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Systematic Review
Revisão Sistemática

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Vocabulary assessment in Brazilian children: a systematic review with three instruments

Avaliação do vocabulário em crianças brasileiras: revisão sistemática de estudos com três instrumentos

Keywords

Vocabulary
Systematic Review
ABFW
EVT
Peabody

ABSTRACT

Purpose: To investigate, through a systematic review, how three assessment instruments for children's vocabulary (*Test of Childhood language ABFW, Expressive Vocabulary Test – EVT*, and *Peabody Picture Vocabulary Test – PPVT*) have been used in Brazilian research, verifying its purposes of uses and the main results of the researches. **Research strategy:** This review was organized in three studies. Study 1 referred to the process of a priori search and Study 2 referred to the a posteriori search. We searched for three Brazilian's database (CAPES, SciELO, and PePSIC). **Selection criteria:** For Study 1, we selected empirical studies containing research data with one of the three-targeted tests, using typically developing school children (7 to 10 years old). For Study 2, we enlarged the age range for pre-school and extended the search to non-typically developing children. **Data analysis:** The selected articles were fully read and synthesized in a table containing the study's aims, the age range of the sample, instrument, research design, main results, and journal. **Results:** We found out 24 articles, most of which from the speech-language therapy area. The results indicated the predominance of cross-sectional and observational studies, aiming to delineate the cognitive profile of children with some developmental disturbance, with or without control groups. None of the researches conducted a psychometric inquiry of the instruments. **Conclusion:** In Brazil, it is necessary to carry out research focusing on the psychometric inquiry of instruments for evaluating the vocabulary in pre-school and school-age children.

Descritores

Vocabulário
Revisão Sistemática
ABFW
EVT
Peabody

RESUMO

Objetivo: investigar, por meio de revisão sistemática, como três instrumentos de avaliação do vocabulário infantil (Teste de Linguagem Infantil ABFW, *Expressive Vocabulary Test – EVT* – e *Peabody Picture Vocabulary Test – PPVT*) têm sido utilizados nas pesquisas brasileiras, verificando seus propósitos de usos e os principais resultados encontrados. **Estratégia de pesquisa:** a revisão foi organizada em dois estudos. O Estudo 1 referiu-se ao procedimento de busca *a priori*, e o Estudo 2, ao procedimento de busca a *posteriori*. Foram consultadas três bases de dados nacionais (CAPES, SciELO e PePSIC). **Critérios de seleção**: para o Estudo 1, foram selecionados artigos empíricos contendo resultados de pesquisas em um dos testes de interesse, em amostra de crianças com desenvolvimento típico em idade escolar (7-10 anos). Para o Estudo 2, foi ampliada a busca para crianças em idade pré-escolar e com algum tipo de transtorno do desenvolvimento. **Análise dos dados:** os artigos selecionados foram lidos na íntegra e sintetizados em uma tabela contendo objetivo do estudo, faixa etária da amostra, instrumento, delineamento, principais resultados e periódico de publicação. **Resultados:** foram encontrados 24 estudos, a maioria na área da Fonoaudiologia. Os resultados indicam predominância de pesquisas transversais e observacionais, que buscaram traçar perfil cognitivo de crianças com algum transtorno do desenvolvimento, utilizando ou não grupos de controle. Nenhuma pesquisa tratou da investigação psicométrica dos instrumentos. **Conclusão:** mostra-se necessária a condução de pesquisas no Brasil que enfoquem na investigação psicométrica de instrumentos de avaliação do vocabulário em crianças pré-escolares e em idade escolar.

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INTRODUCTION

The habitual concept of vocabulary indicates the set of words of a certain language, or words known by an individual. Vocabulary is usually seen as an inventory of individual words and their meaning; in this perspective, vocabulary knowledge implies knowing the meaning of the word. Thus, it is necessary to understand that words are the language building blocks, units of meaning that form the most complex structures such as phrases, paragraphs, and texts[1]. The use of a more specific definition can distinguish the terms "lexicon" and "vocabulary", with the first being a group of words available to the subjects, while the latter would be a sample of the individual lexicon, i.e., "a group of words that are used by the speaker in the act of speech" (p. 759)[2]. We can also distinguish between receptive and expressive vocabulary. Receptive vocabulary corresponds to a group of words that the person can understand, while the expressive is related to the lexicon, i.e., the words that can be produced[2].

