Aquisição do morfema de número em crianças em desenvolvimento normal de linguagem****

Number morpheme acquisition in children within normal language development

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Abstract
Background: studies about Brazilian Portuguese number morpheme acquisition and its productive usage have indicated controversial results. Aim: to verify the comprehension and production of singular and plural markers in children within normal language development. Method: participants were 64 children ranging in age from 3:0 to 6:11 years. In the comprehension test, children were encouraged to point to the correctly inflected noun picture, among three foils. In the production test, they had to name each picture with the correctly inflected article and noun. Results: there was an increase of correct answers with age. The production of the plural form received the lower scores, but presented a significant enhancement from 3:0 to 5:0 years. Conclusion: this ability improved with development and was considered productive after 5:0.
Key Words: Child Language; Language Development; Language Tests.

Resumo
Tema: estudos sobre a aquisição e o uso produtivo da morfologia de número no Português Brasileiro demonstraram resultados controversos. Objetivo: verificar a compreensão e a produção do singular e do plural em crianças em desenvolvimento normal de linguagem. Método: participaram 64 sujeitos de 3:0 a 6:11 anos. Na prova de compreensão apontava-se a figura do substantivo flexionado corretamente, junto a três tipos de distratores. Na prova de produção, nomeava-se a figura com artigo e substantivo flexionados. Resultados: houve aumento dos acertos nas duas provas com a idade. A produção do plural foi a variável com menor índice de acertos, mas apresentou aumento significativo dos 3:0 aos 5:0 anos. Conclusão: esta habilidade aprimorou-se com o desenvolvimento, estando produtiva a partir dos 5:0 anos.
Palavras-Chave: Linguagem Infantil; Desenvolvimento da Linguagem; Testes de Linguagem.

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Introduction

Flexional morpheme acquisition is influenced by different linguistic aspects such as phonological structure, semantic information and frequency in language(1). At the beginning of morphological development, children usually imitate the same grammatical structures that they are exposed to without analyzing the morphemes they produce(2-5), or use words in their basic (uninflected) forms(6,7), showing, in both cases, the absence of consistent morphological rules(8,9). Solely at around 3;6 years of age children are able to productively use most of the morphemes, demonstrating the grammatical rule learning(10).

Studies on number morpheme acquisition, in Brazilian Portuguese (BP), showed early sensitivity for this morpheme at 27 months of age(11), but indicated a belated master of plural knowledge(12), which can reflect the role played by linguistic and cultural diversity in this grammatical category acquisition(13). Number morpheme acquisition seems to be one of the most complex grammatical processes in BP, given the abstractness of its semantic concept(14).

Considering that linguistic demands can influence the number morpheme acquisition, some researchers have found that before mastering this skill, whilst children are still not able to consistently produce the arquiphoneme /S/(15-17), other sorts of linguistic information are used to express the conceptual knowledge of number(2). Thus, the typology of error analysis is, in that case, of great importance to verify the underlying knowledge.

The aim of this study, therefore, was to analyze both comprehension and production of singular and plural in children within typical language development. It was also the purpose of this research to verify the types of responses in the plural production's task.

Methods

This research was approved by the Ethics Committee (CAPPesq - nº 226/05) and all parents or caregivers signed consent forms.

Participants

Sixty four children within typical language development, who were attending state primary school and kindergarten, participated in this study (8 of 3 years, 19 of 4 years, 20 of 5 years and 17 of 6 years of age). The inclusion criteria were absence of speech and language complaints and normal performances on Vocabulary(19) and Phonology(19) Assessments of the ABFW Test.

Material

Two tasks were created in order to verify number morpheme's processing:

1. Singular and plural comprehension task: after receiving a prompt, children had to point to the picture that correctly represented the noun inflected in the singular or in the plural (e.g.: Show me the apples). For all items, there was one number foil (e.g. the apple - singular form), one lexical foil (e.g. the cows) and one number-lexical foil (e.g. the cow).
2. Singular and plural production task: children had to use the correct inflection (singular or plural) to answer the examiner's question, taking an action picture as a visual cue (e.g. Who is running? The boys - picture of two boys running; Who is jumping? The girl_ - picture of a girl jumping).

There were ten items in the comprehension task (five in the singular and five in the plural) and ten items in the production one (five in the singular and five in the plural).

