

Comparative study on the acquisition of open class and closed class words in children with typical language development

Estudo comparativo sobre a aquisição de palavras de classe aberta e classe fechada em crianças com desenvolvimento típico de linguagem

Estudio comparativo sobre la adquisición de palabras de clase abierta y clase cerrada en niños con desarrollo típico de lenguaje

*Letícia Arruda Nóro**
*Diogo Ribas dos Santos**
*Renata de Quadros Machado**
*Karine Rodrigues Freitas**
*Gabriela Brum dos Santos**
*Fernanda Marafiga Wiethan**
*Helena Bolli Mota**

Abstract

Introduction: The increasing of vocabulary is an aspect of great importance for the child's cognitive development. Covering various aspects of words as their pronunciations, definitions of their meanings, syntactic rules of their uses and the way words are written. **Purpose:** to investigate the acquisition of open and closed class words in children aged 2 years to 4 years, 11 months and 29 days, enrolled in preschools within the municipal public network of Santa Maria. **Methods:** the sample was composed of 72 children

*Universidade Federal de Santa Maria, Santa Maria, RS, Brazil.

Authors' contributions:

LAN: was responsible for the study design, collection and elaboration of the database; DRS, RQM, KRF and GBS: results analysis, literature review and manuscript elaboration; FMW: Drafting and Critical Review; HBM: elaboration and critical review

Correspondence address: Letícia Arruda Nóro titamecmat@gmail.com

Received: 21/01/2019

Accepted: 24/09/2019

aged from two to four years, 11 months and 29 days, being 36 boys and 36 girls, with typical language development, distributed evenly among age groups. Filming of spontaneous speech of each subject was held, and after, was held the analysis of the vocabulary and mean length of utterance. For statistical analysis was used the *Statistical Analysis System*, 9.2, and *Mann-Whitney* and *Kruskal-Wallis* tests, with significance level $p < 0.05$. **Results:** it was not observed influence of gender in performance acquisition of speech. However, as to the age group, it can be observed significant difference in the acquisition of closed-class words. **Conclusion:** According to the results, it was concluded that the acquisition of open class words is not influenced by gender and age variables. There was a positive relationship between acquisition of closed-class words and the age range, being higher in children with higher age.

Keywords: Vocabulary; Language Development; Child Development; Speech; Child

Resumo

Introdução: O aumento do vocabulário é um aspecto de grande importância para o desenvolvimento cognitivo da criança. Abrange vários aspectos das palavras como suas pronúncias, as definições de seus significados, regras sintáticas de seus usos e o modo como as palavras são escritas. **Objetivo:** verificar a aquisição de palavras de classe aberta e fechada em crianças com idades entre 2 anos e 4 anos, 11 meses e 29 dias, matriculadas em escolas de educação infantil da rede pública municipal de Santa Maria. **Métodos:** a amostra foi composta por 72 crianças com idades entre dois e quatro anos, 11 meses e 29 dias, sendo 36 meninos e 36 meninas, distribuídos uniformemente entre faixas etárias, com desenvolvimento típico de linguagem. Foram realizadas filmagens da fala espontânea de cada sujeito, e após, realizou-se a análise do vocabulário. Para análise estatística foram utilizados o Programa *Statistical Analysis System*, versão 9.2 e os testes de *Mann-Whitney* e *Kruskal-Wallis*. Em ambos os testes o nível de significância adotado foi de 5% ($p < 0,05$). **Resultados:** não houve influência do sexo no desempenho de aquisição de classes de palavras. No entanto, quanto à faixa etária, pode ser observada diferença estatisticamente significativa na aquisição de palavras de classe fechada. **Conclusão:** de acordo com os resultados, foi possível concluir que a aquisição de palavras de classe aberta não é influenciada pelas variáveis sexo e idade. Houve relação positiva entre aquisição de palavras de classe fechada e a faixa etária, sendo maior nas crianças com maior idade.

Palavras-chave: Vocabulário; Desenvolvimento da Linguagem; Desenvolvimento Infantil; Fala; Criança.

Resumén

Introducción: El aumento del vocabulario es un aspecto de gran importancia para el desarrollo cognitivo del niño. Abordando varios aspectos de las palabras como sus pronunciaciones, las definiciones de sus significados, reglas sintáticas de sus usos y el modo en que se escriben las palabras. **Objetivo:** verificar la adquisición de palabras de clase abierta y cerrada en niños con edades entre 2 años a 4 años, 11 meses y 29 días, matriculadas en escuelas de educación infantil de la red pública municipal de Santa Maria. **Métodos:** la muestra fue compuesta por 72 niños con edades entre dos años a cuatro años, 11 meses y 29 días, siendo 36 niños y 36 niñas, distribuidos uniformemente entre franjas etarias, con desarrollo típico de lenguaje. Se realizaron filmaciones del habla espontánea de cada sujeto, y después, se realizó el análisis del vocabulario. Para el análisis estadístico se utilizó el Programa *Statistical Analysis System*, versión 9.2 y las pruebas de *Mann-Whitney* y *Kruskal-Wallis*. En ambas pruebas el nivel de significancia adoptado fue del 5% ($p < 0,05$). **Resultados:** no hubo influencia del sexo en el desempeño de adquisición de clases de palabras. Sin embargo, en cuanto al grupo de edad, puede observarse una diferencia estadísticamente significativa en la adquisición de palabras de clase cerrada. **Conclusión:** de acuerdo con los resultados, fue posible concluir que la adquisición de palabras de clase abierta no está influenciada por las variables de género y edad. Hubo relación positiva entre adquisición de palabras de clase cerrada y el grupo de edad, siendo mayor, en los niños con mayor edad.

