

Phonological consciousness and lecturing of third grade students of primary basic education*

La conciencia fonológica y la lectoescritura de estudiantes de tercer grado de educación básica primaria*

Consciência fonológica e alfabetização de alunos do terceiro ano do ensino fundamental*

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Abstract

This investigative study wanted to determinate the relationship between the phonological awareness and the reading – writing process in 3th grade students from an EBP school in Sincelejo. The used instruments were the Prueba de Procesamiento Fonológico to seize the phonological awareness and the PROLEC and PROESC batteries, to measure the reading – writing process. The chosen sample were 55 students (ages 8 – 10) who were the result of previous assessments on hearing, visual and cognitive competences. The data processing was processed through an analysis using the IBM statistical package SPSS 23.0.0.0 (2015), based on the tests made by Kolmogorov–Smirnov and on Pearson's correlation. The results show a highly

relevant relationship between the phonological awareness and the output in reading – writing process.

Keywords: Phonological Awareness, Writing, Reading.

Resumen

El presente estudio buscó determinar la relación existente entre la conciencia fonológica y la lectoescritura de los estudiantes de tercer grado de E.B.P. Los instrumentos utilizados fueron la Prueba de Procesamiento Fonológico para medir la variable conciencia Fonológica y las baterías de PROLEC y PROESC para medir lectoescritura. La muestra consistió en 55 alumnos (8 a 10 años), que resultaron de previas valoraciones auditiva, visual y cognitiva. El procesamiento de los datos se realizó a través de un análisis utilizando el paquete Estadístico IBM SPSS 23.0.0.0 (2015), tomándose como nivel de significancia las pruebas de Kolgomorov-Smirnov, y de correlación de Pearson. Los resultados evidencian una relación altamente significativa entre la conciencia fonológica y el rendimiento en lectura y escritura.

Palabras clave: Conciencia Fonológica, Escritura, Lectura.

Resumo

O presente estudo buscou determinar a relação entre consciência fonológica e alfabetização de estudantes de terceiro grau da E.B.P. Os instrumentos utilizados foram o Teste de Processamento Fonológico para medir a variável consciência fonológica e as baterias PROLEC e PROESC para medir leitura e escrita. A amostra foi composta por 55 estudantes (8 a 10 anos), resultado de avaliações prévias auditivas, visuais e cognitivas. Os dados foram processados através de uma análise utilizando o pacote IBM SPSS Statistics package 23.0.0.0 (2015), tomando como nível de significância os testes de correlação de Kolgomorov-Smirnov e Pearson. Os resultados mostram uma relação altamente significativa entre

consciência fonológica e desempenho em leitura e escrita

Palavras-chave: Consciência Fonológica, Escrita, Leitura.

Introduction

The learning of the literacy process is the first link that every student must achieve for the success of their academic life, we can't ignore its complexity and the intervention of multiple neurocognitive and sensory processes that make possible the development of this competence. One of the processes that have been intimately link in the lasts decades to the development of that learning is the phonological awareness, so that it has been assigned a very important role in the development of the literacy abilities (Gutiérrez and Díez, 2015), because, as far as it favors the understanding of the links between phonemes and graphemes, it allows the child to have an appropriate competence to read and to write, at the same time that makes possible to know how the sounds act inside the words.

In transparent writing systems like the Spanish one, the link between graphemes and phonemes is especially evident, because there's an almost absolute reciprocation between the graphemic forms and phonological segments (Bravo-Valdivieso and Escobar, 2014). Actually, this particularity makes necessary that, to be able to access to writing and reading, the rules of conversion of graphemes to phonemes and phonemes to graphemes are required, respectively (Cuetos, 2014). From this author perspective, such mechanism belong to what is known as phonological or indirect route, whose use needs the capacity of being aware that words are divided into smaller parts.

The last part, in words of Núñez and Sancho (2014) and González, Cuetos, Vilar and Uceira (2014), makes reference to the phonological awareness, defined as the explicit knowledge that speech can be segmented into smaller units. In that sense, and as multiple researches have shown, it's necessary the development of the child's phonological

awareness abilities, in its different levels, so he could be able to understand the coding principle, that is, the letters (graphemes) work as sound signals of speech sounds (phonemes) (Núñez and Sancho, 2014).

