ANALYSIS OF THE DISTINCTIVE FEATURES AND OF THE PHONETIC AND PHONOLOGICAL SYSTEMS IN DIFFERENT SEVERITIES OF PHONOLOGICAL DISORDER

Análise dos traços distintivos e dos sistemas fonético e fonológico nas diferentes gravidades do desvio fonológico

Gabriela Bayer Schneider[1], Roberta Freitas Dias[1], Carolina Lisbôa Mezzomo[1]

ABSTRACT

Purpose: to characterize and to analyze the phonetic system, the phonological system and the altered distinctive features in different severities of phonological disorder. **Methods:** speech data from 145 children with ages between 4:0 and 8:0 diagnosed with phonological disorders were analyzed. They were submitted to the Child's Phonological Assessment to observe: the phonetic inventory, the phonological system and the distinctive features. The children were grouped according to the severity of the phonological disorder, calculated through the Percentage of Correct Consonants. The data were compared and analyzed among the groups through the Kruskal-Wallis test, with significance level of 5%. **Results:** in the phonetic inventory, it was noticed that the average of absent phones was higher in the severe disorder. The fricative, the plosives and the laterals were the most absent classes. In the same way, in the phonological system it was observed that the severe disorder was the most damaged, with the highest average of alteration for all analyzed classes of phonemes in all possible syllable and word positions. For the distinctive features, there was statistically significant difference among the disorder degrees, with more alterations in the severe disorder and less alterations in the mild disorder. **Conclusion:** as more severe the speech disorders are, more alterations and absence of sounds will be perceived in relation to the phonetic inventory and to the phonological system. The results which were obtained in this study reinforce the importance of knowing the qualitative characteristics of each degree of phonological disorder.

KEYWORDS: Speech; Speech Disorders; Language; Child Language; Articulation Disorders

INTRODUCTION

In children's first years of life, the phonemes are acquired in a chronology which is similar for most infants. In Brazilian Portuguese (BP) it is observed the following phonemes acquisition order: plosives and nasals>fricatives>liquids[1].

The difficulty of some children to mentally organize the sounds which are part of the language, as well as the input, is called phonological disorder[2]. In these cases, it is possible to observe the permanence of repair strategies after children are 4:0 (boundary age to acquire the phonemic contrasts of Brazilian Portuguese)[3] illustrates that the language sounds are used in an improper way, considering the adult pattern of their linguistic community[4].

Those children perform several repair strategies, in order to obtain a phonological system which is similar to the adult's, what also occurs in cases of typical phonological acquisition. However, in cases of phonological disorders, those strategies last for a longer time[5]. During the atypical phonological acquisition, examples of the most used repair strategies, in the segmental level are the obstruent devoicing (zebra à ['sepa]) and fricative anteriorization (acho (find) à [a'su]). In the syllabic level, there is frequently cluster reduction (prato (plate) à ['patu]) and the non performance of coda (porta (door)à ['pota])[1].

[1] Universidade Federal de Santa Maria – UFSM, Santa Maria, RS, Brasil.

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Procedures that quantify the severity of phonological disorders and their impact in communication are important to more specific performance of therapeutic planning, as well as the development of prognostic in those cases[6].

In this sense, some studies were performed with the purpose of quantifying and classifying the phonological disorders according to their severity. Among those classifications the PCC (Percentage of Consonants Correct)[6] is the most used in speech-language clinic. According to the PCC, the phonological disorders can be classified as mild (PCC higher than 86%); mild moderate (PCC from 85% to 66%); moderate-severe (PCC from 65% to 51%) and severe (PCC lower than 50%). Some studies reported that the use of this method of phonological disorder severity classification is important for diagnosis and treatment of those cases[4,5,7].

In the analysis of the phonological disorder, considering the perceptive evaluation by the therapists, it was observed that there is difficulty of classification when the levels are very close of each other, such as the moderate severe and mild moderate levels[7]. Although there is difficulty, it was observed that even through perceptive evaluation, the characteristic of the disorder is closely related to the disorder severity and, as a consequence, to the number of repair strategies used by the children, absent phones and phonemes[8].