Palabras clave: Vocabulario; Desarrollo del Lenguaje; Desarrollo Infantil; Habla; Niño

Introduction

One of the indexes for monitoring language development is vocabulary production. Knowledge and increased vocabulary is a very important aspect for the child's cognitive development. It contributes to the good reading and comprehension of words and has implications for the process of later learning during school teaching, for example¹⁻⁴.

This knowledge covers various aspects of words such as their pronunciations, the definitions of their meanings, syntactic rules of their uses, and the way they are written. All of these elements are connected to a mental network representation, and their quality will relate to the good use of vocabulary⁵⁻⁷.

Research⁸ states that there is influence of the type of words in the oral production of children. Didactically, they can be divided into open or closed class. The former are considered content words and have lexical meaning and in principle always enable new creations. This class includes nouns, adjectives, verbs, adverbs and numerals, which play a fundamental role in the transmission of semantic information.

The second class refers to functional (or closed class) words, which have a grammatical meaning. They are indexes of grammatical properties that make a difference between languages. These words are the articles, prepositions, conjunctions, pronouns and interjections, which mainly perform syntactic function, serving as phrasal linking elements with their own low semantic load.

As an example of acquisition studies in typically developing children, a research⁹ analyzed the change in types and tokens and the type / token rate in children of both sexes, between 18 and 36 months, Brazilian Portuguese speakers, regarding grammatical class and total and segmental measurement. The results indicated that the nouns appear first than verbs, adverbs and adjectives and other grammatical classes that complete up to 32 months.

Another study¹⁰ has looked at how early lexical acquisition occurs in typically developing children in terms of types and occurrences of lexical items and whether the nominal bias hypothesis actually occurs. The results of the analysis indicated that the number of nouns was higher than the verbs during the lexical acquisition period studied, but the production of nouns was not exclusive even in this very early period of linguistic acquisition.

In addition to this research, another also showed superiority in the acquisition of nouns, in which it occupied an average of 55% of the lexicon of children with vocabulary between 100 and 200 words, while content words accounted for less than 15%.

Based on the above, the objective of this study was to verify the acquisition of open and closed class words in children aged 2 years to 4 years, 11 months and 29 days, enrolled in kindergartens of Santa Maria municipal public school.

Methods

This study is characterized as quantitative, descriptive and cross-sectional data collection and is part of a project approved by the Research Ethics Committee of a higher education institution in a city in the interior of *Rio Grande do Sul*, under the number of *CAEE*: 0219.0.243.000-11. As a mandatory condition for participation in the study, those responsible for the subjects signed the Informed Consent Form.

The sample consisted of 72 children aged two years to four years, 11 months and 29 days, 36 boys and 36 girls, evenly distributed among age groups. All children were members of Brazilian Portuguese-speaking monolingual families with typical language development. Children who had hearing loss, neurological, emotional and / or cognitive impairment, detectable through observation; presence of oral motor or organic alterations, or children who had performed or were undergoing speech therapy were excluded from the study.

Data collection was performed at municipal preschools of a kindergarten in a city in the interior of Rio Grande do Sul. The speech-language evaluation included a questionnaire designed for the parents or guardians, orofacial and oral praxis assessment, oral language assessment and hearing screening.

To assess the orofacial aspects, the adapted "Protocol orofacial myofunctional evaluation with scores (OMES)¹¹" was used. For children older than three years and six months, the Dyspraxia Evaluation Protocol¹² was also used to verify oral praxes.

Language assessment was performed using the Behavioral Observation Protocol (BOP)¹³. Thus, it was possible to observe the language and cognitive development, regarding semantic, syntactic

and pragmatic aspects. Thus, one can evaluate the motor and social behaviors. The BOP is built for children from one to four years old, is easy to apply and contains defined reference values. With older children, spontaneous oral narratives were employed. In addition, phonetic and phonological aspects of speech were observed in spontaneous conversation and repetition of phonetically balanced words.

Children who met the inclusion criteria were assessed for vocabulary by spontaneous speech and naming miniature objects and toys. Video recordings were made for 20 minutes for subsequent broad phonetic transcription of the child's speech and alphabetic transcription of the examiner's speech. For speech transcription of children up to 3 years 3 months and 29 days, the consensus method was used^{14,15}, that is, two judges worked independently on the transcript; after the transcripts were compared and discrepancies heard again by a third judge until they reached agreement on all utterances / words / sounds produced by the child. If there was no agreement between at least two judges, the passage was excluded.