Vocabulary is part of oral language skills, and as such its evaluation is an important indicator of language problems, as well as of reading performance and text comprehension[3]. Biemiller[4] indicates that around 3rd grade (8-9 years old), 95% of the children can read more words out loud than they can comprehend, suggesting that vocabulary, in addition to the identification of words, is the biggest limiting factor in reading comprehension. Similarly, Tunmer and Chapman[5] demonstrate that vocabulary has unique contributions to text understanding in third graders from New Zealand beyond the contribution of words recognition and oral comprehension. Quinn et al.[6] verified that the development of text comprehension partially depends on the vocabulary knowledge, with this relationship being stronger for the initial years than for the final years.

In her thesis, Tibério[7] listed 10 instruments found in the literature for the evaluation of receptive and expressive vocabulary in children and adults. Most of the tests found by the author are from North American and are not adapted to the Brazilian context. Two of the listed tests are focused on the evaluation of babies (*MacArthur-Bates e Language Development Survey*); two of them are for pre-school age (Language Development Assessment and a specific test to assess emerging literacy, the *Test of Preschool Early Literacy*); three tests are for ages ranging between preschoolers and schoolchildren (*Montgomery Assessment of Vocabulary Acquisition – MAVA –, Renfrew Word Finding Vocabulary Test and ABFW Children's Language Test*); and three tests for a wide age range, ranging from 2 to 90 years old or more (*Expressive One-Word Picture Vocabulary Test* – applied along with the *Receptive One-Word Picture Vocabulary Test –, Expressive Vocabulary Test – EVT* – and *Peabody Picture Vocabulary Test – PPVT*). Thus, only five of the instruments reviewed by the author include the age range of students in the initial years of schooling (from 7 to 10 years), with two of them (MAVA and Renfrew) not presenting studies for the Brazilian population. According to the author, the ABFW[8] and PPVT[9] present studies for the population of Brazil; it is not clear whether there are studies for the *Expressive Vocabulary Test*[10].

The ABFW language test[11] was created for the Brazilian context, being composed of subtests that evaluate different areas involved in the communication process: phonology, vocabulary, fluency, and pragmatics. It is intended for the evaluation of children from 2 to 12 years old. The vocabulary subtest aims to verify the lexical competence of children, evaluating their expressive vocabulary by naming 118 figures belonging to different lexical classes (for example, clothing and animals). The EVT[10] allows measuring the expressive vocabulary and word recovery skills in the age group of 2 years and 6 months up to 90 years old or more. At the initial level of the EVT, children are presented with individual color images for identification and, at the advanced level, they are instructed to provide synonyms for the marked images[7]. Finally, *PPVT* consists of evaluating receptive vocabulary, being considered one of the most used instruments in the national and international literature[7]. Like the EVT, the test covers a wide age range in its original version (2 years and 6 months to 90 years old) and contains 125 boards composed of four black line drawings on a white background[2]. Children must select which figure best represents the word spoken by the evaluator.

The vocabulary assessment requires the use of instruments that present performance parameters for the target population, as well as indicators of validity and accuracy of the scores. Tibério[7] points out that Peabody is one of the most used instruments for the assessment of vocabulary in children worldwide, in addition to presenting studies of adaptations and norms for Brazilian children, performed by the Capovilla group[12-14] for previous versions, and is currently in its fifth edition in the North American version. Furthermore, the relevance of ABFW for the context of clinical and language research in Brazil is cited, as it is an instrument created for this context, available for commercialization. As for the EVT, it is not clear based on the review by Tibério[7] whether there are studies or not for the Brazilian population, being of interest to investigate if there is research with the instrument in the reality of Brazil.

As presented in this introduction, vocabulary is a factor closely associated with learning to read and performing text comprehension, being an important variable to be investigated both in the clinic and in research for children who are learning these skills. In this sense, it is relevant to find out how these instruments have been used in Brazilian research, to verify the purposes of uses and the main results found. Profiling these researches will allow us to understand the uses that have been made of the listed instruments, as well as helping to develop new studies in the area. Therefore, this study aims to carry out a systematic review to verify how Brazilian researchers have used the three tests mentioned when evaluating the vocabulary of children in the initial years of schooling (from the 2nd to the 5th year), to 1) carry out a mapping of where these researches are taking place and what the researchers' profiles are; 2) check the journals in which the subjects covered in these surveys are most published; 3) synthesize the objectives, methods and main results obtained by the researchers in their studies.

