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Intervention based on shared story reading: effect on low and high challenge reading and writing tasks

Intervenção baseada em leitura compartilhada de histórias: efeito nas tarefas de baixo e alto desafio de leitura e escrita

ABSTRACT

Purpose: to investigate the effectiveness of an intervention proposal based on shared story reading for reading comprehension, written narrative and word reading/writing. **Methods:** 44 children were divided into two groups according to their performance in a reading comprehension test – The first group, G1, consisted of children with reading comprehension difficulty, and the second, G2, consisted of children who did not have difficulties. All children were evaluated regarding reading/writing isolated words, reading comprehension of sentences, and written narrative. After this evaluation, G1 children participated in an intervention program (15 meetings) that stimulated shared story reading. After this intervention, all children were reevaluated. Intra- and intergroup data were analyzed statistically by applying appropriate statistical tests, with the level of significance set at >0.05%. **Results:** after the intervention program, G1 children showed significant improvement in the variables evaluated. In the intergroup analysis, at the time of evaluation, G1 differed from G2 in reading/writing, reading comprehension, ability to correctly judge the verbs, and in textual coherence. At reassessment, G1 matched G2 in textual coherence and approached G2 in reading/writing isolated words and reading comprehension. **Conclusion:** shared story reading promoted the development of low and high level reading and writing skills, being more effective for high-level strategies (example: written narrative). It is suggested that a specific program for orthographic questions be associated.

RESUMO

Objetivo: investigar a eficácia de uma proposta de intervenção baseada em leitura compartilhada de histórias para a compreensão leitora, narrativa escrita e leitura/escrita de palavras. **Método:** 44 crianças divididas em dois grupos, segundo o desempenho destas em uma prova de compreensão leitora – G1: crianças com dificuldade em compreensão leitora; G2: sem dificuldades. Todas as crianças foram avaliadas em relação à leitura e escrita de palavras isoladas, compreensão leitora de frases e narrativa escrita. Após avaliação as crianças do G1 participaram de um programa de intervenção (15 encontros) que estimulava a leitura compartilhada de histórias. Após a intervenção todas as crianças (G1 e G2) foram reavaliadas. Os resultados foram comparados intra e intergrupos, sendo aplicados testes estatísticos pertinentes, adotando o nível de significância menor que 0,05. **Resultados:** após o programa de intervenção as crianças do G1 apresentaram melhora significativa nas variáveis avaliadas. Na análise intergrupos, no momento da avaliação, G1 era diferente do G2 em leitura/escrita, compreensão leitora, capacidade julgar corretamente os verbos e em coerência textual. Na reavaliação, G1 se igualou ao G2 em coerência textual e, se aproximou do G2 em leitura/escrita de apalvras isoladas e compreensão leitora. **Conclusão:** a leitura compartilhada de histórias promoveu o desenvolvimento das habilidades de baixo e alto nível de leitura e escrita, sendo mais eficaz para as estratégias de alto nível (exemplo, narrativa escrita). Sugere-se que, para questões ortográficas, um programa específico para este aspecto seja associado.

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INTRODUCTION

Shared story reading can be defined as an interaction between an adult and a child or an adult and a group of children in which the adult reads a book using a range of structured strategies[1]. These strategies may be used before, during, or after the reading, getting the child involved in the story[1-3].

The strategies can be built on questions beginning with "why, when, who, and where" with gradually increasing complexity, according to the extent of the children's repertoire. Along with other strategies, they can also associate the children's previous knowledge with what is being read in the text, promoting a deeper level of processing[1,4-5].

Shared story reading is a tool that can be used for a broad age group ranging from early childhood[2,6] to adolescence[7] to stimulate skills in oral language[2], reading/writing[2,8], and executive functions[9]. It can also be used at school[6], at home[1,10], and/or as a therapeutic strategy – for instance, when stimulating/rehabilitating language in children with autism spectrum disorder[5,11].

