

# THE PRODUCTION OF THE COMPLEX ONSET: ACQUISITION GUIDED BY THE SYLLABLE OR SEGMENT?

## *A produção do onset complexo: aquisição guiada pela sílaba ou pelo segmento?*

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### ABSTRACT

**Purpose:** to compare and analyze the influence of the characteristics of the complex onset segments in the correct production in children with typical and atypical phonological development. **Methods:** it was analyzed the speech data of 88 children, 44 with typical phonological development and 44 atypical, aged between 2:6 to 5:3 and 5:3 to 8:0, respectively. With a corpus of 524 words in typical development and 1310 in atypical. The dependent variable had variants: correct production of complex onset, simplification for Consonant<sup>1</sup>-Vowel with and without change of obstruent, simplification for Consonant<sup>2</sup>-Vowel, obstruent change, substitution of liquid cluster, epenthesis, metathesis and others, as compensatory lengthening. Extralinguistic variables were: *gender, age and type of development* and the linguistic: *tone, number of syllables, syllable preceding context and ensuing; position in the word, type of liquid complex onset; articulatory point, loudness and obstruent class*. The statistical analysis was by computational package VARBRUL. **Result:** the statistical program selected for all groups at least one of the variables: articulatory point, loudness and class of obstruent. The type of liquid cluster was significant for the unique group and atypical and type of development, to produce correct and simplify Consonant<sup>1</sup>-Vowel with obstruent change. **Conclusion:** the linguistic variables related to obstruent and liquid cluster were significant to the production of Consonant-Consonant-Vowel. The variable type of development was also relevant. Showing the evidence that the acquisition of complex onset can be guided by segment and there is a difference between typical and atypical children.

**KEYWORDS:** Language Development Disorders; Language Development; Speech; Child Language

### ■ INTRODUCTION

Acquiring and using complexes and dynamic systems of conventional symbols to communicate and to think is related to a skill which is called language, which emerges through organization

and running of human minds<sup>1</sup>. One of the aspects that are involved in the dominion of that skill is regarded to the language phonological system, or the inventory of sounds and the rules to match them in significant units<sup>2</sup>.

The language acquisition occurs gradually, with the settlement and productive use of different units by children, showing, gradually, the development of the target language<sup>3</sup>. When that development occurs in typical way, there are variations into a pattern of fast and dynamic change, until the stabilization of the phonological system. On the other hand, when there are no important changes in relation to the variation, there is some delay in the settlement of all elements of the phonological system, obstructing correct speech productions, without apparent reason. So, it is observed the "phonological disorder"<sup>4</sup>.

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Assistance source: CAPES scholarship

Research performed at Universidade Federal de Santa Maria – UFSM – Santa Maria (RS), Brasil, with scholarship by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES.

Conflict of interest: non-existent

The ways children cover during the process of phonological system acquisition, typical or atypical, has been studied by several authors<sup>2-4</sup>. Those investigations are related as to segments, as to syllable structures and they have aroused some questions about that course, top-down (syllable guided) or bottom-up (segment guided)<sup>4,5</sup>.

In the present study, it was analyzed the acquisition of the C<sup>1</sup>C<sup>2</sup>V syllable structure, where the first consonant must be an obstruent (/p,b,t,d,k,g,f,v/) and the second is completed by the segments // or /r/ in Brazilian Portuguese (BP). This is the last template to be acquired, because of its complexity<sup>6,7</sup>. In typical speech data, there are evidences that those segments fill the complex onset (CO), simultaneously<sup>6</sup>. In the same way, the author retakes that investigation, using atypical data, considering the possibility that such acquisition comes from a top-down process. The hypothesis of the author for atypical data is based on the fact that the phoneme /r/ presents different age of acquisition for each syllable position in BP. This segment is acquired in medial and coda when children are 3:10, followed by simple onset, with 4:2, and complex onset with 5:0. Those data evidence that the /r/ stability depends on the syllable position<sup>4</sup>.

It is believed that as the correct production of the complex onset, as the repair strategies used during its acquisition may be influenced by linguistic and extralinguistic variables, such as type of cluster liquid (lateral or non lateral), obstruent characteristics (sonority, point and class) and the type of phonological development (typical or atypical), the gender (male or female), respectively. To investigate the role of the type of obstruent and liquid of the linguistic consonant cluster during its acquisition, typical or atypical, may contribute, through analysis of the data which will be presented in this study, with the discussion about the process of acquisition of that structure, top-down or bottom-up. Besides, that data may help the clinic speech-language therapist in the evaluation and in the therapeutic process of patients with phonological disorders.

