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Performance in receptive vocabulary and sociodemographic variables in schoolchildren complaining of learning difficulties

Desempenho em vocabulário receptivo e variáveis sociodemográficas em escolares com queixa de dificuldades de aprendizagem

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ABSTRACT

Purpose: To describe and relate the performance of receptive vocabulary in students with learning difficulties of different genders, educational levels, and socioeconomic levels. **Methods:** Documentary study, approved by the Research Ethics Committee under number 1,012,635, with 46 records between 2017 and 2019, considering demographic data: gender, education, and socioeconomic level of the family. The medical records included were those with complete speech-language assessments. To check the family's socioeconomic level, the questionnaire from the Brazilian Association of Research Companies - ABEP was used, and for the receptive vocabulary skill, the Picture Vocabulary Test - TVfusp139o. In this test, the classification very low, low, medium, high and very high is used. For the classification criterion to be presented as the average, the score of correct answers by education is 2nd grade (105.8), 3rd grade (112.8) and 4th grade (117.4). **Results:** Of the 46 participants in the sample, 31 (67.4%) were male and 15 (32.6%) female, with a predominance of students in the 4th year (34.80%) and socioeconomic class between levels B2 and D-E. In the vocabulary assessment, 28 (60%) of the 46 participants obtained an "average" classification. There was a correlation between education and receptive vocabulary performance ($p = 0.008$) and; between age and receptive vocabulary performance ($p = 0.007$). **Conclusion:** Performance in receptive vocabulary advanced with age and education, but there was no influence on a socioeconomic level.

Keywords: Language development; Low income; Education; Language tests; Learning

RESUMO

Objetivo: Descrever e relacionar o desempenho do vocabulário receptivo em escolares com dificuldades de aprendizagem de diferentes gêneros, escolaridades e níveis socioeconômicos. **Métodos:** Estudo documental, entre 2017 e 2019, considerando os dados demográficos gênero, escolaridade e nível socioeconômico da família. Os prontuários incluídos foram aqueles com avaliação fonoaudiológica completa. Para verificar o nível socioeconômico da família, foi utilizado o questionário da Associação Brasileira de Empresas de Pesquisa - ABEP e, para a habilidade do vocabulário receptivo, o Teste de Vocabulário por Figuras USP - TVfusp 139o. Nesse teste, o desempenho em vocabulário é classificado como "muito rebaixado", "rebaixado", "médio", "elevado" e "muito elevado". Para o critério de classificação apresentar-se na média, o escore de acertos por escolaridade é de 105,8 para o 2º ano, 112,8 para o 3º ano e 117,4 para o 4º ano. **Resultados:** Dos 46 participantes da amostra, 31 (67,4%) eram do gênero masculino e 15 (32,6%) do feminino, com predomínio de estudantes no 4º ano (34,80%) e classe socioeconômica entre os níveis B2 e D-E. Na avaliação do vocabulário, 28 (60%) participantes obtiveram classificação média. Houve correlação entre a escolaridade e o desempenho em vocabulário receptivo ($p=0,008$) e entre a idade e o desempenho em vocabulário receptivo ($p=0,007$). **Conclusão:** O desempenho em vocabulário receptivo avançou com a idade e a escolaridade, porém, não houve influência do nível socioeconômico.

Palavras-chave: Linguagem; Baixa renda; Educação; Teste de linguagem; Aprendizagem

Study carried out at Universidade Federal do Rio Grande do Norte – UFRN – Natal (RN), Brasil.

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INTRODUCTION

The relationship among phonological, semantic, morphosyntactic, and pragmatic levels provides for children's language acquisition and development[1]. Vocabulary is present at the semantic level and consists of an indirect access to language subdivided into expressive and receptive[2,3].

Expressive vocabulary corresponds to words spoken by children, while receptive words refer to the set of words accessed by children from their inferential skill to use contextual information. This allows their expressive vocabulary to evolve[4] and supports oral language development, since the phonetical production of a word must be understood for it to be spoken effectively[5].

The acquisition of this skill is complex and differs among school children of the same age group. Throughout the school years, vocabulary expands with fast-paced development peaks; however, in addition to individual biological conditions, vocabulary also varies according to the interference of environmental factors present in the individual's particular context, being influenced by both intrinsic and extrinsic issues, such as family and school settings and socioeconomic level[3,4,6,7].

