Expressive vocabulary and regional variables in a sample of students from Maceió

Vocabulário expressivo e variáveis regionais em uma amostra de escolares de Maceió

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ABSTRACT

Purpose: To characterize the expressive vocabulary and analyze the variables in a regional sample of students of first grade of elementary school in Maceió. Methods: The sample was composed by 72 children from three Maceió public schools. To select the sample, the children underwent speech evaluation through the ABFW Test - Phonology; and expressive vocabulary through the ABFW - Vocabulary Test. Following, statistical analysis was conducted using Kruskal-Wallis, Mann-Whitney and Wilcoxon tests. Statistical significance was considered as p value smaller than 0.05. Results: There was no difference between gender and among age ranges in lexical performance. Differences among schools were observed. When compared to data from the ABFW, the children from Maceió underachieved the expected scores in the semantic fields sites, clothing, food, and shapes and colors. The best performance was observed for the fields animal, vehicles, furniture and utensils. The most recurrent substitution processes were the co-hyponym, valorization of the visual stimulus, words that designate their semantic attributes, hypernym, parasynonym or equivalents. Conclusion: The children of Maceió present a similar lexical development, independent of gender or age group, with a difference only among the schools tested.

Keywords: Vocabulary; Language tests; Child; Language; Language development

RESUMO

Objetivo: Caracterizar o vocabulário expressivo e analisar as variáveis regionais em uma amostra de escolares do primeiro ano do ensino fundamental de Maceió. Métodos: Participaram 72 escolares de três escolas de Maceió. Para selecionar a amostra, os escolares foram submetidos às seguintes avaliações: avaliação da fala, por meio da prova de Fonologia do ABFW; avaliação do vocabulário expressivo, por meio da aplicação da Prova de Vocabulário do ABFW e avaliação do desenvolvimento infantil, por meio da Escala de Desenvolvimento Infantil Denver. Foram realizadas análises estatística descritiva e analítica (p<0.05). Resultados: Não houve diferença de desempenho lexical entre os gêneros, nem entre as faixas etárias, mas foi verificada diferença entre as escolas. Os escolares apresentaram desempenho abaixo do esperado nos campos semânticos locais, vestuário, alimentos e formas e cores. Melhor desempenho foi observado para os campos semânticos animais, meios de transporte e móveis e utensílios. Os processos de substituição mais realizados foram: substituição por co-hipônimo, por valorização do estímulo visual, por vocábulos que designam seus atributos semânticos, por hiperônimos e parassinônimos. Foram observadas diferentes designações para os vocábulos balança, escorregador, privada e casinha. Conclusão: Os escolares de Maceió que compuseram a amostra apresentaram desempenho lexical semelhante, independente do gênero e da faixa etária, mas houve diferença para a variável escola.

Descritores: Vocabulário; Testes de linguagem; Criança; Linguagem; Desenvolvimento da linguagem

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INTRODUCTION

The acquisition of words is an individual and heterogeneous process that can be influenced by cognitive and socio-pragmatic abilities\(^1\) and it marks the beginning of the possibility of effective oral communication between the developing child and the world around her\(^2,3\).

The first words are acquired at approximately one-year of age; at two years of age, children begin to rapidly group new words, featuring a phenomenon called explosion of vocabulary\(^4\). When the child reaches the age of five, she can acquire a large number of words, making the vocabulary numerically similar to that of an adult. However, it is not possible to affirm that the vocabulary of adults and children is equal because the child is able to select characteristics in her word choices\(^5\).

The lexicon can be seen as a compendium of all words of a language\(^6\). During the process of language acquisition, children tend to perform semantic deviations. These deviations occur when there is a mismatch between the meaning of the word in adult language and the meaning of the same word in the language of the child\(^7\). Semantic deviations, also called substitution processes, have been frequently observed in studies with picture naming vocabulary tests\(^8,10\).

Studies on lexical acquisition currently allow not only the most accurate description of how the development of the vocabulary should be, but also what might be considered deviant\(^2\). The investigation of the vocabulary can be performed through dialogical interacting or evocative testing\(^3\).

In Brazil, the vocabulary test of the ABFW Child Language Test is used for evaluation of lexical competence. The ABFW vocabulary test has been used in national studies with different populations, including children with typical development, phonological disorder, specific language impairment and hearing impairment.

The expressive vocabulary analysis shows that there is a difference in performance among the semantic fields studied, with poorer performance observed for the sites (locais) field\(^8,11-13\). As for the substitution processes, one study indicates that the substitution process for word of the same semantic field, called co-hyponym is the most common substitution process observed in children\(^14\).