RESEARCH STRATEGY

The research focused only on national databases that provide completely open access papers. We selected the following journal

portals: CAPES, SciELO and PePSIC. Original empirical articles, published in the period of the 10 years preceding the search (2007-2018), were included in the search to guarantee the obtainment of the most recent studies, according to the objectives proposed in the research. Therefore, articles published from 2007 to March 2018 (the date on which the search was conducted) were considered for analysis. From the search results, we included only peer-reviewed articles containing ABFW, EVT and/or Peabody test results in samples of school-age children (7-10 years old), with typical development (children without developmental problems or complaints, which may result in the need for some kind of special attention in the school or family environment, for example, by a psychiatrist, psychologist, speech therapist, among other professionals in the field of Education or Health).

We organized the review in two studies. Study 1 refers to the *a priori* search procedure. We used keywords to search three national databases to find empirical articles containing research results in the three tests of interest, in a sample of school-age children (7-10 years old) who met the inclusion criteria adopted and were not eliminated by the exclusion criteria. The search yielded no results. For this reason, we conducted Study 2, which refers to *a posteriori* search procedure. In this study, we decided to extend the search to pre-school children and remove the criterion of belonging to a specific population, i.e., for this study, children who have some type of developmental disorder (global or specific).

INCLUSION CRITERIA

Study 1 included studies with typical development children, between 7 and 10 years old, Portuguese speakers that reported the statistics for the analyzed instrument. The exclusion criteria were: (1) review articles; (2) articles that did not use the selected instrument as method; (3) case studies; (4) non-Portuguese speaker children; (5) articles with children in age different from the established school age; (6) articles that studied children with complain of cognitive, behavioral or emotional problems, or diagnosed with some development disorder, including language problems; and (7) articles that did not report descriptive statistics including the instrument (e.g., used the test to separate groups).

For the ABFW Children Language Test, in the three bases selected, we used the descriptors "ABFW" AND "Vocabulário" [all indexes]. For PPVT, the descriptors were "Teste de vocabulário por imagens Peabody" AND "Vocabulário" [all indexes]. Regarding the EVT, the search was performed with the descriptors "Expressive Vocabulary Test" AND "Vocabulário". We added field filters to the CAPES journals to eliminate studies of completely different areas (e.g., Literature or Law): Medical Clinic, Education, Special Education, Teaching-learning, Speech Therapy, Applied Linguistics, Portuguese Language, Medicine, Neurology, Psychology, Cognitive Psychology, Teaching and Learning Psychology, Experimental Psychology, Social Psychology, Collective Health, Health, and Biological, Psychological Treatment and Prevention.

As stated in the previous section, because of the absence of studies that fit the inclusion criteria, for study 2 we used the same articles from Study 1 and modified two exclusion criteria: we considered children with chronological age below 12 years old (including preschoolers, as well as children in pre-adolescence) and removed the criteria of typical development. The remaining exclusion criteria were maintained to avoid problems with the analysis of the results with the instruments selected (e.g., including children that did not speak Portuguese or that did not report the statistics). Thus, we reviewed studies with samples composed of children up to 12 years old, with or without development disorders, in which the research presented the statistical analysis of the referred instrument.

DATA ANALYSIS

Initially, the first author read the abstracts and the pool of abstracts of the articles found, she classified them according to the inclusion criteria. When in doubt on whether or not to exclude the article, the article was partially read until the final selection. The selected articles were fully read and summarized in a table containing the study's aims, the age range of the sample, instrument, research design, main results, and publishing journal. The studies' profiles were tabulated to show the descriptors in percentage.

RESULTS

Study 1

Figure 1 shows the search process in the three databases, with the application of the inclusion and exclusion criteria. In general, the search in the three databases resulted in 254 articles: 104 (40.95%) articles for ABFW, 22 (8.66%) for *Peabody* and 128 (50.39%) for *EVT*. To facilitate the results exposure, first, we considered the exclusion criteria (1) to (4) and, from those results, we applied the remaining criteria. Thus, from the total number of studies (n=254), 25 (9.84%) were literature review, 97 (38.19%) did not use the test in question, 13 (5.12%) were case studies and 66 (25.98%) did have Portuguese speakers children in their sample. We describe here the results of the application of these four exclusion criteria for each test (Figure 1).

