Competência lexical e metafonológica em pré-escolares com transtorno fonológico***

Lexical and metaphonological abilities in preschoolers with phonological disorders

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Abstract

Background: lexical and metaphonological abilities of phonologically disordered preschoolers. Aim: to investigate the influence of Phonological Disorder on the lexical and metaphonological abilities of a group of preschoolers and the correlation between them. Method: participants were 56 preschoolers - 32 boys and 24 girls – with ages between 4 years and 6 months and 6 years and 11 months, divided into two different groups: the Research Group, composed of 28 preschoolers with Phonological Disorder, and the Control Group, composed of 28 preschoolers with normal speech and no oral speech-related complaints, paired to the research group by gender and age. All of the participants were initially assessed by the ABFW Test - Phonology. After that, they were assessed on their lexical and metaphonological abilities by the ABFW Test - Vocabulary and phonological awareness test: sequential assessment instrument, CONFIAS – identification tasks and, rhyme and alliteration production, respectively. Results: regarding lexical ability, the preschoolers from both groups presented similar behavior. The disordered preschoolers presented the worst performance on the overall analysis of the metaphonological ability. Age had an influence on the performance of lexical ability for both groups and the metaphonological abilities only for the Control Group. Correlations were identified, mostly positive, good to moderate between lexical and metaphonological abilities. Conclusion: the influence of Phonological Disorder may only be observed on the metaphonological performance. Phonological Disorder did not interfere with the development of the lexical ability of this group of preschoolers. Positive correlations were identified between both abilities in the studied age group.

Key Words: Child; Preschool; Articulation Disorders; Vocabulary.

Resumo

Tema: competência lexical e metafonológica em pré-escolares com transtorno fonológico Objetivo: investigar, em um grupo de pré-escolares a influência do transtorno fonológico sobre as competências lexical e metafonológica e a existência de correlações entre ambas. Método: a amostra foi composta por 56 pré-escolares, 32 meninos e 24 meninas, entre 4:0 a 6:11 anos, que constituíram dois grupo: o Grupo Pesquisa, composto por 28 pré-escolares com transtorno fonológico e o grupo de comparação, composto por 28 pré-escolares com fala normal e sem quaisquer queixas relacionadas à comunicação oral, pareados aos primeiros por sexo e idade. Todos os 56 pré-escolares foram inicialmente avaliados por meio do Teste ABFW - Fonologia. Após, foram avaliados em suas competências lexical e metafonológica, por meio do Teste ABFW - Vocabulário e do teste consciência fonológica: instrumento de avaliação sequencial, CONFIAS - tarefas de identificação e produção de rima e aliteração, respectivamente. Resultados: em relação à competência lexical, os pré-escolares dos dois grupos apresentaram comportamento semelhante. Os pré-escolares com transtorno mostraram pior desempenho na análise geral da competência metafonológica. A idade influenciou o desempenho na competência lexical em ambos os grupos e na metafonológica apenas no de comparação. Identificaram-se correlações, positivas, em sua maioria, de boas a moderadas, entre as competências lexicais e as metafonológicas. Conclusão: a influência do transtorno fonológico pôde ser observada somente sobre o desempenho metafonológico. O transtorno fonológico não interferiu no desenvolvimento da competência lexical desse grupo de pré-escolares. Identificaram-se correlações positivas entre ambas as competências na faixa etária estudada.

Palavras-Chave: Pré-Escolar; Transtornos da Articulação; Vocabulário.

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Introduction

Consensually, the literature reports that children with Phonological Disorder exhibit speech alterations caused by difficulties related to use, production, organization and/or mental representation of speech sounds1-4. Considering that the primary deficit of this type of speech disorder is phonological in nature, it would be expected that other subsystems of language would not show deficits in their processing. However, there are still divergences among the studies that have investigated, for example, the lexical competence of preschoolers with Phonological Disorder5-8. On the other hand, the influence of the deficit of mental organization and representation of sounds on the processes of perception, analysis and conscious manipulation of syllables and phonemes is an unanimous reference in studies3-4,9-15. Some authors have investigated the effect of Phonological Disorder in tasks that assess the metaphonological ability and, in fact, have found inadequate performance4,9-15. Other authors added the notion that the therapy of Phonological Disorder should include metalinguistic activities involving phonological awareness16-17.

