

# Phonological Awareness And Early Reading In Children With And Without The Phonological Disorder

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## ABSTRACT

This quantitative study with a single non-experimental correlational group design was aimed at determining the relationship between phonological awareness and the initial reading level in children with and without the phonological disorder, through the application of standardized linguistic segmentation assessment tests. -PSL by Jiménez and Ortíz (2014) and initial reading-EGRA (adapted from Jiménez, 2009) in 60 students, 30 children sample with phonological simplification processes, and 30 students without the phonological disorder with 5 years and 9 months mean age in a public educational institution from the department of Sucre - Colombia. For data coding and processing, the statistical program EZAnalyze 2.5, a complement to Microsoft Excel 19.0 was used. At the phonological awareness level, the results indicate that there is a high difference of .00 on average, this is evidenced by the means and standard deviation of 46.07 (20.54) in children without phonological disorder and 27.27 (19.91) with phonological simplification processes. Likewise, a highly significant difference is found in most of the phonological awareness dimensions. However, in the reading comprehension task, it does not intervene in the reading acquisition because it is statistically above .05 (.14). The general findings established a  $p = .000$  indicating an occurrence high probability of correlation, given the value of  $r =$  between .407 and .836 of moderate and high in the different tests, establishing a directly proportional relationship between the variables. Therefore, it is concluded that phonological development awareness affects the initial stage of reading in children with and without phonological disorders.

**Keywords:** Phonological disorder, Phonological Awareness, Initial Reading.

## 1. INTRODUCTION

One of the most common difficulties in the preschool stage is the phonological disorder presence in children, determined by the incorrect phonological persistence and reduced syllabic patterns, restriction in the phonological system, unusual errors, and incorrect forms

of variation. (Acosta, León and Ramos, 1998, as cited in Vilela, 2020). However, in those children with a linguistic breakdown are observed lower skills for school activities, taking the initiative when making their requirements, asking questions or clarifying doubts, expressing daily routines, and little participation in school events. (Acosta and Moreno, 2001 as cited in Araya, 2019). Thus, Hulme and Swoling (2014) found that oral language skills play an important role in reading development. Now, there is currently a consensus in the scientific community about the importance of language in relation to reading acquisition, and especially phonological awareness. Therefore, Aguilar et al. (2010); Bizama, Arancibia, and Sáez (2011;) emphasize that language skills are relevant in the reading initial stage. From this perspective, numerous studies have determined that the phonological awareness absence is an explanatory factor for learning difficulties in the acquiring reading and writing process. In fact, De la Calle, Aguilar, et al. (2011); Guarneros and Vega (2014); Melby, Lyster, and Hulmen (2012); Nunez and Santamarina (2014); and Shakeri et al. (2015) support the relationship between reading level and phonological awareness tasks.

In the same sense, before this scientific debate, Calet et al. (2016) showed that phonological awareness skills predict a significant percentage of the variance in reading activities, after controlling for the phonological influence and vocabulary awareness. Similarly, Botting, Simkin, and Conti (2006) found that early phonological skills are reading accuracy predictors and comprehension. In fact, Gallego, 2006 (as cited in Núñez and Santamarina, 2014) argues that the reading concept and writing prerequisites are the prior set conditions necessary for learning to start and develop successfully and effectively. Hence, there is a close relationship between phonological processes and reading and writing acquisition; these skills would be deficient in dyslexia. (Defior and Serrano, 2011). However, Ramus et al., (2013) report that specific language impairment and dyslexia are not always related, and that some children with specific language impairment do not have a phonological deficit. In addition, children with specific language impairment and dyslexia show partially different phonological deficit profiles along these two dimensions, indicating that a language skills multicomponent model better explains the relationship between specific language impairment and dyslexia, and the different deterioration profiles. With the same idea, Coloma et al. (2007) point out that there is no relationship between phonological performance awareness and phonological disorder in children with and without SLI. In addition, they established that the simplification number processes did not influence phonological performance awareness in both groups of children, although children with SLI who presented decreased metaphonological skills evidenced a severe phonological disorder.