Using functional magnetic resonance imaging and other techniques (for example., electroencephalogram, long-latency auditory evoked potentials, and so on) authors have demonstrated that shared story reading activates brain regions corresponding to language and executive functions[3,9-10]. Also, mothers and/or other adults caring for children who use this strategy in everyday life make the children more likely to have an adequate linguistic development[10].

For schoolchildren, the ultimate goal of literacy is for the student to be able to understand written texts. Various factors are important for reading comprehension: linguistic components (vocabulary, syntax, phonological skills, and so forth)[4,12]; cognitive components (executive functions – working memory, attention, cognitive flexibility, and so on)[4,12-14]; and social variables (social context, motivations, etc.)[4,12].

Shared story reading, by stimulating skills in oral language, narrative ability, and executive functions, is a tool that can help rehabilitate children with school difficulties. Few studies have investigated the effectiveness of therapeutic programs in the rehabilitation of children whose mother tongue is Portuguese, whose textual comprehension is inadequate, and/or who have other learning difficulties.

Given the positive relationship between shared story reading and language, this study aimed to investigate the effectiveness of an intervention approach based on shared story reading for reading comprehension, narrative writing, and word decoding and writing.

METHODS

The study was a parallel, randomized, controlled, open, treatment clinical trial. Regarding ethical considerations, the study was approved by the Human Research Ethics Committee under approval registry number 2893/2011. Complying with the ethical issues, since the study involved data collection from children, the parents/guardians were informed about the assessments to be conducted and the intervention program; those who agreed with them gave written informed consent.

Sample selection and makeup

The initial study sample comprised 127 children regularly enrolled in fourth or fifth grade at four municipal elementary schools (all the children whose parents/guardians authorized their participation were assessed). Of all the children initially assessed, only 44 were included in the final sample.

The final sample was selected with the following inclusion criteria: being older than 8 years and younger than 10 years and 11 months; being in the fourth or fifth grade at school; not being an inclusion student (i.e., children diagnosed with intellectual disability, autism spectrum disorder, etc.); not having any degree or type of hearing loss. Exclusion criteria were: parents/guardians' nonadherence at the time of intervention; children who were attending other stimulation/rehabilitation groups; who had a history of speech-language-hearing/psycho-pedagogical therapy or were attending it at the time; or who attended less than 75% of the intervention activities (i.e., they had to attend at least 11 sessions).

It is important to point out that the first two inclusion criteria (age and school grade) were meant to ensure that most of the research subjects would have already learned to read and write and could perform text writing and comprehension tasks.

Phases of the study and data collection materials/procedures

The study was conducted in three phases:

- Phase 1 – Sample selection and makeup: the children were submitted to auditory screening and assessment with the Contrastive Test of Listening and Reading Comprehension – reading comprehension subtest (CTLRC-RC)[15].xx

The objective of auditory screening was to exclude children with a possible hearing loss. The exam was performed with a pediatric audiometer PA5 (manufactured by Interacoustics) with a TDH-39 headset. Pure-tone threshold audiometry surveyed the air-conduction thresholds (the lowest intensity a person can hear) at the frequencies of 500, 1000, 2000, and 4000 Hz. The children "passed" the screening test when their thresholds at these frequencies were lower than 25 dB.

The CTLRC-RC[15] was used to assess the children's reading comprehension of simple/complex sentences, to divide them into groups, and to measure to what extent the intervention helped their reading comprehension skills. The test has six training items and 40 assessment items, each containing a written sentence followed by five images from which to choose. The task consists of reading the sentence and checking the image that best corresponds to it. The written sentences vary in size and syntactic and lexical complexity. Each correct answer was given one point, with the highest possible score being 40 points.

The children's performance in the CTLRC-RC[15] was classified based on the instructions of the instrument's authors. They were classified according to age, thus being divided

into G1 and G2. The improvement in reading comprehension performance was assessed by comparing their gross pre- and post-intervention scores.

As described above, the 44 children of the final sample were divided into two groups according to their performance in the reading comprehension skill assessment, as follows:

- G1 "Shared story reading intervention group": 17 children (nine males – 53%), classified in the first assessment with low or very low performance in the sentence comprehension task. Initially, 20 children had been allocated to this group, but three participants were excluded for attending less than 75% of the sessions.

