

THE INFLUENCE OF PHONOLOGICAL AWARENESS ABILITIES IN THERAPY FOR PHONOLOGICAL DISORDER

A influência das habilidades em consciência fonológica na terapia para os desvios fonológicos

Carolina Lisbôa Mezzomo ⁽¹⁾, Helena Bolli Mota ⁽²⁾, Márcia Keske-Soares ⁽³⁾,
Marizete Ilha Ceron ⁽⁴⁾, Roberta Freitas Dias ⁽⁵⁾

ABSTRACT

This study aimed to analyze the phonological awareness skills and progress (phonetic and phonological inventory and generalizations) in phonological therapy. The research group consisted of five children presenting speech disorders, aged 5:0 and 6:11, subjected to phonological therapy. The results of the phonological awareness assessment were analyzed before the treatment in order to verify the performance of children and their phonological knowledge. The evaluation was performed before and after the treatment. It was possible to obtain the phonetic and phonological inventories of the subjects and, after that, the generalizations obtained with phonological therapy were analyzed (considering lexical items that were not used during treatment, other positions in word, within one sound class or another class of sounds). The results showed that there is no relation between the performance in phonological awareness tasks and the evolution of the phonological therapy. On the other hand, the results agree with the research findings from the literature, reinforcing the idea that, children with phonological disorder can be able to react properly to metalinguistic tasks such as phonological awareness without being able to correct their speech problems. Finally, it can be conclude that this research subject should be investigated deeper and another analysis should be carried out involving a higher number of subjects, including the phonological awareness evaluation before and after therapy. By doing this, it will be possible to obtain other important data to improve the treatment of phonological disorder.

KEYWORDS: Speech; Speech Disorders; Speech Perception; Speech Therapy; Generalization, Response

⁽¹⁾ Speech-Language Pathologist; Professor at the Speech-Language Course and at the Post Graduation Program in Human Communication Disorders at Universidade Federal de Santa Maria – UFSM, Santa Maria, RS, Brazil; Doctor in Applied Linguistics at Pontifícia Universidade Católica do Rio Grande do Sul – PUCRS.

⁽²⁾ Speech-Language Pathologist; Professor at the Speech-Language Course and at the Post Graduation Program in Human Communication Disorders at Universidade Federal de Santa Maria – UFSM, Santa Maria, RS, Brazil; Doctor in Applied Linguistics at Pontifícia Universidade Católica do Rio Grande do Sul – PUCRS.

⁽³⁾ Speech-Language Pathologist; Professor at the Speech-Language Course and at the Post Graduation Program in Human Communication Disorders at Universidade Federal de Santa Maria – UFSM, Santa Maria, RS, Brazil; Doctor in Applied Linguistics at Pontifícia Universidade Católica do Rio Grande do Sul – PUCRS.

⁽⁴⁾ Speech-Language Pathologist; Doctoral Student of Human Communication Disorders at Universidade Federal de

■ INTRODUCTION

The communication evolution is facilitated by the emergence of more elaborate and slow speech analyses processes called linguistic awareness. These processes involve errors self-correction during speech comprehension and production basic

Santa Maria – UFSM, Santa Maria, RS, Brazil; Master in Human Communication Disorders at Universidade Federal de Santa Maria – UFSM.

⁽⁵⁾ Speech-Language Pathologist; Professor at the Speech-Language Course and Doctoral Student of Human Communication Disorders at Universidade Federal de Santa Maria – UFSM, Santa Maria, RS, Brazil; Master in Human Communication Disorders at Universidade Federal de Santa Maria – UFSM.

Conflict of interest: non-existent

operations; the testing and expansion possibilities of using the language during the acquisition of these basic communicative abilities; as well as the necessity of learning the writing code ¹.

The phonological awareness is a subtype of linguistic awareness which is related to the ability of explicitly analyzing speech in its phonological components ¹. This ability seems to be developed gradually, from the more global phonological units' awareness – words and syllables – to the phonemic awareness development. The varied types in phonological awareness follow, in general, a sequence of emergence – word awareness ability, followed by rhyme awareness ability, after syllables and, lastly, phonemes ¹.

The abilities in phonological awareness may or may not be out of phase in children with atypical phonological development when compared to the metalinguistic abilities of children with typical phonological development.

The relationship between phonological disorders and phonological awareness difficulties was confirmed in studies which observed lower performance in phonological awareness tests by children with atypical ² phonological development in comparison to the ones with typical ³⁻⁹ phonological development. In contrast, there is literature data which evidenced that children with atypical phonological development are not different from children with typical phonological development when performing phonological awareness tasks ¹⁰.

