactions is a known predictor of language and reading development<sup>12</sup>. This pilot program, while reading the books, also promoted shared reading, vocabulary development and the production of oral narratives, as well as phonological training activities, based on the principles of the Sound Linkage Program<sup>10</sup>, modified and adapted for Brazilian Portuguese. These are group activities working on syllabic and phonemic levels and rhyme.

In view of the above, the hypothesis was raised that the RELATo-BRAZIL intervention program would lead to gains in the process of learning to read within the sample of children studied, since it proposes explicit work on oral language skills integrated with motivating reading content for the age of the children participating in the program.

This paper aimed at carrying out a pilot study, applying the Reading and Language Together - Brazil (RELATo-Brazil) program, with a view to encourage the development of reading and oral language through work with phonological awareness skills and improving vocabulary in the school context.

## METHODS

This is a pilot study, approved by the Research Ethics Committee of the Federal University of Santa Catarina, Brazil, in accordance with CNS Resolution No. 466/2012, under number 15912919.2.0000.0121 and report No. 3.490.955. It is an intervention program designed to be applied in the school environment, by regular elementary school teachers, integrating the pedagogical planning of the school that hosted the research and was designed with three phases in mind: pre-intervention (pre-test), intervention and post-intervention (post-test). The Informed Consent Form (ICF) and the Written Assent Forms were signed by the parents/legal guardians and by the children participating in the study.

As inclusion criteria, children should be duly enrolled in the second year of elementary school and have the consent of their parents or guardians by signing the ICF.

The exclusion criteria for participating in the research were having some type of neurological, sensory or learning impairment; having a school gap of more than two years, not being collaborative, not completing - for some reason - the assessments proposed in the study and having other biophysical conditions that prevented them from participating in the program.

Nine children of both genders, between 7 and 10 years of age, duly enrolled in the second year of elementary school at a private school in the city of Florianópolis, SC, participated in the study.

The study was organized and carried out in three phases.

**Phase 1 - pre-intervention:** initial assessment of participants using the following instruments:

- a) Protocol for Early Identification of Reading Problems - IPPL<sup>13</sup>, this is an assessment instrument that can be used as a universal screening, which assesses cognitive-linguistic skills and is organized into tests that explore knowledge of the alphabet, phonological working memory, metaphonological skills, rapid automatic naming, reading words and pseudowords and understanding sentences from pictures;
- b) Children's Language Test-ABFW – Part B - Vocabulary<sup>14</sup>, an instrument recommended for children aged 2 to 12 years old that assesses the conceptual fields of animals, food, furniture and utensils, places, clothing, shapes and colors, toys, means of transport, professions and musical instruments. With this test, the percentages of designations using common words (DCW), non-designations (ND) and substitution processes (SP) were analyzed.
- c) Reading rate – this was obtained by recording the participants reading aloud a 207-word excerpt from the book "The boy who learned to see", by Ruth Rocha<sup>15</sup>.

**Phase 2 – intervention:** phase in which the intervention was carried out with the RELATo-Brazil Program. The group sessions in the second year of primary school classrooms aim to develop children's reading, vocabulary and oral narrative skills. Twenty-one group sessions were held using seven literature books, with themes such as: family relationships, ecology and prejudice. Each book was worked on in three types of consecutive sessions (A/B/C). Sessions A and B were structured as follows: in session A, the target is the development of vocabulary through the teacher's reading aloud of the book and the children's active

listening; explicit vocabulary instruction; the production of oral narratives to answer questions of understanding and interpretation of the story read and the plenary (recovery of the words worked on and closing the session). In the final fifteen minutes of the session, playful activities are carried out with games involving phonological awareness tasks. Session B focuses on retelling the story of the book read in the previous session (session A) and suggesting new outcomes through oral narratives produced by the children; vocabulary instruction with the meaning and use of three new words taken from the book; and the plenary (retrieval of the vocabulary and content/message of the book read). Activities, such as games, are also carried out at the end of session B aimed at developing phonological awareness (at syllabic, phonemic and rhyme levels - recognition, identification and production). In sessions C of each book, oral reading activities are

worked on with different strategies aimed at textual understanding (shared reading; group reading; reading imitating the voices of the characters and the narrator; questions and answers succeeding reading an excerpt from the book). Present in all stages of the program, the Plenary was held at the end of the sessions and consisted of presenting and remembering the day's vocabulary, segmenting words or syllables and consolidating vocabulary. All intervention sessions, 50 minutes long each, were applied by the class teacher during her classes and took place twice a week, in groups, with observation and guidance from the researchers. The teacher received prior training that included essential practice to ensure knowledge of how language is the basis for school learning. From this moment forth, more specific training was provided on how to implement the program and monitor children's progress during the intervention.

