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Application of a vocabulary screening instrument for children between 3- and 7-years-old: a pilot study

Aplicação de um instrumento de triagem do vocabulário para crianças entre 3 e 7 anos: estudo piloto

Keywords

Vocabulary
Child
Child Language
Mass Screening
Validation Study

Descritores

Vocabulário
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ABSTRACT

Purpose: to describe the performance of children between three and seven years of age in using an expressive and receptive screening instrument. **Methods:** the sample consisted of 133 children between 3 and 7 years of age, without diagnoses of neurodevelopmental disabilities or disorders. The screening was performed with the TRILHAR instrument, which includes receptive and expressive vocabulary skills. The data were analyzed by the Kruskal-Wallis, Mann-Whitney, and Spearman Correlation tests. **Results:** we observed a statistical difference in the groups' performance, in addition to a positive correlation between the age group and the final score in the screening. There was statistical difference in the performance on the receptive and expressive vocabulary subtests. **Conclusion:** We observed difference in the performance of the groups in receptive and expressive tasks, and in the final score, with better performance for the children with 7 years. In addition, age and performance on the screening test were positively correlated, that is, the older the age, the better the performance.

RESUMO

Objetivo: descrever o desempenho em vocabulário expressivo e receptivo de crianças entre três e sete anos de idade em um instrumento de triagem. **Método:** a amostra foi composta por 133 crianças entre três e sete anos de idade, sem diagnósticos de deficiências ou transtornos do neurodesenvolvimento. Para a triagem, foi utilizado o instrumento TRILHAR, que inclui as habilidades de vocabulário receptivo e expressivo. Os dados foram analisados pelos testes Kruskal-Wallis, Mann-Whitney e Correlação de Spearman. **Resultado:** houve diferença no desempenho dos grupos, além de correlação positiva entre a faixa etária e a pontuação na triagem. Ainda, verificou-se diferença nos desempenhos das provas de vocabulário receptivo e expressivo. **Conclusão:** Foi verificada diferença no desempenho dos grupos nas tarefas de vocabulário receptivo, expressivo e no resultado final, com melhores resultados para o grupo de sete anos. Além disso, observou-se correlação positiva entre a idade e o desempenho na triagem, ou seja, quanto maior a idade, melhor o desempenho.

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INTRODUCTION

The vocabulary is formed by receptive and expressive skills, which correspond to the understanding and production of words, respectively⁽¹⁾. Words' form and meaning are stored in the lexical-semantic system⁽²⁾. During development, learning a new vocabulary allows communication between the child and the environment in which it is inserted⁽³⁾.

One of the first milestones in vocabulary development is the production of the first word at approximately 12 months of age. In this age group, about 86% of the guardians notice significant changes in their children's expression⁽⁴⁾. Commonly, the first appointments are related to objects, food, animals, body parts and routine activities⁽⁵⁾. After 18 months, usually, when the lexicon is formed by 50 words, vocabulary acquisition starts to occur quickly⁽⁶⁾, characterizing the vocabulary explosion⁽⁷⁾. During this period, words are used in sentences and coordinated with the use of gestures⁽⁸⁾. Another important semantic growth will be noticed after school insertion⁽⁹⁾. Through reading, there will be contact with low-frequency words in the oral language, which allows for incidental learning, especially in the case of narrative texts⁽¹⁰⁾.

The restricted vocabulary is considered a risk sign for language disorders⁽¹¹⁾, therefore, the importance of this aspect of language. Individuals with this characteristic may experience delays at the morphosyntactic level⁽¹²⁾, difficulties in socializing⁽¹³⁾, decoding⁽¹⁴⁾ and reading comprehension⁽¹⁵⁾, aggressive behaviors, depression, and anxiety⁽¹⁶⁾. Longitudinally, many of these children persist with difficulties, especially those identified late⁽¹³⁾.

In the national literature, validated instruments for vocabulary assessment are available, which have been fully researched, they are: Auditory Vocabulary Test by Figures USP (TVfUSP), ABFW Child Language Test, Token Test, Auditory Vocabulary Test, among others⁽¹⁷⁾. The purpose of these tests is to clinically assess vocabulary performance and obtain a diagnosis.

