

The acquisition of the non-lateral liquids in Brazilian Portuguese

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1. INTRODUCTION

In Portuguese and in the Iberian languages as a general rule, there is an asymmetric distribution of the 'r's, strong and weak, which contrasts only in an intervocalic position (*caro/carro, era/erra*). This asymmetry led Mattoso Câmara Jr., in 1953, to defend the thesis, that there was only one rhotic in the consonant system of the language: the '*strong-r*', which caused a polemic at the time and was immediately abandoned by the author. A similar proposal to that presented by Mattoso was put forward for Spanish, based on work by Harris in 1969, which argued for the existence of only one subjacent 'r'; in this case the '*weak-r*'. These two works are generators of a great number of discussions which try to explain the true subjacent nature of rhotic sounds in the phonological system of these languages. It is important to point out that these works and subsequent work about rhotics have always been based on diachronic data or on variation data. However, the present research aims at contributing to this discussion, searching for evidence in the data on language acquisition.

2. METHODOLOGY

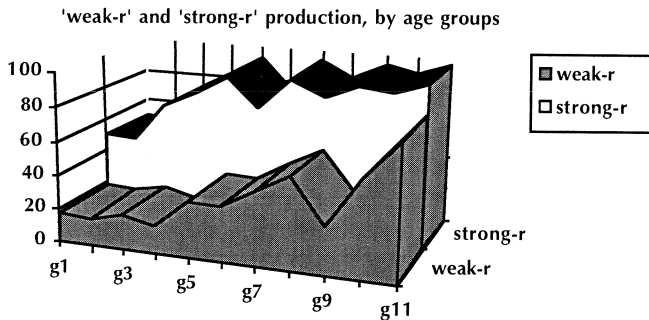
The study is based on the language acquisition data of 110 children divided into 11 age groups. The age of the subjects ranges from 2 to 3:9 years of age. All of them live in the cities of Pelotas and Porto Alegre – Rio Grande do Sul, Brazil, presenting normal patterns of development. The data, collected transversely, were obtained with an instrument proposed by Yavas et al. (1991). In this paper, results will be presented in relation to the following variables: the production or not of the segment; what was produced; the position of the syllable (only for the '*weak-r*') and the position in the word.

3. BACKGROUND

In relation to the theoretical basis used, it can be said that after an analysis of the different theoretical proposals and the first results found, it became necessary to study the data, in this work, based on notions from the Syllable Theory, as the '*weak-r*' can occupy all the syllable positions except the peak. As pointed out by Selkirk (1982), the syllable is understood as a linguistic unit with an internal structure, among the constituents of which a hierarchical relation is established and which has two immediate basic constituents, the onset (O) and the rhyme (R). The onset is not obligatory and can be subdivided, and the rhyme is constituted obligatorily from a sonority peak, the peak (N) and from a coda (C), which is optional. The occupation of

the positions of the syllabic skeleton, according to this theoretical model, suffers constraints dictated by the Sonority Scale. There are different proposals of the scale. This study has adopted the proposal of Bonet & Mascaró (1996), which attributes different degrees of sonority to the 'strong-r' and the 'weak-r'. According to the authors, the scale can be presented as follows: **obstruents < fricatives and /R/ < nasals < laterals < glides and /r/ < vowels.**

4. SOME RESULTS



The above figure shows the production of rhotics by the children studied, by age group. It was been noted that the acquisition of the 'strong-r', even at 2 years of age (g1), reaches rates that will only be obtained for the 'weak-r' by children of three years and two months of age (g8). According to the criteria adopted, that considers the rate of 75% as the expression of the acquisition of the segment even though not yet stabilized, it can be stated that as from group 4 the 'strong-r' is acquired, the same only being possible for the 'weak-r' in the data for group 11. In this figure it is possible to verify also that the acquisition is not a linear process, as moments of decrease in the ascending line of the development can be clearly observed. The literature in the area has shown, principally in case studies, that it is common for the child to present regressions during the developmental process, not producing that which s/he had already produced. A hypothesis is put forward considering that this may happen because the child is paying greater attention to more complex aspects. This kind of phenomenon, known as the *U-shaped curve*, is frequently and principally registered in longitudinal studies.

4.1 The results of 'weak-r'

In relation to the acquisition of 'weak-r', it is necessary first to refer the nature of the segments that can substitute it. We were able to observe that between the segments produced in the place of the rhotic, there are similarities in the degree of sonority. Considering the Sonority Scale adopted, we observed that the substitutions of 'weak-r' are made, either by segments that share the same degree of sonority, or by those which are adjacent in the scale, that is, laterals and glides.

In relation to the position of complex onset, the omission of a segment predominated. We also observed the production of a lateral which was significant, not for the rate, but because it denoted a probable period of transition, in which the CCV parameter was already set but in which there were still constraints of an articulatory kind. We arrived at this statement mainly

from the fact that the production of a lateral concentrated on a period of development immediately prior to an important growth in the rate of production of the 'weak-*r*'. It is important to point out that according to the data studied, the occurrence of this phase of transition was not common to all children.