At this point, it is worth highlighting the significant relationship between vocabulary development and socioeconomic level. Children experiencing lower socioeconomic conditions may present a more restricted receptive vocabulary given the difficulty in accessing linguistic and cognitive stimuli and shortage of stimulation resources[8]. Such a lack of material resources and leisure activities may be behind the lower performance of low-income children in vocabulary tests[6]. Thus, socioeconomic level has an indirect impact on semantics, mediated by parents' capacity to provide a proper environment for its stimulation, which is impaired in families experiencing lower socioeconomic conditions[9,10].

Furthermore, children from families in those conditions may experience learning difficulties marked by failures in linguistic skill development processes, especially in the reading and writing scopes, thus impacting on the child's entry into the formal school process[11,12].

Vocabulary seems to be directly related to the process of learning to read and write; therefore, understanding the lexical development is fundamental to identify different lexical developmental profiles in children[13,14], in addition to analyzing the variables linked to the learning process, such as socioeconomic level. Thus, a longitudinal perspective of vocabulary development and its relationship with socioeconomic level must be thorough, especially in cases involving school complaint.

Language performance in children with learning difficulties and disorders is generally marked by a vocabulary deficit. Since early ages, children at familial risk for dyslexia already experience impaired receptive vocabulary, later influencing further reading development. In cases where such delay is severe, difficulties in the development of phonological awareness skills are also expected[15].

By considering the relationship among vocabulary, socioeconomic level, and reading comprehension, this research goal is to explore the current gap in the literature over the relationship among the variables of gender, education, and socioeconomic level. Our study covers a particular group of individuals with learning difficulties that represent risks of potential disorders.

In view of the above and considering the effect of social and economic background on the receptive vocabulary development, we established the following research question: "Do sociodemographic variables influence receptive vocabulary performance in children with learning difficulty complaints?" To answer this question, our objective was to describe the receptive vocabulary performance in children and adolescents with learning difficulties from different educational and socioeconomic levels, attended at the Laboratory of Writing Language, Interdisciplinarity and Learning – LEIA, of the Federal University of Rio Grande do Norte (UFRN).

METHOD

This research was approved by the Research Ethics Committee of the Onofre Lopes University Hospital of the Federal University of Rio Grande do Norte – HUOL/UFRN, protocol 1.012.635, CAAE 42847315.1.0000.5292.

We applied the retrospective documentary research method based on medical records analysis covering the period from 2017 to 2019. We explored data in the medical history and assessment of patients from the LEIA Laboratory, whose purpose is to assess and intervene with children and adolescents with school difficulty complaints to identify potential signs of learning disorders. In general, these school children are directed to LEIA by other health or educational services, the teaching clinic of Speech Therapy of the UFRN, or spontaneously by their families.

The selection of medical records was based on the following inclusion criteria: children who participated in comprehensive phono audiological assessment process in laboratory and availability of anamnesis data presenting complaint of reading comprehension, writing and/or mathematics difficulties. In turn, the exclusion criteria covered children and adolescents with history of already diagnosed uncorrected sensory, neurological and/or psychiatric problems, that is, prior alterations that could explain their learning difficulties. Forty-six out of 100 medical records met the inclusion criteria to be analyzed in this study.

We established a protocol for the demographic data analysis of choice and receptive vocabulary assessment from the prior anamnesis:

- Demographic data: analysis covered the following specific data from the semistructured anamnesis of the LEIA Laboratory: gender, age, child's education, and family socioeconomic level by means of a questionnaire by the Brazilian Association of Research Companies – ABEP[16], dividing the population into A, B1, B2, C1, C2, and D-E classes based on the ownership of items present in the households and educational level of the heads of the households.

- Receptive vocabulary: Picture Vocabulary Test – USP - TVfusp[17], extended version (TVfusp139o), to assess auditory vocabulary development (word comprehension). Instrument composed of 139 stimuli, each containing four pictures of choice. The child must choose the picture that corresponds to the word spoken by the examiner. Total score and classifications per educational grade were considered, respectively. According to the number of hits, receptive vocabulary is classified as "very low", "low", "average", "high", or "very high".

Classification criterion: average performance, score of hits by education of 105.8 for the 2nd grade, 112.8 for the 3rd grade, and 117.4 for the 4th grade. Considering the learning difficulties of the children and adolescents seen at the LEIA Laboratory and the absence of any Brazilian receptive vocabulary test for the 5th grade, we applied the maximum score in the test, the 4th grade, for school children in the following grades. The score analysis procedure was performed beforehand. Thus, our research results are classified according to this test (very low, low, average, high, or very high). All families signed an Informed Consent Form (TCLE).