Despite the number of assessment instruments, there are few national studies dedicated to screening vocabulary and its application in children who speak Brazilian Portuguese. As evidenced in a previous literature review⁽¹⁸⁾, there are vocabulary screening tools for English speakers, duly validated for this population, such as the Dynamic Indicators of Vocabulary Skills⁽¹⁹⁾, Language Development Survey⁽²⁰⁾ and the Receptive Vocabulary Screener Application⁽²¹⁾. These instruments are capable of early detection of children with risk signs in relation to the semantic level of language, which makes it possible to promote early intervention practices.

Given the above, there is a need for research dedicated to the creation, validation, and application of screening in the area of children's language. This study aimed to apply a screening tool for receptive and expressive vocabulary in children between 3 and 7 years of age. The study hypothesizes that there will be a difference in performance between the age groups, with an increase in the number of correct answers in the screening according to the advancing age.

METHODS

Type of study and ethical aspects

This is a descriptive, cross-sectional, and quantitative study, approved by the Ethics Committee, opinion number 2.548.341. Adults responsible for the participants signed the Informed Consent Form (ICF) and the participants signed the Informed Assent Form (IAF).

Participants

Initially, 136 children were selected, but one had a diagnosis of Down Syndrome and two of Autism Spectrum Disorder (ASD). The final sample included 133 children from kindergarten to the first year of the elementary school, enrolled in public schools in the city where the study was applied. Of those, 45.9% (n=61) were male and 54.1% (n=72) female, with an average age of 4.99 years (sd=1.384), subdivided into the following groups, according to the age group: G1 - 38 children aged three; G2 - 21 children with four years of age; G3 - 30 children with five years of age; G4 - 32 children aged six; G5 - 22 children with seven years of age. The sample was selected for convenience, according to the availability of the children. As it is a pilot study to verify the initial aspects of the application of the instrument, no sample calculation was performed.

The following inclusion criteria were taken into account: children between three and seven years of age regularly enrolled in public education, without a diagnosis of syndromes, disabilities or neurodevelopment disorders, according to the teacher's report or previous diagnosis. If the researchers detected any change in language development, the child would not be included in the study and should be referred for a specific assessment. It is important to mention that, for individuals in the earliest age group, phonological development was considered during the application of the instrument, in which common phonological processes for each age group were not considered signs of changes.

Material

The TRILHAR screening instrument aims focus on the receptive and expressive vocabulary of children between three and seven years of age, aiming at identifying risk signs for changes in the development of the semantic level of oral language, considering that in this range vocabulary development is essential for the acquisition of other language skills and the development of reading. It was built by Brazilian researchers, based on the observation of the need for vocabulary screening tools through an integrative literature review. The selection of words and construction of figures occurred carefully, considering vocabulary assessment instruments. The detailed process of literature review and construction of the instrument, including the selection of words and the elaboration of figures, is referenced⁽¹⁸⁾.

TRILHAR has ten semantic activities for the reception and ten for expression. In the receptive vocabulary, the child should point to images corresponding to the words spoken by the evaluator. In the expressive vocabulary, you must name ten images presented. It consists of words from the following

Table 1. Items of the receptive and expressive vocabulary of the screening instrument

	G1	G2	G3	G4	G5
RV1	To bite	To Run	To cut	To drink	Domino
RV2	Walk	Church	Drum	Sandwich	To telephone
RV3	Fridge	To sleep	To smash	To knock	Sock
RV4	Pineapple	Airplane	Garbageman	School of teeth	Pig
RV5	Orange	Ant	Dress	To comb	To fish
RV6	House	Bike	Whale	Owl	To sing
RV7	Apple	Shoe	Cup	Giraffe	Brain
RV8	Window	To cry	Slipper	To bark	Ambulance
RV9	To jump	Bread	To lick	Fireman	Chef
RV10	Cow	Television	Mountain	Swing	Fork
EV1	Duck	Shirt	Coat	Handbag	Alligator
EV2	Cake	Horse	Monkey	Elephant	Cheese
EV3	Stove	Banana	Popcorn	Pastel	Broom
EV4	To harvest	Table	Clock	Towel	Helicopter
EV5	Seesaw	Car	Bus	Rocket	Whistle
EV6	School	Doll	Robot	Ferris wheel	Astronaut
EV7	To laugh	Clown	Doctor	Farmer	Castle
EV8	Carrot	Bedroom	Bathroom	Beach	Spider
EV9	Chicken	Mouth	Nose	Belly button	To dig
EV10	Tap	To break	To sit	To swing	To drive

Caption: RV - receptive vocabulary; EV - expressive vocabulary; G - group

semantic fields: clothes, animals, food, furniture, utensils, means of transport, toys, instruments, professions, places, body parts, adjectives, and verbs (Table 1). During its construction, the use of words that suffered cultural variation was avoided and, in the analysis, the production of synonyms is considered correct.