So, this research had the purpose of comparing and analyzing if the characteristics of the complex onset segments (type of liquid and obstruent characteristics) interfere in its correct production in children with typical and atypical phonological development.

## ■ METHODS

The data collected in this study are part of data bases from two research projects, both approved by the institutional ethics committee, n. 064/2004 and 046/02, respectively.

This transversal research is exploratory and quantitative, with analysis of data of 88 children, 44 with typical and 44 with atypical phonological development. Both groups consisted of 22 girls and 22 boys, monolingual BP speakers.

After the authorization of the children's responsible people through the signature of the free consent term and through their oral consent, the infants were submitted to speech-language screening, with diagnosis of phonological disorder or typical phonological acquisition. So, the participants who did not present hearing loss and alterations in their neurological, cognitive, psychological aspects and the ones who were not patients of speech-language therapy were selected to be part of the sample.

The data was obtained through speech samples, collected based on the instrument Children's Phonological Assessment – CPA<sup>8</sup>, which consists of five thematic pictures (toilet, kitchen, living room, vehicles and zoological). That tool is favorable for spontaneous naming for all contrastive phones of Brazilian Portuguese, in all words and syllable positions.

The survey of the words was performed in the same way for both groups. Thus, all the words, in the speech recordings of all children, with the CO with // (lateral liquid) and with /r/ (non lateral liquid) targets were part of the sample. In the group of children with typical development, the corpus consisted of 524 words, 46 with // complex onset and 478 with /r/ complex onset, and in the group of children with atypical phonological development, the corpus consisted of 1310 words, 194 with complex onset with // and 1116 with complex onset with /r/, a total of 1834 words. It is emphasized that the word corpus of each group was different, because it was considered the data of evocation (through the CPA) as well as spontaneous speech. After that procedure, the data was codified and organized in tables, according to the group and investigated variables.

The same variables were considered for both groups. So, for the performance of the statistical analysis of the dependent variable (CO correct production versus CO incorrect production), it was considered: correct production of the complex onset (cobra – ['kobra] (snake), blusa – ['bluza] (blouse)); simplification for C<sup>1</sup>V (cobra – ['koba], blusa – ['buza]); simplification for C<sup>2</sup>V (zebra – ['zera], claro – ['laro] (clear)); simplification for C<sup>1</sup>V with obstruent change (bruxa – ['pu□a] (witch), placa – ['kaka] (sign)); obstruent change (bruxa – ['pru□a], flauta – ['plawta] (flute)); substitution of the cluster liquid (braço – ['blaso] (arm), bloco – ['broco] (block)); epenthesis (prato – [pa'ratu] (plate), blusa – [bu'luzã]); metathesis (preto – ['pertu] (black), placa

– [ˈpawka]) and the other forms of production which were classified as “others”, such as compensatory lengthening.

The independent linguistic variables were *tonicity* (pretonic; tonic and post-tonic, such as *dragão* (dragon), *floresta* (forest), *braço* (arm), *placa* (sign), *livro* (book), *amplo* (broad), *number of syllables* (monosyllables; disyllable; trisyllable and polysyllable). For example, *cruz* (cross), *flor* (flower), *prato* (plate), *placa* (sign), *estrela* (star), *floresta* (forest), *professora* (teacher), *bicicleta* (bike), *precedent syllable context* (zero; consonant (coda); glide; coronal vowel; dorsal vowel; labial vowel, such as *grama* (grass), *blusa* (blouse), *estrela* (star), *exclamação* (exclamation), *poltrona* (couch), *templo* (temple), *pedra* (stone), *bicicleta* (bike), *teatro* (theater), *atleta* (athlete), *cobra* (snake), *nublado* (cloudy), *following syllable context* (coronal vowel; dorsal vowel; labial vowel. For instance, *fraco* (weak), *placa* (sign), *fruta* (flute), *flor* (flower), *tigre* (tiger), *flecha* (arrow), *word position* (initial onset; medial onset, such as *franja* (fringe), *floresta* (forest), *igreja* (church), *bicicleta* (bike), *obstruent class* (fricative; plosive – *livro* (book), *flauta* (flute), *vidro* (glass), *pluma* (plume)), *type of complex onset liquid* (lateral liquid or non lateral liquid – *prato* (plate), *planeta* (planet)), *obstruent point* (labial; coronal; dorsal, such as *preto* (black), *placa* (sign), *trator* (tractor), *atleta* (athlete), *gripe* (flu), *claro* (clear)), *obstruent sonority* (voiceless or voiced. For example, *prego* (spike), *braço* (arm), *clube* (club), *globo* (globe)). In this study, however, because of its purposes, only data regarding obstruent class, point and sonority will be explored, as well as type of onset liquid.