The semantic aspect can be influenced by family and school environment, age of the child, maternal education\(^7,15-19\) and sociocultural diversity\(^12,14,15,17,20-22\). Regional differences may also influence the lexical performance, especially considering a country with great cultural and geographical extent as Brazil. Therefore, tests that assess language should take into account Brazilian regional differences\(^10\), which are marked not only by variations in performance, but also by variations in the denomination of words. Thus, the sociolinguistic reality must be considered in the application of semantic performance tests in different populations\(^14\).

Considering the influence of linguistic, social, cultural and geographical aspects on lexical acquisition, the present study aimed to characterize the expressive vocabulary and analyze the regional variations in a sample of students of the first grade of elementary education from the city of Maceió.

METHODS

The protocol of this research is based on the relevant legislation (Resolution number 196/96 and 251/97, National Health Council of Health Ministry for studies in humans) and was approved by the Ethics Committee in Research of Universidade Estadual de Ciências da Saúde de Alagoas (UNCISAL) under protocol number 1721/12.

Statistical tests were not performed for sample calculation. Based on geographic and convenience criteria, three elementary public schools in the city of Maceió (AL) were selected. In order to select schools from different regions, the city was divided into three main areas (high, middle and low). One school from each region was selected and named School 1, School 2 and School 3, respectively located in the neighborhoods of Serraria, Pontal da Barra and Ponta Verde.

In each school, the researchers promoted a collective meeting with the parents and/or guardians of children in the first grade in order to explain the research objectives and obtain consent by signing the informed consent (Resolution MS/CNS/CNEP number 196/96, October, 10, 1996).

The inclusion criteria for this study were: to be regularly enrolled in the first grade of elementary school, age between 6 years to 7 years and 11 months, and to have permission from parents and/or guardians to participate in the study. Children with speech disorder, developmental delay, or signs of hearing loss were excluded from this study. The children underwent speech, developmental and hearing assessment during conversation.

The Phonology test of the Child Language Test - ABFW\(^23\) was used to assess speech. The test is composed by 34 figure naming and 39 imagitations of words. The presence of productive phonological processes, characterizing phonological disorder, was analyzed. The Denver Scale of Infant Development was applied to evaluate development. The scale screens four distinct areas of development: gross motor, fine-adaptive motor, personal-social behavior and language. A developmental delay was considered when one area had two or more errors\(^24\). The auditory performance during conversation was assessed through the activity of spontaneous interaction and the performance in tests that were part of the sample selection.

Participants were 72 students, including 32 boys and 40 girls. The distribution was as follows: 30 students from School 1, 15 from School 2, and 27 from School 3. Among the three schools, 14 children with phonological disorder, three with developmental delay, 12 with more than 7 years and 11 months of age, and 14 that were not present during data collection were excluded from the study.
The presence of the parent or guardian of the children excluded from the study due to developmental delay or speech alteration was requested. The researchers conducted a collective meeting in order to guide them in the use of strategies conducive to language stimulation. In addition, referral documents were handed for further clinical assessment.

In order to investigate the expressive vocabulary, the Vocabulary test of Child Language Test - ABFW was applied. The test consists of nine different semantic fields: clothing, animals, food, transportation, furniture and fixtures, professions, sites, shapes and colors, toys and musical instruments. The responses were analyzed considering Designation by usual word (DUW), Non-Designation (ND) and Substitution Process (SP). Considering regional differences present in the designation of words of children from Maceió (AL) observed in a previous study, some adjustments were necessary. For the semantic field toys and musical instruments, the following words were considered appropriate for escorregador (slide): escorrega, escorrega-rela e rela-rela; and balanço for balança (swing). Likewise, for the word privada, in the semantic field furniture and utensils, vaso, sanitário e vaso sanitário were accepted. All words described above were considered DUW. In addition, data from children with more than 7 years were analyzed based on the standard of children 6 years since the test does not provide reference values above that age.

All assessments were conducted individually in a silent room at the school. The average time to evaluate each child was 40 minutes. Therefore, the assessment was completed in a single session. The speech assessment data were recorded on digital camera Sony® Cyber-shot 14.1 megapixels. All data were individually analyzed by the researchers and questions were discussed in a consensus meeting.

Descriptive statistics, mean and standard deviation were used on data analysis. In analytical statistics the Kruskal-Wallis test was used to compare expressive vocabulary between schools and the Mann-Whitney test was used for variables such as gender and age. In order to compare the performance of children from Maceió with the values expected by ABFW, the Wilcoxon test was applied. Significance level adopted was 0.05.