- G2 "Control group": 27 children (nine males – 33%) whose performance was classified as average or high in the CTLRC-RC[15] in the first assessment. This group was not submitted to any intervention.

- Phase 2 – Reading/writing assessment: The children of both groups participated in this phase – in which their word reading and word dictation performance was assessed with the Academic Achievement Test (AAT)[16]; also, an image-based text writing sample was collected. These instruments were applied individually in the school setting.

The objective of using the AAT[16] was to quantify each child's reading and writing performance – the arithmetic task was not used. The writing subtest consisted of writing their name and 34 dictated words (presented first alone and then read in a sentence, in which the word to be written was stressed). Each correctly written word was given one point (maximum of 35 points). The reading subtest consisted of presenting a stimulus sheet with 70 words for the children to read, beginning with short words structured in consonant-vowel syllables and ending with infrequent and more complex words. Each correctly read word was given one point (maximum of 70 points). The gross score of each task was used for statistical analysis.

For the narrative writing, each child was shown a visual stimulus (an image of children playing and having fun in a room with an adult) and was then asked to write a story. No time limit or word/line limit was set for them to perform this task.

Three aspects were assessed in their writing task. The first one concerned the types and frequency of misspellings, and the second, the use of nouns, verbs, pronouns, and other words. These two aspects were analyzed according to the instructions of a study that aimed to analyze written narratives[17]. In it, the relative frequency of the various types of misspellings (section 2 of the protocol suggested in the study) and of the use of pronouns, nouns, verbs, and other words (section 3) were calculated.

The third aspect assessed was related to textual coherence. The instrument used in this research[18] classifies narrative coherence into four levels – level I encompasses the children with greater coherence difficulties, while level IV includes those for whom this task is easy. The classification into levels analyzes the character's presence throughout the story, the continuity of the theme, the main event, and the conclusion of the story.

For this study, the children at coherence levels I or II were classified as "inadequate", whereas the children who produced written narratives at levels III or IV were classified as "adequate". They were judged to show adequate or inadequate performance based on instructions from the instrument's authors, who state that the first two coherence classification levels are found in children whose such skill is in its initial development – which can be considered an abnormal result if these children are in a more advanced schooling level.

- Phase 3 – Intervention program based on shared story reading: Only the children in G1 participated. This intervention program proposes 15 one-hour sessions, conducted in small groups (five children at most), with two sessions a week for two months. The sessions took place in the part of the day opposite to that of classes, in a room at a municipal school made available by the department of education.

The intervention approach with shared story reading was developed based on reviewed articles that used the same therapeutic strategy, though with different objectives[1-2,4,7-8,10]. The work plan involved previously selected story reading activities to be carried out in five stages: 1. Introducing the story – getting acquainted with the characters and settings; 2. Exploring the story – analyzing the details of the setting and the relationship between the characters; 3. Handling the story – understanding the relationship between the facts and realizing that a change in events affects the whole progress of the story; 4. Completing the story – Using cloze (desconheço este termo; presumo que faça parte do jargão deste assunto) activities as a strategy to develop reading comprehension; 5. Changing the story – changing parts of the story and analyzing the new conclusions.

During the intervention process, three books with different stories were used. In all of them, the text was explored and the activities were developed in the same sequence of the work model (in five stages of one hour each). Hence, a total of 15 sessions had been held by the end of the intervention. The activities used in the intervention program are briefly described in Chart 1.

In the sessions, the researchers read the stories aloud. During the activities, all children participated in storytime, following the reading and answering, drawing, retelling, or writing.

- Phase 4 – Reassessment: In this part, the children in G1 and G2 were reassessed with the sentence comprehension test[15] (instrument described in phase 1 of this study), word reading and writing test[16], and narrative writing with visual support (instruments described in phase 2). The collection took place individually at school, one week after ending the intervention with G1.