Even, it has been documented in the last years that the phonological mechanisms support the acquirement of orthographical knowledge, that is, influencing in the development of the lexical or visual route (Ferroni and Diuk, 2014). According to these expositions, to recognize a word by the phonological route promotes the necessary lexical knowledge for the direct visual recognition of that word, indicating that the role of phonological knowledge is to provide the base on which the lexical representations are made. This could support even more the crucial role of the phonological awareness abilities in the acquirement and development of literacy and especially in the explanation of their difficulties.

When this mechanism fails, continuous difficulties arise in the literacy process, which can be from delaying the automatic and comprehensive reading acquirement stages, to endanger the preparatory stages of the reading process. This is clearly translated in writing mistakes as the omissions, substitutions and reversion, which are the most frequent in the early learning stages (Cuetos, Ramos y Ruano, 2004); while in the reading process, the difficulties are represented in substitutions, omissions and transpositions that affect the acquirement of reading abilities according to grade level (Cuetos, Rodríguez and Ruano, 2000).

In most cases, these difficulties tend to occur simultaneously, that is, almost always children who make reading mistakes often have similar mistakes on writing process. Thus, it draws the attention that being this such a great and wide investigation ground of the link between the phonological awareness and literacy, the previous studies have analyzed this link by separate and most of them have only focused on reading (Muñoz and Melenge, 2017; Torres and Granados, 2014). Likewise, the tendency is clear on studying preschool and primary school population, (Gutiérrez and Díez, 2015; Gutiérrez and Díez, 2017; Negro and Traverso, 2011).

The results of these and many other investigations have shown that there's a significant link between phonological awareness and literacy development, so it might be thought that this subject has been sufficiently addressed, however it's considered as necessary to contribute information about this connection, analyzing simultaneously the reading and writing variables on children who have already acquired the literacy code. For this reason, the link between phonological awareness and literacy level on third grade children was pretended to be validated.

There are many research antecedents and previous studies found about phonological awareness and its link between reading and writing processes, however, it was found that most of these have focused on analyze this link by separate, prevailing the studies more focused on reading. Also, it can be highlighted the tendency of studying preschool and primary school population.

The theoretical fundamentals kept in mind in this investigation were the postulates of Bravo (2003), and Bravo and Pinto (2004) for Phonological Awareness; Cuetos (2014) for Literacy; and Jiménez and Ortiz (2000) for the link between Phonological Awareness and Literacy learning.

Methodology

Design: This study goes inside the quantitative focus, being also a transversal type one with a non-experimental correlational design.

Participants: The population was conformed by 204 third grade basic school students from Sincelejo, who've fulfilled the criteria for this study: third grade students who have been enrolled to the chosen school, with father's permission to carry out this research, with ages between 8 – 10 years old; also, the students with decreases on the hearing of hearing loss, visual decrease and mental disability were excluded. This discretionary sampling established a sample of 55 students.

Instruments:

- *Prueba de procesamiento fonológico* PPF of Bravo and Pinto (2004) for the phonological

awareness variable assessment. This one evaluates the phonological processing in children of 8 – 10 years old and allows to establish the ability to discriminate, to segment and to integrate the linguistic units or language phonemes, to decode the written language. It consists in 5 subtests, each one with maximum scores, being: Auditive discrimination (21 points), Auditive-phonemic sequence (12 points), Word segmentation according its phonemes (15 points), Oral reversion of syllables 1 and oral reversion of syllables 2 (16 points). To determinate the performance in each of the tests, there were chosen the averages and deviations (DE), as references, that accompany such averages (provided by the tests), which mark the expected limits for children with a normal performance.

-Batería de evaluación de los procesos lectores de los niños de Educación primaria (PROLEC) of Cuetos, Rodríguez and Ruano (2000) to value Reading variable. The objective of this “battery” is to value the reading capacity of words, sentences and paragraphs on primary school children between the 6 – 10 years old. The test application is individual and it consists in four large blocks: letters recognition, lexical, syntactical and semantics processes (Cardozo, Zafra, Vergel, 2017). The evaluation criteria obey to give one (1) point for each correct answer and zero (0) for each incorrect answer; also, it offers tables of scales, percentiles, average and standard deviation in each test.

-Batería de Evaluación de los procesos de escritura (PROESC) of Cuetos, Ramos y Ruano (2004), used for the writing evaluation. The battery has as objective the purpose to evaluate the main processes involved in reading and detecting mistakes that could occur. Its application is individual in a 40 to 50 minutes time and its especially aimed to third grade primary basic students to fourth grade secondary basic students. It consists in 6 heterogeneous tests aimed to evaluate different aspects of reading: Syllable dictation, words dictation, pseudowords dictation, phrase dictation, story writing and text writing. For the evaluation, the battery offers scales and direct scores that could be interpreted according its distance to the average.