Given the above approaches, it is evident that there is no consensus in determining that the phonological disorder affects phonological development awareness and therefore affects the initial stage of reading, therefore, the need to validate the relationship between Phonological awareness and initial reading level in children with and without the phonological disorder. This interest is based on the theoretical assumption that indicates that

difficulties can be shown in the word representation, the product of an alteration in said representation. (Watery, 1999).

Therefore, the research will become a valuable contribution to phonological awareness study, initial reading, and its relationship with phonological disorder, since it will contribute to establishing a consensus in the relationship between phonological processes and the variables that are involved in reading access. In addition, it will provide an explanation point for the high percentage of children with a phonological disorder diagnosis that show difficulties in school learning reported by the educational institution speech therapy service. Additionally, this study becomes relevant and important as it will serve as a basis for future research execution related to this topic and propose. The intervention program design applicable to the child population studied, providing a concrete benefit for school development and its educational context.

## **2. MATERIALS AND METHODS**

The research study was framed under a quantitative approach, with a single non-experimental correlational group design because the measurements made allowed describing, explaining, and predicting the variables phenomena (Hernández, Fernández, and Baptista, 2014). The population was made up of 187 students aged 5 years, 0 months to 5 years 11 months of the official educational institution San Juan Bautista de la Salle in the municipality of Since, Sucre-Colombia. From this group It was selected a sample of 60 students, 30 with phonological disorder and 30 without phonological simplification processes, through an intentional non-probabilistic sampling for convenience, who met the children inclusion criteria in the initial reading stage, with a phonological disorder diagnosis with an evaluation report from the speech therapy service; and exclusion of presenting sensory and cognitive deficits.

To achieve the objectives, it was necessary to make an approach to the educational institution to fill out the respective permits and request information from the students according to the academic information system enrollment, and databases, and medical speech therapy records service. Next, it was established an interview with the parents, with the purpose of signing the informed consent, according to the ethical regulation in research with human beings in Colombia determined by resolution 008430 of the Ministry of Health (1993) that establishes the scientific, technical and health administrations and at the international level the Helsinki Declaration ethical principles (2013). To collect the information, it was developed through an evaluative technique through the application of the linguistic segmentation test - PSL of Jiménez and Ortíz (2014), in order to determine the ability to understand lexical segmentation skills, isolate syllables and phonemes in words, syllables and phonemes omission in words, recognize if the initial and/or final syllable matches the other word, count the syllables in a word, recognize and pronounce the word broken down into a syllables sequence and omission of syllables in words. The application and scoring test

standard determine the recording of the information in an individual format that has direct factorial scores. It became normative in hepta categorization scales. This describe performance from a very low to a high point with its corresponding centiles, allowing each test analysis through statistical procedures that allow obtaining an indices series of difficulty, discrimination, homogeneity, and validity.

Likewise, the initial reading evaluation test - EGRA of the United States Agency for International Development adapted from Jiménez (2009) was administered with the purpose of assessing different reading processes related to the name and sound of the letter's knowledge. Also with word reading, and listening comprehension, which establishes correction and punctuation standards considering the number of letters, syllables and/or words read correctly per minute (LCMP). For results analysis, the test determines the LQAS methodology for thresholds compliance or performance, and a higher or lower level of normality or risk, and a rating system based on direct, and standard scores, establishing performance in percentiles. The statistical program EZAnalyze 2.5, Microsoft Excel 0.19 (2019) complement, was used for data coding and processing. A descriptive statistical analyzes types were executed according to the quantitative variables scales, estimating the descriptive central tendency statistics and variability of the variables with an interval scale, calculating the minimum, maximum, arithmetic averages, and standard deviations (objective 1 and 2). For the inferential analysis of the two variables, a parametric statistical type of correlation was implemented through the Pearson correlation coefficient to establish the relationships between the variables (objective 3).

### 3. RESULTS

Table 1 shows the population evaluated results with phonological disorder in the linguistic segmentation test, indicating that they are below the expected average determined by a normative mean score of 25.267 corresponding to a percentile of 20 with a general equivalence of a phonological low-level awareness.

