

# Effects on Reading of an Early Intervention Program for Spanish Children at Risk of Learning Difficulties

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## **Abstract**

The study aimed to analyze the effects on reading of an early oral and written language intervention program for Spanish children at risk of learning difficulties. The goal of this classroom-based program was to prioritize a systematic approach to reading and writing and to foster phonological knowledge and the development of oral language (phonology, semantics, morphology, and syntax) within the Spanish school curriculum. The sample comprised 56 students at risk of learning difficulties. The repeated measures longitudinal design involved four assessment and three intervention points over a period of three years, considering two study groups (instruction vs. no instruction) and two variables (reading accuracy and reading comprehension). Children were assessed between the ages of 5 and 7 years. The instruction group scored higher on both reading accuracy and reading comprehension at all assessment points. Overall, the results demonstrate that this early intervention program for oral and written language is an effective way of improving the reading performance of children at risk of learning difficulties.

**Keywords:** Early intervention, learning difficulties, reading accuracy, reading comprehension.

## **Effects on Reading of an Early Intervention Program for Students at Risk of Learning Difficulties**

Recent Program for International Student Assessment reports have highlighted the high levels of underachievement that students in many European countries show from as early as primary school. Research over the last decade or so has also found that many secondary school students present serious difficulties with reading and writing (González, Martín, Delgado, & Barba, 2002).

In an attempt to address these problems, researchers have sought to develop ways of tackling underachievement and learning difficulties while children are still young. The proposed solutions include the early detection of risk factors and approaches such as RtI (response to intervention), which seeks to optimize students' resources and abilities from an early age (Fletcher & Vaughn, 2009; Vaughn, Wanzek, Woodruff, & Linan-Thompson, 2007). Clearly, the question of when and how school learning should begin is of key importance in terms of improving students' academic performance and preventing learning difficulties (Baroccio & Hagg, 1999; Burns, Griffin, & Snows, 1999; Swartz, Shook, & Klein, 2003). In this context, early intervention is argued to be crucial for tackling underachievement and for preventing the development of learning difficulties, which if left unaddressed are costly to rectify. Such intervention is also

thought to improve students' academic performance and to provide a solid foundation for the rest of their school career.

The majority of studies carried out in this area suggest that learning difficulties can be addressed through changes to the curriculum at an early age, specifically by prioritizing a systematic approach to learning to read and write (Baroccio & Hagg, 1999; Brand & Dalton, 2012; Brown, Scull, Nolan, Raban, & Deans, 2012; Burns et al., 1999; Dunphy, 2012; Elliott & Olliff, 2008; Swartz et al., 2003; Vadasy & Sanders, 2008; Wright, Stackhouse, & Wood, 2008). Research in different languages indicates that such an approach to the teaching of reading and writing would focus on the development of phonological awareness and oral language, and specifically on phonological, semantic, and syntactic and morphological development (Babayiğit & Stainthorp, 2011; Beauchat, Blamey, & Walpole, 2009; Brand & Dalton, 2012; Ford, Cabell, Konold, Invernizzi, & Gartland, 2013; González, Martín, & Delgado, 2011, 2012; Hipfner-Boucher et al., 2014; Jiménez et al., 2004; Pullen & Justicia, 2003; Roberts, 2005; Schaadt, Pannekamp, & van der Meer, 2013; Scheffner, Hammer, Farkas, & Maczuga, 2010; Swartz et al., 2003; Vadasy & Sanders, 2012; van Weerdenburg, Verhoeven, van Balkom, & Bosman, 2009; White, 2011). Some of these studies, which have been carried out in alphabetic languages with different linguistic consistency, show that a systematic, direct, and early focus on promoting oral language and phonological awareness can lead to earlier improvements in reading and writing and prevent the development of learning difficulties; such an approach also appears to be associated with better academic performance at a later stage (Ford et al., 2013; González et al., 2011, 2012; Roberts, 2005; Swartz et al., 2003; Ziegler et al., 2010).