Method: The investigation was developed in three stages. The first one consisted in the initial approach to the community where there were some meetings with school principals, teachers and family parents of the third-grade primary basic students from the chosen school, with the purpose of communicate about the research and to access to the informed consent. In the second stage, the sample was chosen from the population (204), through the previous applications of auditive perceptions ratings (audiometry sieve), visual perceptions ratings (optometry sieve) and intelligence quotient (psychological test of WISC IV), which gave us the total result of 55 children.

Later, PROLEC, PROESC and individual phonological processing tests instruments were applied, in a free-distractions place, with a three stages length of 30 to 40 minutes of duration time each one. In the third stage, the results generated in the research field were analyzed, through the use of informatic programs consistent with the investigation instruments; which gave way to the preparation of the final report.

Analysis of the data: For the statistical analysis the IBM statistical package SPSS 23.0.0.0 64-bits 2015 edition was used. The data was subjected to a descriptive analysis to stablish the corresponding statistics and a correlational analysis, which required in first instance, to check the normality of the data distribution for the variables as “reading level”, “writing level” and mainly the “phonological awareness level”, through the Kolmogorov-Smirnov test, to then use Pearson’s parametric test to establish the correlations, in a significance level of $p < .05$ under the following hypothesis:

Ho: The writing level is NOT correlated with the awareness level.

Ha: The writing level IS correlated with the awareness level.

Ho: The reading level is NOT correlated with the awareness level.

Ha: The reading level IS correlated with the awareness level.

Interest conflicts

The researchers declare not having any kind of interest conflicts in this article.

Results**Phonological awareness level on the population**

In Table 1 are described the results of PA (Phonological Awareness) of the population, being relevant that in most of the tests inadequate performance prevails, except for the one corresponding to auditive discrimination. As can be seen, almost all population had difficulties to consciously operate the language segments in *oral reversion of syllables* tasks. Children also showed poor ability to listen sequences and to integrate them into words with and without visual support, as well as to segment words in phonemes.

Table 1. Frequency distribution of Phonological Awareness Performance.

	Performance	N	%
Auditive discrimination	Adequate	35	64
	Inadequate	20	36
Auditive – phoneme sequence	Adequate	22	40
	Inadequate	33	60
Oral auditive sequences	Adequate	7	13
	Inadequate	48	87
Words segmentation in phonemes	Adequate	20	36
	Inadequate	35	64
Oral reversion of syllables 1	Adequate	2	4
	Inadequate	53	96
Oral reversion of syllables 2	Adequate	0	0
	Inadequate	55	100

Source: Authors.

Literacy performance of population

Table 2 shows the population's performance in the different evaluated reading processes.

In the letter's recognition process was found that population shows bigger difficulties in distinguishing letters and sounds tasks, than

comparison between words and different letters tasks.

The registered behave in lexical processes showed that students have notorious difficulties for lexical decisions tasks, evidencing that 58% of them showed mistakes to recognize the presence of words or pseudowords (no words or invented words) using the orthographical representation. On the other hand, the results varied at the moment of decoding words and decoding pseudowords, because students showed a better performance reading word than pseudowords. Also, it was found a bigger ability to decode frequent words than infrequent ones and pseudowords.

Regarding the syntactic processes, it was identified a considerable proportion of children (45%) with difficulties to assign syntactical roles to words in grammatical structures. On the other hand, it was found a lot of difficulties in punctuation marks, because a high percentage of students (95%) showed failures using pauses and intonations that indicate the punctuation at the moment of reading.

In semantic processes was evidenced that a high percentage of population (76%) show difficulties to understand narrative and expository texts by means of literal and inferential questions.

The results of writing processes are showed in Table 3, which are organized according the tasks of dictation of syllables, dictation of words, dictation of pseudowords, dictation of phrases, story writing and text writing. Most difficulties in population were registered in the phrase's dictation, where it can be seen the poor ability children have for the adequate use of capital letters (73%) and punctuation marks (60%). Likewise, a high percentage showed difficulties in the pseudowords dictation (64%) and syllables dictation tasks, where better results were expected given the students ages and grade levels. Conversely, the writing stories and texts tasks did not show any difficulty despite being a complex ability of writing.