Children who presented contrastive phonemes mental organization alterations, in unexpected ages, should be observed and treated. The phonological therapy aims at speech adaptation through phonological inventory reorganization, whose function is the communication effectiveness ¹¹⁻¹².

In this process, the therapist has the purpose to shorten the time between the therapy beginning and ending, which is obtained through generalization, which is defined as learning extension or transfer. The generalization is the occurrence of treated sounds in other contexts or not treated words. It can also occur into a sound class or for other sound classes ¹¹. Not only the generalization, but the phonetic and phonological inventories pre- and post-treatment analyzes are useful to measure the changes occurred through therapy.

The phonological therapy may facilitate the performance in phonological awareness tasks ⁷. This aspect was demonstrated by the results obtained through a study which investigated the phonological awareness performance of children with atypical phonological development, considering speech-language therapy. The children who were treated through phonological therapy, without phonological

awareness direct intervention, obtained better results when compared with children who did not receive such intervention ⁷.

Therefore, it is possible to believe that children with positive performance in phonological awareness tasks present faster gradual development during phonological therapy. So, the aim of this case report is to analyze the phonological awareness abilities and the gradual development (phonetic and phonological inventories and generalizations) through phonological therapy.

■ CASES PRESENTATION

The sample of this case report consists of five children with atypical phonological development aged between 5:0 and 6:11, four male and one female. The selected data from the selected subjects are part of the Speech and Language Study Center (CELF) data basis, whose project was approved by the Comitê de Ética em Pesquisa – CEP (Research Ethics Committee) of a Higher Education Institution, under No 0103.0.243.000-07. In order to participate in this research, the parents or the people responsible for the children signed the Free and Clarified Consent authorizing the use of data referent to evaluations and therapy procedures in research and publication of results in academic environment, keeping anonymous information.

Currently, this data basis consists of 193 subjects, who were evaluated and submitted to different phonological therapy models (ABAB-Withdrawal and Multiple Probes Model, Modified Cycles Model, Minimal Pairs, Minimal Pairs/ Maximum Opposition). For this study, data of five subjects were selected randomly, according to the following inclusion criteria: diagnosis of phonological disorder; normal hearing; not presenting neurologic, cognitive or psychological impairments; having protocols of phonological awareness (tasks from the Phonological Awareness Protocol proposed by Cielo ¹) and phonology evaluations complete; and being submitted to phonological therapy.

All participants of this research underwent speech and hearing screening. For this screening, the following evaluations were performed: anamnesis, expressive and comprehensive language, stomatognathic system, articulatory examination, hearing screening, phonological awareness, simplified auditory processing, vocabulary, audiological evaluation and phonological evaluation. Besides, the complementary evaluations were held: neurologic and otorhinolaryngologic, both with normal pattern. So, it is possible to confirm atypical phonological development diagnosis.

After the evaluations, the subjects were submitted to different phonological therapy approaches. These therapy approaches were chosen according to researches which were performed at CELF and according to alterations of the phonemes observed in the phonological inventories pre-treatment, which showed possibilities of intervention. Therefore, S1, S2 and S3 were submitted to therapy through ABAB-Withdrawal and Multiple Probes Model¹³, in which two therapy cycles were analyzed, in about eighteen sessions, except S1 who finished treatment with only nine sessions. The fourth (S4) and fifth (S5) subjects were treated through the Minimal Pairs¹⁴ and Minimal Pairs/ Maximum Opposition Approaches¹⁵, which analyzed twenty-five therapy sessions. According to what was previously exposed, the research subjects were treated through different therapy approaches (ABAB-Withdrawal and Multiple Probes Model, Minimal Pairs, Minimal Pairs/ Maximum Opposition), which were not considered to isolated analyzes, because several studies¹⁶⁻¹⁹ used these approaches and showed their efficacy to treat children with atypical phonological development.

The evaluations which were used for analysis in this research are: phonological awareness pre-treatment and phonological evaluations pre- and post-treatment of the five subjects. The phonological awareness evaluation had the purpose to verify the children's performance in relation to their phonological knowledge. To evaluate this ability, the Phonological Awareness Protocol was used¹. This protocol presents twelve phonological awareness tasks which are divided into subtasks in a coherent complexity order. The phonological awareness tasks include segmentation of sentences in words (T1); nominal realism (T2); rhyme detection (T3); syllabic synthesis (T4); syllabic segmentation

(T5); syllable detection (T6); syllabic reversion (T7); phonemic exclusion (T8); phoneme detection (T9); phonemic synthesis (T10); phonemic segmentation (T11) and phonemic reversion (T12).