In the Spanish education system, written language begins to be introduced at the infant stage, although formal teaching of reading and writing does not become compulsory until children begin primary school around the age of six, this being the start of official schooling. However, the main components of what is taught are not standardized across Spain. This situation reflects the views of some professionals and researchers who argue that the teaching and learning of these aspects should not begin until children are mature enough to perform the tasks involved. Furthermore, it is proposed that children should first be helped to develop prior skills and certain basic prerequisites, such as handedness, body schema, psychomotor skills, and/or visuo-spatial perception, among others. Some theoretical perspectives maintain that these skills facilitate the learning of reading and writing and help prevent the emergence of difficulties (Molina, 1991; Muchelli & Bourcier, 1985; Revuelta & Guillen, 1987). With regard to the Spanish education context it should also be noted that children who present difficulties with reading and writing do not receive specialist input until their problems are already consolidated, usually between the age of six and seven; at this point they will be offered special learning support in small groups outside their usual classroom.

In contrast to this traditional perspective in Spain, the present study draws on the abovementioned literature and implements an early intervention program that prioritizes the systematic teaching of reading and writing, it being considered that this could help to prevent learning difficulties and improve reading performance among Spanish children. The focus of the program is on promoting phonological awareness and on phonological, semantic, and syntactic and morphological development. The aim of the study<sup>i</sup> was to demonstrate that the early and systematic teaching of reading and writing, through an approach that promotes phonological awareness and oral language

(development of phonology, semantics, morphology, and syntax), is able to improve the reading performance of Spanish children who are at risk of developing learning difficulties. The hypothesis was that Spanish children at risk of learning difficulties who receive early intervention with reading and writing between the ages of five and seven would show better performance in reading accuracy and reading comprehension than would a similar group of Spanish children who received only standard teaching in line with the existing curriculum.

## **Method**

### **Participants**

Schools were selected by means of stratified random sampling of all schools in the city of Málaga (Spain), which are classified according to socioeconomic areas (high, medium, low). According to official data published by the Department of Education for the region, there were 12 state primary schools located within a medium socioeconomic area of the city. Of these, five randomly-selected schools took part in the study. In the area in question, 30% of the population has below average literacy (González et al., 2012). In six classrooms belonging to three of these schools (two per school) the intervention program was provided to children at risk of learning difficulties, who therefore constituted the instruction group (IG). In four classrooms of the remaining schools (two per school), children who were identified as being at risk of learning difficulties received only standard teaching in accordance with the official school curriculum of Andalusia region, and thus formed the no instruction group (NIG). There were approximately 20 children in each class. The five schools were randomly assigned to either the IG or NIG, and the number of classrooms in each case corresponded to the number in that school.

The study sample comprised 56 children from across these ten classrooms, all

identified as being at risk of learning difficulties. These participants were selected from a total pool of 204 children (120 children from classrooms receiving the intervention program and 84 from non-program classrooms) who were in year 3 of their infant education at the start of the study. The IG for the study comprised 14 boys and 17 girls at risk of learning difficulties and who, at the start of the study, were in their final year of infant school, aged around five ( $M = 5.3, SD = 0.5$ ). The NIG consisted of 14 boys and 11 girls who were also at risk of learning difficulties and similarly were aged around five ( $M = 5.6, SD = 0.5$ ). These two groups did not differ significantly in terms of gender composition ( $t(1,54) = 0.797, p = .429$ ).

All the children in both groups were Spanish speakers and none of them presented any physical, psychological, or sensory disability. They were within average intellectual level and none of them had received any special learning support prior to the study. According to the reports drawn up and filed by the corresponding school psychology services, however, all the children in both groups presented low performance in oral language, reading, and writing. For the purposes of this study, these difficulties were confirmed using the following instruments: the TERA, a questionnaire used by Spanish teachers to assess children's academic performance (Moya, González, & Delgado, 2010); tests of reading performance (RP) and writing performance (WP) developed for use with Spanish-speaking children (González & Delgado, 2006; González et al., 2011); and the Navarra Oral Language Test (PLON, in the original Spanish; Aguinaga, Armentia, Fraile, Olangua, & Uriz, 1989). For both groups we only considered those children who scored below the 20<sup>th</sup> percentile on all these tests (Fletcher, Coulter, Reschly, & Vaughn, 2004; Welsch, 2007), and at the start of the study there were no significant differences between the IG and NIG on any of the tests applied [ $F(1,54) = 2.73, p = .10$ ;  $F(1,54) = 3.73, p = .06$ ;  $F(1,54) = 3.71, p = .06$ ;  $F(1,54) = 2.92, p =$

.08, respectively].