Table 2. Performance in the reading process

Reading process	Tests	Difficulty			
		Yes		No	
		N	%	N	%
Letters recognition processes	Name and sound of letters	33	60	22	40
	Same and different in W and NW.	18	33	37	67
	Lexical decision	32	58	23	42
Lexical processes	W reading	14	25	41	75
	NW reading.	26	47	29	53
	Infrequent short and large W reading.	19	35	36	65
Syntactic processes	Short and large NW reading	32	58	23	42
	Short and large NW reading	33	60	22	40
	Grammatical structures	25	45	30	55
Semantic processes	Punctuation marks.	52	95	3	5
	Sentences understanding	20	37	35	63
	Texts understanding	42	76	13	24

W= Words NW= No words.

Source: Authors.

Similarly, it was found that a significative percentage of students got scores that are inside the "doubt" category, which indicates, according the test, that students don't clearly show a difficulty, although they do not present an optimal performance either, evidencing the need to apply deeper tests to corroborate the difficulties.

In Table 4, it is appreciated that correlation between reading and writing variables and phonological awareness is statistically significant, with a 95% reliability, which shows that children with lower scores in writing also had low scores in PA. Therefore, the null hypothesis is rejected and the alternate ones are assumed.

Table 3. Writing processes performance.

Writing process	Difficulty		
	Yes	No	Doub

Tests		ts			
		N	%	N	%
Syllable dictation		2	4	2	1
		5	5	2	5
Words dictation	a) Arbitrary	2	3	1	3
	Orthography	0	6	7	1
Pseudowords dictation	b) Arranged	2	3	2	4
	Orthography	0	6	4	4
Phrases dictation	a) Total	3	6	1	1
	Orthography rules	5	4	1	6
Story writing	b) Orthography	2	4	2	4
	Y rules	2	4	4	0
Text writing	a) Accents	0	-	1	3
	Capital letters	4	7	4	7
Story writing	b) Capital letters	0	3		1
	Punctuation marks	3	6	7	1
Text writing		3	0	3	5
Story writing		3	5	4	9
				9	0
Text writing		0	-	4	7
				1	5

Source: Authors.

Correlation of Phonological Awareness and Literacy level.

Table 4. Correlation between phonological awareness and literacy

Variables	Test	Probability Value
Writing level	Pearson's correlation	0,267*
	Sig. (bilateral)	0,049
Reading level	Pearson's correlation	0,277*
	Sig. (bilateral)	0,041

*Sig.= Significance.

Source: Authors.

Discussion

At the moment of checking the Phonological Awareness results it can be established that tasks performance, which allowed evaluating it, was not the expected given the children's age and grade level, considering that only auditive discrimination showed good performance, which indicates that these children have the ability to identify differences among sounds, being this one of the first requirements for PA development. However, it's no enough for an adequate performance in the other proposed tasks, because most children failed in these, especially in a task of integrating phoneme sequences both orally and in writing, as well as to segment words in phonemes and to identify inverted words, aspect that matches with researches by Bizama, Arancibia and Sáez (2013); and Pellés and Martínez (2014). The above mentioned reflects a lag in PA development in children, because given their ages and grade levels they should have already acquired segmental or phonetic awareness, according the statements by Bravo (2003), who affirms that learning success in reading implicates that child acquires a certain degree of language awareness that allows him the ability to make this segmentable into units that could be separated.

Jimenez and Ortiz (2000) consider phonological awareness as an active capacity, through which the subject has to make discoveries in relation with oral language, which allows him to dominate written language. Syllable segmentation that consists in dividing words in its syllables turns out to be an easier task than phonemic, but the direct syllables that start words denote faster the access to the word's meaning that complex starting syllables. In this regard, Bravo (2003) argues that initial high frequency syllable facilitates the access to lexicon, being a good inductor to learn to read.

As far as concerned to particular analysis of reading variable, children denote notorious difficulties at the moment of making simple tasks of letters and sound recognition and lexical decision tasks, as the pseudowords recognition. According to Cuetos, Rodríguez and Ruano (2000), this is because the scarce consolidation of the link of grapheme – phoneme, that appears in the first stages of the literacy process and it consolidates the necessary phonological route for its optimal development. When children have failures in this aspect, they

show difficulties in letters and sounds recognition, as well in substitution errors.