After the assumptions previously mentioned, it is understood that the phonetic and phonological characteristics of each phonological disorder level, based on the PCC, may bring important contributions for speech-language treatment in those cases. With those information, it is believed that the clinical speech-language therapist may organize a therapeutic planning, as well as therapeutic strategies for phonological disorders, even more effective.

In this sense, in the present study it was analyzed the phonetic and phonological inventories of children with phonological disorders, with the hypothesis that alterations of this order would be consistent to the disorder severity, classified through the PCC.

So, this research has the purpose of characterizing and analyzing the phonetic system, the phonological system and the altered distinctive features in different severity levels of the phonological disorder.

METHODS

This research was explanatory, cross-sectional and performed through a survey in a data basis from a Department of Language and Speech studies at a university. The project was approved by the ethics committee, n. 0103.0.243.000-07 in the same institution. To organize the speech data of the subjects, the condition was the signature of the free informed term of consent by the parents or responsible people.

Nowadays, this data basis consists of 212 subjects, with diagnosis of phonological disorder. To establish this diagnosis, the subjects were submitted to a speech-language screening and to complementary, otorhinolaryngologic, hearing and neurological examination. The speech-language screening consisted of: anamnesis, evaluation of oral expressive and comprehensive language, stomatognathic system evaluation, articulatory examination, hearing discrimination evaluation, phonological awareness evaluation, simplified auditory processing evaluation, vocabulary evaluation and phonological evaluation.

The four first evaluations were performed with specific protocols, used at the speech-language department at the university where the data bases was created. The anamnesis was performed with parents or children's responsible people to obtains information such as language development and physio pathological antecedents. The language evaluation was performed through observation of spontaneous speech of the children during the evaluations. Regarding the stomatognathic system, intra and extra-oral aspects of the soft oral tissues (tongue, lips, cheeks) and of the hard tissues (theeth and bones), as well as breathing, shewing and swallowing functions were analyzed. For the articulatory examination, it was used a balanced list of words, with three words for each phone of BP, in each possible word and syllable position. In this examination, the children should repeat the words spoken by the examiner, without visual clue.

The auditory discrimination, the phonological awareness, the auditory processing and the vocabulary were evaluated based on national published studies. The used protocol will be described in this study.

All the subjects of the data basis presented normal results in the complementary exams.

For the performance of this study, the inclusion criteria were: age between four and eight years old and eleven months, as well as presenting filled in evaluation protocols. Those subjects who presented incomplete protocols and age higher than nine years old, when speech alteration is considered residual speech sound errors [9], were excluded from this study. Thus, the sample consisted of 145 children, 91 boys and 54 girls, with ages between 4:0 and 8:11.

It was investigated the children's phonetic inventory, the phonological system and the distinctive features. Then, they were grouped according to the phonological disorder level.

To do it, the CPA (Children Phonological Assessment) was examined, properly filled in by another evaluator, to develop the data basis. This evaluation consists of spontaneous naming of pictures, through the observation of five pictures (bathroom, kitchen, living room, vehicles and zoological), which contain all the phonemes in Portuguese, in all possible syllable and word position. After the data collection, the data were phonetically transcribed and analyzed through phonetic description, to discover the phonetic inventory of the children; contrastive analysis, to compare the phonetic inventory and the phonological system with the adult target system; and the analysis of the speech altered distinctive features[10].

About the first aspect, the phonetic inventory, the absent phones were identified, regarding the articulatory way – plosives, fricatives, nasals, affricates, lateral liquids and vibrants. It was considered as present the phones which were produced, at least, twice by the subjects.

In relation to the phonological system, it was investigated the contrastive sound class(es) and the altered distinctive feature(s). The investigated classes were the plosive, fricative, nasal and liquid. Besides, the analyzed syllable structures were coda (/N/, /L/, /R/, /S/) and consonant clusters (/r/ and /l/). The analyzed distinctive features were: [sonant], [approximant], [vocoid], [voiced], [continuous], [labial], [coronal] and [dorsal].

The data collected through the CPA were described and reviewed by at least two evaluators, with experience in phonetic transcription. In order to include and to analyze the studied words, both evaluators should always agree with that word, otherwise, the word was excluded. Then, to describe the studied children's phonological system, the phoneme was considered as acquired when it occurred from 80% to 100% of the times, partially acquired, when it occurred from 40% to 79% of the possibilities, and not acquired, when it occurred from 0% to 10% of the possibilities[11]. About the distinctive features, the analysis was performed through the substitutions which were identified in the contrastive analysis. So, a distinctive feature was considered as altered every time the substitutions occurred with percentages over 10% of the possibilities[12].