Procedures

Quantitative analysis (mean of correct responses in each task, for the overall group and for each age, separately) and qualitative analysis (only for plural production task) were used. For the latter, eight categories of responses were created:

1. Target answer - correct production of the plural form (e.g.: the boys).
2. Morphological coda placed only in the article/ pronoun - correct production of the plural form in the article/pronoun, but not in the noun (e.g.: these fish).
3. Enumeration - expression of the concept of quantity by identifying two or more characters (e.g. he and he).
4. Redundant information - overgeneralized use of the number morpheme (these fives);
5. Semantic information of collectivity - expression of collectivity notion by using pronouns and adverbs (e.g.: everybody).
6. Semantic information expressed by the numeral - expression of the concept of quantity by identifying the number of characters (e.g. two boy);
7. Use of collective - selection of the collective noun to express the concept of quantity (e.g. the band).

8. Use of the singular - selection of words in their basic (uninflected) forms (e.g. the fish).

Prior to the production task analysis, we calculated the frequency in which the arquiphoneme /S/ was produced through the Phonology Assessment(19), in order to verify whether children were able to correctly produce the number grammatical morpheme.

We carried out statistical analysis (ANOVA, Tukey-Test, Qui-Square and Pearson's correlation) with alpha level of .05.

Results

Children showed an increasing pattern of correct responses in the comprehension task (for both singular and plural forms) with age ($p<.001$). No differences were found between singular and plural forms in the comprehension task (Figure 1).

We calculated the percentage of children who achieved productive scores for the plural form in the comprehension task (productivity criterion: from 80 to 100% of correct answers). At 3 years of age, 37.5% of children could comprehend the plural information productively; at 4 years, 57.9%; at 5 years, 80% and at 6 years, 88.2%.

Regarding the production task, there was no improvement of singular performance with age, indicating that from 3 years of age onwards, children could correctly use the singular form. With regard to plural production, the findings were very different: there was an improvement from age 3 to 5 years, demonstrating a developmental pattern for plural usage. In all analysis, the averages of correct responses for the singular form were higher than for the plural form. (Figure 2).

Concerning the analysis of errors for the plural form in the production task, it was possible to verify that whilst 3-year-old children elected the singular form in the majority of their responses (even when there was an obligated context for plural usage - 57.5%), 4-, 5- and 6-year-old children used mainly the correct plural form. The plural usage thus significantly increased from age 3 to 5 years (10%, 32.6% e 72%, respectively), but remained similar for 5- and 6-year-old children (79.6%).

In order to analyze the percentage of children who used the plural morpheme in between 80% and 100% of the obligatory contexts, we summed the percentage of "target responses" with "morphological coda placed only in article/pronoun". Only three participants of 3 years group presented targert response (one occurrence) or morphological coda (four occurrences) between 80% and 100% of the obligatory contexts; 4-, 5- and 6-year-old children used these kinds of answers in 36.8%, 75% and 70.6% of the cases, respectively.

Pearson's correlation showed a positive and weak linear correlation between the usage of target responses (for the plural form, in production task) and the arquiphoneme /S/ production (naming (p=0,03) and imitation (p=0,05) tasks of Phonology Assessment).

FIGURE1: Comparison between the averages of correct answers for plural and singular forms in the comprehension task, for overall participants and for each age, separately.