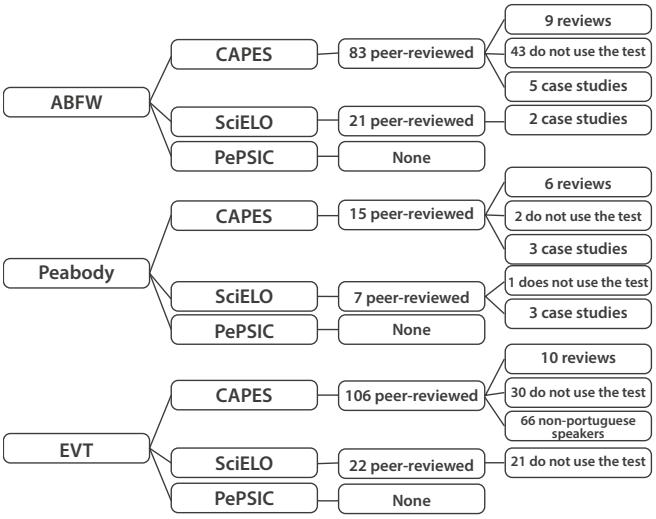

Figure 1. Flow diagram of the research strategy and study selection. ABFW, ABFW Children's Language Test; *EVT*, Expressive Vocabulary Test; PPVT, *Peabody Picture Vocabulary Test*

ABFW resulted in 83 articles reviewed by pairs in the CAPES database, 21 in SciELO and none in PePSIC. From the articles found in CAPES, we excluded 57 of them in the first phase for being literature reviews (10.84%), for not using the test (51.81%) or for being case studies (6.02%). Twenty-six studies remained. For Scielo database, from the 21 studies found, we excluded 2 (9.5%) for being case studies, ramaining 19 studies. Thus, from the total found in two databases (n=104), 45 articles remained to be analyzed by the additional exclusion criteria.

Peabody had 15 articles in the CAPES database, 7 in SciELO and none in PePSIC. In CAPES, we excluded 6 (40%) for being literature reviews, 2 (13.33%) for not using the instrument, and 3 for being case studies (20%), remaining 4 studies for the application of the remaining criteria. For the SciELO database, we excluded 1 article for not using the research instrument (14.28%) and 3 for being case studies (42.86%), remaining 3 studies. Thus, from the total found in two CAPES and SciELO (n=22), 7 articles remained to be analyzed by the additional exclusion criteria.

For EVT, we found 106 articles reviewed by pairs in CAPES, but all of them were excluded in the first phase: 10 for being literature review (9.44%), 30 for not using the instrument (28.30%), and 66 for not including Portuguese speaker children (62.66%). In SciELO, from the 22 articles found, 21 did not use the instrument (95.45%). PePSIC did not show any results. Thus, from the total (n=128), only 1 article was selected to be analyzed with the additional study criteria (SciELO database).

After this first exclusion, we verified that there were repetitions. For ABFW, from the 45 articles, 17 (37.77%) were intra and/or inter databases repetitions. For Peabody, from the 7 articles, we observed 3 repetitions (42.86%). Since only 1 article had EVT, after the removal of repetitions, 33 articles remained, from which most of them (28; 84.85%) used the ABFW vocabulary test, followed by Peabody (4; 12.12%) and EVT (1; 3.03%). All were evaluated with the remaining criteria (5, 6 and 7). Upon analysis of the articles, we concluded that none fit the inclusion criteria. Some even presented more than one exclusion criterion.

We excluded seven (21.21%) articles due to criteria 5 "age group" (articles with children out of the age group 7 to 10 years old). One article (3.03%) was excluded due to criteria 6 "sample population" (participants with a phonological disorder or another specificity). A total of 18 articles (54.54%) were excluded due to both criteria "age group" and "sample population", while 1 article (3.03%) was excluded due to age group and absence of group statistics (criteria 7). Finally, 6 articles (18.18%) simultaneously had participants out of the age group, population with some deviation/disorder, in addition to not having descriptive statistics with some of the instruments reviewed in this study.