**Chart 1.** Sessions A, B and C

Sessions/Stages	Activities in each session
Session A: <ul style="list-style-type: none"> <li>• Active listening</li> <li>• Vocabulary instruction</li> <li>• Oral narratives</li> <li>• Plenary</li> </ul>	<ul style="list-style-type: none"> <li>• Reading the book aloud, comprehension activity and interpretation of the story read.</li> <li>• Explicit and interactive teaching of three words from the book used in multiple contexts.</li> <li>• Playful activities at the semantic, phonemic and/or rhyme level.</li> </ul>
Session B <ul style="list-style-type: none"> <li>• Review of the story read in session A</li> <li>• Vocabulary instruction</li> <li>• Oral narratives</li> <li>• Plenary</li> </ul>	<ul style="list-style-type: none"> <li>• Rereading, retelling of the book's history and explicit and interactive teaching, used in multiple contexts of two new words from the book read.</li> <li>• Playful activities at the semantic, phonemic and/or rhyme level.</li> </ul>
Session C <ul style="list-style-type: none"> <li>• Review of the story read in sessions A and B</li> <li>• Vocabulary review</li> <li>• Oral narratives</li> <li>• Plenary</li> </ul>	<ul style="list-style-type: none"> <li>• Rereading, retelling of new outcomes for the story, resumption of the five words studied in the previous sessions.</li> <li>• Playful activities at the semantic, phonemic and/or rhyme level.</li> <li>• Oral reading and vocabulary consolidation.</li> </ul>

**Phase 3 – post-intervention:** this is the moment subsequent to the intervention, using the same protocols applied for the initial assessment, or Phase 1 – pre-intervention. At this point, the research subjects were re-evaluated, with the intention of discovering possible changes in performance in the aftermath of the implementation of the intervention sessions.

The seven children's literature books selected for this study are in line with the Brazilian National Common Core Curriculum (BNCC) and the National Literacy Policy, especially with regard to article 8, XI of Decree No. 9,765/2019. These are literary works appropriate to the school year and the level of children enrolled in the second year of elementary school and aim to contribute to the development of oral language and emerging learning in order to enrich and progressively expand the children's linguistic repertoire<sup>16</sup>.

The titles of the children's books selected for use in this research were: *Tarsila e o papagaio Juvenal (Tarsila and Juvenal, the parrot)*<sup>17</sup>; *Junta, Separa e Guarda (Gather it, sort it out and put it away!)*<sup>18</sup>; *Lilás: uma menina diferente (Lilac: a different little girl)*<sup>19</sup>; *Vovô não toma jeito! (Grandpa doesn't get a grip!)*<sup>20</sup>; *Lição de Geografia (Geography Lesson)*<sup>21</sup>; *Os Meninos Verdes (The Green Boys)*<sup>22</sup> e *A Eleição da Criançada (The Kids' Election)*<sup>23</sup>.

## Instruments

The Protocol for Early Identification of Reading Problems (IPPL) was applied, consisting of seven abilities divided into the subtests described below:

1. Knowledge of the alphabet (KA);
2. Metaphonological Skills - consisting of six tasks:
  - I. rhyme production (RP);
  - II. rhyme identification (RI);
  - III. syllabic segmentation (SS);
  - IV. production of words based on the given phoneme (PWP);
  - V. phonemic synthesis (PS); phonemic analysis (PA);
  - VI. identification of the initial phoneme (IIP);
3. Phonological working memory (PWM);
4. Rapid automatic naming (RAN);
5. Silent reading (SR);
6. Reading of words and pseudowords (RWP);
7. Listening comprehension of sentences from pictures (LCS).

The ABFW test – part B - vocabulary was also applied, evaluating nine conceptual fields: clothing, animals, food, means of transport, furniture and utensils, professions, places, shapes and colors, toys and musical instruments. This test analyzed the percentages of designations using common words (DCW), non-designations (ND) and substitution processes (SP).

The reading rate was obtained through a calculation that considered the number of words read per minute, that is: Rate = number of words read X 60 seconds, divided by the number of words in the selected section of the book (in this case, 207 words).

## Data analysis

The categorical variables of the sample were represented by absolute (n) and relative frequencies (%). Regarding numerical variables, they were described using the following measures of central tendency and dispersion: mean, 95% confidence interval (95%CI), standard deviation (SD), median, minimum value and maximum value. All analyzes were stratified as specified by the research stages, that is, pre-intervention and post-intervention.