Data analysis covered a descriptive analysis of category and quantitative variables by means of absolute (n) and relative (%) frequencies and average, standard deviation, minimum and maximum values, respectively. The results of demographic data variable are graphically represented, whereas vocabulary performance frequency by gender, age, education, and socioeconomic level are tabulated. Inferential analysis was performed using Pearson's chi-square test to associate the classifications of receptive vocabulary and socioeconomic and educational levels, as well as receptive vocabulary. Spearman Correlation Coefficient (cc) verified the occurrence of correlation between the values of receptive vocabulary performance and age with a magnitude classified as follows: negligible (less or equal to 0.3), weak (between 0.4 and 0.5), moderate (between 0.6 and 0.7), strong (between 0.8 and 0.9), or very strong (higher than 0.91). Statistical significance level for all inferential analysis tests was $p \leq 0.05$.

RESULTS

The sample encompasses 46 medical records of children and adolescents aged between 6 and 16 presenting learning difficulty complaints.

The descriptive analysis of demographic data from the anamnesis showed 16 (32.60%) female and 31 (67.40%) male individuals in the total sample, mostly aged between 9 and 10 years old, respectively (Figure 1).

As for the educational level, the participants attended elementary school I and II (as in the Brazilian system), with prevalence of elementary school I students (85.95%). The socioeconomic analysis reveals that the public attended corresponded to the B2 and D-E classes, according to the classification of the Brazilian Association of Research Companies (Figure 2).

In the intragroup proportion, the descriptive analysis between genders shows a greater average performance frequency for both, with a higher concentration of boys between high and very high performances (Table 1).

Performance in the distribution by age, education, and socioeconomic level also concentrated on the average level of receptive vocabulary (Tables 2, 3, and 4).

The inferential analysis using Spearman Correlation Coefficient test found statistically significant correlation between age and receptive vocabulary (p=0.007), but with a weak magnitude (cc=0.395). In turn, the Pearson's chi-square test found correlation (p=0.008) between vocabulary and education, indicating that the higher the educational level the better the receptive vocabulary performance. As for the relationship between receptive vocabulary and socioeconomic level, the Pearson's chi-square test found no association between them (p=0.458) (Table 5).

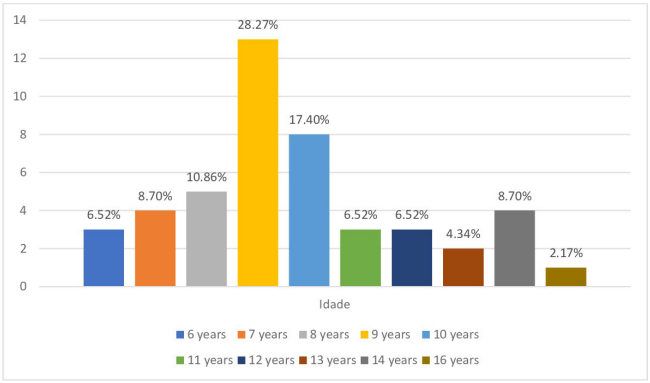

Figure 1. Age distribution in the sample

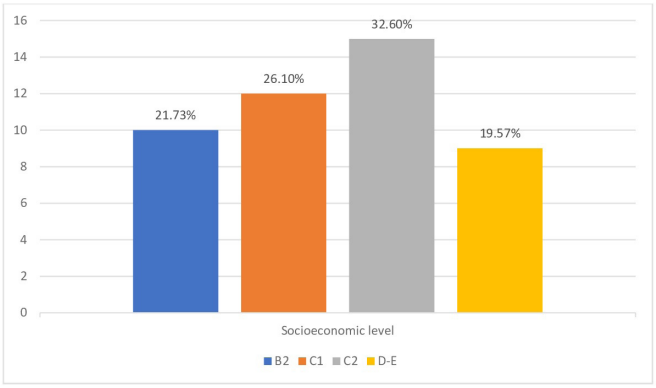

Figure 2. Level socioeconomic distribution in the sample

DISCUSSION

A holistic perspective of language development, especially regarding the relationship between vocabulary and children's socioeconomic setting, is much relevant to detect signs of involvement in linguistic-cognitive development. In this sense, this research aimed to describe the receptive vocabulary performance in school children from different educational levels with learning difficulties and associate it to the sociodemographic variable.