The severity of the phonological disorder was analyzed through the PCC-R[13], when omissions and substitutions are considered as "errors". It was also used, for the calculation and classification of the phonological disorder, the PCC[6], which is obtained through the division of the number of correct consonants by the total number of consonants (correct and incorrect), multiplied by 100. After the obtainment of the percentage, there is the following classification: severe disorder, with percentage of correct consonants lower than 50%; moderate-severe disorder, with percentage of consonant correct between 51% and 65%; mild-moderate disorder, with percentage of consonant correct from 66% to 85%; and mild disorder, with percentage of consonant correct higher than 86%.

After this classification, the group of children with severe disorder consisted of 10 subjects; the group of children with moderate-severe disorder consisted of 32 subjects; the group with mild-moderate disorder consisted of 58 subjects; and the group with mild disorder consisted of 45 subjects.

The analyzed data (phonetic inventory, phonological inventory and distinctive features), after organized according to the severity of the phonological disorder, were confronted among the groups with different disorder levels, with the *Kruskal-Wallis* test, 5% significance level. For this, it was used the computer program SAS (Statistical Analysis System), 9.2 version.

RESULTS

In Table 1, it was presented the characteristics of all the levels of phonological disorder regarding the phonetic system characterization. It can be observed that the average of absent phones in the children's phonetic system was different in each phonological disorder level. It is statistically significant for all analyzed classes (Table 1).

Table 1 – Comparison of the phonetic system, regarding the absence of phones, among the different severity levels of the phonological disorder**

Disorder severity	MILD			MILD MODERATE			MODERATE SEVERE			SEVERE			p value
Variable	N	Average	DP	N	Average	DP	N	Average	DP	N	Average	DP	
Plosives	45	0.07	0.33	58	0.16	0.45	32	0.34	0.60	10	**1.10**	0.57	0.001*
Fricatives	45	0.16	0.56	58	0.74	1.04	32	2.22	1.43	10	**2.80**	1.55	0.001*
Nasals	45	0.00	0.00	58	0.00	0.00	32	0.00	0.00	10	**0.10**	0.32	0.004*
Affricates	45	0.04	0.30	58	0.07	0.26	32	0.16	0.51	10	**0.90**	0.57	0.001*
Laterals	45	0.02	0.15	58	0.33	0.60	32	0.69	0.69	10	**1.00**	0.94	0.001*
Vibrants	45	0.04	0.21	58	0.17	0.38	32	0.44	0.56	10	**0.80**	0.42	0.001*

Legend: N – number of subjects, DP – standard deviation.
***Kruskal-Wallis*
*p value<0.05

It was noticed that the average of absent phones was higher in the severe disorder, and the fricatives, plosives and laterals were the most absent classes in this level. In general, as the phonological disorder severity decreases, the amount of absent phones also decreases. The nasal phones are present in all degrees, except in the severe disorder, because the fricative class was the most absent, regardless the level of the phonological disorder.

In relation to the phonological system, the results also illustrated that the severe phonological disorder group was the most impaired one, with a higher average of alteration for most of the analyzed phonemes classes, in all possible syllable positions. It is highlighted that for the phonemes and positions such as CO with /r/, coda with /R/ and coda with /N/, the averages of alterations obtained for the severe disorder was the same as for the moderate-severe disorder. Besides, the average of alteration for coda with /L/ was the same for the severe and moderate-severe disorder. Except for coda with /R/ and /L/, the differences among the averages of alteration of the analyzed phoneme classes were statistically significant for the different levels of phonological disorder. As well as in the phonetic system, in general, as lower the disorder level is, the lowest number of phonemes were altered (Table 2).

