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The influence of sociocultural and biological variables on the performance of receptive language in preschool children

A influência de variáveis socioculturais e biológicas no desempenho da linguagem receptiva em pré-escolares

La influencia de variables socioculturales y biológicas en el desempeño del lenguaje receptivo en preescolares

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Abstract

Introduction: Child development consists of a process of continuity and change in several interdependent domains. Receptive language, in turn, becomes important in the development of communication, because through it the child develops phonological awareness skills, conversation behaviors, among others. **Objective:** To verify the influence of socio-cultural and biological aspects on the receptive language performance of pre-school children. **Methods:** Thirty children in the 24-36 month age group participated in the study duly enrolled in the maternal I of two municipal centers of early childhood education. A questionnaire prepared by the researchers was applied to the collection of biological, economic and social data of the sample. Children with hearing, neurological and / or visual impairment were excluded. To verify the development of the language was applied the proof regarding the receptive language of the Bayley III Scale of Child Development. The Bayley score was correlated

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CPMV: wrote the scientific article.
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with social and biological variables in the present study. **Results:** In the Bayley III scores, 63.33% (n = 19) children were below the mean of the receptive language test. The variables family income and sex and the receptive language score were statistically significant. **Conclusion:** The performance of the preschool language was lower than expected for the age group according to the scores obtained in Bayley III. It can be considered that biological aspects are recognized as a precondition for language acquisition and development while environmental aspects are determinant aspects for the quality of language skills.

Keywords: Child Development; Language; Preschool.

Resumo

Introdução: O desenvolvimento infantil consiste em um processo de continuidade e mudanças em vários domínios interdependentes. A linguagem receptiva por sua vez se faz importante no desenvolvimento da comunicação, pois por meio dela a criança desenvolve habilidades de consciência fonológica, comportamentos de conversação, entre outros. **Objetivo:** Verificar a influência de aspectos socioculturais e biológicos no desempenho da linguagem receptiva de crianças pré-escolares. **Métodos:** Participaram do estudo 30 crianças na faixa etária entre 24 e 36 meses devidamente matriculadas no maternal I de dois centros municipais de educação infantil. Foi aplicado um questionário elaborado pelos pesquisadores para a coleta de dados biológicos, econômicos e sociais da amostra. As crianças com alterações auditivas, neurológicas e/ou visuais foram excluídas. Para verificar o desenvolvimento da linguagem foi aplicada a prova de linguagem receptiva da Escala *Bayley III* de Desenvolvimento Infantil. A pontuação do escore da *Bayley* foi correlacionada com variáveis sociais e biológicas no presente estudo. **Resultados:** Nos escores alcançados na escala *Bayley III,* 63,33% (n=19) crianças ficaram abaixo da média do teste de linguagem receptiva. As variáveis renda familiar e sexo e o escore de linguagem receptiva foram estatisticamente significativas. **Conclusão:** O desempenho da linguagem de pré-escolares foi inferior ao esperado para a faixa etária de acordo com os escores obtidos na *Bayley III*. Pode-se considerar que os aspectos biológicos são reconhecidos como pré-condição para aquisição e desenvolvimento da linguagem, enquanto os aspectos ambientais são determinantes para a qualidade das habilidades de linguagem.

Palavras-chave: Desenvolvimento infantil; Linguagem; Pré-escolar.

Resumen

Introduccion: El desarrollo infantil consiste en un proceso de continuidad y cambios en varios dominios interdependientes. El lenguaje receptivo a su vez se hace importante en el desarrollo de la comunicación, pues por medio de ella el niño desarrolla habilidades de conciencia fonológica, comportamientos de conversación, entre otros. **Objetivo:** Verificar la influencia de aspectos socioculturales y biológicas en el desempeño del lenguaje receptivo de niños preescolares. **Metodos:** Participaron del estudio 30 niños en el grupo de edad entre 24 y 36 meses debidamente matriculados en el maternal I de dos centros municipales de educación infantil. Se aplicó un cuestionario elaborado por los investigadores para la recolección de datos biológicos, económicos y sociales de la muestra. Los niños con alteraciones auditivas, neurológicas y/o visuales fueron excluidos. Para verificar el desarrollo del lenguaje se aplicó la prueba de lenguaje receptivo de la Escala Bayley III de Desarrollo Infantil. La puntuación de la puntuación de Bayley fue correlacionada con variables sociales y biológicas en el presente estudio. **Resultados:** En los escasos alcanzados en la escala Bayley III, el 63,33% (n = 19) niños quedaron por debajo del promedio de la prueba de lenguaje receptivo. Las variables de ingreso familiar y sexo y la puntuación de lenguaje receptivo fueron estadísticamente significativas. **Conclusión:** El desempeño del lenguaje de preescolares fue inferior al esperado para el grupo de edad de acuerdo con los escasos obtenidos en Bayley III. Se puede considerar que los aspectos biológicos son reconocidos como precondición para la adquisición y el desarrollo del lenguaje mientras que los aspectos ambientales son aspectos determinantes para la calidad de las habilidades del lenguaje.