The speech data were obtained through a phonological evaluation instrument which consists of thematic pictures spontaneous naming, what allowed the obtainment of a significant linguistic sample with all language phonemes in different word position and in different words. The data were recorded, phonetically transcribed and analyzed through contrastive analysis, which allowed the attainment of the subjects' phonetic and phonological inventories. A sound was considered as present in the phonetic inventory when it occurred at least twice in any word position. A phoneme was considered as acquired in the phonological inventory when it occurred in 80% of the possibilities or more. Besides, the improvements in therapy by the occurrence of types of generalization (lexical items not used in treatment, other word positions, to be into a sound class, other sound class) were also analyzed.

■ RESULTS

S1, S2 and S3 did not present absent sounds in their initial inventory to be add, while S4 and S5 presented several (S4 – [g, v, t, d, ʒ, R, dʒ, λ, r] and S5 – [k, g, v, R, dʒ, λ, r]) absent sounds in their phonetic inventory. All sounds were included, except [g] which remained absent for both subjects. S4 and S5 were the ones who presented the most absent and partially acquired phonemes in their phonological inventory pre- and post-therapy (Table 1).

Table 1 – Absent sounds in the phonetic inventory and partially acquired and absent phonemes in the subjects' phonological inventory

Subjects		Phonetic Inventory		Phonological inventory	
		AS		PAP	AP
S1	IA	-		-	r
	FE	-		-	-
S2	IA	-		-	ʌ, r
	FA	-		r	-
S3	IA	-		-	r
	FE	-		-	r
S4	IA	g, v, t, d, ʒ, R, dʒ, ʌ, r		-	b, d, k, g, v, s, z, ʃ, ʒ, l, ʎ, r, R
	FE	g		b, d, s, ʎ	k, g, v, z, ʒ, l, ʎ, r, R
S5	IA	k, g, v, R, dʒ, ʌ, r		d, z	b, k, g, v, ʒ, l, ʎ, r, R
	FE	g		b, d, v, z, ʒ, R	k, g, l, r, ʎ

Legend: IA: initial evaluation; FE: final evaluation; AS: absent sounds; PAP: partially acquired phoneme; AP: absent phoneme

Differences pre- and post-treatment are observed regarding the number of acquired sounds into the phonological inventory and the percentage of generalizations (items not used in treatment, for other Word position, for other sound class and into a sound class) in all five studied subjects (Table 2).

S1 obtained the best results, with 100% of generalization for lexical items which were not used in treatment and for other word position. S1, S2 and S3 could not present generalization into a sound class and for other sound class because

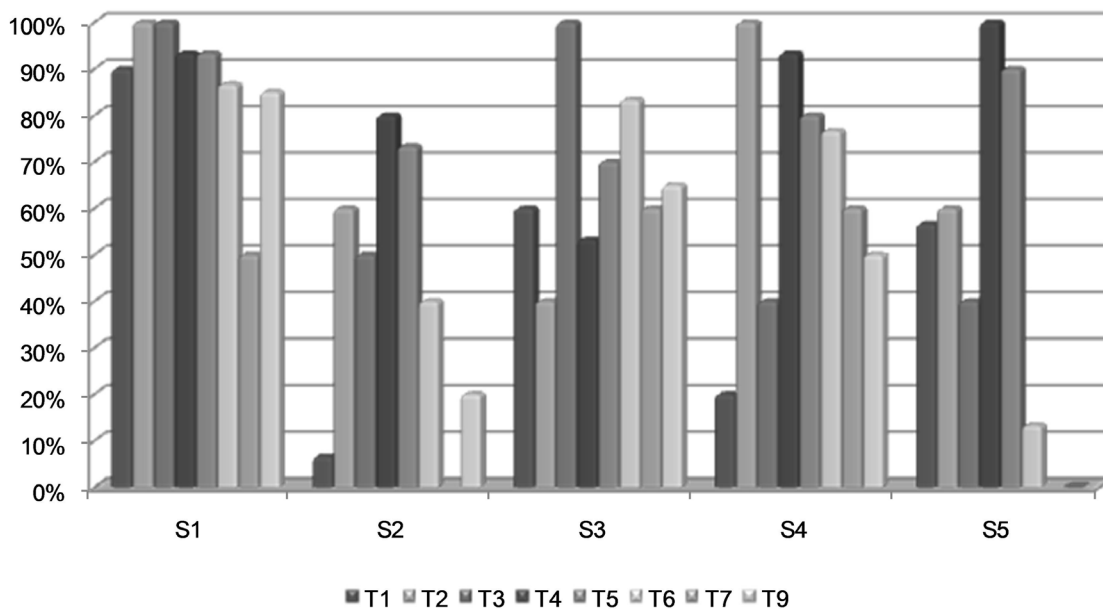
their phonological inventories did not present other phoneme alterations. Likewise, S5 could not generalize for other sound class, because all sound classes which presented alterations were treated in therapy. S4 presented all types of generalization, with the highest percentages obtained for generalizations into a sound class and for lexical items which were not used in treatment.