### **Instruments**

Reading performance was assessed using tests of reading accuracy (RA) and reading comprehension (RC) developed for use with Spanish-speaking children (Barba, Delgado, & González, 2004; González & Delgado, 2006; González et al., 2011, 2012).

The RA test assesses the extent to which children can correctly identify 28 letters (vowels and consonants), 16 syllables with different vowel-consonant combinations (CV, VC, CVC, CCV, CCVCC), 16 words of different length and frequency (one and three syllable words, both common and infrequent), 8 pseudowords of different length (two and three syllables), 6 sentences of different length and complexity (up to six words of different frequency and familiarity), and 6 texts (containing a total of 257 words) of different linguistic characteristics (length, familiarity of content, and grammatical complexity). The maximum scores for each of the sub-tests coincided with the total number of items in each one and the maximum score for RA was the sum of the total number of items (331). The normative total score by age corresponds to the mean number of correct responses on the test as a whole in each assessment completed by normative subjects in each academic year. These mean scores are shown in Figure 1. The original validation study for this test showed that it has a single factor with item-factor loadings of .33 or above, explaining 43.75% of the variability. The index of sampling adequacy was .87. As regards its reliability, the item analysis yielded homogeneity indices above .30 and internal consistency of .92 (Barba et al., 2004).

The RC test assesses children's ability to understand 14 words (definition of words and word-drawing association), 6 complete sentences, and 6 texts (3 questions about the main ideas contained within each text). The maximum scores for each of the sub-tests coincided with the total number of items in each one and the maximum score for RC

was the sum of the total number of items (38). The normative total score by age corresponds to the mean number of correct responses on the test as a whole in each assessment completed by normative subjects in each academic year. These mean scores are shown in Figure 2. The original validation study for this test showed that it has a single factor with item-factor loadings of .33 or above, explaining 47.85% of the variability. The index of sampling adequacy was .85. As regards its reliability, the item analysis yielded homogeneity indices above .30 and internal consistency of .96 (Barba et al., 2004).

### **Procedure**

The study employed a longitudinal design involving four measurement points, three intervention stages, two study variables (reading accuracy and reading comprehension), and two groups (IG and NIG).

The children were assessed individually by the researchers during the normal school day, subsequent to having obtained the reports from the corresponding school psychology services and an informed consent form signed by each child's parents.

The researcher who administered the tests at each assessment point was blind to the child's group assignment. The first assessment (pretest) was performed at the start of the academic year (September) when the children were beginning their final year of infant school. The other three assessments (post-tests) were carried out after the different periods of intervention, in June of the subsequent academic years (i.e., when the children were completing their final year of infant school and at the end of years one and two of primary school). For each of these academic years the intervention was implemented between October and May.

The NIG, in which the intervention program was not applied, received only standard teaching on reading and writing in accordance with the official compulsory curriculum



for each of the corresponding academic years. The curricular goals are established by Spanish education laws 105 and 107 (CECJA, 1992) covering infant and primary education, respectively. For infant education (age five), the content of classroom teaching on oral language across the school year involves listening to stories, songs, and oral narrations. At this level of schooling, reading and writing are only addressed in terms of knowledge of highly frequent words (CECJA, 1992). For primary education (ages six and seven), oral language is addressed through the same kinds of task as are used in the previous academic year, but the teaching of reading and writing is now specifically introduced through components related to visual processing, such as visual and spatial discrimination, psychomotor skills, handedness, and body schema (CECJA, 1992). All these aspects of the curriculum were addressed in the ordinary classroom by the children's usual teacher, and were not given priority or presented in a systematic way at any point during the study period. Consequently, the amount of time that was dedicated on a daily basis to these aspects could vary across academic years. The NIG comprised a total of four teachers.