Studies have also investigated the relationship between phonological awareness and expressive vocabulary and have reported the presence of positive correlations between these variables in children without speech alteration18-19. This demonstrates that performance in phonological awareness can also be influenced by vocabulary, and not only by the integrity of the phonological system3,20-21.

Front of the above mentioned considerations, this study aimed to investigate, in a group of preschoolers, the influence of Phonological Disorder on lexical and metalinguistic abilities as well as correlations between them both.

Method

The study was approved by the Ethics in Research Committee of the State University of Health Sciences, Alagoas (Universidade Estadual de Ciências da Saúde de Alagoas) - UNCISAL, under protocol number 718, and by the Federal University of São Paulo (Universidade Federal de São Paulo) under protocol number 0300/09. All those responsible for the participants involved signed a consent form agreeing with the completion and dissemination of this research and its results according to Resolution 196/96. This was a cross sectional observational study, developed at the Treatment Unit in Speech Language Pathology and Audiology Prof. Jurandir Bóia Rocha (UTFONO) of UNCISAL and at the Municipal Elementary Public School Parque Monsenhor Luiz Barbosa (Maceio, AL).

Fifty-six preschoolers - 32 boys and 24 girls - with ages between four years and zero months and six years and 11 months participated in the study. All children were regularly enrolled at Elementary Public Schools of the state of Alagoas. Of these, 28 children had Phonological Disorder and composed the Research Group (RG) and 28 children with typical speech and no complaints related to oral communication composed the Comparison Group (CG). Preschoolers of this group were matched to the ones of the RG at a 1:1 ratio and by the variables age and sex. Children from both groups were similar regarding the educational level.

For the composition of the RG, the inclusion criteria were defined as follows: age between 4 years and 6 years and 11 months; enrollment in Elementary School; normal hearing for speech; global development, including language, with no alterations; structural and functioning normality of the articulatory organs; speech with Phonological Disorder. The same criteria, with the exception of Phonological Disorder, were adopted for the composition of the CG. The following exclusion criteria were established for both groups: preschoolers who were receiving or had received previous Speech and Language therapy; preschoolers who did not have the consent of parents or guardians to participate in the study.

To ensure that all inclusion criteria were strictly fulfilled, the following procedures were carried out: screening of the development, through the Child Development Scale - Denver I; audiometry (pure tone thresholds, SRT and SDT) with the purpose of excluding preschoolers with hearing loss; structural and functioning assessment of the Oral Motor System (OMS), with inspection of nasal cavity, mouth and ear by ENT examination (only children from RG were submitted to this examination); phonological assessment, conducted through the Naming and Imitation tasks of the Child Language Test/ABFW - Phonology 22. Each of the procedures adopted for sample selection was carried out in a single session with an approximate duration of 20 minutes.

The assessment of lexical ability was performed by applying the Child Language Test/ABFW - Vocabulary 23. The assessment of metaphonological ability was accomplished

through the implementation of the tasks of identification and production of rhymes and alliterations contained in the Test Phonological Awareness: Instrument of Sequential Assessment (Teste Consciência Fonológica: Instrumento de Avaliação Sequencial) - CONFIAS24. Both assessments were carried out in a single session with an approximate duration of 30 minutes.

All assessments were individually conducted in a silent room either at UTFONO or at an Elementary School. Provision and speed of performance of each preschooler was respected. After the assessments, children with Phonological Disorder started Speech therapy at UTFONO.

Results

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) version 16.0. The Mann-Whitney U test was used on the between-groups comparison of lexical and metaphonological abilities. Kruskal Wallis test was applied on the comparison among the age groups. To analyze the correlation between lexical and metalinguistic abilities, both for the RG as for the CG, the Spearman coefficient of bivariate correlation test was used. A confidence interval of 95% was considered for all results.

Table 1 shows that RG and CG exhibited similar performance regarding DUW and SP. In contrast, difference was observed for ND, with higher occurrence on the RG. In relation to the metaphonological ability, difference between groups was also observed, with better performance of CG.