For the application, there is a puppet that facilitates the interaction between the child and the evaluator, as well as stimulates the motivation for the completion of the activities. The material also has a user manual for the test applicator and sheets for recording responses. Observation of qualitative aspects is indicated, and it is important to record the presence of important behavioral signs, phonological or phonetic changes in orality, inattention, slowness and not understanding the test. The instrument must be used by a speech-language therapist.

The result is calculated according to the number of correct answers in the expressive and receptive vocabulary tests, in which the maximum score is ten points. The final score, out of a maximum of twenty, is obtained from the sum of the points of the tests.

Procedure

First, we contacted two public schools for children and elementary education to obtain consent. After that, we sent letters explaining the research to the parents, and held meetings to describe the instrument, its form of application and to obtain signature of the ICF and IAF, from the age of seven.

All screenings were performed individually, in a room with adequate acoustic and lighting conditions, at the agreed time with the teachers of each class. The instrument's printed material was used, with the support of the puppet to motivate the child in the activity. The application was initiated by the receptive vocabulary, followed by the expressive vocabulary, with an average total application time of 04 minutes and 03 seconds (sd=01m39s).

Data analysis

The data were analyzed in a descriptive and inferential manner, using the Kruskal-Wallis tests to verify the difference between ages; Mann-Whitney for the difference between the sexes and Spearman's Correlation to verify the correlation between the variables of age, sex, and performance in the test. The 95% confidence interval and 0.05 significance level were considered. IBM SPSS Statistics, version 23, was used.

RESULTS

The descriptive values of the scoring performance of the groups in the screening are shown in Table 2, followed by the descriptive values according to sex in Table 3. In addition, it is possible to verify the percentage of correct answers for each item of the screening (Table 4).

Finally, we observed a positive correlation between performance in receptive vocabulary and expressive vocabulary ($p=0.01$, $r=0.22$).

DISCUSSION

Based on our results, we observed the difference in the mean between the groups and the correlation between age and performance in receptive, expressive vocabulary and the final score. This confirms the hypothesis of a gradual increase in vocabulary according to the age group⁽²²⁾. As the age progresses, there is an expansion of cognitive skills that provide the learning of new words during everyday experiences and communication situations⁽²³⁾.

Although our data show no difference in performance in tasks regarding sex, in general, it is observed that girls

Table 2. Performance in screening according to age group

	G1 S (SD)	G2 S (SD)	G3 S (SD)	G4 S (SD)	G5 S (SD)	p
RV	9.64 (±0.559)	10.00 (±0.000)	9.77 (±0.504)	9.88 (±0.336)	9.95 (±0.213)	0.01* 0.03** (r=0.18)
EV	7.63 (±0.690)	9.10 (±0.995)	9.10 (±1.125)	7.91 (±1.201)	9.55 (±0.566)	< 0.01* < 0.01** (r=0.31)
RF	17.07 (±0.813)	19.05 (±0.999)	18.80 (±1.324)	17.81 (±1.306)	19.55 (±0.59)	< 0.01* < 0.01** (r=0.36)

*statistically significant value in the Kruskal-Wallis test; **statistically significant value in the Spearman Correlation test

Caption: S - score; SD = standard deviation; RV - receptive vocabulary; EV - expressive vocabulary; RF - final score

Table 3. Performance in screening according to sex

	Female S (SD)	Male S (SD)	p
RV	9.83 (±0.05)	9.84 (±0.04)	0.74 0.74 (r=0.29)
EV	7.63 (±0.69)	9.10 (±0.99)	0.61 0.61 (r=-0.04)
RF	17.07 (±0.81)	19.05 (±0.99)	0.35 0.35 (r=0.08)

Caption: S - score; SD = standard deviation; RV - receptive vocabulary; EV - expressive vocabulary; RF - final score.