The analyzed extralinguistic variables were *gender*, *age and type of development* (typical and atypical). The variable gender consisted of 22 girls and 22 boys in each group. In the variable age, it was used the interval of three months between the initial and the final age of each group, a total of twenty-two age groups. Each age group consisted of two girls and two boys. In the group with typical phonological acquisition, the age varied between 2:6 and 5:3, and in the group with atypical acquisition, the age varied between 5:3 to 8:0 (the age groups include the month until the 29<sup>th</sup> day, such as 2:6 to 2:8;29). However, it was decided to use the other form to facilitate the text reading). From those extralinguistic variables, only the type of development will be investigated in the present study.

The statistical program VARBRUL<sup>9</sup> in Windows environment, the Varbwin<sup>10</sup>, was used for the statistical analysis. This program is used in the sociolinguistics area and it has been applied successfully in language acquisition.

First, the analyzed data were classified and categorized according to the CO production, as correct or incorrect. This categorization was typed in two forms in the program Microsoft Office Access 2003, considering the type of production: correct or incorrect.

After the organization of the forms, they were statistically analyzed through the statistical program VARBRUL, separately. The program provides frequencies and probabilities and it selects the relevant variables in the process of phonological acquisition among the studied data<sup>11</sup>.

The probabilistic analysis is performed in binary way, through statistical calculations. The program attributes relative weights to the variants of the independent variables, regarding both variants of the researched linguistic phenomena, represented by the dependent variable (correct or incorrect CO production).

Six basic programs are part of the VARBRUL program: CHECKTOK, READTOK, MAKECELL and IVARB or TVARB or MVARB. From those, the four first mentioned were used in the present research.

The first step to use that program was the organization of two files with data, one for the correct CO production and another for incorrect CO production, which were corrected by the CHECKTOK. To perform this procedure, it was provided information regarding the codes which were used for each variables factor. The information were transferred, through data typing, to a specification file, and corrected by the CHECKTOK.

After that step, the READTOK made some transformation in the data which were corrected by the CHECKTOK, generating new data with some changes and grouping, in an occurrence file, several corrected files. Thus, it reached the grouping and the total of identical sequences.

The data generated by the READTOK were received by a third program, the MAKECELL, which prepares the data to be executed by the IVARB.

The IVARB makes a probabilistic analysis in binary way, through statistical calculations. This program attributes relative weights to the variants of the independent variables. In this case, it is in relation to the correct and incorrect CO production.

The IVARB works with error of 5%, and any factor with significance lower than that value was not statistically expressive. In the present study, all the results were presented, regardless if they present or not statistical relevance.

It is important to highlight that the VARBRUL attributed significance values to the linguistic and extralinguistic variables, through interaction between them (CO formed with /l/ versus CO formed with /r/ and typical versus atypical development). So, the

VARBRUL does not attribute p value to the variants into a variable, it does not generate significance value, for example, in the comparison between typical and atypical phonological development. For these variants, it attributes relative weigh.

The relative weighs or probability of occurrence of this study come from the statistical interaction, containing all significant selected variables, with a margin of error of 5%. The values of relative weigh under .50 were considered as not favorable, the values between .50 and .59 were considered as neutral, and the values higher than .60 were considered as favorable for the studied phenomenon.

## ■ RESULTS

The statistical program VARBRUL performed all the possibilities of the dependent variable (*correct production, C<sup>1</sup>V simplification, C<sup>2</sup>V simplification, C<sup>1</sup>V simplification with obstruent change, obstruent change, substitution of the cluster liquid, epenthesis, metathesis, etc.*), in order to verify if the linguistic variables *type of cluster liquid, sonority, obstruent*

*point and class*, as well as the extralinguistic variable *type of phonological development, typical or atypical*, would be selected as significant in this study.

The statistical results related to the linguistic characteristics of the complex onset obstruent in the typical development expressed that only for the correct production and for the metathesis those factors were relevant (Table 1).