The normality of numerical variables was tested using the Shapiro-Wilk test and graphically, using histograms. For variables that did not bring out a normal distribution, the Wilcoxon signed-rank test was used and, for variables with normal distribution at both moments, the t-test for paired samples was used.

The data were stored in Microsoft Excel spreadsheets and exported for statistical analysis using the IBM SPSS software, the 25<sup>th</sup> version. The significance level considered in this study was  $p \leq 0.05$ .

## RESULTS

Nine students collaborated in the study, the majority (n=5) being male (55.6%). The average age of the participants was 8.4 years (SD=0.72), with a minimum and maximum of 8 to 10 years of age respectively.

Chart 2 presents the characteristics of the sample of students in the performance of the subtests of the IPPL instrument. It is noted that the students' performances past the intervention were better for the RI, PS, PA, IIP and RWP subtests, when compared to the pre-intervention subtests, with these differences being statistically notable (Chart 2).

**Chart 2.** Description of mean, median, minimum and maximum scores of the student groups in the subtests of the Early Identification of Reading Problems instrument (IPPL), pre and post-intervention

Subtests	Pre-intervention				Post-intervention				P-value
	Mean (CI95%)	SD	Median	Min - Max	Mean (CI95%)	SD	Median	Min - Max	
KA	22.9 (22.6-23.1)	0.3	23	22-23	23 (23-23)	0	23	23-23	0.317 <sup>a</sup>
RP	9 (5.8-12.2)	4.1	7	4-14	11.9 (9.2-14.6)	3.5	12	5-17	0.137 <sup>a</sup>
RI	17.4 (15.9-19.0)	2.0	18	14-20	19.4 (18.8-20.1)	0.9	20	18-20	<b>0.028<sup>a</sup></b>
SS	20.9 (20.6-21.1)	0.3	21	20- 21	21	0.0	21	21-21	0.317 <sup>a</sup>
PWP	20.8 (19.6-21.9)	1.5	21	18- 22	21 (19.8-22.2)	1.9	22	18-22	0.760 <sup>b</sup>
PS	4.2 (0.70-7.7)	4.6	2	0-15	12.8 (8.5-17.0)	5.5	13	0-18	<b>0.018<sup>a</sup></b>
AF	7.3 (1.1-13.6)	8.1	3	0-18	13.7 (9.4-17.9)	5.6	15	0-19	<b>0.012<sup>a</sup></b>
IIP	15.1 (10.6-19.6)	5.9	18	6-21	19.3 (17.6-21.1)	2.3	20	15-21	<b>0.023<sup>a</sup></b>
PWM	22.9 (17.5-28.3)	7.0	22	16-40	21.4 (19.3-23.6)	28	23	16-24	0.903 <sup>a</sup>
FAN	30.6 (25.0-36.1)	7.2	27	23-43	27.0 (24.4-29.6)	3.3	26	22-32	0.230 <sup>b</sup>
SR	10.7 (10.3-11.1)	0.5	11	10-11	11	0.0	11	11-11	0.083 <sup>a</sup>
RPW	33.1 (30.2-36.0)	3.8	34	26-39	35.7 (33-38.3)	3.5	37	30-40	<b>0.008<sup>b</sup></b>
ACS	16 (13.5-18.5)	3.2	15	12-20	14 (12.7-15.3)	1.7	15	11-16	0.118 <sup>b</sup>

<sup>a</sup> Wilcoxon Signed-Rank Test. <sup>b</sup> T-test for paired samples.

Captions: KA= knowledge of the alphabet; RP = rhyme production; RI = rhyme identification; SS = syllabic segmentation; PWP = production of words from the given phoneme; PS = phonemic synthesis; PA = phonemic analysis; IIP = identification of the initial phoneme; PWM = phonological working memory; FAN= fast auto-naming; SR = silent reading; RPW = reading pseudowords; ACS = auditory comprehension of sentences from pictures; SD= standard deviation; CI = 95%.

In Chart 2, it is possible to observe the results regarding lexical competence for the nine conceptual fields of designations by usual words (DCW), non-designations (ND) and substitution processes (SP) of the ABFW instrument (Chart 2).

Regarding DCW, it can be seen that the conceptual field *Animals* was the one that obtained the highest average percentage in both assessment moments (91.1 pre-intervention; 94.8 post-intervention). Furthermore, children began to name, in a usual way, a greater number of words in the fields Food ( $p=0.012$ ), Furniture and Utensils ( $p=0.026$ ), Professions ( $p=0.026$ ) and Places ( $p=0.024$ ) after the intervention, when compared to the pre-intervention moment, uncovering higher and statistically significant mean and median percentage values (Chart 2).