As opposed to this standard teaching based on the official curriculum, children in the IG received structured and systematic instruction in oral language and reading and writing, specifically in the form of the intervention program developed by the authors in previous studies (González, 2012; González et al., 2011, 2012). The aims of this program are to foster accuracy in reading and writing and to develop both reading comprehension and written composition skills, integrating both oral and written language within tasks that can be performed during both infant (age five) and primary (ages six and seven) education. Accuracy in reading and writing is addressed through activities involving the recognition of letters, words, and texts; copying and dictation of letters, words, sentences, and texts; phonological development (phonemic articulation

and discrimination of all the graphemes in the alphabet); and tasks requiring knowledge of syllables and phonemes (identification, counting, addition, omission, and substitution of syllables and phonemes in words of different lengths; identification of rhyming sounds; recognition of the vocalic structure of words; linking words together, etc.) (González, 2012; González et al., 2011, 2012). Reading comprehension and written composition are addressed through oral and written activities involving: the identification and organization into hierarchies of the main ideas present in texts of different length and complexity; giving texts a title; changing or guessing the ending of a written text; producing messages or short texts involving pictures, words, or sentences; metacognition about one's own reading comprehension and written composition (i.e., self-questioning about what they haven't understood and self-correction of writing mistakes, according to the given model); and tasks related to semantic, morphological, and syntactic development (defining and associating pictures and words; finding antonyms and synonyms; categorization of concepts; ordering pictures and/or words in order to construct sentences of different lengths; identifying and distinguishing the role of words in different types of sentences; identifying and converting masculine/feminine words, plurals/singulars, and affirmatives/interrogatives; detecting absurd content, etc.) (González, 2012; González et al., 2011, 2012). In the present study, this content was presented sequentially for each academic year in accordance with the level of cognitive complexity implied by the tasks used (González, 2012). The activities performed as part of the intervention program were implemented by the usual class teacher in the children's ordinary classroom. However, teachers had to dedicate around two and half hours per day over approximately twenty weeks of the academic year to this content. The activities involved both individual and group work, were implemented at the start of the school day, and formed part of the teaching of other

subjects, such as language and knowledge of the environment. The IG comprised a total of six teachers. The Appendix provides details about one of the classroom sessions conducted by these teachers at a specific point during the intervention. The chart shows the objectives and content of the session, and the activities performed. The teachers were trained to apply the program by the authors of this study. This pre-intervention training involved seminars and workshops in which the latest knowledge on teaching reading and writing was presented, followed by modeling of the procedures to be implemented in the classroom. During the intervention the teachers received feedback from the authors and were monitored on a weekly basis through direct classroom observation, as well as through individual and/or group interviews (again with the authors), the aim being to analyze their experiences, to address any problems they encountered, and to comment on and appraise the achievements made. A concordance index was calculated for the observations made by two observers during 30 randomly chosen classroom sessions, and revealed good inter rater agreement (0.87). This process served to control the validity and reliability of the teachers' interventions.

### **Data Analysis**

In accordance with the study objectives we performed a one-way repeated measures analysis of variance in order to analyze between- and within-subject differences with respect to the study variables. Prior to conducting this analysis, we checked that the assumption of sphericity was met (Mauchly's test) and tested the homoscedasticity of variances (Levene's test). Post-hoc comparisons between and within the two groups were adjusted by the Bonferroni correction.

All data analyses were performed using SPSS v20.

## **Results**

### **Results for Reading Accuracy**

The descriptive statistics derived from the test of RA show a progressive increase in scores across the second, third, and fourth assessments compared with the pretest measure, this being the case for both the groups, IG and NIG. However, scores in the IG were always higher than both those in the NIG and the mean scores for children aged 6 and over. By contrast, scores in the NIG at all assessment points were lower than the mean or normative scores (Figure 1 and Table 1).