In the correct production, it was selected only the variable obstruent class, in which there was higher statistical probability when the C<sup>1</sup> consonant was constituted by a fricative. It means that the complex onsets with fricatives would be easier to be produced and that the segmental quality is important for the correct production of that syllabic structure. In the metathesis, it was observed that the selected variable was the obstruent point, with higher occurrence relative weigh when the complex onset is formed by a coronal or dorsal obstruent. Thus, this phonological process would not be favored by the labial articulation point in words such as *braço* (arm). In both types of production the variable obstruent sonority was not selected.

**Table 1 – Probability and frequency of correct production and metathesis occurrence by children with typical development, in relation to the complex onset obstruent characteristics.**

VARIABLE/VARIANT	TYPICAL DEVELOPMENT			
	CORRECT PRODUCTION		METATHESIS	
	RW	F	RW	F
<b>OBSTRUENT CLASS</b>				
Fricative	.66	49/73=67%	-	0/73=0%
Plosive	.47	195/451=43%	-	9/401=2%
<b>OBSTRUENT POINT</b>				
Labial	-	153/305=50%	.29	1/305=0%
Coronal	-	58/147=39%	.83	7/147=5%
Dorsal	-	33/72=36%	.60	1/72=1%
<b>OBSTRUENT SONORITY</b>				
Voiceless	-	134/292=46%	-	8/292=3%
Voiced	-	110/232=47%	-	1/232=0%
<b>Significance</b>	.017		.044	

Statistical program: Varbrul; Significance: 5% (p<0.05)

Legend: RW: relative weigh; F: frequency; -: categorical values does not present relative weights

In the atypical development, it is perceived that the aspects related to the cluster obstruent were statistically relevant to the correct production and to the several repair strategies. However, the obstruent class was not selected in any type of production (Table 2). It means that as for the correct production, as for the occurrence of repair strategies (phonological processes) the fact that the obstruent is plosive (*bruxa* - witch) or fricative (*fruta* - fruit) interferes in the occurrences.

In the correct production, it is observed that the relative weigh was neutral in relation to the variable

obstruent sonority, but it is possible to notice that the children present higher probability of correct production with voiced phonemes. In the strategies of obstruent change, the simplification of C'V with obstruent change and in the strategy called "other", it was verified that the voiced phonemes also present higher probability to be produced in complex onsets. Most frequencies of occurrence happened when the complex onset presented as articulation point a coronal consonant in the strategy of liquid cluster substitution and a coronal or dorsal consonant in the C'V simplification with obstruent change.

**Table 2 – Probability and frequency of occurrence of correct production, C'V simplification, with and without obstruent change, substitution of the cluster liquid, other and obstruent change by children with phonological disorders in relation t the complex onset obstruent characteristics**

ATYPICAL DEVELOPMENT												
VARIABLE/ VARIANT	CORRECT PRODUCTION		C'V SIMPLIFICATION		SUBSTITUTION OF THE CLUSTER LIQUID		OTHER		OBSTRUENT CHANGE		SIMPLIFICAÇÃO C'V SIMPLIFICATION WITH OBSTRUENT CHANGE	
	RW	F	RW	F	RW	F	RW	F	RW	F	RW	F
<b>OBSTRUENT CLASS</b>												
Fricative	-	45/184=24%	-	126/184=68%	-	4/184=2%	-	1/184=1%	.21	2/184=1%	-	5/184=3%
Plosive	-	243/1126=22%	-	663/1126=59%	-	19/1126=2%	-	11/1126=1%	.55	50/1126=4%	-	136/1126=12%
<b>OBSTRUENT POINT</b>												
Labial	-	148/655=23%	.57	423/655=65%	.52	16/655=2%	-	6/655=1%	-	27/655=4%	.27	30/655=5%
Coronal	-	85/373=23%	.46	22/373=60%	<b>.81</b>	<b>4/373=1%</b>	-	3/373=1%	-	12/373=3%	<b>.68</b>	<b>47/373=13%</b>
Dorsal	-	55/282=20%	.40	144/282=51%	.11	3/282=1%	-	3/282=1%	-	13/282=5%	<b>.78</b>	<b>64/282=23%</b>
<b>OBSTRUENT SONORITY</b>												
Voiceless	.42	190/757=25%	.55	486/757=64%	-	18/757=2%	.36	3/757=0%	.13	3/757=0%	.36	54/757=7%
Voiced	.56	98/553=18%	.43	303/553=55%	-	5/553=1%	<b>.68</b>	<b>9/553=2%</b>	<b>.93</b>	<b>49/553=9%</b>	<b>.69</b>	<b>87/553=16%</b>
<b>Significance</b>	.000		.040		.040		.010		.045		.031	