For ND, it was observed that, in the conceptual fields Clothing, Animals and Means of transport, there was no absence of designations (percentage of 0%) in these semantic fields at both moments (pre and post-intervention), that is, all subjects named the lexical items of the instrument at both moments of the investigation. However, higher average percentages of ND were

detected in the semantic fields of Toys and musical instruments, followed by the semantic field of Places. This was found in both assessment moments. There was no statistically major difference in the percentage distributions of ND in the nine conceptual fields before and after the intervention (Chart 2).

It was also identified that the conceptual fields Professions (average=34.4%) and Locations (average=33.3%) were those that obtained the highest average percentages of occurrence of replacement processes in the pre-intervention. At post-intervention, the highest average percentage was observed in the Toys and musical instruments field (average=23.2%), followed by the fields Professions (average=22.2%) and Locations (average=22.2%). Regarding the difference in the occurrences of Replacement Processes between pre and post-intervention moments, a statistically significant difference was seen in the percentage distributions of the fields Furniture and utensils ( $p=0.028$ ), Locations ( $p=0.009$ ) and Shapes and colors ( $p=0.047$ ) between the two moments, which previewed relatively lower means and medians in the post-intervention moment (Chart 3).

**Chart 3.** Description of the percentages obtained in the conceptual fields of ABFW - Part B - Vocabulary, pre and post-intervention