Table 2 – Comparison of the phonological system, regarding phonemes alteration, among the different severity levels of phonological disorder**

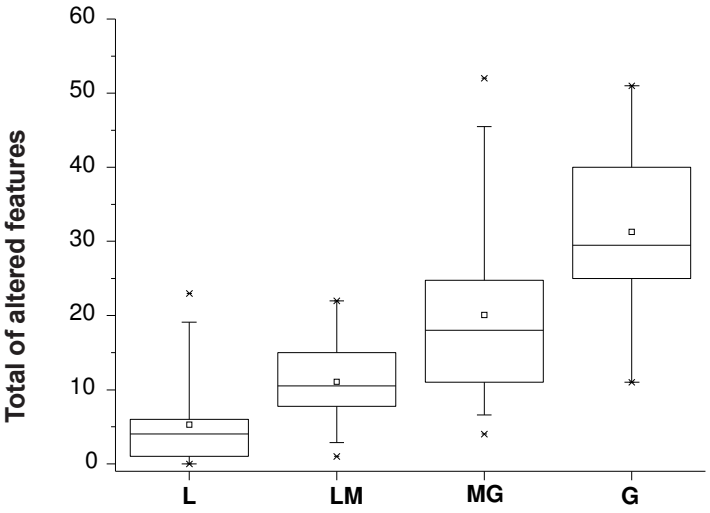
Disorder level	MILD			MILD MODERATE			MODERATE SEVERE			SEVERE			p value
Variable	N	Average	DP	N	Average	DP	N	Average	DP	N	Average	DP	
SO Plosives	45	0.20	0.55	58	1.33	1.26	32	2.38	1.45	10	3.90	1.29	0.001*
SO Fricatives	45	0.96	1.17	58	2.34	1.47	32	3.84	1.46	10	4.80	1.03	0.001*
SO Nasals	45	0.02	0.15	58	0.05	0.22	32	0.13	0.42	10	1.10	1.20	0.001*
SO lateral liquids	45	0.33	0.52	58	0.79	0.83	32	1.34	0.79	10	1.80	0.63	0.001*
SO non lateral liquids	45	0.58	0.58	58	1.24	1.25	32	1.50	0.62	10	1.70	0.48	0.001*
CC with /l/	45	0.80	0.40	58	0.97	1.18	32	0.97	0.18	10	1.00	0.00	0.008*
CC with /r/	45	0.78	0.42	58	0.95	0.22	32	1.00	0.00	10	1.00	0.00	0.002*
Coda with /R/	45	0.82	0.39	58	0.79	0.41	32	1.00	0.00	10	1.00	0.00	0.23
Coda with /L/	45	0.07	0.25	58	0.10	0.31	32	0.03	0.18	10	0.10	0.32	0.65
Coda with /N/	45	0.00	0.00	58	0.05	0.22	32	0.03	0.18	10	0.30	0.48	0.001*
Coda with /S/	45	0.29	0.46	58	0.48	0.50	32	0.75	0.44	10	1.00	0.00	0.001*

Legend: N – number of subjects, DP – standard deviation, SO – Simple Onset, CC – consonant clusters.
***Kruskal-Wallis*
*p value<0.05

Regarding the altered distinctive features, the results presented statistically significant difference among the different levels of phonological disorder, with p<0.001 (Figure 1).

With the results obtained in the analysis of the distinctive features, it was observed that the severity of the phonological disorder may have relationship with alterations in the distinctive features in a positive way. As there is higher average of altered distinctive features, there is higher disorder level.

It is emphasized, however, that the phonological disorders with moderate-severe and severe level presented higher variation in the results, as it is observed in Figure 1. For the mild and mild-moderate levels, the variations regarding the minimal and maximal level of features alteration was low.



Legend: L – Mild, LM – Mild-Moderate, MG – Moderate-Severe, G – Severe.
****Kruskal-Wallis**, with p<0.05. P value < 0.001

Figure 1 – Comparison of the number of altered distinctive features among the different severity levels of phonological disorder**

DISCUSSION

The results of this study demonstrated that as higher the disorder severity is, more impaired the phonetic inventory and the phonological system will be, and also the distinctive features will be more altered. Those data agree with several researches that investigated the use of repair strategies in different levels of phonological disorder severity[5,12,14-18].

Repair strategies are ways used during the phonological acquisition, typical or atypical acquisition, in order to adapt the phonological system, during its formation, to the target phonological system. Those strategies are used by children instead of segments or syllable structures that they do not know or whose structure they do not completely understand[1].