Table 2 shows the differences between DUW and SP among the age groups, both for the RG and CG. No ND difference was observed in either group. For metaphonological ability, difference among the age groups was only observed for the CG.

Table 3 shows the correlation between variables for preschoolers of RG and CG. The analyses showed that DUW presented good negative correlation with SP in both groups. In contrast, DUW presented good positive correlation with metaphonological ability for RG and moderate for CG. The SP was negatively correlated with the metaphonological ability, being the degree of correlation good for RG and moderate for CG. The ND was not correlated with any variable in the RG and showed weak negative correlation with DUW in the CG.

TABLE 1. Between-groups comparison of mean and standard deviation for lexical (DUW, ND and SP) and metaphonological abilities.

	DUW		ND		SP		Metaphonological Ability	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
RG	69	16	6	5	43	15	6,9	3,0
CG	72	13	3	2	43	12	8,2	2,5
p-value	0,238		0,032*		0,676		0,042*	

Note: RG: research group; CG: comparison group; DUW: designation by usual word, ND: non designation, SP: substitution process; M: mean; SD: standard deviation; test: Mann - Whitney U.

TABLE 2. Intragroup comparisons of mean and standard deviation values of lexical (DUW, ND and SP) and metaphonological abilities according to age group.

Group	Age Group	DUW			ND			SP			Metaphonological Ability		
		M	SD	p-valoue	M	SD	p-valoue	M	SD	p-valoue	M	SD	p-valoue
RG	4 years	59	13	0,006*	8	6	0,341	52	14	0,036*	6	3	0,256
	5 years	66	14		5	5		47	13		7	3	
	6 years	83	12		4	5		31	14		8	3	
CG	4 years	60	13	0,000*	3	2	0,556	55	12	0,000*	7	2	0,040*
	5 years	72	10		3	3		43	9		8	2	
	6 years	83	2		2	1		32	2		10	2	

Note: RG: research group; CG: comparison group; DUW: designation by usual word, ND: non designation, SP: substitution process; M: mean; SD: standard deviation; test: Kruskal Wallis.

TABLE 3. Correlation between mataphonological ability - rhyme, alliteration, identification, production – and expressive vocabulary – DUW, ND and SP – for RG and CG.

		DUW	ND	SP	Metaphonological Ability	Statistics
DUW	RG	------	0,136	0,000*	0,000*	p-value
		------		-0,922	0,706	c
	CG	------	0,046*	0,000*	0,016*	p-value
		------	-0,379	-0,981	0,452	c
ND	RG		------	0,779	0,948	p-value
			------			c
	CG		------	0,195	0,322	p-value
			------			c
SP	RG			------	0,000*	p-value
				------	-0,736	c
	CG			------	0,020*	p-value
				------	-0,437*	c

Note: DUW: designation by usual word, ND: non designation, SP: substitution process; M: mean; SD: standard deviation; test: Spearman Coefficient.

Discussion

The results in Table 1 showed no differences between RG and CG regarding the ability of designation by usual word and regarding the use of substitution processes. These data corroborate with findings of previous studies5-6. In contrast, other studies indicated that children with phonological disorders have alterations on the lexical domain7-8. The discrepancy observed between the results of the current study (low values) and other studies carried out with Brazilian children indicates the need for studies in all Brazilian territory. These studies should investigate the expressive vocabulary in children with Phonological Disorder bringing new findings for the discussion in question.

The comparison of results of ND revealed difference between the groups, with poorer performance for the GP (higher mean of ND) when compared to CG. Although this difference has been verified, the values of ND were low when considering the total of 118 pictures that composes the test. Therefore, this difference may be due to the sample size effect or due to the influence of characteristics of the test itself, especially with regard to the semantic field sites - in which the highest percentage of ND have been reported in the literature7.

In the current study, therefore, it can be affirmed that the RG presented similar performance to that of the CG in the assessment of lexical ability. This result shows that the speech alteration of preschoolers with Phonological Disorder did not involve loss of lexical ability. This reaffirms the possibility that there are characteristics that are strict to phonological use, organization and representation that are not associated with lexical difficulties in certain cases of Phonological Disorder 5-6.