Statistical program: Varbrul; Significance: 5% (p<0.05)

Legend: RW: relative weigh; F: frequency; -: categorical values does not present relative weighs

In the analysis of the whole group (typical and atypical data), in relation to the linguistic variables, it was verified that the statistical program selected the following variables: obstruent class, obstruent point and obstruent sonority. The highest relative weighs were observed when the first consonant of the complex onset consisted of a coronal obstruent in the substitution of the cluster liquid (/

treze/→[ˈtɛze] (thirteen)) and by a coronal or dorsal in the C'V simplification with obstruent change (/grama/→[ˈdama] (grass)). The last mentioned strategy had as relevant factor the sonority, with the voiced obstruent with the highest relative weigh (Table 3). It means that onset may present more possibilities to be simplified and its obstruent to be replaced when it is voiced.

**Tabela 3 – Probabilidade e frequência de ocorrência de produção correta, simplificação de C'V, substituição da líquida do encontro e simplificação de C'V com mudança de obstruente no grupo único em relação às características da obstruente do onset complexo**

SINGLE GRUP (TYPICAL AND ATYPICAL)								
VARIABLE/ VARIANT	CORRECT PRODUCTION		C'V SIMPLIFICATION		CLUSTER LIQUID SUBSTITUTION		C'V SIMPLIFICATION WITH OBSTRUENT CHANGE	
	RW	F	RW	F	RW	F	RW	F
<b>OBSTRUENT CLASS</b>								
Fricative	-	94/257=37%	-	148/257=58%	.29	6/257=2%	-	5/257=2%
Plosive	-	438/1577=28%	-	895/1577=57%	.54	30/1577=2%	-	139/1577=9%
<b>OBSTRUENT POINT</b>								
Labial	-	301/960=31%	.54	563/960=59%	.56	23/960=2%	.30	33/960=3%
Coronal	-	142/58=27%	.49	299/518=58%	<b>.76</b>	<b>8/518=2%</b>	<b>.69</b>	<b>47/518=9%</b>
Dorsal	-	89/356=25%	.41	181/356=51%	.10	5/356=1%	<b>.74</b>	<b>64/356=18%</b>
<b>OBSTRUENT SONORITY</b>								
Voiceless	.53	324/1049=31%	.53	626/1049=60%	-	28/1049=3%	.37	54/1049=5%
Voiced	.46	208/785=26%	.46	417/785=53%	-	8/785=1%	<b>.67</b>	<b>90/785=11%</b>
<b>Significance</b>	.021		.016		.046		.000	

Statistical program: Varbrul; Significance: 5% (p<0.05)

Legend: RW: relative weigh; F: frequency; -: categorical values does not present relative weighs

In Table 4, which consisted of the analysis about substitution of the cluster liquid, it was verified that the selected variable was the *type of cluster liquid*. This phenomenon was selected in the single group and in the atypical development, with higher

probability that the complex onset is target of cluster liquid substitution when it is formed by the phoneme //l/. This fact suggests that for the occurrence of this process (/prato/ → [ˈplatu] (plate)), the liquid segmental characteristic is a significant factor.

**Table 4 – Variable substitution of the complex onset liquid in the single and atypical groups**

SUBSTITUTION OF THE COMPLEX ONSET LIQUID				
VARIABLE/ VARIANT	SINGLE GRUP		ATYPICAL	
	PR	F	PR	F
<b>TYPE OF CLUSTER LIQUID</b>				
Lateral	<b>.93</b>	<b>19/243=8%</b>	<b>.96</b>	<b>17/195=9%</b>
Non lateral	.40	17/1591=1%	.36	6/1115=1%
<b>Significance</b>	.046		.040	

Statistical program: Varbrul; Significance: 5% (p<0.05)