Those strategies reveal characteristics related as to the phonetic inventory, as to the phonological system (altered phonemes or distinctive features). The first is related to the way the speech sounds are produced, considering their articulatory, acoustic and auditory characteristics. The phonological system is related to the vehiculation of meaning by the smallest language distinctive unit. They are the language sounds which can distinguish words [such as ***f**aca* (knife) x ***v**aca* (cow)]. Those sounds consist of minimal units called distinctive features, which characterize them, highlighting their acoustic or articulatory aspects[1].

In the analysis of the use of repair strategies in different phonological disorder severity levels, it was considered that there is difference among them, with higher use of repair strategies in the severe disorder[5,14]. The obtained results reinforce that consideration, because the severe disorder presented higher average of absent phones for all analyzed classes and higher alteration in the number of phones that are part of the phonological system, in a significant way.

In the previously referred studies, the authors observed that in the severe disorder there was higher presence of segments and syllabic

structures omission, comparing to the other phonological disorder severity levels[5,14]. This aspect was confirmed in the results obtained for the phonetic inventory in the present study, because the severe disorder presented higher average of phones absence for all classes, when compared to the other severity levels.

Those findings agree with the literature about the severe disorders, which are characterized by the presence of restricted phonetic and phonological inventories, absence or alteration of several sounds involving, mainly, the plosives (velars), fricatives (coronals) and liquids[12,14].

The fricatives were the most impaired in all severity levels, with higher average of phones absence and phoneme alterations in simple onset, in the phonetic and phonological system, respectively. This sound class is acquired right after the nasals and plosives in the order of phonological acquisition, with the phonemes /f/ and /v/ in the initial acquisition, while /s/, /z/, /ʃ/, /ʒ/ present later acquisition[19-21].

In the investigation of the repair strategies used in the production of the fricative phonemes in atypical speech data, some studies observed that in cases of severe disorder there was higher use of repair strategies such as omission and plosivization. In the omission, it is evidenced lower phonological knowledge by those children[16,17], what is absence of approximation of children production in comparison to the adult target. This fact was also reinforced by the findings of the present study, because the severe disorder presented higher average of absent and altered fricatives, in the phonetic inventory and in the phonological system, respectively.

The nasals, on the other hand, were totally present in the phonetic inventory of almost all analyzed levels, except in the cases of severe disorder. About the phonological system, this class was also the least altered one, regardless the position in the syllable structure.

In relation to this data, it is verified that the nasals are the first segments to be acquired in typical phonological development, and also the plosives [14,19,20-24]. Usually, these phonemes are not difficult to be acquired. They are stabilized in the phonological systems of children with phonological disorders, thus, they are present in their phonetic inventories[25,26].

In relation to the plosives, the results obtained in this study demonstrated that this class was impaired, mainly, in cases of severe disorders, as in the phonetic inventory, as in the phonological system. This finding confirms what was observed in a study about the occurrence of repair strategies in plosive phonemes, in the different levels of phonological disorder[18]. The authors observed that as more complex in terms of acquisition and production the plosive phonemes are, more repair strategies are used. Besides, in cases of moderate-severe and severe disorders there was the use of one or more strategies in plosives with precocious acquisition in the speech of children, such as /b/[18] .

The affricates are allophones in BP, without distinctive value. Those sounds result in the rule of palatalization, characterized by the production of plosives /t/ and /d/ such as [tʃ] and [dʒ], when they appear before the vowel [i][1,27]. These sounds are acquired between three years and six months old and four years and six months old[20], through a non linear process[28].

In the data from this study, the affricates were not so impaired regarding the phonetic inventory, even if they were clearly influenced by the severity of the phonological disorder. The affricate are not usually individually studied in researches, being incorporated in the plosives class.

A study about phonological therapy for phonological disorders reveals in data from the treated subjects that the affricate are acquired[29], what indicates that these allophones are rarely damaged in these cases, so, the analysis of the acquisition of these phones are not common.

About the liquid class, only for the mild phonological disorder, the vibrant phones were more absent than the lateral in the phonetic inventory. In relation to the phonological system, the non lateral liquids in simple onset were more altered than the lateral for the levels mild, mild-moderate and moderate-severe.