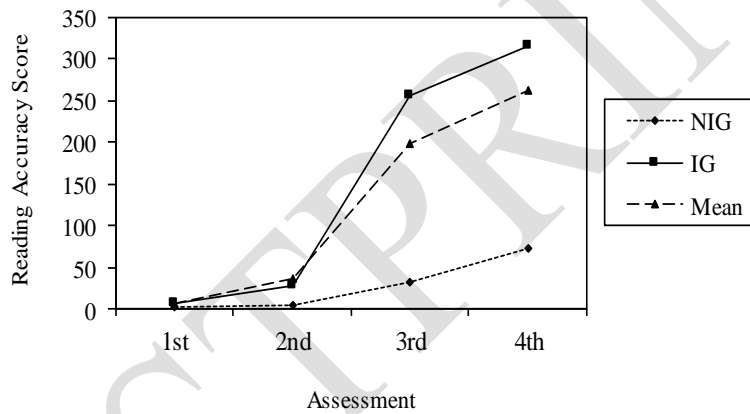


Figure 1: Mean scores for reading accuracy (RA) at each of the four assessment points in the two groups.

In order to determine whether these differences were significant we performed a repeated measures analysis of variance. The sphericity assumption was tested ( $\chi^2=67.43$ ,  $p < .05$ ) and corrected by means of the Huynh-Feldt epsilon ( $\epsilon = .57$ ). The homogeneity of variances was examined by means of Levene's test at all four

assessment points: first ( $F(1,54) = 0.54, p = .46$ ), second ( $F(1,54) = 2.50, p = .12$ ), third ( $F(1,54) = 3.41, p = .07$ ), and fourth ( $F(1,54) = 0.01, p = .93$ ).

Regarding the between-subjects factor, the results revealed significant differences between the groups [ $F(1,54) = 72.36, p < .001$ ] and a hypothesis test demonstrated excellent power ( $\beta=1$ ) and a considerable effect size ( $\eta^2 = .66$ ). It can be seen in Table 1 that the two groups did not differ significantly in RA at the initial assessment. However, the IG scored significantly higher than the NIG at the second, third, and fourth assessments. Furthermore, the difference between the groups increased over the period during which the intervention program was applied, thus confirming its effectiveness.

With regard to the within-subjects factor, the results showed significant differences between the four assessment points [ $F(1.66,59.93) = 80.94, p < .001$ ] and a hypothesis test with excellent power ( $\beta=1$ ) in both groups and a considerable effect size ( $\eta^2 = .69$ ). It can be seen in Table 2 that scores for RA in the IG increased progressively and significantly across the four assessments. By contrast, RA scores in the NIG were only significantly different between the first and fourth assessments (at ages five and seven, respectively), and between the second and fourth assessments (also ages five and seven). These data also support the effectiveness of the intervention.

**Table 1**

*Comparison between the groups for each assessment of their reading accuracy (RA) and reading comprehension (RC)*

Assessment	$\bar{x}$ IG	$S_x$	$\bar{x}$ NIG	$S_x$	$\bar{x}$ (IG-NIG)	Sign. <sup>a</sup>
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RA						
1	6.26	4.34	2.86	4.18	3.43	
2	28.84	24.59	3.43	3.91	25.41	*
3	257.68	101.71	32.71	51.87	224.96	**
4	316.97	56.28	72.57	36.17	244.39	**
RC						
1	.61	1.50	.14	.38	.47	
2	3.29	5.68	1.14	2.60	2.14	
3	28.84	9.14	4.71	6.90	24.12	**
4	31.87	6.91	14.57	7.46	17.30	**

(\*) \*  $p < .05$ , \*\*  $p < .001$ .

Note: IG (Instruction Group), NIG (No Instruction Group), RA (Reading Accuracy), RC (Reading Comprehension).

Finally, with respect to the Assessment x Group interaction factor, the results showed significant differences [ $F(1.66,59.93) = 36.99, p < .001$ ] between the IG and the NIG at the various assessment points. In addition, the hypothesis test showed optimum power ( $\beta=1$ ) and a sufficient effect size ( $\eta^2=.50$ ).