Reading comprehension is influenced by multiple educational, cognitive, psychological, and developmental variables. In general, our sample presented average vocabulary performance by education[17], which may not elucidate the origin of the learning difficulties. Thus, other factors may have influenced these children's reading development, like family background, for potential learning disorders[18], phonological processing deficit[19], and other related pedagogical issues.

As for gender, we found similar frequency between boys and girls for the average receptive vocabulary performance, with better results for girls, who use more learning strategies[20]. In contrast, the proportion of number of boys with performance between high and very high was larger. At this point, it is worth

Table 1. Description of performance frequency of receptive vocabulary by gender

		Female	Male	f Grand total (%)
Very high	*f* (%)	1 (6.66%)	2 (6.45%)	3 (6.52%)
High	*f* (%)	1 (6.66%)	5 (16.12%)	6 (13.04%)
Average	*f* (%)	10 (66.66%)	18 (58.06%)	28 (60.86%)
Low	*f* (%)	1 (6.66%)	1 (3.22%)	2 (4.34%)
Very low	*f* (%)	2 (13.33%)	5 (16.12%)	7 (15.21%)
Total by gender	*f* (%)	15 (100%)	31 (100%)	46 (100%)

Subtitle: f = performance frequency; % = percentage

Table 2. Description of performance frequency of receptive vocabulary by age

	Very high *f* (%)	High *f* (%)	Average *f* (%)	Low *f* (%)	Very low *f* (%)	f Total (%)
6 years	0 (0%)	0 (0%)	1 (2.17%)	1 (2.17%)	1 (2.17%)	3 (6.62%)
7 years	0 (0%)	0 (0%)	1 (2.17%)	0 (0%)	3 (6.52%)	4 (8.69%)
8 years	1 (2.17%)	1 (2.17%)	3 (6.52%)	0 (0%)	0 (0%)	5 (10.86%)
9 years	1 (2.17%)	2 (4.34%)	9 (19.56%)	0 (0%)	1 (2.17%)	13 (28.26%)
10 years	0 (0%)	0 (0%)	7 (15.21%)	0 (0%)	1 (2.17%)	8 (17.39%)
11 years	0 (0%)	0 (0%)	3 (6.52%)	0 (0%)	0 (0%)	3 (6.62%)
12 years	0 (0%)	2 (4.34%)	1 (2.17%)	0 (0%)	0 (0%)	3 (6.62%)
13 years	0 (0%)	0 (0%)	2 (4.34%)	0 (0%)	0 (0%)	2 (4.34%)
14 years	1 (2.17%)	1 (2.17%)	1 (2.17%)	1 (2.17%)	0 (0%)	4 (8.69%)
16 years	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2.17%)	1 (2.17%)
Total f (%)	3 (6.62%)	6 (13.04%)	28 (60.86%)	2 (2.17%)	7 (15.21%)	46 (100%)

Subtitle: f = performance frequency; % = percentage

Table 3. Description of performance frequency of receptive vocabulary by education

	Very high *f* (%)	High *f* (%)	Average *f* (%)	Low *f* (%)	Very low *f* (%)	Total *f* (%)
1st grade	0 (0%)	0 (0%)	1 (2.17%)	1 (2.17%)	4 (4.34%)	6 (13.04%)
2nd grade	1 (2.17%)	1 (2.17%)	2 (4.34%)	0 (0%)	0 (0%)	4 (8.69%)
3rd grade	1 (2.17%)	1 (2.17%)	7 (15.21%)	0 (0%)	1 (2.17%)	10 (21.73%)
4th grade	0 (0%)	2 (4.34%)	12 (26.08%)	0 (0%)	2 (4.34%)	16 (34.78%)
5th grade	0 (0%)	0 (0%)	4 (8.69%)	0 (0%)	0 (0%)	4 (8.69%)
6th grade	0 (0%)	1 (2.17%)	1 (2.17%)	1 (2.17%)	0 (0%)	3 (6.52%)
7th grade	0 (0%)	0 (0%)	1 (2.17%)	0 (0%)	0 (0%)	1 (2.17%)
8th grade	0 (0%)	1 (2.17%)	0 (0%)	0 (0%)	0 (0%)	1 (2.17%)
9th grade	1 (2.17%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2.17%)
f Total (%)	3 (6.52%)	6 (13.04%)	28 (60.86%)	2 (4.34%)	7 (15.21%)	46 (100%)

Subtitle: f = performance frequency; % = percentage

Table 4. Description of performance frequency of receptive vocabulary by socioeconomic level