**Table 1: Descriptive statistics of the linguistic segmentation test-PSL results in children with phonological disorder**

	<b>Variable dimensions</b>	<b>Media</b>	<b>D.E</b>	<b>P. Máx.</b>	<b>P. Mín.</b>	<b>P. N</b>
	<b>phonological awareness</b>					
F1	n Discover words that do not rhyme	6.73	5.14	12.00	0.00	40
F2	Omission of syllables in initial position in two-syllable words	5.87	3.05	9.00	0.00	80
F3	Segment three-syllable words	3.37	2.28	5.00	0.00	40

F4	Omission of syllables in the initial position in trisyllabic words	2.00	1.98	5.00	0.00	60
F5	Discover words that match in the final syllable	2.33	2.22	5.00	0.00	20
F6	Omission of previously specified syllables in final position in disyllabic words	3.07	1.66	4.00	0.00	40
F7	Recompose trisyllabic word	4.33	1.58	5.00	0.00	40
F8	Segment disyllabic words	3.90	1.79	5.00	0.00	40
F9	Omission of syllables in final position in two-syllable words	2.30	1.15	3.00	0.00	40
F10	Segment Sentences with Links	1.07	1.48	4.00	0.00	80
F11	Omission of syllables in final position in trisyllable words	0.63	0.93	2.00	0.00	40
F12	Isolate syllables	1.97	1.00	3.00	0.00	40
F13	Discover words that coincide in the initial syllable	2.13	1.25	3.00	0.00	40
F14	Segment sentences without links	3.20	1.22	4.00	0.00	60
F15	Isolate consonant sounds	2.20	0.98	3.00	0.00	60
F16	Omission of previously specified syllables in the initial position in two-syllable words	0.97	0.98	3.00	0.00	40
<b>PD TOTAL</b>		<b>46.07</b>	<b>20.54</b>	<b>75.00</b>	<b>5.00</b>	<b>60</b>

Table 2 describes the means and standard deviations of each group evaluated with the linguistic segmentation test, indicating that in most of the tasks and the general average there is a high significant difference. Therefore, the phonological simplification processes affect the phonological awareness performance. In this regard, the performance great variability in each group stands out, reflecting in the high value of the standard deviations.

**Table 2: Comparison of means according to children with and without phonological disorder in the linguistic segmentation test**

Variable dimensions phonological awareness		SPFS Media (D.E.)	CPSF Media (D.E.)	Prueba T (p)
F1	nDiscover words that do not rhyme	6.73(5.14)	2.33(3.85)	0,00*

F2	Omission of syllables in initial position in two-syllable words	5.87(3.05)	2.70(3.61)	0.00*
F3	Segment trisyllable words	3.367(2.28)	1.77(2.34)	0.01*
F4	Skipping Syllables in Initial Position in Trisyllabic Words	2.00(1.98)	1.23(1.76)	0.12
F5	Discover words that match in the final syllable	2.33(2.22)	0.80(1.50)	0.00*
F6	Omission of prespecified syllables in final position in disyllabic words	3.07(1.66)	1.47(1.756)	0.00*
F7	Recompose trisyllable word	4.33(1.58)	3.17(2.40)	0.03*
F8	Segment bisyllable words	3.90(1.79)	3.07(2.07)	0.01*
F9	Omission of syllables in final position in two-syllable words	2.30(1.15)	1.20(1.40)	0.00*
F10	Segment sentences with links	1.07(1.48)	0.13(0.57)	0.00*
F11	Omission of syllables in final position in trisyllable words	0.63(0.93)	0.17(0.53)	0.02*
F12	Isolate syllables	1.98(1.00)	1.47(0.94)	0.05*
F13	Discover words that match in the initial syllable	2.13(1.25)	1.40(1.40)	0.04*
F14	Segment sentences without links	3.20(1.22)	1.80(1.52)	0.00*
F15	Isolate consonant sounds	2.20(0.98)	2.03(0.90)	0.50
F16	Omission of previously specified syllables in the initial position in disyllabic words	0.97(1.35)	0.53(1.11)	0.17
<b>PD TOTAL</b>		<b>46.07(20.54)</b>	<b>25.27(19.91)</b>	<b>0.00*</b>

Table 3 specifies the initial reading test-EGRA results, determining that the population evaluated with phonological disorder presented a low performance in the knowledge tasks of the letters sounds, simple words, word decoding, reading and understanding of passages. However, in the letter sound knowledge and listening comprehension tasks, they showed a performance above the expected average, which indicates that the phonological simplification processes significantly influence the learning of the initial reading.