### Results for Reading Comprehension

The descriptive statistics from the test of RC show a progressive increase in scores across the second, third, and fourth assessments compared with the pretest measure, this being the case for both the groups, IG and NIG. However, scores in the IG were always higher than both those in the NIG and the mean scores for children aged 6 and over. By contrast, scores in the NIG at all assessment points were lower than the mean or normative scores (Figure 2 and Table 1).

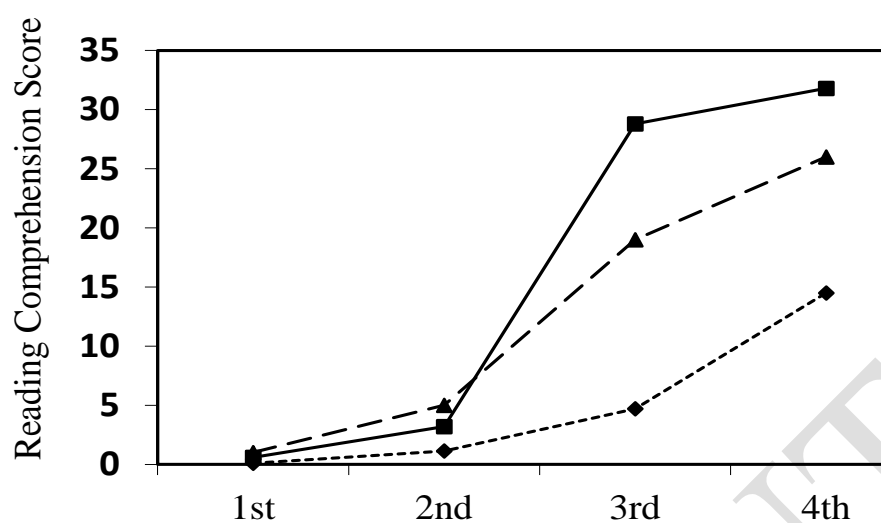


Figure 2: Mean scores for reading comprehension (RC) at each of the four assessment points in the two groups.

In order to determine whether these differences were significant we again performed a repeated measures analysis of variance. The sphericity assumption was tested ( $\chi^2 = 75.42$ ,  $p < .05$ ) and corrected by means of the Huynh-Feldt epsilon ( $\epsilon = .55$ ). The homogeneity of variances was examined by means of Levene's test at all four assessment points: first ( $F(1,54) = 0.01$ ,  $p = .98$ ), second ( $F(1,54) = 2.56$ ,  $p = .12$ ), third ( $F(1,54) = 3.56$ ,  $p = .07$ ), and fourth ( $F(1,54) = 0.01$ ,  $p = .98$ ).

With regard to the between-subjects factor the results revealed significant differences between the groups [ $F(1,54) = 40.16$ ,  $p < .001$ ], as well as excellent power ( $\beta = 1$ ) and a considerable effect size ( $\eta^2 = .52$ ). It can be seen in Table 1 that the IG scored significantly higher than the NIG on RC at the third and fourth assessments, and that the difference between the groups generally showed a progressive increase across the period during which the intervention program was applied. This confirms the effectiveness of the program.

Regarding the within-subjects factor, the results showed significant differences

between the assessment points [ $F(2.134,76.82) = 96,61, p < .001$ ] and a hypothesis test with excellent power ( $\beta=1$ ) in both groups and a considerable effect size ( $\eta^2 = .72$ ). It can be seen in Table 2 that scores for RC in the IG increased progressively and significantly across the four assessments. By contrast, RC scores in the NIG were only significantly different between the first three assessments and the fourth (ages five and six compared with age seven). These data also support the effectiveness of the intervention.

**Table 2**

*Comparisons between the four assessment points for each group on the tests of reading accuracy (RA) and reading comprehension (RC)*

Group	Assessment (I)	Assessment (J)	$\bar{x}_{(I-J)}$	Sign. <sup>a</sup>
RA				
IG	1	2	-22.54	**
		3	-251.38	**
		4	-310.67	**
	2	3	-228.83	**
		4	-288.12	**
	3	4	-59.29	**
NIG	1	2	-.57	
		3	-29.85	
		4	-69.71	*
	2	3	-29.28	
		4	-69.14	*
	3	4	-39.85	
RC				
IG	1	2	-2.67	*
		3	-28.22	**
		4	-31.25	**
	2	3	-25.54	**
		4	-28.58	**
	3	4	-3.03	*
	1	2	-1.00	



		3	-4.57	
		4	-14.42	**
NIG	2	3	-3.57	
		4	-13.42	**
	3	4	-9.85	**

<sup>(a)</sup> \*  $p < .05$ , \*\*  $p < .001$ .