Data analysis

Descriptive data analysis was used to characterize the sample. The parameters were submitted to quantitative analysis, comparing each group's pre- and post-intervention assessment (intragroup analysis). To this end, the Wilcoxon test for paired samples was used to compare their reading, writing, and sentence

Chart 1. Brief description of each session of the intervention program based on shared story reading used in this study.

1st stage	Before reading	Introducing the story: describing the setting and characters.
	While reading	Targeted understanding (e.g., what is the name of the character?).
	After reading	The children drew the part of the story they liked the most.
2nd stage	Before reading	Expanded introduction: detailed analysis. Finding the central idea, recalling details of the story, answering questions from the previous session.
	While reading	Self-monitored comprehension (e.g., what is the idea in this paragraph?).
	After reading	The child wrote three of the story happenings in the proper time sequence.
3rd stage	Before reading	Targeted reading: exploring the images in the book based on the researcher's question.
	While reading	Before answering the questions, each child had one minute to think about the answer and phrase it. The answer should have details and a different vocabulary from what was read.
	After reading	Each child was handed images and phrases related to the story, which they had to organize in order
4th stage	Before reading	Recalling the book: asking about details of the story.
	While reading	Story with cloze activities: filling in the gaps while reading each paragraph and reviewing the activity.
	After reading	Each child was expected to change some happening in the story, writing a new end
5th stage	Before reading	Self-questioning: each child was expected to ask himself questions and write them in the notebook.
	While reading	Story with cloze activities: filling in the gaps while reading – the written word had to be a synonym of the one in the text.
	After reading	Changing the character's traits and developing a new conclusion.

comprehension, while the Student t-test for paired samples was used to compare their misspellings and use of nouns and other words in text writing analysis.

Performance was compared between groups (intergroup analysis) at each moment (pre- and post-intervention) with the Mann-Whitney test (for reading, writing, and sentence comprehension) and the Student t-test (for unpaired samples of certain variables in the written narrative). The written narrative coherence was analyzed (comparison between percentages of adequate narratives) with the two-proportion z-test. The level of significance was set at 0.05 in all analyses.

RESULTS

The mean score of each group for all the parameters considered in this study is described in Table 1. The statistical analysis refers to intragroup performance – i.e., whether there was a difference in each group's performance between the two assessments (each child had his own performance in the first assessment compared to the second one).

It was observed that, after the intervention, the children in G1 had a better performance in word reading and dictation, written sentence comprehension, use of correctly conjugated verbs, and greater use of adjectives in their written narratives.

The intergroup performance (between groups) at first assessment (pre) and then at reassessment (post) is shown in Table 2. A difference in the same parameters was observed between G1 and G2 pre- and post-intervention. However, the difference between these groups was smaller in the post-intervention.

The analysis of written narrative coherence is presented in Tables 3 and 4. In the first assessment, 12 (71%) children in G1 had difficulties making their text coherent, compared to one (3%) of the children in G2. In the second assessment, G1 was equal to G2, and most of the children were classified as "adequate" – the number of children classified as inadequate was 3 in G1 (17%), and 1 in G2 (3%).

DISCUSSION

The present study developed and proposed an intervention program based on shared story reading, analyzing whether this strategy would positively influence reading comprehension, text writing, and reading/writing activities (reading and writing words of various sizes and regularities).

The discussion and analysis of the results related to the effectiveness of this approach were organized by covering two aspects: intragroup comparison (in which each group was analyzed and compared to itself based on its initial and final score) and intergroup comparison (i.e., G1 was compared to G2 in the pre-intervention, as well as in the post-intervention).

In the intragroup comparison, the results showed that G1 significantly improved in most variables assessed (reading, writing, reading comprehension, textual coherence, correct verb conjugation in the written narrative, and greater use of adjectives), indicating that shared story reading is a strategy that helps the development of reading and writing skills from the most basic to the most complex levels.

However, the intergroup data revealed that the children in G1 were still behind the control group, especially in terms of

Table 1. Intragroup comparison of the various tests applied in the assessment and reassessment.