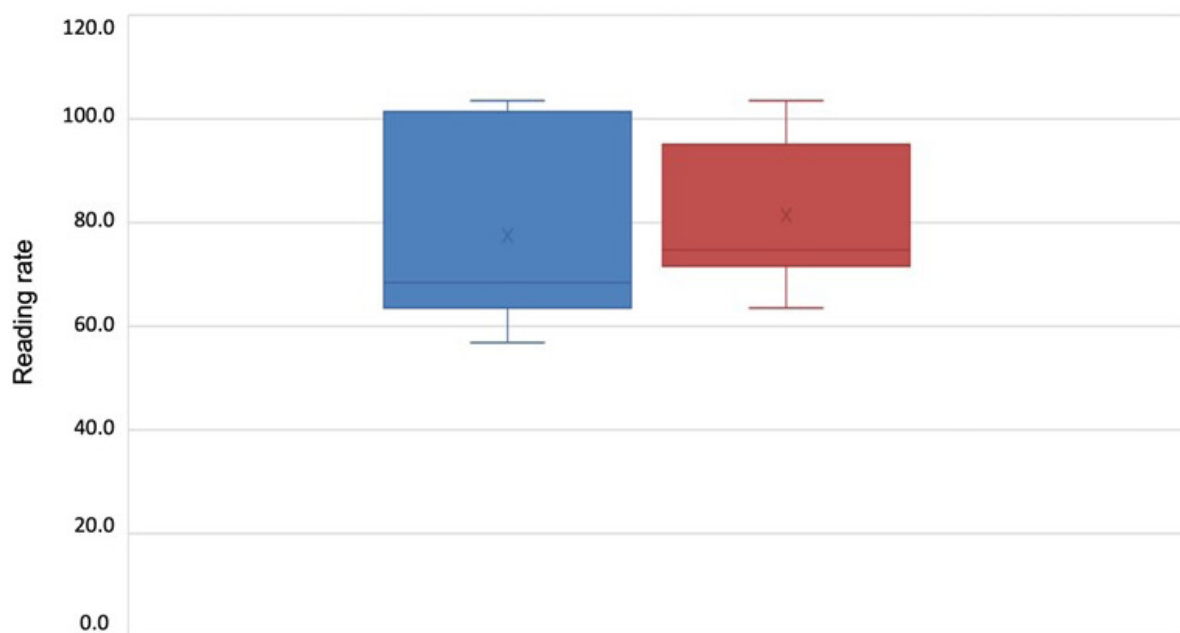
Conceptual fields of the test		Pre-intervention				Post-intervention				P-value
		Mean (CI95%)	SD	Median	Min - Max	Mean (IC95%)	SD	Median	Min - Max	
DCW%	Clothing	74.4 (66.7-82.2)	10.1	80.0	60-90	82.2 (72.2-92.2)	13	90	60-100	0.065 <sup>b</sup>
	Animals	91.1 (83.9-98.4)	9.4	93.3	73.3-100	94.8 (90.5-99.1)	5.6	93.3	86.7-100	<b>0.066<sup>a</sup></b>
	Food	80.0 (72.3-87.7)	10	80	60-93.3	84.4 (74.2-94.7)	13.3	86.7	53.3-93.3	<b>0.012<sup>a</sup></b>
	Means of transport	87.9 (82.9-92.8)	6.4	90.9	72.7-90.9	89.9 (87.6-92.2)	3	90.9	81.8-90.9	0.414 <sup>a</sup>
	Furniture and utensils	77.3 (70.5-84.1)	8.9	75	66.7-91.8	86.1 (80.8-91.4)	6.9	87.5	70.8-95.8	<b>0.026<sup>a</sup></b>
	Professions	63.3 (57.9-68.8)	7.1	60	50-70	75.6 (66.9-84.2)	11.3	80	60-90	<b>0.026<sup>a</sup></b>
	Places	63.0 (55-70.9)	10.3	66.7	50-83.3	76.9 (67.9-85.8)	11.6	83.3	58.3-91.7	<b>0.024<sup>a</sup></b>
	Shapes and colors	82.2 (70.8-93.6)	14.8	90	60-100	91.1 (85.1-97.1)	7.8	90	80-100	0.104 <sup>b</sup>
ND%	Toys and musical instruments	64.6 (54.5-74.8)	13.2	63.6	45.5-81.8	71.7 (63.6-79.9)	10.6	72.7	54.5-90.9	0.174 <sup>b</sup>
	Clothing	0	0	0	0-0	0	0	0	0-0	-
	Animals	0	0	0	0-0	0	0	0	0-0	-
	Food	0.7 (1.0-2.4)	2.2	0	0-6.7	0	0	0	0-0	0.317 <sup>a</sup>
	Means of transport	0	0	0	0-0	0	0	0	0-0	-
	Furniture and utensils	2.8 (0.5-5)	2.9	4.2	0-8.3	0.9 (1.2-3.1)	2.8	0	0-8.3	0.066 <sup>a</sup>
	Professions	2.2 (2.9-7.3)	6.7	0	0-20	1.1 (1.5-3.7)	3.3	0	0-10.0	0.655 <sup>a</sup>
	Places	3.7 (0.9-8.4)	6.1	0	0-16.7	2.8 (1.8-7.3)	5.9	0	0-16.7	0.317 <sup>a</sup>
SP%	Shapes and colors	1.1 (1.5-3.7)	3.3	0	0-10	2.2 (1.2-5.6)	4.4	0	0-10	0.317 <sup>a</sup>
	Toys and musical instruments	4 (3-11.1)	9.2	0	0-27.3	4 (3-11.1)	9.2	0	0-27.3	<b>1.000<sup>a</sup></b>
	Clothing	25.6 (17.8-33.3)	10.1	20	10-40	17.8 (7.8-27.8)	13	10	0-40	0.065 <sup>b</sup>
	Animals	8.9 (1.6-16.1)	9.4	6.7	0-26.7	5.2 (0.9-9.5)	5.6	6.7	0-13.3	0.131 <sup>a</sup>
	Food	19.3 (11.4-27.1)	10.2	13.3	6.7-40	15.6 (5.3-25.8)	13.3	13.3	6.7-46.7	<b>0.236<sup>a</sup></b>
	Means of Transport	12.1 (7.2-17.1)	6.4	9.1	9.1-27.3	10.1 (7.8-12.4)	3	9.1	9.1-18.2	<b>0.414<sup>a</sup></b>
	Furniture and utensils	19.9 (12.8-27.0)	9.3	20.8	4.2-33.3	12.5 (7.4-17.6)	6.6	12.5	4.2-25	<b>0.028<sup>a</sup></b>
	Professions	34.4 (30.4-38.5)	5.3	30	30-40	22.2 (14.8-29.7)	9.7	20	10-40	<b>0.009<sup>a</sup></b>
SP%	Places	33.3 (23.2-43.5)	13.2	33.3	8.3-50	22.2 (13.2-31.3)	11.8	16.7	8.3-50	0.122 <sup>a</sup>
	Shapes and colors	17.8 (6.4-29.2)	14.8	10	0-40	6.8 (0-13.3)	8.7	0	0-20	<b>0.047<sup>a</sup></b>
	Toys and musical instruments	31.3 (21.4-41.3)	12.9	27.3	18.2-54.6	23.2 (14.6-31.9)	11.2	27.3	0-36.4	0.137 <sup>a</sup>

Captions: DCW = designations by common words; ND = non-designations; SP = substitution processes; SD = standard deviation; CI = 95% confidence interval.

<sup>a</sup> Wilcoxon Signed-Rank Test. <sup>b</sup> T-test for paired samples.

Chart 3 shows the distribution of reading rates in the pre and post-intervention phase. Statistical analysis indicated that there was no difference between the rates at the two moments ( $p=0.499$ ). However, as

shown in Figure 1, descriptively, it was pointed out that the group presented higher mean (81.4) and median (74.8) reading rates later than the intervention (pre-intervention: mean = 77.5; median = 68.2) (Figure 1).