Legend: RW: relative weigh; F: frequency

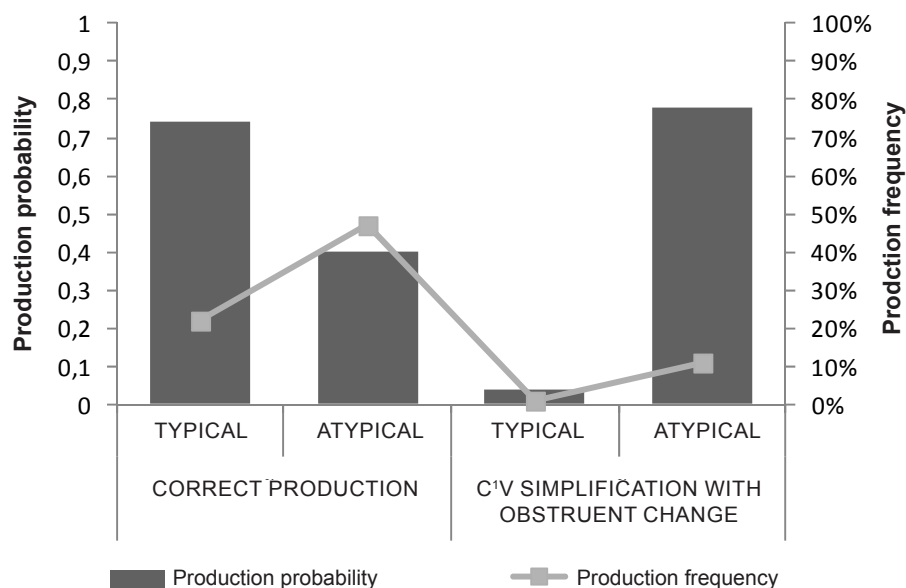
Another important factor in the study was the variable type of development, because it was detected that there is difference between typical and atypical children regarding correct production and C'V simplification with obstruent change.

## ■ DISCUSSION

The data which were investigated and compared in this study showed that the obstruent and type

of liquid that constitute the complex onset were important factors for the CCV structure acquisition.

In the correct production performed by the children with typical phonological development, only the C' obstruent class was relevant. The fricatives presented higher relative weigh, what demonstrates that this obstruent is favorable for the correct production of the mentioned structure. A study mentions that, also considering the liquid which comes with that obstruent, the presence of the non



Statistical program: Varbrul; Significance: 5% ( $p < 0.05$ )

**Figure 1 – Relevant dependent variables to the type of development in complex onset**

lateral liquid is favorable for the correct production when the CCV complex structure presents the voiceless labiodentals fricative in C<sup>1</sup> position<sup>12</sup>.

It is highlighted that in that type of development the characteristics of the first complex onset consonant were important only for the correct production and for the use of metathesis. Children with typical phonological development and the older ones, usually, use the metathesis strategy in a more productive way, when compared with the other studied group. It would be explained considering that those children would have already overcome in part their difficulties with that segment, so, they would take their components, not only delete them<sup>13,14</sup>. In the present study, the use of the repair strategy in the typical development was favored by the coronal or dorsal obstruent, in crescent order of probability of occurrence.

Although it is observed that the correct production relative weigh in atypical data was neutral in relation to the variable obstruent sonority, there is higher probability of voiced phonemes correct production. Despite some studies do not verify only that type of variant, there are evidences that voiceless and voiced labial plosives would favor the correct production of the complex onset obstruent, in that type of development (children with phonological disorders)<sup>13</sup>.

The strategy compensatory strengthening, commonly used in complex onset simplification by children with atypical phonological development and classified as “other” in the present study,

presented higher probability of occurrence when the obstruent was voiced. Some studies observe<sup>13,15</sup> data in relation to the complex onset obstruent in the compensatory strengthening, but there are no reports about their sonority.

In the C<sup>1</sup>V simplification with obstruent change in atypical data and in the single group (typical and atypical), it was verified that the sonority and the obstruent point were the significant selected variables, where the voiced phoneme and the coronal or dorsal obstruents obtained higher performance probability. This data disagrees with a recent study in which the repair strategies in the constituents of the complex onset were analyzed. The authors verified that for the strategy C<sup>1</sup>V in cases of phonological disorders, the voiceless labial plosive obstruent was favorable for that process<sup>16</sup>. Even so, it is verified that there is influence of the complex onset obstruent in the correct production of the structure.