**RESULTS**

There was no difference in performance of expressive vocabulary analyzed through DUW, ND and SP for the variables age and gender. Differences in DUW and SP were observed when comparing schools, with a better performance of School 3 and poorer performance of School 1 (Table 1).

The comparison between the expected performance on the ABFW vocabulary test and scores obtained by the students of Maceió who composed the sample shows that for DUW, the students of Maceió performed below norms for the semantic fields sites, clothing, food, and shapes and colors. In contrast, better performance was observed in the field animals, transportation, and furniture and utensils (Table 2). Rates of ND were below or equal to that expected in all semantic fields except food, which ND index was higher than the established. The SP were high, with a difference in the above mentioned semantic fields, which had low DUW performance as well as in the fields professions, and toys and musical instruments (Table 2).

The substitution processes most often used by children in Maceió, in descending order were: substitution by co-hyponym, valorization of the visual stimulus, words that designate their semantic attributes, hypernym and parasyonym or equivalent. The other substitution processes were less frequent or did not occur (Table 3).

Regional variations were observed during the application of the expressive vocabulary test. Difference was observed in the naming of some words, among which stand out balança e escorregador, present in the semantic field of toys and musical instruments, in which there were no designation by usual word.

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Table 1. Comparison of the expressive vocabulary performance of children according to age, gender and school

|                        | DUW   | ND    | SP    |
|------------------------|-------|-------|-------|
|                        | Mean  | SD    | Mean  | SD    | Mean  | SD    |
| **Age**                |       |       |       |       |       |       |
| 6 years                | 78.91 | 10.74 | 3.10  | 4.47  | 36.01 | 9.72  |
| 7 years                | 82.93 | 10.71 | 2.68  | 3.71  | 32.50 | 10.52 |
| **p-value**            | 0.122 |       | 0.296 |       | 0.145 |       |
| **Gender**             |       |       |       |       |       |       |
| Boys                   | 80.81 | 8.39  | 2.06  | 2.22  | 35.15 | 8.02  |
| Girls                  | 79.00 | 12.43 | 3.77  | 5.32  | 35.30 | 11.34 |
| **p-value**            | 0.914 |       | 0.161 |       | 0.662 |       |
| **School**             |       |       |       |       |       |       |
| School 1               | 151.93| 22.31 | 6.93  | 5.81  | 77.26 | 20.92 |
| School 2               | 161.86| 19.42 | 8.66  | 15.63 | 65.46 | 17.32 |
| School 3               | 166.81| 19.66 | 3.55  | 4.58  | 65.70 | 18.35 |
| **p-value**            | 0.021 |       | 0.016 |       | 0.054 |       |

*Significant values (p<0.05). Gender and age were analyzed with the Mann-Whitney non-parametric test. Differences between schools were analyzed with the Kruskal-Wallis non-parametric test.

**Note:** DUW = designation by usual word; ND = non designation; SP = substitution process; SD = standard deviation.
### DISCUSSION

Regarding the variable age, studies\(^{10,25}\) conducted with children between three and six years of age observed increases in performance scores as a function of increasing age. One study\(^{7}\) found no differences in children aged between five and six years, although differences were observed in children aged between 3 and 5 years.

The literature shows that by five years of age, the vocabulary of a child is numerically similar to that of an adult in their day-to-day life\(^3\). This fact may justify the lexical similarity of children over the age of five observed in the sample of the current study.

As for the gender variable, findings of the current study agree with studies\(^{10,25}\) that found no difference between boys and girls. Previous research suggests that the difference for this variable occurs at earlier ages and that, regarding communicative ability and linguistic organization, girls start speaking earlier and produce more utterances than boys\(^{25,26}\).

No studies that compared schools from different regions of the same city were found in the literature. The reason for performance differences among public schools can be explained by the socio-economic differences of the population living in neighborhoods in which the schools are located. Although they are all public schools, School 3 is located in an elite neighborhood of the city of Maceió, unlike the neighborhoods where Schools 1 and 2 are located.

This hypothesis is supported by the fact that the socio-cultural aspects, such as low income and low educational levels, may interfere with the acquisition of vocabulary\(^{14,16,17,20,21}\). Moreover, accessibility to cultural objects and toys, as well as meetings and activities shared with parents, are important for child development\(^7\).