Children of the other age groups, who present the most stable productions, used the reliability method^{16,17} between transcriptions. Thus, for vocabulary analysis, the following criteria were used: "types and occurrences" or "types and tokens" and open class and closed class of words.

Types and occurrences or types and tokens: children's speech was separated by words, and the

types and occurrences (types and tokens) of each subject were accounted for. For the classification of types, the number of different lexical items produced by the child was considered. The count of occurrences followed the same criteria, from the identification of the number of repetitions of each type of word in the corpus. Thus, the production frequencies of each word class can be verified: open class (content words): nouns, adjectives, verbs, adverbs and numerals; closed class (functional words): articles, prepositions, conjunctions, pronouns, interjections.

Statistical Analysis System, version 9.2 was used to perform the *Mann-Whitney* test for comparison of open class and closed class between genders, and the *Kruskal-Wallis* test for comparison of open class and closed class between age groups. In both tests, the significance level adopted was 5% ($p < 0.05$).

Results

The performance of the open and closed class words, as well as the comparison between age groups can be seen in Table 1. There was a statistically significant difference between the age groups for closed class words.

Table 2 presents the performance of open and closed class words in relation to gender. The results indicate that there is no statistically significant difference for the variables.

Table 1. Comparative analysis of word classes between age groups

	2 years of age	3 years of age	4 years of age	Value of P
Open class	196,29	223,58	227,04	0,147
Closed class	89,92	129,29	160,17	<0,001

*Statistical test used: Kruskal-Wallis. P values <0.05 were considered statistically significant.

Table 2. Comparative analysis of word classes between sexes

	Mean of the OC	Mean of the CC
Female	227,42	135,39
Male	203,86	117,53
Value of P*	0,262	0,161

*Statistical test used: Mann-Whitney. Were considered statistically significant p values <0.05.

Caption: OC= Open class; CC= closed class.

Discussion

From the results found in Table 1, it can be seen that increasing age seems to imply greater use of closed-class words. This is due to a greater need to refine phonological and lexical representations, indicating a high relationship.

The results of this study corroborate a recent research, which aimed to observe the acquisition of the first words by the children, contrasting the acquisition of open and closed class words and observing the emergence of the first word combinations. In this research the authors could observe that the number of closed classes increases considerably over time¹⁸.

This confirms studies^{19,20} that show an initial tendency for the production of open classes, those that have a referent in the world, and then expand to the production of closed classes, which have specifically grammatical functions, allowing the child to construct the syntax of his/her language. Relating to the present study, it is understood that children acquire open class words early, so there are a considerable number of these words early in the acquisition (around two years), with a slower but steady increase after this period. Already closed-class words are related to the more complex syntax, and therefore not yet stabilized even at the age of 4, still needing a lot of refinement in terms of the acquisition of more complex words such as conjunctions, for example.

According to the statistical results, it can be inferred that the initial acquisition favors open classes over closed classes. An international study²¹ has shown that early in the process of language acquisition children have greater understanding of acquiring open class words, due to their more concrete content and their greater use in language.

As children are exposed to new lexical items, in order to increase vocabulary, they begin to acquire closed-class words due to the syntactic requirement for phrasal linking elements²².

Still, many hypotheses try to explain how the acquisition of functional categories occurs. One of them, the Maturational Hypothesis²³, indicates that children do not have the functional categories available in their mental grammar. The other hypothesis, Continuous Hypothesis, supports the idea that children have these categories in their mental grammar since birth²⁴. The main objective of the present study does not specifically address this

issue, but it is important to emphasize for future studies.

It is important to analyze the relationship that memory and language establish during childhood. Before the first year of life, mechanisms already favor word learning. At age 2, there is evidence that language information available to children directs memory information storage. At 3 years of age, verbal short-term memory impairment is associated with vocabulary restriction and the production of simpler, shorter sentences²⁵⁻²⁸.

In Table 2, no statistically significant distinctions were observed between boys and girls, demonstrating an evolutionary balance between the groups.

A French study²⁹ examined the influence of gender and sociocultural factors on language production of 316 speech samples from children, where grammatical and lexical development measures were taken including Mean Spell Length and *type / token* relationship.

The statistical result of the above study revealed intense influence of sociocultural factors, showing that children from families of high socio-cultural level have more complex lexical production and a higher rate of development.

Conclusion

From the results it is possible to conclude that, for the studied population, the acquisition of open class words is not influenced by the variables gender and age. The acquisition of closed-class words is influenced by age, that is, the older the child, the more grammatical words he/she produces.

These results are mainly related to syntax, because it is acquired later by children by the fact that it implies the acquisition of complex words, which only have meaning in the phrasal context.

Acknowledgments

We thank CNPq and CAPES for the support offered for the realization of this research.

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