Table 4. Percentage of correct answers per item for each age group to check the level of difficulty

	G1	G2	G3	G4	G5
RV1	100%	100%	100%	100%	95,5%
RV2	100%	100%	100%	100%	100%
RV3	100%	100%	90%	96,9%	100%
RV4	100%	100%	100%	100%	100%
RV5	92,9%	100%	100%	96,9%	100%
RV6	82,1%	100%	100%	100%	100%
RV7	100%	100%	100%	100%	100%
RV8	100%	100%	100%	96,9%	100%
RV9	92,9%	100%	90%	100%	100%
RV10	96,4%	100%	96,7%	96,9%	100%
EV1	92,9%	90,5%	80%	100%	100%
EV2	100%	100%	96,7%	100%	100%
EV3	89,3%	100%	100%	25%	100%
EV4	96,4%	100%	100%	96,9%	90,9%
EV5	42,9%	100%	93,3%	93,8%	100%
EV6	46,4%	100%	93,3%	56,3%	90,9%
EV7	28,6%	100%	73,3%	56,3%	100%
EV8	82,1%	57,1%	93,3%	93,8%	95,5%
EV9	92,9%	90,5%	93,3%	90,6%	86,4%
EV10	67,9%	71,4%	86,7%	81,3%	90,9

Caption: RV - receptive vocabulary; EV - expressive vocabulary

obtain better results in tasks that involve language, as they can use more learning strategies⁽²⁴⁾. However, in terms of vocabulary, the findings corroborate other studies in the Brazilian population^(22,25).

Regarding the type of task, the children obtained better results in the receptive vocabulary, since the development of understanding skills occurs earlier and more quickly than production⁽²⁶⁾. In addition, the receptive vocabulary is the basis for the development of production and the better the comprehension skills, the better it will be in expression in the language⁽²⁷⁾. This pattern is considered one of the lexical acquisition trends⁽³⁾, with

an interval of about five months between comprehension and the production of 50 words.

Nine words obtained a low percentage of correct answers, they were: seesaw, school, laughing, tap, room, to break, pastel, Ferris wheel and farmer. One of the reasons that may have influenced this result was the graphic construction of the figures. For the recognition to occur fully, there must be a relationship between the figure and the object known to the child⁽²⁸⁾. It is possible that the items indicated above did not represent the words properly, since there was no specific age group, which suggests the need for revisions.

Expressive vocabulary tasks led among those with low percentage of correct answers. This can be explained by the fact that, in the expressive vocabulary, the child needs to make a direct relationship between the image and the word. In the receptive vocabulary, there is the possibility of success by exclusion, which facilitates the identification of the image for the word heard.

It is noteworthy that the Brazilian Portuguese has cultural variations referring to the lexicon and Brazilian children have a high level of variability in naming tasks⁽²⁹⁾. For this reason, TRILHAR was built to minimize this bias and considers the production of synonyms to be correct, since when this variable is ignored, the child may present a performance compatible with a language change due to incompatibility between his dialect and the instrument's dialect., leading to a situation of a false diagnosis for language disorders⁽³⁰⁾.

The initial data of this pilot study aimed to observe the preliminary performance of children with typical development in screening the vocabulary and the practical functioning of TRILHAR. These data will assist in the composition of the final version of the instrument. In the future, it must be applied in different diagnostic groups, with a focus on investigating the risk signs related to the semantic level of language. Also, other steps in the validation process are necessary to define the cutoff score to be considered in the analysis of the instrument.

It is important to clarify that TRILHAR is a screening, so its objective is to identify children with signs of risk for different changes in language development, which have symptoms related to vocabulary. Semantic performance and other language levels must be subsequently evaluated clinically with a view to diagnosis and beginning of the intervention in case the alteration is confirmed.

A possible limitation to be scored was the lack of analysis of the type of semantic exchange performed by the child, since initially, the authors considered this type of observation more appropriate for assessment situations. In addition, the application only in public schools cuts the child population, requiring more studies with individuals from private schools and different socioeconomic situations.

This research can contribute to educational and scientific aspects in children's language and Educational Speech-Language Therapy, given the existence of a vocabulary screening tool that allows the identification of children with risk signs for language disorders, enabling early intervention and prevention of reading learning difficulties afterward.

CONCLUSION

There was a difference in the performance of the groups in the receptive vocabulary tasks, followed by the expressive and in the final score, with better results for the group of seven years. In addition, we observed a positive correlation between age and performance in screening, that is, the older the age, the better the performance.

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Authors' contributions

ALAB made substantial contributions to the conception and design of the study, acquisition, analysis or interpretation of the work data, preparation of preliminary versions of the article; FFL has made substantial contributions to the acquisition, analysis or interpretation of job data; CASA made substantial contributions to the conception and design of the study, preparation of preliminary versions of the article, critical review of important intellectual content and final approval of the version to be published.