Therefore, one should consider the sociolinguistic reality when applying semantic performance tests in different populations\(^{14}\) and discuss the large number of social variables that influence social development of the child so that the community, the school and the health services can work together on projects that improve child development\(^{20,21}\).

The lexical performance achieved by the students of Maceió was compared with the expected values for the vocabulary test of ABFW Child Language Test (Table 2). Some of the semantic aspects, such as display, were also found for the words *privada* and *casinha* (Table 4).

### Table 2. Comparison between the expected performance on the vocabulary test ABFW and the performance achieved by the children

| Semantic fields          | DUW     | ND       | SP       |
|--------------------------|---------|----------|----------|
|                          | E (%)   | O (%)    | p-value  |
| Animals                  | 70      | 87       | <0.001*  |
| Food                     | 90      | 73       | <0.001*  |
| Clothes                  | 80      | 60       | <0.001*  |
| Sites                    | 70      | 33       | <0.001*  |
| Professions              | 45      | 50       | 0.630    |
| Transportation           | 70      | 82       | <0.001*  |
| Furniture and fixtures   | 65      | 75       | <0.001*  |
| Toys/musical instruments | 70      | 73       | 0.693    |
| Shapes and colors        | 85      | 80       | 0.004*   |

*Significant values (p<0.05) – Wilcoxon non-parametric test

**Note:** DUW = designation by usual word; ND = non designation; SP = substitution process; SD; E = expected performance; O = observed performance of children from Maceió

### Table 3. Frequency of use of the substitution processes on expressive vocabulary

| Substitution process                                | Frequency of use |
|-----------------------------------------------------|------------------|
| Change in grammatical category                      | 163              |
| Substitution by hypernym                            | 250              |
| Substitution by co-hyponym                          | 817              |
| Substitution by hyponym                             | 63               |
| Creation of a new word by morpho-semantic-syntactic| 12               |
| category                                            |                  |
| Creation of a phonetically expressive new word      | 0                |
| Substitution by parasyonym or equivalent             | 205              |
| Substitution by words that designate semantic       | 284              |
| attributes                                          |                  |
| Substitution and/or complementation of verbal by    | 16               |
| non- verbal semiotics                               |                  |
| Substitution and/or complementation of verbal       | 1                |
| semiotics by indicative gesture                      |                  |
| Substitution by cultural paraphrases                 | 0                |
| Substitution by designation of function             | 142              |
| Substitution by co-hyponym attribute                | 9                |
| Substitution by affective paraphrases                | 1                |
| Valorization of visual stimulus                     | 552              |
| Onomatopoeia                                        | 3                |
| Unintelligible segment                              | 3                |

as displayed in the ABFW Vocabulary test. Variations were also found for the words *privada* and *casinha* (Table 4).
fields with poorer performance coincided with previous studies, such as sites, clothing, food, and shapes and colors. The semantic field sites was also considered as the most difficult one in studies with children with phonological disorders and hearing impairment.

The corpus of this study consists of children without developmental delay or speech disorders. The results show that the performance of students from Maceió on the semantic fields sites, clothing, food, and shapes and colors do not match the standard expected by the ABFW vocabulary test. Thus, there is a question of whether difficulties encountered in these fields should be considered as inadequate performance or just different from the proposed standard.

Previous studies highlighted that tests that are intended to assess lexical competence should consider the size of Brazil and its regional diversity. Thus, there is a need to work towards standardization that can cover different states and regions in an attempt to obtain values representing the average national performance for children with typical development. While the importance of considering regional differences and the need to establish standardization of language testing is considered, the possibility of effective realization of this proposal should be discussed.

A study that investigated different instruments of lexical assessment found that the use of the dialogical interaction methodology is preferred against evocative tests and checklists for investigation of child vocabulary. However, one cannot fail to consider that test objectivity enables a more accurate analysis, because the results are analyzed and compared to the proposed values. Furthermore, the tests are also important to carry out scientific research as they allow reproduction of methods without difficulty.

On one hand, the dialogic interaction best represents the uniqueness of the language of a child, on the other, naming tests brings objectivity to the analysis. From this paradox, it is important to reflect on the best methodology to be used in clinical and research when investigating the vocabulary of children.

The children in the current study had low ND index, agreeing with other studies that found that it is more common for children to carry out a substitution process than to not to name an object. Thus, the tendency of children to name, define or characterize the images indicates that they show some type of knowledge about the figures that compose the test.

Cultural and developmental characteristics, familiarity with the word, lack of visual clarity of the figures and the frequency of accessibility to objects in everyday life of participants should be taken into account on picture naming tests.