Tasks performed in the assessment and reassessment	G1					G2				
	Pre (assessment)		Post (reassessment)		P-value	Pre (assessment)		Post (reassessment)		P-value
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Writing	9	6.3	13	1.8	**0.0001***	22	5.1	22	5.4	0.2
Reading	41	16.9	49	6.8	**0.0007***	62	5.5	63	4.1	0.6
CTLRC-RC	25	6.8	33	15.2	**0.008***	36	1.8	37	2.3	0.4
Text writing – total number of words	64	48.5	51	28.1	0.2	58	30.5	69	37.2	0.1
Text writing – percentage of misspellings	40	26.3	31	18.9	0.07	13	12.6	12	13.5	0.7
Text writing – percentage of nouns	18	8.4	21	6.3	0.5	24	4.7	27	5.8	**0.04***
Text writing – percentage of properly conjugated verbs	11	7.1	17	4.5	**0.02***	20	5.5	21	5.5	0.5
Text writing – percentage of adjectives	2	2.4	4	3.4	**0.02***	3	3.3	3	4.1	0.7
Text writing – percentage of pronouns	8	6.4	5	4.4	0.09	6	4.2	6	5.7	0.8

Wilcoxon test and Student t-test for paired samples (text writing); *Statistical difference considering $\alpha = 0.05$
SD = standard deviation/ CTLRC-RC = Contrastive Test of Listening and Reading Comprehension – reading comprehension subtest.

Table 2. Intergroup comparison of the various tests applied in the assessment and, later, in the reassessment.

Tasks performed	Assessment (pre)					Reassessment (post)				
	G1		G2		P-value	G1		G2		P-value
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Writing	9	6.3	22	5.1	**0.000001***	13	1.8	22	5.4	**0.03***
Reading	41	16.9	62	5.5	**0.000001***	49	6.8	63	4.1	**0.001***
CTLRC-RC	25	6.8	36	1.8	**0.000001***	33	15.2	37	2.3	**0.001***
Text writing – total number of words	64	48.5	58	30.5	0.6	51	28.1	69	37.2	0.09
Text writing – percentage of misspellings	40	26.3	13	12.6	**0.001***	31	18.9	12	13.5	**0.002***
Text writing – percentage of nouns	18	8.4	24	4.7	0.06	21	6.3	27	5.8	**0.004***
Text writing – percentage of properly conjugated verbs	11	7.1	20	5.5	**0.0001***	17	4.5	21	5.5	**0.008***
Text writing – percentage of adjectives	2	2.4	3	3.3	0.1	4	3.4	3	4.1	0.8
Text writing – percentage of pronouns	8	6.4	6	4.2	0.2	5	4.4	6	5.7	0.4

Mann-Whitney test and Student t-test for paired samples (text writing); *Statistical difference considering $\alpha = 0.05$
SD = standard deviation/ CTLRC-RC = Contrastive Test of Listening and Reading Comprehension – reading comprehension subtest.

Table 3. Intragroup comparison of written narrative coherence.

		Inadequate		Adequate		p-value (intragroup)
		level I	level II	level III	level IV	
G1	Assessment (pre)	5	7	5	0	**0.002***
	Reassessment (post)	1	2	13	1	
G2	Assessment (pre)	0	1	9	17	1
	Reassessment (post)	0	1	12	14	

Two-proportion z-test; *Statistical difference considering $\alpha = 0.05$.

Table 4. Intergroup comparison of written narrative coherence.

		Inadequate		Adequate		p-value (intergroup)
		level I	level II	level III	level IV	
Assessment (pre)	G1	5	7	5	0	**0.00001***
	G2	0	1	9	17	
Reassessment (post)	G1	1	2	13	1	0.1
	G2	0	1	12	14	

Two-proportion z-test; *Statistical difference considering $\alpha = 0.05$.

reading and writing more complex words (irregular, long, and unfamiliar words were misspelled and misread more often). An important result in intergroup analysis was the percentage of children in G1 that managed to write more coherent texts, equaling G2 at reassessment (after G1 intervention).