With respect to the low performance in short and long pseudowords reading, Vieiro and Gómez (2004) considerate that is due to difficulties in phonological processing, given that "they are characterized by reading problems in new, irregular and pseudo words. On the other hand, Cuetos, Rodríguez and Ruano (2000) claim that word are read more quickly than pseudowords, suggesting a preference for the lexical route in the first ones and for phonological route in the second ones; therefore, children of this study denote more preference for the lexical route than for the phonological route. The preference of lexical route is associated to the age, the reading experience, the reading teaching method and the kind of reading that child requires; thereby, younger children with less dexterity prefer the phonological route, while older and good reader children will have a bigger number of orthographical representations of words (because they read more) and they could use the lexical route.

However, all of the reading processes are compromised, although it's notorious a bigger jeopardize in syntactic and semantic aspects. The link between one and another, is due to what Cuetos (2014) and Vieiro and Gómez (2004) claim, which is that access to meaning is complete with the knowledge of syntactic-type functional links. For Cuetos (2014) the syntactic processing is important for reading and necessary for comprehensive processing, but it differs from this because discovers the link between the sentence's constituents, but it does not analyze the meaning of them; but nevertheless, he claims that before the understanding it must always undergo through syntactic operations (syntactic label assignment, components and structure of the corresponding structure link's specification) to guarantee a proper understanding. On the other hand, Vieiro and Gómez (2004) affirm that syntactic processing is a formal component of the understanding because it is independent of the content of the units with which it operates, and also necessary, insofar as without its participation, statements greater than words couldn't be interpreted. So, syntactic analysis could be defined as a cognitive process that

consists in assign a constituent's structure to the sentence, for which the reader must: to segment the lexical units sequence into broader sentential constituents, to assign a structural role or syntactic label to each one of the linguistic constituents in which the sentence have been segmented, and to establish syntagmatic links between the labeled constituents.

At the moment of analyzing the writing process, it was registered difficulties in almost all the abilities, excepting the ones concerning to writing stories and texts tasks, showing a bigger commitment in the dictation abilities of phrases with capitalization and punctuations, and in the dictation of pseudowords. These results are due, according to Cuetos, Ramos and Ruano (2004), to difficulties in the mechanism of phoneme-grapheme conversion or phonological route, which is the one that allows writing correctly any regular word, even if it's an unknown one (whether words or pseudowords). For the mentioned authors, this process requires three different tasks: to write a word, the student has to be conscious that it divided in smaller parts that are phonemes, and every phoneme must have it's a graphic representation (grapheme); Secondly, the student has to assign to each phoneme a grapheme (phoneme-grapheme conversion; and finally, he must put each grapheme in its place, so the phonemic sequence could match with the grapheme sequence. When any of this sub-process fail, some mistakes are made, being the most commons the omission, substitution and phonemes reversion (transposition).

Another of the endangered aspects in the writing process is the orthographic representation of the words with arbitrary orthography, which for Cuetos, Ramos and Ruano (2004) is due to failures in the direct or lexical route that is responsible for activating the written representation without the need of decompose the word into its phonemes/graphemes. In other words, it results useful to write arbitrary spelling words, as long as they are known.

By last, the population shows writing mistakes that evidence jeopardize of motor processes intended to convert words into visible graphic signs, for example: capital and lowercase letter, italic and

script letters, among others. According Cuetos (2009), the responsible process of this ability is the motor designed to translate alographies in muscular movements that allows their representations.

On the other side, the obtained results in this research ascertain the proposed in general hypothesis; because, it ratifies the existence of a link between PA and the performance in reading and writing tasks in students.

At the level of reading, the found data corroborate previous studies such as the ones made by Galicia, Robles and Sánchez (2015), De la Calle, Aguilar and Navarro (2016) and Cannock and Suárez (2014), who also demonstrated a significant and direct link between PA and the reading level of subjects. That is, the higher the score in PA abilities, there will be greater performance in these abilities.

At the level of writing, the found data corroborate the previous studies such as the ones made by Suárez, García and Cuetos (2013), Gutiérrez and Díez (2015) and Gutiérrez and Díez (2017), who also demonstrate a significant and direct link between writing level of subjects. The writing phrases ability, using correctly the accents, was the writing task that got a most significant correlation with PA. That is, the higher the score in phonological awareness abilities, there will be a greater performance in these abilities.

Conclusions

In summary, this study allowed to extract as general conclusion that most of the included children showed difficulties in PA, what causes that they show minor abilities in the literacy process. In writing, it was evidenced that a significant number of students showed doubts at the performance time, which evidence the need to apply deeper tests to corroborate whether they are children with difficulties and children who does not have them. Similarly, the correlation demonstrated between variables, denotes the existing imbrication between PA and reading and writing acquirement that is so important for the first school years.

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