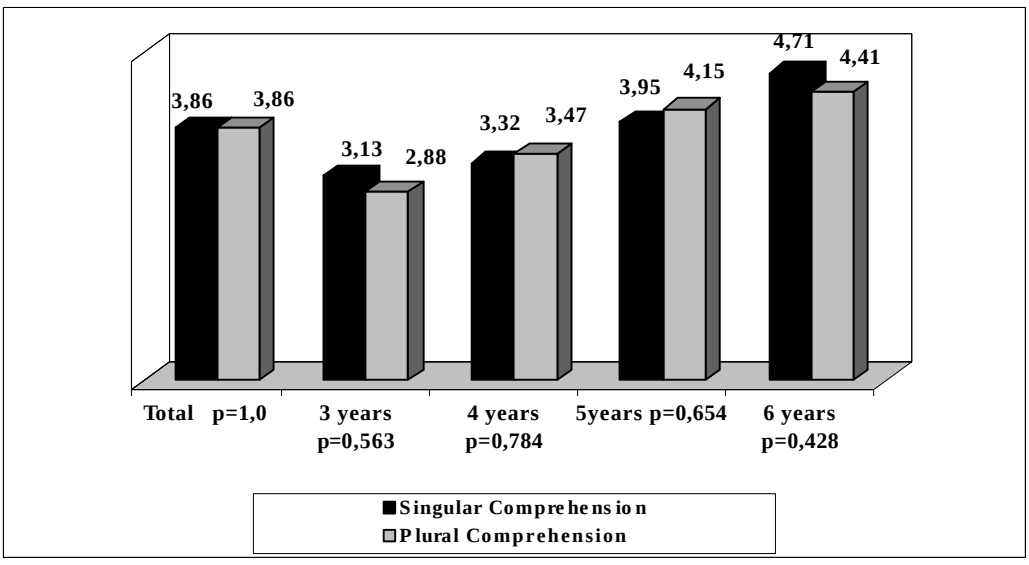
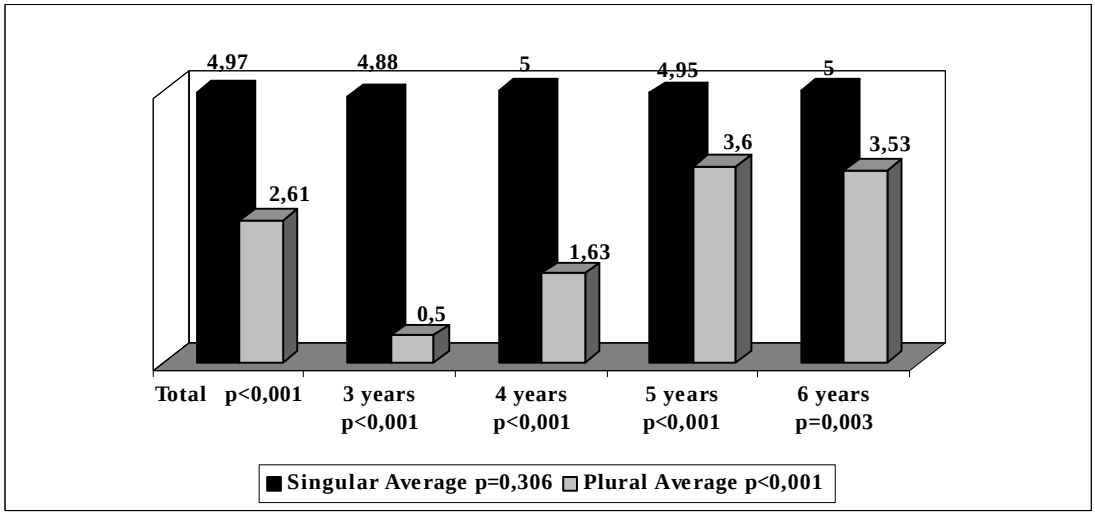


FIGURE 2: Comparison between the averages of correct answers for plural and singular forms in the production task, for overall participants and for each age, separately.



Conclusion

Children with typical language development could identify the number grammatical morpheme and its semantic information since 3 years of age and this ability improved with age becoming productive at around 5 years. For all groups, there was no difference between the average of correct responses for plural and singular comprehension forms, which seem, this way, to develop in parallel and in early stages of language development.

Most of children, including the youngest group, correctly used the singular form in the production task. Regarding plural production, we only found productive responses (in between 80% and 100% of correct responses) from 5 years on. Thus, 3- and 4-year-old children were not able to master plural information, reflecting, possibly, difficulties regarding semantic processing and articulatory production.

Thus, if we assume that the complete number morpheme knowledge implicates in both, singular and plural productive productions, is not possible to say that 3- and 4-year-old children master even the singular, since this is the easiest and most frequent production form. This assumption can be reinforced by two relevant analyses: the high percentage of usage of the singular form in plural obligatory contexts, at 3 years of age; and the positive linear correlation between the usage of target responses (for the plural form, in the production task) and the arquiphoneme /S/ production (in Phonology Assessments).

Concerning the analysis of errors for the plural form, in the production task, we verified that although 3-year-old children mainly used the singular form, they showed an incipient sensibility to produce the plural form or to enumerate scene elements to express the concept of number. At 4 years, children were more able to perceive and use the arquiphoneme /S/ and consequently could use it to express the number morpheme information referent either to the noun or to the article/pronoun. Thus, both the improvement of articulatory abilities and the development of the number concept allowed children to use this morpheme as a plural marker. This suggests the parallel development of number knowledge and number grammatical system. From 5 years on, the grammatical rule seems strong enough for children to use the plural marker in at least 80% of obligatory contexts, indicating that the singular and plural knowledge might be well established in the mental lexicon.

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