Some studies that analyzed the influence of shared story reading on reading/writing tasks considering their initial development (name of the letters, phoneme/grapheme relationship, and misspellings) observed that this type of stimulation helps – though not enough – to solve the orthographic difficulties[2,8,19]. It is suggested that, along with this type of stimulation/rehabilitation program, another program be also carried out to stimulate metalinguistic skills (e.g., phonological awareness) and/or spelling rules in the mother tongue of the children[8]. These combined intervention

programs would broaden written language development from the initial to the more complex levels.

To promote reading comprehension, the child needs to actively participate when a story is read to him, with critical thinking about the material being read and mental images of what is being decoded[2,20]. Also, interruptions during the reading process allow the readers to relate their previous knowledge to what they are reading in the text, providing a deeper processing level[4]. All of these aspects are stimulated in the shared reading programs.

In this study, the children made great progress in sentence comprehension. However, to further develop this skill, it is suggested that story reading be encouraged both at home and in school, becoming a routine practice in these environments – rather than providing only a short-term program to rehabilitate children who are behind in reading comprehension.

Another important point in this study refers to the written narrative. There was no difference in the number of words used by the two groups. On the other hand, there was a difference in the use of correctly conjugated verbs, percentage of misspellings, and especially in the ability to maintain coherence (data referring to the pre-intervention assessment). Few studies have assessed children's written narrative, so there are few data for comparison. What is found in the national literature is that when children with difficulties at school write narrative texts, they have a higher percentage of misspellings (particularly involving irregular phoneme-grapheme relationships and with support on orality)[17,21], they write texts with fewer words[17], and have difficulties conjugating verbs, using adverbs[17,22], and maintaining textual coherence[17].

In this study, since the groups were selected based on their performance in sentence reading comprehension – a more complex task –, no difference was found in the total number of words. Also, after the intervention, the children in G1 made progress in their spelling, though they were still behind G2. Moreover, they equaled the control group in coherence ability.

Intuitively, we might expect children with spelling difficulties to also have coherence difficulties. Nevertheless, several authors have reported that these are different though positively related skills[17,23] – hence, both must be analyzed in written narratives[24-25]. According to these authors, children who write longer and more structured narratives are at risk of misspelling more often[24], and the misspellings do not preclude a coherent text. After all, despite having many misspellings, the child's narrative may have characters, the creation and solution of a problem situation, and a place/time where the story unfolds[25].

Thus, the intervention based on shared story reading positively helped the children's ability to write coherent texts – in which G1 equaled G2 in the second assessment. This strategy may shape the reader's behavior regarding four domains: text comprehension (synthesis, inference, etc.), vocabulary (search for unknown words, contextual inference, etc.), text structure (narrative structure, cause-and-effect relationships, etc.), and additional text components (title, illustrations, etc.)[7]. Some of these domains are also present in coherence development, showing the positive relationship between text reading and writing.

It should be pointed out that the activities proposed in this intervention program are simple and do not require specific materials or training. Hence, shared story reading is a strategy to be used not only in the therapeutic setting but also, as suggested, in the school and home contexts, where its implementation will promote adequate linguistic development and prevent written language mistakes.

CONCLUSION

The present study demonstrated that the intervention program based on shared story reading benefitted the children with reading comprehension difficulties, also improving their ability to write narratives and their performance in isolated word reading and writing tasks.

Despite the improvement in isolated word reading and writing skills, it is highlighted that this intervention strategy was not sufficient to solve spelling difficulties. Thus, specific rehabilitation programs should be carried out for the spelling issues. Shared story reading was more effective in stimulating the more complex reading/writing skills, such as reading comprehension and coherent text writing.

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Authors' contributions

PAZ: Study conceptualization and design, data analysis and interpretation, article writing and revision; CBN: Study conceptualization and design, data collection, analysis and interpretation, initial article draft; MTHF: Research advisor, study conceptualization and design, revision of the final draft.