Note: IG (Instruction Group), NIG (No Instruction Group), RA (Reading Accuracy), RC (Reading Comprehension).

Finally, with respect to the Assessment x Group interaction factor, the results showed significant differences [ $F(2.134,76.82) = 26.03, p < .001$ ] between the groups. In addition, the hypothesis test showed optimum power ( $\beta=1$ ) and a sufficient effect size ( $\eta^2 = .42$ ).

### Discussion

The aim of this study was to analyze the effects on reading (accuracy and comprehension) of an early oral and written language intervention program for Spanish children identified as being at risk of learning difficulties. It was hypothesized that the group of children who received the intervention program between the ages of five and seven (IG) would score higher on both reading accuracy (RA) and reading comprehension (RC) than would the group who did not receive this special instruction (NIG).

The results showed that the performance of the two groups of children in RA and RC was similar prior to the intervention. At all subsequent assessment points, however, the IG scored substantially better than did the NIG. The difference between the two groups in RA increased progressively across the whole of the intervention period, whereas the difference in RC decreased slightly between the ages of 6 and 7. In other words, children at risk of learning difficulties who received the oral and written

language intervention program performed significantly better on reading accuracy and reading comprehension than did their peers who were taught only in accordance with the goals of the official curriculum. The analysis also revealed that in the IG, scores for both RA and RC increased progressively and significantly across the four assessment points, whereas in the NIG, differences only began to emerge when these children were in year two of primary school (aged seven). In other words, children at risk of learning difficulties who received the intervention program showed a progressive improvement in reading accuracy and reading comprehension between the ages of five and seven, whereas among their peers who did not receive the program a significant difference was only observed between their performance at age seven compared with that at age five. These results support the validity of this intervention program with Spanish-speaking children. The effectiveness of the program is also revealed by the maximum and mean scores obtained on each test. In fact, the scores for both reading accuracy and reading comprehension obtained by children in the IG from age six onwards are higher than would be expected based on age-related norms (mean score).

These results also suggest that Spanish-speaking children at risk of learning difficulties can improve their reading ability and achieve an optimum performance from an early age if priority is given to the systematic teaching of reading and writing, oral language, and phonological awareness. Specifically, our findings show that the inclusion in the curriculum of direct and systematic teaching of phonological awareness and of phonological, semantic, and syntactic and morphological development is an effective approach in an alphabetic and transparent language such as Spanish, this being consistent with previous research, including studies conducted in languages of different linguistic consistency (Babayiğit & Stainthorp, 2011; Beauchat et al., 2009; Brand &

Dalton, 2012; Ford et al., 2013; González et al., 2011, 2012; Hipfner-Boucher et al., 2014; Jiménez et al., 2004; Pullen & Justicia, 2003; Schaadt et al., 2013; Scheffner et al., 2010; Slavin, Madden, Dolan, & Wasik, 1996; Swartz et al., 2003; Vadasy & Sanders, 2012; van Weerdenburg et al., 2009; White, 2011). In addition, and in line with previous studies carried out in other languages, including less transparent ones (Baroccio & Hagg, 1999; Brand & Dalton, 2012; Brown et al., 2012; Burns et al., 1999; Dunphy, 2012; Elliott & Olliff, 2008; González et al., 2011, 2012; Swartz et al., 2003; Vadasy & Sanders, 2008; Wright et al., 2008), our results underline the importance and effectiveness of introducing a systematic and structured approach to reading and writing from an early age. The majority of these studies indicate that, for alphabetic languages, the early prioritizing in the curriculum of a systematic and structured approach to reading, writing, phonological knowledge, and the development of oral language, among other aspects, leads to short- and medium-term improvements in children's reading, writing, and academic performance in different subjects, and reduces the number of children who will require special education due to their learning difficulties.