The results of the medial coda were similar to those of the complex onset by the high rates of omissions. However the motivation for this high rate does not seem to be of a syllabic model because, in this specific case, the analysis could not ignore that in the data of the final coda the production of the rhotic was very early, this position being the one in which children start to produce the 'weak-*r*'.

The analysis of the data on final coda showed that the production of the weak rhotic is earlier in this position, even presenting higher rates than those of the simple onset position. We can also find in the final coda cases of production of a lateral consonant, which is important, not because of the proportion of the occurrence, but because the presence of this segment denotes that the child, from a very early age, recognizes the parameter of the coda. It is in the syllabic position of final coda that the cases of semivocalization for [y] appear more frequently, principally in the first groups. Once again it is evident that the position is recognized by the child, who fills it with a segment as sonorous as 'weak-*r*', creating in this case a falling diphthong.

The core syllable – CV-, being shown as an unmarked structure, tends to have its onset fulfilled in the initial stages of linguistic development. This figure shows that, in this position, the rate of omissions does not reach 10%. Even so, in this case, there is a percentage of production of the rhotic – 'weak-*r*'- that does not reach 50%, probably because of questions of a phonetic-phonological order. The phonological aspect refers to the subjacent representation of the segment, which for the 'weak-*r*', according to Bonet & Mascaró (1996), is more marked by the presence of the feature [a]; the phonetic aspect is related to the difficult articulation of the 'weak-*r*'. The majority of the substitutions by a lateral consonant are situated in simple onset. The lateral alveolar liquid shares all the features of the 'weak-*r*' except one, the feature of the mode of articulation [lateral]. The fulfillment of the onset position, with the production of the lateral consonant, can be attributed to the fact that the segment, apart from occupying an adjacent position to the 'weak-*r*' in the Sonority Scale, is unmarked, escaping, in this way, from the phonological constraints that have just been mentioned.

4.2 The results of 'strong-*r*'

In relation to the data of 'strong-*r*', it was observed that the greatest occurrence is the production of the rhotic segment, 77% of the total of the examines data. Referring to the substitutions in the data of 'strong-*r*', we observed that there was an occurrence of stop consonants. Although the numbers are not high, this is an important fact, because it shows that a group of informants are treating the rhotic as a velar stop, that is, like a segment with zero degree of sonority. Starting from the most traditional proposal of the Sonority Scale, which attributes the same degree to 'weak-*r*' and 'strong-*r*', we cannot explain phenomena of this kind. Neither can we explain the procedure of the informants who, because they have not yet acquired the velar point of articulation for consonants produced coronal stops in place of the 'strong-*r*' ([X] → [t] in a word like *relógio*, 'clock'). These facts are indicators that the motivation for the change is not a simple phonetic similarity, seeing as the 'strong-*r*' is produced like a velar fricative, but something to do with the phonological representation of children.

The presence of substitutions for laterals which are radically smaller than those found in the

data of the onset of 'weak-r', does not invalidate the hypothesis presented in relation to the position in the Sonority Scale. Even if they occupy different places on the scale, rhotics and laterals form a natural class of liquid consonants. The occurrences of laterals, as well as of stops, are situated in the first age groups. We can again observe that it is the existing differences among the children that motivate one or the other production. What cannot be denied is the fact that the adoption of Bonet & Mascaró's proposal (1996), for this study, explains phenomena like stopping, not leaving cases like the substitution of [R] for [l] without an explanation. In relation to the semivocalizations, we observed that they happened in a reduced number and, as we can see below, are conditioned, like the stoppings, to the position that the 'r' occupies in the word.

Yet again there is confirmation that there are sequential constraints and, in this case, constraints of position acting in an undeniable way during the period of acquisition of the phonological component. Rarely are words found in the lexicon of Portuguese in which rising diphthongs come to the surface. Children, obeying this tendency of the language, have reserved the middle of the word to substitute the rhotic for a semivowel, but in no case was there the production of [w] or [y] in the place of the 'strong-r' at the beginning of the word. The opposite happens with the production of stops, as all the cases of their use are found at the beginning of the word. This means that when the position of onset at the beginning of a word is fulfilled, there is the preference for elements which are less sonorous.

5. CONCLUSIONS

The canonical linguistic forms, segmental and prosodical, are those preferred by children during the period of language acquisition, and the obedience of phonological patterns and constraints of the language system that are being acquired is constant from the first phases of their linguistic development. These rates, found in the study that originated this article (Miranda, 1996), support the idea that language acquisition is bound by general principles and specific parameters set from the linguistic input.

The results obtained from the quantitative analysis of data from language acquisition and from evidence provided by each observed child in the process of the construction of his/her grammar, examined in the light of the Syllable Theory and the Sonority Scale (Bonet & Mascaró, 1996), parallel to the study of different proposals regarding the phonological status of the 'r', have permitted us to state the existence of two rhotic phonemes in the phonological system of Brazilian children and, by extension, in the system of the Portuguese of Brazil.

6. REFERENCES

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