Captions: Pre-intervention in blue; Post-intervention in red. \*Wilcoxon Signed-Rank Test.

**Figure 1.** Reading rate - Comparison of performance in the pre and post-intervention moments

## DISCUSSION

There is a consensus among several researchers<sup>24-27</sup> that the development of phonological awareness skills goes hand in hand with learning the written code, so that they are reinforced as the child progresses through the school years.

Studies indicate that the development of phonological awareness is related to the success of learning to read and write<sup>1,6,25,26,27</sup>. As children become aware of the different types of phonological units, such as syllables, rhymes and phonemes, and learn to manipulate these structural components, there is concomitant progress in reading and writing, thus, the explicit teaching of letter/sound correspondence tends to maximize the students' learning, whether with or without alterations in learning<sup>25</sup>.

Despite these findings, some studies show that phonology training on rhymes, syllables and phonemes alone is not so efficient in terms of reading progress in pseudowords, isolated words or in context and in understanding texts<sup>24,26</sup>. What is effective, according to the *Sound Linkage Program*<sup>10</sup>, is phonology training associated with reading training, a task focusing on word recognition in the context of the material read. This was the practice adopted in this study, in which the intervention program mixed phonological training activities with moments of reading children's literature books. Portuguese, as it is a language with alphabetical spelling, has, as an essential element, the development

of metalinguistic skills that help children understand that sentences are made up of words, words by syllables and syllables by phonemes. To this end, the facilitator of the acquisition of written language is the development of metalinguistic awareness, with express instructions on the structure of alphabetic writing, with the explicit intention of familiarizing the child with what writing makes of all the speech sounds<sup>24,25</sup>.

Considering the prowess directly stimulated by the intervention program proposed here, it was observed that the participants' performance was favorable, indicating the development of their metaphonological abilities posterior to the intervention, a fact that allowed them to successfully carry out phonemic manipulation and adequate recognition of the word in reading. This can be confirmed by the results of the IPPL subtests of Initial Phoneme Identification, Rhyme Identification, Phonemic Synthesis and Phonemic Analysis, in which study participants presented statistically positive results in the post-intervention phase of the research. These findings demonstrate that activities with games using rhymes and alliteration, for example, were effective in developing such metaphonological skills. By reason of this, such findings corroborate that investment in the systematic and explicit teaching of metaphonological skills, when inserted in a relaxed and playful environment, brings gains to the development and interest in reading<sup>24,27</sup>.



It is worth highlighting that the playful environment may have favored the positive result, as well as the association of phonological activities with the reading of attractive children's reading content. It is reasonable to consider that the motivating environment can make learners assimilate knowledge more effectively<sup>28-31</sup>.

The relationship between vocabulary and reading seems logical, since the more you read, the more words are learned from the context. In this way, as more words are included in the vocabulary, both in breadth (number of words known by the individual) and in depth (richness of knowledge that the individual has about known words), the better the understanding of what is being read will be. There are also notes regarding the importance of lexical development for the child's development in all curricular areas, as it corroborates the understanding of instructions and problem solving<sup>32-35</sup>.

It was possible to verify that the activities that promote the increase of vocabulary, used in the program under study, with the use of children's books, contributed positively and remarkably to the expansion of children's vocabulary. The number of commonly named figures, observed in the vocabulary test - ABFW, increased after the intervention, demonstrating that vocabulary accuracy is an aspect to be considered as an effect of reading practice<sup>25,32,33</sup>. In the first stage of the evaluation, the number of figures usually named by the participants varied between 81 and 100 of the 118 figures in the test, while, in the second stage, this number increased to 92 to 105.

In addition to the above, it was remarked that there was no statistically significant result in relation to the reading rate and this may have occurred due to the small number of research participants. However, the accuracy of reading the same passage selected in the second evaluation drew attention, pointing to the improvement of reading fluency and accuracy, preponderant factors for achieving reading comprehension. It can be inferred that the tasks carried out during the intervention with vocabulary brought positive results in reading comprehension, translated by the participants' responses to questions about the material read, including questions about the inferences contained in the texts, as well as observation of the appropriation of vocabulary studied in their colloquial speeches.

It should be noted that reading abilities must be taught and once learned, used in the most diverse situations<sup>35,36</sup>. To this end, the teacher does this by teaching the use of reading strategies that help the child to apply their prior knowledge and, at the same time,

updating them to understand inferences contained in the material read. In the present study, reading strategies were used such as reciting and singing, reading imitating the voices present in the text, narrator, and characters, reading aloud, correlating passages of the text with lived experiences and others. Therefore, it is considered important that moments of reading aloud and the use of other text exploration strategies are valid routines in the classroom.