This finding agrees with most of the literature, which presents that the liquid class, because of its acoustic and articulatory characteristics, presents late acquisition[19,21,22,29,30], commonly impaired in atypical phonological development[25,26,29,31]. In typical speech data, it is verified that the lateral liquids emerge first, followed by the non laterals. It is observed, so, the following order: /l/, /ʎ/, /R/ and /r/[19,21].

In a study about the repair strategies applied for the liquid class, it was detected that there is influence of the phonological disorder severity level in this aspect, but it is variable according to the target segment[15]. Similarly, there was predominance of non occurrence of repair strategies for the phonemes /l/, /ʎ/ and /R/ for the mild disorder. For the severe disorders, there was predominance of the use of repair strategies, with the possibility of more than one strategy for the same phoneme, such as /l/ and /R/[15].

In relation to the syllabic acquisition, it is verified that some studies about BP presented an acquisition order, starting with less complex structures, followed

by the most complex ones[19,32,33]. So, for the syllabic structures there is the acquisition order: V and CV >> CVC >> CCV. The coda and the consonant clusters are the last sequences to be acquired, as for typical, as for atypical data, because they are more complex[19,22,31-35].

In the analysis of the coda and consonant clusters structures, the data revealed significant differences among the disorder levels, except for the coda with /R/ and coda with /L/. For each level of phonological disorder, it is clear the highest difficulty in the production of the consonant clusters with /l/ and /r/, and the codas with /R/ and /S/.

Several studies about phonological acquisition mentioned that the consonant clusters is the last structure to be acquired and it is subject to repair strategies because of its complexity[23,33,36]. The simplification of the consonant clusters is the most commonly used strategy in typical and atypical speech data[21,23,32,36-38]. In this study, it was noticed that for the mild and mild-moderate levels this syllable structure was more altered when formed by /l/. For the moderate-severe and severe levels, the consonant clusters with /r/ was more altered.

In a study about the acquisition of the liquids /l/ and /r/ in phonological disorders, the data showed that in consonant clusters these phonemes were not acquired, regardless the disorder severity[33]. According to the author, the severity of the phonological disorder, through the PCC is not a good indicator to analyze what is acquired or not, regarding the liquids /l/ and /r/.

About the coda, some studies which investigated its acquisition observed that this syllable structure, when it is formed by the archiphonemes /R/ and /S/, demonstrates later acquisition when compared to /L/ and /N/[34,39] . In one of the previously mentioned studies, it was observed that as more severe the phonological disorder is, higher was the use of the strategy omission of /R/ in coda[15].

The distinctive features, also analyzed in this study, were more or less altered according to the phonological disorder, in significant way. It is clear, in the figure 1, that as higher the disorder level is, more distinctive features were altered.

This study agrees with the data obtained in a recent study[40], that had the purpose of classifying the phonological disorders, considering the distinctive features. The authors proposed four categories to classify the phonological disorder considering the presence and the co-occurrence of distinctive features in the consonant system of subjects with this pathology.

In this classification, there is decrease in relation to the level of contrasts in the consonant system, starting in a minimal level of contrasts, going to the levels medium and medium high, to the high level of contrasts, which correspond to the categories 1, 2, 3 and 4, respectively. In the comparison with the PCC, the quantitative evaluation, it was observed a positive relationship between the disorder severity and the categories proposed by the authors. However, as higher the severity of the disorder, more distinctive features were altered. The opposite is also confirmed, it means that as lower the severity of the disorder is, lower amount of features were altered[40].

The findings of the present study about distinctive features also reinforce in a certain way what was observed in another research, in which it was investigated the treatment of disorders through therapeutic approach based on those minimal contrastive units – the features[26]. In this research, seven children with diagnosis of phonological disorders were treated through the 'reinforcement' or 'contrast' of the altered distinctive features in their phonological system. It is evident that as higher the disorder severity, more distinctive features were altered. The authors discovered that there were changes in the phonological systems of all subjects through generalization and PCC increase, regardless the level of the phonological disorder[26].

To know the characteristics of the different severity levels of the phonological disorders may be useful, mainly for the therapeutic practice. This information contribute to a more detailed evaluation of those cases, to estimate the prognostic of every case, as well as the choice of the most appropriate phonological model, according to the level of the disorder.

CONCLUSION

The absence of phones in the phonetic inventory, as well as the alteration of phonemes and distinctive features in the phonological system was different for all phonological disorders severity levels. Again, those differences were confirmed, significantly in the majority, indicating that as more severe the speech disorders are, more sounds alterations and absence will be perceived.