Palabras claves: Desarrollo Infantil; Lenguaje; Preescolar.

Introduction

Child development consists of a process of continuity and change in several interdependent domains: motor, cognitive and psychosocial, which are under the influence of genetic, biological and environmental factors. Physical, social, economic and emotional environments may positively or negatively affect the development of children and promote long-term impacts, such as the achievement of school success and social and work life in adulthood[1].

Before children start talking, they begin their communication through their eyes, facial expression and gesture in order to establish a way of communication with others. In addition, there is also the ability to discriminate speech sounds early. Learning the linguistic code is related to the existing knowledge between the use of objects, actions and the places where children attend[2].

Receptive language becomes important in the development of communication, because through it the child develops phonological awareness skills, conversation behaviors, and other behaviors involving shift changes, initiatives related to expression or verbal exploration, use of gestures and eye contact, evolving to understand stories. Access to toys that allow symbolic play and stimulate the development of fine motor skills is associated with many benefits for children, as early receptive language skills, intrinsic motivation, and a positive attitude towards learning. In addition, the child's familiarity with story books is related to the receptive vocabulary, as well as the initial reading ability. These story books allow a prognosis of parental practices, since they may be able to enable the learning of relevant verbal, social and academic skills in personal life[3].

In the typical language development, the oral comprehension consists mainly from the birth to five years of age, after which it will only be improved. Listening children, up to six years of age, already mastered almost all the essential elements needed to be competent communicators in their language. This moment is known as the critical period for language development[4].

The early detection of problems related to children development is a challenge. This detection has contributed so that changes in development may be unnoticed and often only become evident very late when the child enters elementary school. Most scales used in developmental assessment are based on the maturation that is perceived through the acquisition of new abilities of children over time, which can be observed and monitored[5].

According to this context on the receptive language development and the variables that influence its development, the objective of this research is to verify the influence of socio-cultural and biological aspects on the receptive language performance of preschool children.

Methods

This is a quantitative, observational, analytical and cross-sectional study, approved by the Research Ethics Committee, under the no. 1,941,492 and CAAE: 542840161.00005011.

The legal guardians for minors received the information on the objectives and procedures of the study, then signed the Free and Informed Consent Term (FICT) and answered a questionnaire prepared by the study applicator with respect to biological, economic and social data of the child.

The sample consisted of 30 participants, all born at term, with gestational age between 39-40 weeks. The inclusion criteria were as follow: children of both sexes, enrolled in Kindergarten I, in the 24-36 month age group, from two educational centers of a municipality in the Brazilian Northeast, without hearing, neurological and/or visual impairment diagnosed by specialists, as registered in the institution.

The Bayley-III scale, which is considered as a 'gold standard', was the instrument used to check the language development mainly because it encompasses a very complete and detailed assessment of neuropsychomotor development. This scale is composed of 326 items and assess five areas of development: motor (gross and fine), cognitive, language (receptive and expressive), socioemotional and adaptive behavior. This tool is a standardized assessment of mental, motor and language skills of children aged 15 days to 42 months[6,7].

The scale was individually applied in the school environment and it lasted one hour for each child on average. By default, the application was terminated after five consecutive errors presented by the participant. Children's understanding was observed through semi-directive dialogue and playful games proposed by the test. Tasks were performed with docking toys; 04-piece puzzle;

miniatures of objects, such as glasses, doll and ball; storybooks and picture books, in addition to the interaction with the researcher and the guardian.

In this study, through oral production the applicator requested an action and the child would have to perform it by pointing to a specific object exposed in the application environment. From this, the applicator would identify if the action performed by the child was correct according to what was requested.

Thus, children would score 1 point for each task that they understood, thus obtaining a maximum score of 17 points for the selected tests of the receptive language scale, since the items that are applied with children of age higher than that of the study population were excluded. The Bayley-III scale consists of 326 items. Of these, 49 items assess the receptive language, and 17 items that correspond to the age range of the children studied were used, each item being equivalent to 1 point.

According to the scores in the scale, scores lower than 9 points were considered as receptive language impairment. The score obtained in the assessed area was correlated with the secondary variables included in the study: the gender of the participants; income and maternal education.

The Excel Office 2010 software and the BioEstart 5.3 statistical software, with the Pearson correlation, Spearman correlation and Independent Samples T Test were used for data analysis. The results regarding receptive language have been described and are shown in statistical tables. A 95% confidence interval and a significance level of 5% were used.

Results

30 children participated and were evaluated, of which 53.33% (n=16) were female and 46.66% (n=14) were male. Regarding the sociocultural variables of maternal education, it could be noticed that 60% (n=18) had less than 10 years of schooling (elementary education II) and 40% (n=12) had more than 10 years of schooling. While in relation to family income, 73.33% of the children (n=22) had a family with low socioeconomic status and 33.33% (n=8) had a socioeconomic level for one and a half minimum wage.

Table 1. Distribution according to the study variables and the performance on receptive language skills.