**Table 3: Descriptive statistics of the initial reading test -EGRA results in children with phonological disorder**

Variable dimensions	Media	D.E	P. Máx.	P. Mín.	P. N
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<b>Initial Reading</b>					
Knowledge of letter names	7.40	6.51	21.00	0.00	60
Letter sound knowledge	1.87	2.27	11.00	0.00	25
Knowledge of simple words	4.47	8.52	37.00	0.00	40
Decoding nonsense words	3.00	5.99	23.00	0.00	30
Reading a passage	6.13	13.56	64.00	0.00	40
Reading comprehension of a passage	0.43	1.14	5.00	0.00	10
oral compression	2.77	1.81	5.00	0.00	75

In Table 4, the application results of the initial reading test to the population without phonological disorder are pointed out, establishing that they presented a performance above the average indicated by the means and normative scores above the 50th percentile, determined a good initial level of automatic and comprehensive reading.

**Table 4: Descriptive statistics of the initial reading test -EGRA results in children without phonological disorder**

<b>Variable dimensions initial reading</b>	<b>Media</b>	<b>D.E</b>	<b>P. Máx.</b>	<b>P. Mín.</b>	<b>P. N</b>
Knowledge of letter names	19.77	13.36	46.00	0.00	90
Letter sound knowledge	6.60	7.17	27.00	0.00	75
Knowledge of simple words	14.07	15.26	51.00	0.00	60
Decoding nonsense words	10.07	12.19	45.00	0.00	65
Reading a passage	17.10	1.99	64.00	0.00	65
Reading comprehension of a passage	1.30	1.99	5.00	0.00	55
Oral compression	3.50	1.94	5.00	0.00	80

In table 5, the means and typical deviations of the initial reading test-EGRA tasks are compared, indicating in most of the tasks that there is a high significant difference, determining that phonological disorders have a decisive influence on the learning of initial reading. However, in the reading comprehension task it does not intervene in the reading acquisition because it is statistically above 0.05 (0.14).

**Table 5: Comparison of means according to children with and without phonological disorder in the initial reading test**

<b>Variable dimensions initial reading</b>	<b>SPFS Media (D.E)</b>	<b>CPSF Media (D.E)</b>	<b>Prueba T (p)</b>
Knowledge of letter names	19.77(13.36)	7.40(6.51)	0.00*
Letter sound knowledge	6.60(7.51)	1.87(2.27)	0.00*
Knowledge of simple words	14.07(15.26)	4.47(8.52)	0.00*
Decoding nonsense words	10.23(12.19)	3.00(5.99)	0.01*
Oral reading of a passage	17.10(19.78)	6.13(13.56)	0.02*
Compression of a passage	1.30(1.99)	0.43(1.14)	0.04*
Oral compression	3.50(1.94)	2.77(1.81)	0.14

Table 6 details the correlation data distribution of the phonological awareness variables and the initial reading test-EGRA tasks in the population with and without phonological disorders based on the Pearson coefficient. The results showed a value of  $p= 0.000$  indicating a high probability of correlation occurrence given the value of  $r=$  between 0.407 and 0.836 from moderate to high in the different tests, establishing a directly proportional relationship between the variables, a factor that It implies that to the extent that phonological awareness is enhanced, it will allow better performance in the aspects of initial reading.

**Table 6. Relationship between phonological awareness and initial reading dimensions according to EGRA**

<b>Variable</b>	<b>CNL</b>		<b>CSL</b>		<b>CPS</b>		<b>DPSS</b>		<b>LOP</b>		<b>CP</b>		<b>CO</b>	
	<b>r</b>	<b>p</b>	<b>r</b>	<b>p</b>	<b>r</b>	<b>p</b>	<b>r</b>	<b>p</b>	<b>r</b>	<b>p</b>	<b>r</b>	<b>p</b>	<b>r</b>	<b>p</b>



<b>Phono logical aware ness</b>	0.8 4	0.0 00*	0.6 32	0.0 00*	0.7 53	0.0 00*	0.7 32	0.0 00*	0.7 39	0.00 *	0.56 8	0.0 00 *	0.4 0	0,0 01*
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CNL: Letter Name Knowledge, CSL: Letter Sound Knowledge, CPS: Simple Word Knowledge, Decoding Nonsense Words, Oral Reading of a Passage, CP: Comprehension of a Passage, CO: Listening Comprehension, \*significance  $p < .05$ ; \*\* significance  $p < .01$ : Pearson's coefficient; p: significance.