For the mild disorder, the phones in the phonetic inventory presented the following order of absence: fricatives > plosives > affricates and vibrants > laterals > nasals. The altered phonemes in the phonological system were: fricatives > non lateral liquids > lateral liquids > plosives > nasals (simple onset); coda with /R/ > coda with /S/ > coda with /L/ > coda with /N/ (syllabic coda); consonant clusters with /l/ > consonant clusters /r/ (consonant clusters).

The mild-moderate level presented, in the phonetic inventory, the following absent phones, in

decreasing order: fricatives > laterals > vibrants > plosives > affricates > nasals. The altered phonemes in the phonological system for this level were present in the following way: fricatives > plosives > non lateral liquids > lateral liquids > nasals (simple onset); coda with /R/ > coda with /S/ > coda with /L/ > coda with /N/ (syllabic coda); consonant clusters with /l/ > consonant clusters with /r/ (consonant clusters).

For the moderate-severe level, the absent phones in the phonetic inventory presented the following decreasing absence order: fricatives > laterals > vibrants > plosives > affricates > nasals. The altered phonemes in the phonological inventory were: fricatives > plosives > non lateral liquids > lateral liquids > nasals (simple onset); coda with /R/ > coda with /S/ > coda with /L/ and coda with /N/ (syllabic coda); consonant clusters with /r/ > consonant clusters /l/ (consonant clusters).

For the severe level, the decreasing order of absent phones in the phonetic inventory was: fricatives > plosives > laterals > affricates > vibrants > nasals. For the phonological system, the altered phones were in the following order: fricatives > plosives > lateral liquids > non lateral liquids > nasals (simple onset); coda with /R/ and coda with /S/ > coda with /N/ > coda with /L/ (syllabic coda); consonant clusters with /l/ and with /r/ (consonant clusters).

About the distinctive features, the difference among the levels was significant. The mild level presented the least altered features, in comparison with the mild-moderate level, followed by the moderate-severe disorder, then, the severe level, with the highest number of altered features.

The results obtained from this study quantified the obtained data in an analysis of the atypical speech and they also reinforced the importance of knowing the qualitative characteristics of each level of phonological disorder.

RESUMO

Objetivo: caracterizar e analisar o sistema fonético, o sistema fonológico e os traços distintivos alterados em diferentes gravidades do desvio fonológico. **Métodos:** foram caracterizados e analisados os dados de fala de 145 crianças com idades entre 4:0 e 8:11 com diagnóstico de desvio fonológico. Elas foram submetidas à Avaliação Fonológica da Criança em que foram analisados: o inventário fonético, o sistema fonológico e os traços distintivos. As crianças foram agrupadas, conforme a gravidade do desvio fonológico, calculado por meio do Percentual de Consoantes Corretas. Os dados foram comparados e analisados entre os grupos, por meio do teste *Kruskal-Wallis,* ao nível de significância de 5%. **Resultados:** no inventário fonético**,** notou-se que a média de fones ausentes foi maior no desvio grave, sendo as fricativas, as plosivas e as laterais, as classes mais ausentes. Da mesma forma, no sistema fonológico observou-se que o desvio grave esteve mais prejudicado, apresentando uma média maior de alteração para todas as classes de fonemas analisados em todas as posições que podem ocorrer na sílaba e na palavra. Para os traços distintivos houve diferença estatisticamente significante entre os graus de desvio, estando mais alterados no desvio grave e menos alterados no desvio leve. **Conclusão:** quanto mais graves forem os desvios de fala, mais alterações e ausência de sons serão percebidos em relação ao inventário fonético e ao sistema fonológico. Os resultados obtidos neste estudo reforçaram a importância de se conhecer as características qualitativas de cada um dos graus de desvio fonológico.

DESCRITORES: Fala; Distúrbios da Fala; Linguagem, Linguagem Infantil, Transtornos da Articulação

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Mailing address:
Gabriela Bayer Schneider
Avenida Roraima, 1000 - Cidade Universitária - Bairro Camobi
Santa Maria – RS – Brasil
CEP: 97105-900
E-mail: gabi.schneider@live.com.pt