Our findings are also consistent with those obtained in less consistent languages and other education systems, showing that an early, explicit, and structured approach to reading and writing, coupled with direct and systematic teaching of oral language and phonological knowledge, among other aspects, is a good strategy in terms of preventing the development of learning difficulties (Burns et al., 1999; González, 2012; González et al., 2011, 2012; Lopez-Escribano & Beltran, 2009; Slavin, et al., 1996; Swartz et al., 2003). Some of the programs described in the literature have been developed precisely to prevent future learning difficulties and to tackle the high rates of school underachievement. The majority of them seek, from the ages of three to twelve years, to foster the systematic teaching of reading and writing in the classroom, the emphasis

being on phonological awareness, auditory discrimination, vocabulary, and the cooperative learning of reading and writing (comprehension and spelling). It would be interesting to examine, however, whether the effects of this type of intervention are different in languages that are less transparent than is Spanish, especially as regards the speed with which children learn to read and write, and the extent to which they may present fewer difficulties in this area. In languages that are less consistent than is Spanish, one would expect the improvements to be of smaller magnitude, since children learn to read more quickly in languages that are more consistent (Georgiou, Parrilla, Kirby, & Stephenson, 2008; Ziegler et al., 2010).

With regard to the present study it should be noted that the results do not indicate which aspect was most important in terms of improving the reading performance of children at risk of learning difficulties, that is to say, whether a greater contribution was made by making the systematic teaching of reading and writing a priority at an early age or by the emphasis placed on the teaching of reading and writing, oral language, and phonological awareness. This issue was not an objective of the study, and nor is it a goal of the intervention program, since the two aspects are considered to be of complementary importance when it comes to preventing the development of learning difficulties and/or improving children's reading performance.

Finally, the fact that a single teacher implemented the intervention program in each classroom could be considered a limitation of the present study, notwithstanding the high inter-rater agreement regarding the teacher's actions. The small sample size prevented us from conducting a more sophisticated analysis to address the nested nature of the data. We encourage future inquiry to address this limitation. It should also be noted that it remains to be seen whether the improvements in reading accuracy and reading comprehension observed among children at risk of developing learning

difficulties who received the program will be maintained. In terms of future research, therefore, our goal now is to evaluate the long-term effectiveness of the reading intervention program by comparing the performance of children in the two groups at the next stage of their school career which would be at the end of the second cycle of their primary education (age nine), the aim being to see whether there continue to be differences in reading accuracy and reading comprehension. It should also be noted that other reading interventions carried out with children at risk of learning difficulties have resulted in improvements in non-target areas such as mathematics, and have raised performance levels to be commensurate with their peers without learning difficulties (González et al., 2012; Slavin et al., 1996; Swartz et al., 2003). Consequently, it would be useful in future studies to explore whether the academic performance of these at-risk children is maintained at grade-level throughout their school career, and whether the intervention program applied here also leads to improvements in math performance.

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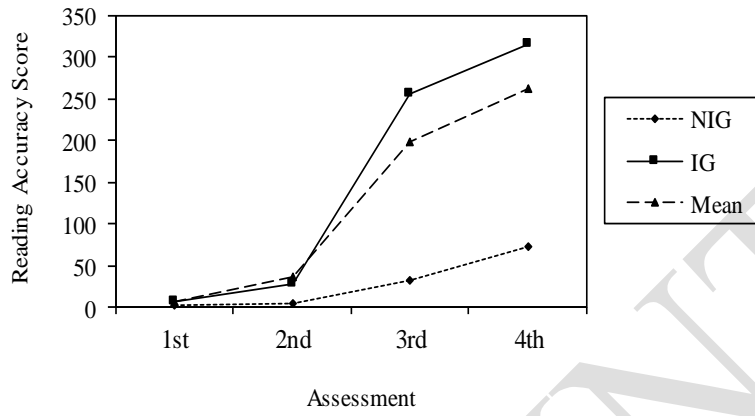
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