In general, S1, S3 and S4 were the ones who obtained a better result regarding the performance in phonological awareness tasks (Figure 1).

Table 2 – Phonetic and phonological inventories pre-treatment and the occurrence of generalizations after phonological therapy in all five studied subjects

Subjects	PHEI	PHOI	Generalizations			
			INUT (%)	OWP (%)	ISC (%)	OSC (%)
S1	1	1	100	100	-	-
S2	1	0	8	2,5	-	-
S3	0	0	14.6	11.58	-	-
S4	8	0	44.82	30.48	51.35	28.88
S5	6	1	28.41	52.75	28.44	-

Legend: PHEI: phonetic inventory; PHOI: phonological inventory; INUT: generalization for lexical items not used in treatment; OWP: other word positions; ISC: into a sound class; OSC: other sound class.



Legend: T1 – segmentation of sentences in words; T2 – nominal realism; T3 – rhyme detection; T4 syllabic synthesis; T5 – syllabic segmentation; T6 – syllable detection; T7 – syllabic reversion; T8 – phonemic exclusion; T9 – phoneme detection; T10 – phonemic synthesis; T11 – phonemic segmentation; T12- phonemic reversion.

Figure 1 – Performance of each subject in phonological awareness tasks.

DISCUSSION

Regarding the phonetic inventory, only two subjects (S4 and S5) presented alterations pre-treatment, but most sounds were acquired after therapy, only one sound remained absent. Some studies^{16,19} referred the placement of sounds into the phonetic inventory after treatment, with phonological basis. In relation to the phonological inventory, S1 placed the only absent phoneme in the initial evaluation; S2 placed one of his/her absent phonemes and the other one became partially acquired; and S3 did not acquire his/her only absent phoneme. S4 and S5 did not acquire any phoneme, only some of them became partially acquired in their phonological inventories, after being submitted to phonological therapy. It was possible to observe phoneme increase in the percentage of correct production in the phonological inventory for all subjects, although it was not enough to eliminate all occurred substitutions or omissions.

Regarding the types of researched generalizations, it is possible to observe that all five subjects of the research presented generalizations, some presented more and other less, according to the occurrence possibilities. The generalization is used in many researches^{16-18,20-22} to verify the therapeutic improvement of subjects with atypical phonological development, because when generalizations are obtained, therapy becomes faster, and it is not

necessary to teach all phonemes which are altered in children's speech in all positions they occur.

In tasks of phonological awareness, S1 was the only who succeeded in all analyzed tasks. According to some researches, abilities in phonological awareness can be beneficial factors in therapy for phonological disorders^{23,24}.

As phonological therapy contributes in a positive way to develop phonological awareness abilities⁷, to use activities which involve this ability can lead to changes in children's phonological system^{23,24}. S1 presented positive result in phonological awareness abilities and acquired sounds in his/her phonetic and phonological inventory. This fact was referred by a study²⁵ which affirms it is possible that children who present positive phonological awareness abilities respond therapy in a better way.

S1 obtained the highest generalization percentages for lexical items which were not used in treatment and for other word position. These two types of generalization were also observed in other studies^{11,17,18}. Some researches reveal that the acquisition of the phonetic and phonological inventories, as well as the obtained generalizations, have the selection of treatment targets as causer¹⁶⁻¹⁸.

S2 presented inferior phonological awareness performance if compared with the other analyzed subjects and he/she was the one who improved the least during therapy. The only absent sound

pre-treatment was neither acquired nor generalized when it was possible. Such fact agrees with studies which demonstrate that children with atypical phonological development may present low performance in phonological awareness abilities^{3,5,23}.

S3 succeeded in twelve out of sixteen phonological awareness subtasks. However, during therapy gradual development, it was not possible to detect acquisitions in the phonological inventory and there was low percentage of possible types of generalizations.