To give consistency to the design of this research, it was decided to carry out a pilot study, as it is a capable and essential instrument for reflecting on the processes of construction and deconstruction of a research in order to test the methods, procedures and materials proposed for carrying out a larger study. Even though it is preliminary in nature, it is known that researchers who apply pilot studies of this type have an ethical and scientific obligation to share the results for the development and production of knowledge, as it is by means of a pilot study that one can conduct the process and the stages of a research<sup>37</sup>.

Considering that this was a pilot study, expansions of the intervention, applying the same methodology to larger populations are necessary to confirm the results pointed out here.

It is suggested that, in future research, there is a comparison, not only of the results of the intervention, but also a comparison of the findings with a control group that can better reflect the gains achieved with the intervention.

## CONCLUSION

The findings provide arguments that interventions in reading and language can be implemented within school context, with good prospects for increasing oral language and reading.

The data remark that training phonemic awareness, oral language, and the connection between them in the context of authentic book reading can be an effective intervention in reading, in addition to promoting oral language skills.

## REFERENCES

1. Dias NM, Bueno JOS, Pontes JM, Mecca TP. Oral and written language in early childhood education: relation with environmental variables. *Psicologia Escolar e Educacional*. 2019;23:e178467. <https://doi.org/10.1590/2175-35392019018467>
2. Hatcher PJ, Goetz K, Snowling MJ, Hulme C, Gibbs S, Smith G. Evidence for the effectiveness of the Early Literacy Support Program. *Br J Educ Psychol*. 2006;76(2):351-67. <https://doi.org/10.1348/000709905X39170>