	Very high *f* (%)	High *f* (%)	Average *f* (%)	Low *f* (%)	Very low *f* (%)	f Total (%)
B2	1 (2.17%)	1 (2.17%)	8 (17.39%)	0 (0%)	0 (0%)	10 (21.73%)
C1	2 (4.34%)	1 (2.17%)	7 (15.21%)	0 (0%)	2 (4.34%)	12 (26.08%)
C2	0 (0%)	3 (6.52%)	7 (15.21%)	2 (4.34%)	3 (6.52%)	15 (32.60%)
D-E	0 (0%)	1 (2.17%)	6 (13.04%)	0 (0%)	2 (4.34%)	9 (15.56%)
f Total (%)	3 (6.52%)	6 (13.04%)	28 (60.86%)	2 (4.34%)	7 (14.21%)	46 (100%)

Subtitle: f = performance frequency; % = percentage; B2, C1, C2, D-E = socioeconomic classification

Table 5. Correlation between receptive vocabulary and level socioeconomic, age, and education

	Socioeconomic level	Age	Education
p value	0.458*	0.007**	0.008*
Likelihood ratio	0.266*	0.621*	0.160*

*Chi-square test; **Spearman Correlation Coefficient

noting that fewer girls than boys participated in this study. No consensus is reached in the literature on this topic, most studies indicate major language development changes in boys in relation to girls[21] and demonstrate no significant performance differences between genders[22]. Prospective studies should better explore larger samples of individuals with learning difficulties to understand the relationship of high vocabulary performance and learning issues between genders.

As for age and education, older children achieved better performance in the receptive vocabulary test. Therefore, as reported in the literature, education and vocabulary were significantly related in children with typical language development at the 3rd to 5th elementary school grades[23]. This study also regarded the analysis of age variable as significant information since children with learning difficulties should be studied from their own developmental perspective, as the current educational system does not provide for sufficient support.

Receptive vocabulary is a fundamental predictor of reading comprehension, and it is crucial to deepen studies on school children with difficulty in this skill acquisition. The quality of knowledge on vocabulary relates to an improved reading comprehension rather than the number of words in the lexicon, as interpretation skills for the different meanings of a word in the oral language are transferred to their respective use in the written language[24]. Individuals with good receptive vocabulary become more skilled readers, indicating a link to their reading comprehension potential[22]. Thus, there is a correspondence relationship between vocabulary and reading performance in children at the 2nd to 5th elementary school grades[25] without learning difficulty complaints. Hence, children with adequate receptive vocabulary performance presented no indicators of reading comprehension changes[26], once again referring to other possible etiologies of linguistic and cognitive factors associated with learning to read.

Such a targeted view is crucial to the understanding of the educational reality of children with low receptive vocabulary performance for a potential solution. Therefore, intervention strategies must be explored continuously as such approach contributed to enhance vocabulary receptive performance in children with learning difficulties[27].

In the socioeconomic scope, our findings demonstrate that the children and adolescents attended by the public service studied had different socioeconomic levels, between B2 and D-E. Still, there were no significant correlations between receptive vocabulary and socioeconomic level, even though other studies have pointed to the effect of family socioeconomic level on school children's performance in receptive vocabulary tests – lower than upper-class school children[25,28].

Such divergent findings may be linked to the children being at a later stage of oral language acquisition and development, since receptive vocabulary is one of the first skills to develop in a child[29,30]. In a sense, it already points to the learning difficulties of those with lower performance, even by the age of the individuals studied.

Our performance results divergent from the literature may be linked to the sample ranging school children over 9 years old, as the socioeconomic level is not likely to influence subsequent age groups and permanence in the school environment for some years can assist in the acquisition recovery of this skill, regardless of the family effect. Thus, by expanding the sample aimed at learning difficulty issues in groups already identified from a differential diagnosis perspective, further studies can support the understanding of these relations among the variables studied. Furthermore, understanding this relationship in the context of an attendance service can help to direct actions to a particular public, including the choice of skills for both assessment and intervention.

CONCLUSION

The results found a concentration of high to very high performance in boys, which should be addressed in further studies once it diverges from most reports in the literature for the male gender and its relationship with learning difficulties. Furthermore, receptive vocabulary performance proved to have advanced with age and educational level, as in prior reports in the literature for children with typical development.

Considering the occurrence of average receptive vocabulary performance in children and adolescents from different socioeconomic levels, between B2 and D-E, it appears that the consolidation of this oral language skill had no effect of the socioeconomic factor in this group of children school with learning difficulties.

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