Once the Expressive Vocabulary Test used to assess the lexical ability was standardized in the city of Paulo22, the present study included a control group in order to allow the characterization of the research group in question as regional differences could have influenced the outcomes. It was thus possible to characterize the performance of a group of 56 preschoolers, with or without Phonological Disorder, which resulted in a profile of the lexical ability of preschoolers, boys and girls, aged between 4 years and 6 years and 11 months, enrolled at Elementary Public Schools of the capital of Alagoas. The average performance achieved by the group - which had already gone through the screening of motor, cognitive and language development (Scale of Infant Development - Denver I) and hearing assessment (pure tone thresholds, SRT and SDT) showing good performance - was below the standard established by the test. When considering the size of Brazil, its regional differences, and the results found in this study, it becomes evident the importance of the standardization of language tests that may cover different states and regions in an attempt to obtain values representing the average of national performance for children with typical development.

The data from metaphonological ability shown in Table 1 revealed better performance of CG with a statistically significant difference when compared to RG. These results are consistent with the ones of studies that examined the phonological awareness skills, including segments of rhyme and alliteration 9-12, 14. The deficit in phonological representations must have influenced the performance of preschoolers with Phonological Disorder.

The findings revealed that the difficulty in consciously manipulating the sounds is present even in tasks with larger segments, extending from activities with rhyme and alliteration until the ones with phonemes. The early phonological awareness skills develop, to some extent, independently of formal instruction. The development begins with skills of global perception of the size of words and/or phonological similarities between them and continues until the effective segmentation and manipulation of syllables and phonemes. It is during the preschool years and early education that children learn to read and write by developing the ability to pay attention to the speech analyzing it into its various segments, namely, phonemes, syllables and words 25, 26.

Until recently, the process of rehabilitation of Phonological Disorder remained based on a perspective of articulation, being the phonological organization disregarded27. Currently, studies have shown the efficacy of the combination of strategies of phonological awareness stimulation and the production of targeted speech sounds. This approach brings preventive benefits for preschoolers with Phonological Disorder as the phonological organization is achieved by the metaphonological therapy which, in turn, favors the typical development of reading and writing 15,16.

For both groups, an improvement in performance of lexical ability for DUW and SP with the increase in age can be observed in Table 2. The

expressive vocabulary of the sample developed in function of age increase. This finding is in agreement with findings from previous studies4-5. In relation to metaphonological ability, aging only influenced the performance of the CG. This result is also in agreement with findings from other studies 21, 25. Age did not influence the performance of metaphonological ability in preschoolers with Phonological Disorder, which corroborates with previous study 11.

The analyses of Table 3 show correlations between the lexical and metaphonological abilities. Such correlations were positive for DUW and negative for SP, with good degree of correlation in GP and moderate in GC. These results indicate that the higher the number of designations by usual word and the lower the number of substitution processes in the assessment of lexical ability, the better the performance of preschoolers in the metaphonological ability. Previous studies have confirmed this relationship between expressive vocabulary and phonological awareness skills18-19. This correlation indicated relationship between linguistic and metalinguistic skills. The more the preschoolers appropriated the language code, the better was their performance in tasks requiring metalinguistic domain as they used their linguistic ability on metalinguistic reflections.

There was also a good negative correlation between DUW and SP such for GP as for GC. This shows that the number of ND did not affect the results of lexical ability in either group. In this study, the results of DUW and SP were shown to be inversely related, as expected. Weak negative correlation between ND and DUW was observed only for the CG.

Conclusion

By studying the influence of Phonological Disorder on lexical and metaphonological abilities, it was possible to conclude through the characterization of preschoolers that, compared with preschoolers without speech alterations, the group with Phonological Disorder exhibited similar performance on the lexical ability and poorer performance on the metaphonological ability. Therefore, one can say that the Phonological Disorder did not affect the development of lexical ability in this age group. Despite the positive correlations found between the two abilities, the influence of the disorder on the metaphonological performance could be observed.

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