Study 2

From the 33 articles of Study 1 that passed criteria (1) to (5), we removed those with children below 6 years old and those that did not present descriptive statistics (criteria 7). Therefore, 24 articles remained for analysis. They were distributed in 9 distinct journals[1]. From those, most of the publications were from Revista CEFAC, totaling 12 (50%) of the publications from 2007 to 2018. The journals *Audiology - Communication Research and Pró-Fono* had 3 articles (12.5%) each. The remaining 6 journals had 1 article each. The Qualis of the journals was considered in the analysis of the classification of the journal's main field. Thus, when evaluating the quadrennium 2013-2016, the journal CEFAC had most studies published and was classified as B1. The remaining journals varied from A1 to B1. In the field of Speech Pathology, most journals were classified as B1. It is noteworthy that the Revista da Sociedade Brasileira de Fonoaudiologia became *Audiology - Communication Research* in 2013, and that the journal Pró-Fono Revista de Atualização Científica, became Jornal da Sociedade Brasileira de Fonoaudiologia in 2011, and in 2013 it became CoDAS.

The selected articles used the ABFW Child Language Test and Peabody (no articles were found with EVT). The use of ABFW in the analysis was expressive, with a total of 19 articles[15-33] (79.16%). In addition, 3 articles[34-36] (12,5%) used the Peabody test, and 2 articles[2, 37] (8,33%), used both tests. In methodological terms, all studies are cross-sectional.

Regarding the authors of these studies, most researchers were in the Southeast of Brazil, totaling 66.66% (16 articles)[2, 18, 20-25, 28, 30, 32-34, 36, 37] of the total analyzed. Next came the South region, responsible for 20.83% (5 articles)[15, 16, 19, 27, 31], followed by Northeast, with 12.5% (3 articles)[17, 26, 29]. We found no articles from authors in the North and Center-West regions. Regarding authorship, on average, the articles had 4 authors, ranging from 2 to 7. It is interesting that from the 80 authors with production in the field, only 12.5% (10 authors) were male.

Table 1 summarizes the studies obtained in this systematic review. Most of the studies (70.83%) focused on children presenting some type of disorder such as autism, Down syndrome or specific language disorder. These studies were divided almost equally among those who only sought to characterize the performance of children involved in vocabulary or other measures of interest (redistributing or not the sample in terms of severity of the disorder) and those who aimed to compare the performance of these children with control groups with typical development. Such surveys corresponded to 37.50% and 33.33% of the studies, respectively. The other researches were characterized by observational approaches, whose interest was only to identify the performance of typical children, which could be divided into groups for meaningful comparisons, such as by type of school, grade (or age group), and sex. This last research group contributed with 33.33% of the studies found[34].

[1] The journals are classified as follows, according to the main area: Estudos de Psicologia (A2 - Psychology), Revista CEFAC – B1; Pró-Fono Revista de Atualização Científica – A2; Paideia – A1; *Audiology - Communication Research* – B1; Revista de Logopedia, Foniatría y Audiología – B1; *Journal of Speech, Language, and Hearing Research* – not evaluated; Revista da Sociedade Brasileira de Fonoaudiologia – B1; Psicologia: Teoria e Pesquisa – A1; CoDAS – B1.

The selected articles included children in the age range of 3 to 11 years old. From the 24 articles selected, 8 (33.33%) studied preschoolers with the most frequent age ranging from 3 to 5 years old[16, 19, 37, 24, 28, 30, 32, 36]. Only 3 (12.5%) articles studied school-age children[17, 25, 29], while the remaining articles (13; 54.16%) had samples composed of preschoolers to school-age children[2, 15, 18, 20-23, 26-27, 31, 33-35]. In the latter, we verified that the studies that involved a wider age range (3-11 years old) sought to verify the performance in specific populations (children with specific disorders of speech and language, Down syndrome, cerebral palsy, deafness, etc.), according to the age, the degree of deviation or the social characteristics of the surroundings, be it school or family. For the articles with samples composed of preschooler children, the aims concentrated in the comparison between specific children population (for example, children with developmental disorders and control groups) and exploratory analyses of the performance of children from a specific group (e.g. investigate the performance of vocabulary in children with HIV).