3. Damasceno ESS, Sacalosc M, Costa MO, Kida ASB, Ávila CRB. Stimulation program in an educational setting for improvement of skills underlying reading. *Audiol., Commun. Res.* 2022;27: e2549. <https://doi.org/10.1590/2317-6431-2021-2549>
4. Moreschi MSM, Barrera SD. Multisensory/Phonic Program: effects on preschoolers at risk of literacy difficulties. *Psico.* 2017;48(1):70-80. <https://doi.org/10.15448/1980-8623.2017.1.24197>
5. Lervåg A, Hulme C, Melby-Lervag M. Unpicking the developmental relationship between oral language skills and reading comprehension: It's simple, but complex. *Child Dev.* 2018;89(5):1821-38. <https://doi.org/10.1111/cdev.12861> PMID: 28605008
6. Gough PB, Tunmer WE. Decoding, reading, and reading disability. *Remedial and Special Education.* 1986;7(1):6-10. <https://doi.org/10.1177/074193258600700104>
7. Oliveira KL de, Santos AAA dos, Rosa MT. Reading comprehension in elementary school. *Psico-USF.* 2016;36(3):546-57. <https://doi.org/10.1590/1982-3703001172014>
8. Biemiller A. Vocabulary: Needed if more children are to read well. *The Psychology of Reading.* 2003;24(3-4):323-35. <https://doi.org/10.1080/02702710390227297>
9. Tunmer W, Chapman J. Excellence and equity in literacy: the case of New Zealand. Springer, 2015.
10. Hatcher PJ, Duff FJ, Hulme C. Sound Linkage: Integrated Program for Overcoming Reading Difficulties. 3 ed. Editora Wiley-Blackwell, 2014.
11. Hatcher PJ, Hulme C, Milhas JNV, Carroll JM, Hatcher J, Gibbs S et al. Efficacy of small group reading intervention for early-grade readers with reading-delay: a randomised controlled trial. *J Child Psychol Psychiatry.* 2006;47(8):820-7. <https://doi.org/10.1111/j.1469-7610.2005.01559.x>
12. Garcia FP, Vaz AM, Schmidt A. Shared book reading and word learning amongst preschool children. *Temas psicol.* 2016;24(4):1437-49. <http://dx.doi.org/10.9788/TP2016.4-14Pt>
13. Capellini SA, Cerqueira César ABP, Germano GD. Protocol for Early Identification of Reading Problems – IPPL. Ribeirão Preto, São Paulo. Booktoy, 2017.
14. Befi-Lopes DM. Vocabulary. In: Andrade CRF, Befi-Lopes DM, Fernandes FDM, Wertzner HF, editors. *ABFW: Children's language test in the areas of phonology, vocabulary, fluency and pragmatics.* 2. ed. Rev. Ampl. e Atual. Barueri (SP): Pró-Fono, 2004. Cap. 2.
15. Rocha R. O menino que aprendeu a ver. Editora Salamandra. 8ª edição. 2013.
16. Brasil. MEC. Documento Referencial Técnico-Científico. Programa Nacional do Livro e do Material Didático, Edital PNLD 2022, Educação Infantil. Brasília, DF. 2020.
17. Leitão MM, Duarte N. Tarsila e o papagaio Juvenal. Editora Melhoramentos, 2011.
18. Dias VL. Junta, separa e guarda. Editora Callis, 2012.
19. Whitcomb ME. Lilás: uma menina diferente. Editora Cosac Naify, 2010.
20. Iacocca L. Vovô não toma jeito! Editora Melhoramentos, 2003.
21. Ziraldo. Lição de geografia. Editora Melhoramentos, 2000.
22. Coralina C. Os meninos verdes. Global Editora, 2007.
23. Bandeira P. A eleição da criança. Editora Melhoramentos, 2004.
24. Duarte Leite RC, Brito LRM, Martins-Reis VO, Pinheiro AMV. Phonological awareness in children at the beginning of literacy and associated factors. *Rev. psicopedag.* 2018;35(108):306-17. Available at: [http://pepsic.bvsalud.org/scielo.php?script=sci\\_arttext&pid=S0103-84862018000300006&Ing=pt&nrn=iso](http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S0103-84862018000300006&Ing=pt&nrn=iso)
25. Rodrigues PN, Postalli LMM. Phonological Awareness Skills Promoted by Teaching Reading and Writing. *Psicol Esc Educ.* 2019;23:e189961. <https://doi.org/10.1590/2175-35392019019961>
26. Souza FFM. A contribuição do lúdico no processo de alfabetização e letramento. *REEDUC - Revista de Estudos em Educação.* 2022;8(1):49-60. <https://doi.org/10.31668/reeduc-ueg.v8i1.12440>
27. da Conceição AMS, de Azevedo GX. A questão do lúdico dentro do trabalho pedagógico. *REEDUC - Revista de Estudos em Educação.* 2022;8(1):166-88. <https://doi.org/10.31668/reeduc-ueg.v8i1.12603>
28. Matos PCS de. Ludicity in early literacy. *Revista Caparaó.* 2022;4(1):e72. Available at: <https://revistacaparao.org/caparao/article/view/72>
29. Pereira da Silva MA. A importância dos jogos e brincadeiras na alfabetização. *Revista Primeira Evolução.* 2022;1(34):51-5. Available at: <https://primeiraevolucao.com.br/index.php/R1E/article/view/344>
30. Costa Silva EAA, Magalhães GL, Silva Mendes RDC. O lúdico como recurso didático na educação infantil. *Revista Ibero-Americana de Humanidades, Ciências e Educação.* 2021;08-69. Available at <https://www.periodicorease.pro.br/rease/article/view/3284>
31. Colombo RC, Cárnio MS. Reading comprehension and receptive vocabulary in Elementary School students with typical development. *CoDAS.* 2018;30(4):e201700145. <https://doi.org/10.1590/2317-1782/20182017145> PMID: 30043898
32. Dujardin E, Ecalle J, Auphan P, Bailloud N, Magnan A. Vocabulary and reading comprehension: what are the links in 7-to 10-year-old children? *Scand J Psychol.* 2023;64(5):582-94. <https://doi.org/10.1111/sjop.12912> PMID: 36871195
33. Pedrosa BAC, Dourado JS, Lemos SMA. Lexical development, speech language disorders and school performance: literature review. *Rev. CEFAC.* 2015;17(5):1633-42. <https://doi.org/10.1590/1982-0216201517519913>
34. Santos JSI, Barby AAOM, Vestena CLB. Phonological awareness in teaching reading to students with learning difficulties in the early years. *Journal of Psychopedagogy.* 2022;39(118):14-26. <https://dx.doi.org/10.51207/2179-4057.20220002>
35. Guimarães SB, Mousinho R. Role of vocabulary for reading comprehension skills. *Psico-USF.* 2019;24(4):685-97. <https://doi.org/10.1590/1413-82712019240407>
36. Godoy DMA, Guimarães SRK, Viana FL. Theoretical-methodological assumptions and results achieved with an explicit teaching program of reading comprehension. *Educação.* 2022;47(1):e59/ 1-21. <https://doi.org/10.5902/1984644455281>
37. Benassi CBP, Cancian QG, Strieder DM. Pilot study: A key instrument for science perception research. *Ens. Tecnol. em Revista, Londrina.* 2023;7(1):210-25. ISSN: 2594-3901.

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