ID	Gender*	Age Months	Maternal education (years)	Income	Receptive language
1.	2	29	12	1200	12
2.	1	26	9	890	7
3.	1	24	7	1700	7
4.	1	26	14	2700	6
5.	1	27	12	1800	6
6.	2	26	12	890	6
7.	1	26	12	890	4
8.	2	27	17	1500	12
9.	1	26	9	890	13
10.	1	27	12	350	5
11.	2	28	5	170	13
12.	2	29	9	890	12
13.	2	29	9	500	10
14.	1	29	10	1300	13
15.	1	30	12	700	11
16.	1	30	10	890	3
17.	2	30	10	870	10
18.	2	29	17	1500	17
19.	1	26	2	0	5
20.	1	26	9	890	4
21.	2	27	7	890	4
22.	2	30	5	890	9
23.	1	26	7	2700	8
24.	2	35	2	890	9
25.	2	32	4	790	6
26.	1	32	1	800	9
27.	2	36	4	790	8
28.	2	32	4	790	7
29.	2	33	2	790	9
30.	2	33	2	112	10

Legend: *1 male; 2 female.

According to the analysis conducted with an average score of 10 points, 63.33% (n=19) of the children were below the average in the receptive language test. Of these, 11 were male (57.8%), 15 had a low income family (78.9%) and 13 (68.4%) had a mother with less than 10 years of schooling.

Table 2. Correlation between biological and sociocultural variables and the performance of the receptive language skills.

Variables	Receptive Language Score r(p-value)*
Gender	0.0494
Income	0.0059
Maternal education	0.3217

Legend: *Pearson correlation coefficient.

According to the statistical analysis and to the scores obtained for the receptive language ability on the Bayley-III scale, the gender and income variables showed statistically significant values, with $p<0.05$. However, the maternal education variable showed no statistical significance with $p>0.3$. Thus, the data presented showed that children tend to have a better language development in families with a higher socioeconomic level, as described in Table 2.

Table 3. Comparison of the performance of receptive language skills between genders, with statistical significance.

	Number of participants	Mean*	Variance**
Female	16	9. 6250	10.1167
Male	14	7.2143	10.4690

Legend: *Coefficient of correlation of Independent Samples T Test.
**p>numerical value.

From the analysis conducted using the data obtained, the Independent Samples T Test was also applied in order to compare the mean of the receptive language results between genders; therefore, the application of this test identified significant values, showing that the receptive language performance in females is significantly better when compared to the receptive language in males.

Discussion

Children in the 24-36 month age group are expected to, for example, be able to identify objects, understand inhibitory words, follow instructions in the context of play, identify body parts, clothing, and actions in the vocabulary of semantic categories and understand pronouns. Children with a score above 10 (n = 11) reached some of the receptive language characteristics, as proposed by Bayley III, among them: Identification of objects, identification of semantic categories (body parts) in the vocabulary and understanding of pronouns.

63.33% of the children in this study had below average results in the receptive language. This data corroborates a study conducted in nurseries and preschools that showed that 44.3% of the children had receptive language below the expected average for the age[5]. Despite the use of the Behavioral Development Scale of Gesell and Amatruda (BDSGA) in this study, it also assessed the receptive language development using objects for identification, as well as similar number of participants and evaluated aspects.

The gender variable indicates a correlation with the receptive language. Studies report that there is a significant correlation between children of both sexes, since girls always show superior performance in language tests when compared to boys[9-11]. The language development was significantly lower for male participants. Such data may be suggested considering the speed of neurological maturation, which indicates that the boys' brains present a slower maturation when compared to girls, and therefore would be more vulnerable to risks of all kinds[9-11].

The findings of this study showed a significant association between the receptive ability performance and family income, confirmed by researches that indicate that children whose family has low

socioeconomic level have lower receptive language score[12-14].

Studies indicate that children whose families have a high socioeconomic level may be more likely to opportunities for language stimulation, since their families would be able to provide a greater variety of stimuli and, thus, different strategies so that the child could achieve a better language development[12-14].

Also according to the findings in this study, low-income families have a greater need to accumulate several jobs or an excessive workload, thus resulting in little contact of parents with their children and probably little variety of stimuli, which may lead to a language development delay[15].

The lack of a significant correlation between maternal education and preschool performance on the Bayley III scale shows that this variable is not necessarily a definitive rule, in which a child whose mother has less years of study would necessarily have a deficit when compared to others children whose mothers have a higher educational level. However, there are studies that show significant relationship between maternal education and the receptive language score, suggesting that the worst performance in the receptive language was correlated with the lower educational level of the mother, which also indicates the importance of the educational level of parents in promoting child development[13,16]. However, the Bayley III score scale is not used in these studies, which may explain the difference found.

Conclusion

The performance of the receptive language in preschool children was lower than expected for the age group according to the scores obtained in Bayley III. It can be considered that biological aspects are recognized as a precondition for language acquisition and development while environmental aspects (family dynamics and environmental style) are determinant aspects for the quality of language skills. In addition, the conduction of new studies chronologically directed to the receptive language is suggested, since research in this topic is relevant in order to monitor the performance of children in the preschool period that impact the language development, since the receptive language is directly correlated to cognitive skills, which are the basis for school learning.

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