Table 1. Systematic organization of the analyzed articles presenting the authors, the date, the objectives, the age group, the method, the main results found and the published journal

Authors	Objective	Age	Test	Method	Results	Journal
Araújo; Marteleto; Schoen-Ferreira, 2010	Evaluate the performance of preschool children in terms of receptive vocabulary.	4 to 7 years old.	Peabody.	159 students divided into two school groups: Group 1 - initial year (56%) - and Group 2 - final year of Elementary school.	The children in the final year scored more items on the test than the children in the initial year, but in terms of classification, they were below average, unlike the younger children, who obtained average scores.	Psychology Studies (Campinas).
Armonia et al., 2015	To compare the receptive and expressive vocabulary indexes of children with specific speech and language development disorders.	3 to 11 years old.	ABFW and Peabody.	Sample consisted of 21 children with specific developmental disorders of speech and language.	Most children showed adequate performance in the evaluation of expressive vocabulary and performance compatible with the age group in the evaluation of receptive vocabulary. Tendency for better performance in expressive vocabulary compared to receptive vocabulary.	Revista CEFAC.
Athayde; Carvalho; Mota, 2009	Correlate the performance of expressive vocabulary with the severity of the phonological disorder, the age groups and the reference values of the vocabulary test used.	3 to 8 years old.	ABFW.	The sample was composed of 17 children with phonological deviation, divided into four groups, according to the degree of deviation severity.	Children with lower deviation levels had higher results than others. Children with a medium deviation level had results expected for normality. Younger children presented performance inferior to older children, regardless of their level of phonological deviation.	Revista CEFAC.
Athayde; Mota; Mezzomo, 2010	Verify impact in the lexicon acquisition in children with phonological deviation and compare the vocabulary performance with the test normal reference value.	5 years old.	ABFW.	The sample was composed of 36 children divided into two groups: Study Group (14 children with phonological deviation) and Control Group (22 children with normal language development).	Despite presenting superior results, the Control Group did not differ statistically from the Study Group. Both groups showed satisfactory performance concerning the test reference indexes.	Pró-Fono Revista de Atualização Científica.
Bandini; Santos; Souza, 2013	Evaluate the expressive language skills of children in the 1st year of elementary school and investigate possible associations between phonological awareness and phonological working memory.	6 years old.	ABFW.	Two phases: phase 1 (n=254) assessed phonological awareness and phonological working memory; phase 2 (n=12) evaluated the vocabulary of individuals who obtained low or high scores in working memory and phonological awareness in the first phase.	Students with high scores had levels above expectations when compared to the test benchmark for age, and students with low scores showed results below expectations in expressive language skills.	Paideia.

Table 1. Continuation...

Authors	Objective	Age	Test	Method	Results	Journal
Befi-Lopes; Nuñes; Cáceres, 2012	To verify the influence of age on lexical and grammatical performance and to investigate the existence of a correlation between expressive vocabulary and the mean length of utterance in children with specific language disorders.	4 to 6 years old.	ABFW.	Thirty children with a diagnosis of specific language impairment participated in the study, 10 from each age group.	A positive correlation was observed between the expressive vocabulary and the use of closed-class words and between the expressive vocabulary and the extension of words per statement.	Revista CEFAC.
Brancalioni et al., 2018	To compare the performance in expressive vocabulary tests between preschoolers from public and private schools.	4 to 5 years old.	ABFW.	The sample consisted of 86 preschoolers, of both genders, divided into two groups: G1 - a group of preschoolers from the public school system - and G2 - group of preschoolers from the private school system.	G2 performed better than G1 in the vocabulary test, with a significant difference for all conceptual fields, and, when comparing the performance of preschoolers with the test parameters, most preschoolers in G1 and G2 showed adequate performance.	Audiology - Communication Research.
Colalto et al., 2017	Verify the acquisition of vocabulary in deaf children, users of cochlear implants, as well as the factors that influence development.	4 to 8 years old.	ABFW.	Twenty children using cochlear implants, with an assessment of family participation in the development of these children.	There was no significant relationship between hearing age (time of using the cochlear implant) and vocabulary acquisition. There was no significant difference in chronological age, but the results showed a negative trend in this relationship between age and vocabulary. Family participation was significant.	Revista CEFAC.
Costa; Ávila, 2010	To investigate, in a group of preschoolers, the influence of phonological disorder on lexical and metaphonological skills and the existence of correlations between both.	4 to 6 years old.	ABFW.	Two groups of 56 preschoolers (32 boys)	Both groups showed similar behavior in the test (lexical competence) andconcerning metaphonological competence. Preschoolers with the disorder showed worse performance in the analysis. Positive correlations were identified, from good to moderate, between lexical and metaphonological skills.	Pró-Fono Revista de Atualização Científica.
Dias et al., 2016	To investigate the field of pragmatic language of verbal and non-verbal autistic children.	3 to 7 years old.	ABFW.	Thirty-one children diagnosed with autism spectrum disorder had their pragmatic skills assessed.	The total number of non-verbal autistic patients was 27 (87%). The total number of communicative acts was 2.4 per minute, and the average of communication most used by the sample was gestural. The communicative space occupied by children with dyad was 47.7%. There was a significant difference between the use of skills that are categorized as interpersonal or non-interpersonal functions between verbal and non-verbal autists. The comparison of each function between verbal and non-verbal patients showed significant differences.	Revista de Logopedia, Foniatría y Audiología.