The substitution processes most frequently found (Table 3) corroborate previous study: co-hyponym, visual stimuli, words that designate their semantic attributes, hypernym and parasynonym or equivalent.

The process of replacement by co-hyponym was called overextension diversion in a study that investigated child vocabulary. It is a process commonly observed in lexical acquisition and occurs when a child, due to a lack of a better term, searches for a different word that belongs to the same semantic field.

The substitution process for valorization of visual stimulus occurs when the child names a component that stands out in figure. This was the second most frequently used process by children in the current study and shows that specific characteristics of the images can contribute for process being amongst the most prevalent ones conducted by children.

The process of substitution of terms that designate their semantic attributes was the third most used by children from Maceió. It occurs when the child names qualities of the image, being them relevant or not. This process has not been described in other literature, but it shows that children often can not remember the target word so they describe features that represent the figure.

The substitution by hypernym was the fourth most frequent process and arises when there is a replacement of a word by another semantically broader word. The semantically broader terms of a semantic field are considered less marked and easier to be learned and remembered than the more marked ones. This indicates that the children still perform a generalization, using semantic features that do not specify the word.

The process of replacement by parasynonym is characterized by expressions that refer to the same meaning. With

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**Table 4. Description of regional variations found in the sample**

| Expected designation | Regional variations observed |
|----------------------|-----------------------------|
| **Casinha (little house)** | **Casinha de cachorro** |
| (n=1) | (n=3) |
| **Escorregador (slide)** | **Escorrega rela** |
| (n=0) | (n=19) |
| **Balança (swing)** | **Balanço** |
| (n=0) | (n=61) |
| **Privada (toilet)** | **Vaso, vaso sanitário e sanitário (toilet) Banheiro (bathroom) Pinico (potty)** |
| (n=5) | (n=53) | (n=13) | (n=4) |
| ** Others** | **Others** | **Others** |
| (n=6) | (n=2) | (n=10) |
regard to this process, the nomination of the word *viatura* (police car), from the semantic field transportation should be highlighted, since none of the students in this study appropriately named that figure. It was observed that 37.5% of children named *viatura* as *carro de polícia* and the other 62.5% named it as *carro (car)* or *polícia (police)*. This raises the possibility of this being considered not a substitution, but a semantic variation. It is suggested that *carro de polícia* is accepted as DVU when the vocabulary test is applied in Maceió.

The words that showed variations in naming were: *balança* (swing), *escorregador* (slide), *privada* (toilet) e *casinha* (little house) (Table 4). There was no usual designation for the words *balança* e *escorregador*. In fact, for the residents of the city of Maceió, the word *balança* refers to the machine that is used to measure weight, commonly found in places that sell products by weight, such as supermarkets. The toy that serves to balance, often found in children’s playgrounds, is called *balança*. In relation to the word *escorregador* (slide), it was observed that the designations *escorrega-rela, rela-rela e escorrega* were the most prevalent ones among children.

As for the word *privada*, it could be seen that, although five children in the sample have achieved the expected nomination by the test, most of the students used the words *vaso sanitário, vaso* and *sanitário*. All names described for *balança, escorregador* and *privada* agree with previous research[10], which recommends considering the variations found as usual designations to Maceió.

For the word *casinha* (little house) in the semantic field toys and musical instruments, only one child in the sample held the designation as expected. The other, made the substitution process called modification of grammatical category, in which the word *casinha* was named as *casa* (house). One can assume that the figure of *casinha* in the vocabulary test was not identified as a toy house and, for that reason, most children used the designation *casa* (house). In this case, the variation found could have been influenced by the image and not by regional variations.

The differences in the designation of words observed among children from Maceió bring the discussion not only to the need to nationally standardize tests assessing lexical performance, but also to the importance of considering the variations. It is noted that this goal can only be achieved through multi-centric studies, in collaboration with local researchers inserted in different regions of Brazil.

The tests that assess language are extremely important and necessary, both for clinical practice and for scientific research, but professionals who use these instruments need to consider these variations.

The sample needs to be expanded and selected according to statistical criteria. However, it was possible to observe that child vocabulary is influenced by social, cultural and economic factors. Further studies are suggested in order to characterize the vocabulary of children from different regions of the country.

**CONCLUSION**

The students of the first grade of elementary education in Maceió who composed this sample showed similar lexical performance regardless of gender and age. However, differences regarding the location of schools, which reflects possible interference of socioeconomic factors, were observed.

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