In the substitution of the cluster liquid in atypical data and in the single group, it is perceived that the coronal obstruent is favorable for the occurrence of this strategy. The study of Baesso et al.<sup>16</sup> shows that the strategy alteration of the liquid feature of the complex onset for the group with disorders presented relevant results when the obstruent was filled in by voiced and voiceless labial plosive and voiceless dorsal plosive. This fact confirms that children with phonological disorders try to produce consonant clusters through substitution of the second consonant, instead of omitting it. It

also demonstrates that they use that strategy more efficiently than children with typical phonological development, and they would present skills of input, cognitive and articulation more developed because of their more advanced age<sup>16</sup>.

Also regarding the strategy substitution of the cluster liquid, it is verified that there is high probability of occurrence of that strategy when the segment which is the second consonant of the complex onset consists of a lateral liquid. The values which were found for the single group and for the atypical cases were close to 1, what indicates that this variant usually occurs when the factor *type of cluster liquid* is present. Some studies<sup>2,17,18</sup> mention that in phonological disorders the complex onset, in this type of repair strategy, also had the lateral liquid as favorable, what shows that there is no order to acquire that structure and it may present sociolinguistic influence. Ribas<sup>4</sup>, in her study about liquids with atypical data, noticed that there was indication that the phonological acquisition seems not to depend on the stability of segments in the phonological system, but on the construction of syllabic structures before the segments stability in slots.

The type of development (typical or atypical) was selected in two analyzes of the dependent variables: correct production and C1V simplification with obstruent change. The results agree with a study<sup>19</sup> which mentions that there is no difference between children with typical and atypical development in the acquisition of the complex onset. Children with typical development produce more correctly CCV and the strategy complex onset simplification is more frequent in children with atypical development, although that strategy is used in both types of development.

## ■ CONCLUSION

According to the statistical results which were found in this study, it was possible to observe that, in the complex onset acquisition by children with typical and atypical speech acquisition, the segmental complex onset variables were significant to its production and to the use of repair strategies. Some variables are highlighted, such as the linguistic variables related to obstruent sonority, point and class structural characteristics. In the same way, the type of cluster liquid was considered an influent point which characterizes the complex onset acquisition. Finally, the variable type of development performed an important role in the complex onset target during the phonological acquisition, showing that there is difference in the acquisition of the segments that constitute that structure between children with typical and atypical speech development. So, it is possible to infer, through the studied elements, that there are clues that the complex onset acquisition might be guided by the segment (bottom-up). The analysis of the features regarded the obstruent and the type of liquid shows that the CCV structure may depend on the stability of its segments.

## ■ ACKNOWLEDGEMENT

To the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the support to the development of this research.



## RESUMO

**Objetivo:** comparar e analisar a influência das características dos segmentos do onset complexo na produção correta em crianças com desenvolvimento fonológico típico e atípico. **Métodos:** analisou-se dados de fala de 88 crianças, 44 com desenvolvimento fonológico típico e 44 atípico, com idades entre 2:6 a 5:3 e 5:3 a 8:0, respectivamente. Com um *corpus* de 524 palavras no desenvolvimento típico e 1310 no atípico. A variável dependente teve as variantes: produção correta do onset complexo, simplificação para Consoante<sup>1</sup>-Vogal com e sem mudança de obstruente, simplificação para Consoante<sup>2</sup>-Vogal, mudança de obstruente, substituição da líquida do encontro, epêntese, metátese e outros, como alongamento compensatório. As variáveis extralinguísticas foram: *gênero, idade e tipo de desenvolvimento* e as linguísticas: *tonicidade; número de sílabas; contexto silábico precedente e seguinte; posição na palavra; tipo de líquida do onset complexo; ponto, sonoridade e classe da obstruente*. A análise estatística foi feita por meio do pacote computacional VARBRUL. **Resultado:** o programa estatístico selecionou para todos os grupos pelo menos uma das variáveis: ponto, sonoridade e classe da obstruente. O tipo da líquida do encontro foi significativa para o grupo único e atípicos e o tipo de desenvolvimento, para a produção correta e simplificação de Consoante<sup>1</sup>-Vogal com mudança de obstruente. **Conclusão:** as variáveis linguísticas relacionadas à obstruente e à líquida do encontro foram significativas à produção de Consoante-Consoante-Vogal. A variável tipo de desenvolvimento também foi relevante. Mostrando evidências que a aquisição do onset complexo pode ser guiado pelo segmento e que há diferença entre crianças típicas e atípicas.

**DESCRIPTORIOS:** Transtornos do Desenvolvimento da Linguagem; Desenvolvimento da Linguagem; Fala; Linguagem Infantil

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Received on: November 29, 2012

Accepted on: August 07, 2013

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