Table 1. Continuation...

Authors	Objective	Age	Test	Method	Results	Journal
Ferreira et al., 2012	To investigate the performance of deaf children who use LIBRAS in expressive vocabulary tests.	5 to 8 years old.	ABFW.	The sample consisted of 64 subjects (32 children in the study group and 32 in the control group), who were divided into four groups by age.	The hearing-impaired group performed worse than the control group. Younger children performed better in the two groups analyzed. The performance of deaf children was below expectations for their age in most conceptual fields.	Revista CEFAC.
Ferreira; Lamônica, 2012	To verify the lexical, expressive and receptive performance of children with Down syndrome and compare with the performance of typical children matched by gender and mental age.	3 to 5 years old.	Peabody and ABFW.	Forty children participated in the study: SG = 20 with Down syndrome; and CG = 20 children with typical development, matched for gender and mental age.	The participants of the SG presented inferior performance to the CG in Peabody and in the usual verbal designation of ABFW, with significant differences. The performance in the receptive vocabulary was superior to the expressive in both groups and a correlation was verified between the performance in the receptive vocabulary and in the expressive of both groups.	Revista CEFAC.
Ferreira-Vasques; Abramides; Lamônica, 2017	To verify the expressive vocabulary of children with Down syndrome and to compare the performance of children with typical development of the same gender in two different pairings.	3 to 5 years old.	ABFW.	Forty-two children participated in the study: 14 children with Down syndrome; 14 with typical development, matched by gender and mental age; and 14 with typical development, matched by gender and chronological age.	The study found lower performance of children with Down compared to the chronological age-matched group for correct naming and non-naming of the figures. There was no significant difference between the group with Down syndrome and the group with typical development matched by mental age.	Revista CEFAC.
Fortunato-Tavares et al., 2012	Compare the performance of the expressive vocabulary of children with typical development and children with a specific language disorder.	8 to 10 years old.	ABFW.	Sixteen children with phonological disorders and 16 children with typical speech development, matched for age, gender, and socioeconomic status.	Children with specific language impairment were significantly less accurate in all conditions.	Journal of Speech, Language, and Hearing Research.
Granzotti et al., 2013	To assess lexical proficiency and the incidence of phonological disorders in the language of children infected with HIV.	3 to 7 years old.	ABFW.	The study population consisted of 31 children classified according to the clinical criteria of the disease.	In the vocabulary assessment, all children showed an inadequate response for their age in at least two distinct conceptual fields.	Revista CEFAC.
Kaminski; Mota; Cielo, 2011	Compare performance in expressive vocabulary and phonological awareness among children with phonological disorders and with typical language acquisition and analyze the influence of age on this performance.	5 to 7 years old.	ABFW.	Participants were divided into two groups: control (CG - typical language acquisition) and study (SG - phonological disorder).	The children of the SG achieved a lower performance than the participants of the CG in the analyzed tasks. When comparing the children's performance with the reference values, younger children, from both groups, had difficulties in the same tasks, with expressive vocabulary and phonological awareness. Children aged 6 and 7 showed difficulties only in expressive vocabulary.	Revista CEFAC.

Table 1. Continuation...