S4 was the second subject in terms of therapy gradual development. He/she added eight sounds in the phonetic inventory and presented generalizations for all researched types. This subject obtained phonological awareness positive result and succeeded in thirteen out of sixteen applied subtasks. Some studies^{12,17,18} refer sounds acquisition in phonological inventories after intervention with phonological basis.

S5 succeeded in ten out of sixteen phonological awareness subtasks and he/she obtained positive therapy gradual development, presenting phonetic and phonological inventories and types of generalization improvements. The generalization into a sound class and for other sound class are especially desired because they contribute with phonological inventory global changes¹¹.

When analyzing the phonological awareness performance and the phonological therapy, the person who presented the best results in this evaluation also presented the highest degree of improvement in therapy (S1). However, S3 presented positive result in phonological awareness tasks, when compared to the other subjects, and he/she did not present significant improvement neither in the phonological inventory nor in the types of generalization.

Even if phonological awareness was not evaluated post-therapy, the results observed in this study suggest the hypothesis that there may be relationship between such ability and phonological disorders therapy. It is possible to believe that phonological therapy may influence positively the phonological awareness abilities⁷ gradual development and it can influence atypical phonological development therapy.

A study²⁶ presents the necessity of evaluating phonological awareness abilities of all children

with atypical phonological development, especially the ones who exhibit several sound atypical errors, because these children may present risks to develop phonological awareness abilities, and, consequently, to literacy. The same study refers that many children with atypical phonological development presented positive results in phonological awareness tasks, with relatively few atypical errors, different from children who did not present good results in phonological awareness tasks. The proper phonological system development is the basis for the later development of other linguistic abilities. It highlights the importance of researching phonological therapy emphasizing the phonological processing⁵.

Currently, there are a few researches regarding the interference of phonological awareness in the phonological therapy gradual development. The results of this study are based on the speech of a few subjects. However, it would be important to have other studies in order to investigate this possible relationship. It is believed that the comprehension of these relationships could guide the treatment of children with atypical phonological development.

■ CONCLUSIONS

It is possible to observe, in the subjects of this research, that there was no relationship between phonological awareness abilities and the phonological therapy gradual development.

Literature mentions that children with atypical phonological development are able to properly answer metalinguistic tasks such as phonological awareness. This condition does not help the correction of speech disorders. In this study, gradual development was observed regarding the phonetic and phonological inventories and the types of generalization. However, such improvements were not related to the investigated metalinguistic ability.

Considering that the analyzed data came from only five subjects, it is suggested that other studies may be performed with more subjects in the sample. Besides, it is suggested that therapists reevaluate the phonological awareness when the treatment finishes.

RESUMO

Este trabalho teve como objetivo analisar as habilidades em consciência fonológica e o progresso (inventário fonético e fonológico e as generalizações) na terapia fonológica. O grupo pesquisado foi constituído por cinco crianças com desvio fonológico, com idades entre 5:0 e 6:11, submetidas à terapia fonológica. Foram analisados os resultados obtidos na avaliação da consciência fonológica pré-tratamento, a fim de verificar o desempenho das crianças quanto ao seu conhecimento fonológico. Realizou-se a avaliação fonológica pré e pós-tratamento, em que foi possível obter os inventários fonéticos e fonológicos dos sujeitos. Após, foram analisadas as generalizações obtidas com a terapia fonológica (itens lexicais não utilizados no tratamento, outras posições na palavra, dentro de uma classe de sons, outra classe de sons). Os resultados evidenciaram que não existe relação entre o desempenho em tarefas de consciência fonológica e os progressos na terapia. Tais resultados corroboram os achados da literatura, confirmando que crianças com desvio fonológico podem ser capazes de responder adequadamente a tarefas metalinguísticas como a consciência fonológica, sem que essa condição as auxilie a corrigir os desvios de sua fala. Sugere-se que este assunto seja mais bem investigado com um número maior de sujeitos, bem como com a avaliação da consciência fonológica pré e pós-terapia, no intuito de se obter dados generalizáveis os quais serão importantes para o entendimento dos casos de desvio fonológico.

DESCRITORES: Fala; Distúrbios da Fala; Percepção da Fala; Fonoterapia; Generalização da Resposta

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Mailing address:

Roberta Feitas Dias

Antero Corrêa de Barros, 244 – Centro

Santa Maria – RS

CEP: 97010-120

E-mail: robertafdias@hotmail.com