#### 4. DISCUSSION

In relation to the identification of phonological awareness level in the population under study, the results determined that students with phonological disorder present a worse performance established by a normative mean score of 25.27, corresponding to a percentile of 20, and compared to students with phonological disorders. Children without Simplification phonological processes showed an average performance of 46.07 with a percentile of 60, This is a indicator that in most of the tasks and in the general average there is a high significant difference, except in the omission of syllables tasks at the initial position in bisyllable and trisyllable words and isolate consonant sounds. Therefore, intrasyllabic and phonetic awareness skills in children with phonological disorder are affected by the type of error, establishing a phonological risk awareness deficit compared to the control group (Shakeri et al., 2015). Similarly, phonological factors influence performance differently between groups, determining that children with specific language impairment present low performance in relation to children who develop typically. (Farquharson et al., 2014). In short, this may be due to the fact that the brain processes involved in basic phonological awareness for the organization of functional systems may present some immaturity degree and/or lack of training. (Luria, 1986 (as cited in Mejía and Eslava, 2008).

Regarding the exercise of establishing the students initial reading level , the findings show that children with phonological disorder expose poor performance in most of the tasks. however, in the the sound of letters and oral comprehension knowledge tests, they showed a performance above the expected average, because the tests are characterized by linguistic productions minimal use. However, in the students without phonological disorder, they presented a performance above the average indicated by the means and normative scores above the 50th percentile. Likewise, the comparisons results determine that in most of the tasks there is a high significant difference, It shows that phonological disorders have a decisive influence on initial reading learning. Hence, the language development importance is credited, and especially the phonological repertoire maturity as a facilitator of the initial reading learning process. (Farquharson, et al., 2014; Tambyraja, 2012 and Fraser et al., 2010). Likewise, children require prior development and skills acquisition that are put into practice

when it comes to phonologically recognizing graphemes and syllables, words visual-orthographic identification and meaning semantic recognition. (Brave, 2000).

Now, regarding the relationship between the phonological awareness level and initial reading in children with and without phonological disorder, the findings confirm a high probability of correlation occurrence given the value of  $r=$  between .407 and .836 for moderate and high in the different tests, establishing a directly proportional relationship between the variables, a factor that implies that to the extent that the phonological level awareness presents a low performance, a lower initial reading level will be obtained in children with and without phonological disorder, basing that they are skills necessary for pre-reading to demonstrate the existence of a significant difference between phonological disorders and metalinguistic awareness tasks. (Farquharson et al., 2014, Fraser, 2010, Rodríguez, 2010, and Tambyraja, 2012.). However, Coloma et al. (2007) and Ramus et al. (2013) point out that there is not always a relationship between phonological disorders and reading difficulties, showing that some children with errors can have a good performance in phonological awareness, although in the most severe cases the difficulty worsens and can affect the reading development. Consequently, the research results allow us to validate the relationship between phonological awareness and the initial reading level in children with and without phonological disorder. Checking the theoretical assumption of Aguado (1999) that indicates that the difficulties can be shown in the word representation, an alteration product in said representation.

## **5. CONCLUSIONS**

The general average of children with and without phonological disorder showed high significant differences in the PSL linguistic segmentation test, determining that the simplification processes affect the phonological awareness performance. Phonological disorders have a decisive influence on the initial reading learning. However, phonological awareness does not intervene to a greater extent in reading comprehension determined statistically. It can be inferred by the low use of linguistic skills to solve the reading comprehension task. The phonological awareness development affects the reading initial stage in children with and without phonological disorder, determined by the high probability of moderate occurrence and high correlation in the different tests, establishing a directly proportional relationship between the variables, thus verifying that language represents the basis of learning to read.

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