Authors	Objective	Age	Test	Method	Results	Journal
Lamônica; Ferraz, 2007	To verify the performance of children with cerebral palsy in terms of psycholinguistic skills.	4 to 6 years old.	Peabody.	Eight individuals of both genders, diagnosed as cerebral palsy D, participated in this study.	The results showed a significant positive correlation between cognitive performance and receptive vocabulary.	Pró-Fono Revista de Atualização Científica.
Lamônica; Ferreira-Vasques, 2015	To verify the expressive communicative and lexical performance of children with Down syndrome.	3 to 5 years old.	ABFW.	Twenty children participated in the study: 10 with Down syndrome (SG) and 10 with typical development (CG), matched for gender, chronological age, and socioeconomic level.	There was a significant difference for two of the three categories analyzed in the test, namely: SG obtained a lower performance than the CG for "usual designation" and for "no designation", with a difference in all conceptual fields of the test. In the case of “substitution processes”, there was no difference between groups.	Revista CEFAC.
Medeiros et al., 2013	Characterize the expressive vocabulary and analyze the regional variables in a sample of students from the 1st year of Elementary School in Maceió.	6 to 7 years old.	ABFW.	Seventy-two students from three schools in Maceió participated: school 1 - upper region; school 2 - central region; and school 3 - lower region of the municipality (elite neighborhood).	There was no difference in the performance of the expressive vocabulary for age group and gender. Between schools, a difference was found in the DUV (designation by usual vocabulary) and SP (substitution processes) categories, with better performance for school 3 and worse performance for school 1. Regional variations were observed during the application of the expressive vocabulary test.	Audiology - Communication Research.
Misquiatti et al., 2015	Verify the vocabulary performance of institutionalized children and compare it with the performance of children belonging to the public and private schools.	4 to 5 years old.	ABFW.	Sixteen children in institutional shelter (SG), of both genders, and 32 children from the control group (CG), coming from public schools - CG1 (n = 16) - and private schools - CG (n = 16) - , matched for age.	The study observed that the institutionalized children demonstrated inferior performance in the vocabulary test concerning the CG, which did not present differences between them.	Revista CEFAC.
Mota et al., 2009	To verify the most frequent substitution processes and the most altered conceptual fields in an expressive vocabulary test of children with phonological disorders, relating them to the severity of the disorder.	3 to 8 years old.	ABFW.	The sample was composed of 44 subjects with phonological deviation, divided into four groups, according to the degree of deviation severity.	The “co-hyponym” substitution process is the most used by children, regardless of the degree of severity. It was also observed that children belonging to the medium-moderate degree had the highest percentage of altered conceptual fields, followed by the mild, severe and moderate-severe degree.	Revista da Sociedade Brasileira de Fonoaudiologia.
Oliveira et al., 2011	Compare the development of premature and underweight children (G1) with children born at term (G2), evaluating academic, behavioral, linguistic and cognitive indicators.	5 years old.	Peabody.	The sample consisted of 34 children, of both genders, divided into two groups: preterm and term.	In the language assessment, concerning the applied test, there was no significant difference between the groups analyzed.	Psicologia: Teoria e Pesquisa.

Table 1. Continuation...

Authors	Objective	Age	Test	Method	Results	Journal
Passaglio et al., 2015	To verify the association between phonological profile and vocabulary of children from public and private schools in Belo Horizonte and to analyze the influence of the family and the educational institution on child development.	4 to 5 years old.	ABFW.	Ninety-six children of both genders, from two public and one private institution, were evaluated.	The association between phonology and vocabulary showed an influence of the family environment on child development. Male children showed significantly lower results than female participants. Regarding the institution, children from the private institution showed significantly lower results for vocabulary adequacy.	Revista CEFAC.
Pupo et al., 2016	To analyze the phonological and vocabulary performance of children with unilateral hearing loss.	3 to 7 years old.	ABFW.	Twelve children with unilateral hearing loss, 6 of them with conductive loss due to congenital malformation of the ear and 6 with congenital or acquired sensorineural loss in the 1st year of life.	In the vocabulary test, only two children with sensorineural loss presented values below the expected for their age; thus, in general, there was no difference between the sensorineural and conductive groups in the phonology and vocabulary tests.	Audiology - Communication Research.

DISCUSSION

The present study aimed to perform a systematic review of the Brazilian studies that used tests to evaluate the vocabulary of children in the initial years of elementary school[7]. Thus, the search focused on the ABFW, Peabody and EVT tests, and the desired sample profile was composed of children from second to fifth grade and with typical development (no developmental disorders). At first (Study 1), the search result in the three databases consulted (CAPES, SciELO, and PePSIC journals) was significant in terms of quantity (261 articles in the first search). However, right at the first exclusion criterion, we noted that, in many studies, the instruments were found only in their references, which may be the reason they appear frequently in the searches performed, especially in the case of EVT and ABFW. Regarding EVT, in many articles resulting from searches, the predominant language in the study was English and/or Spanish, being, in its majority, articles on bilingualism (Eng/Spa). Because ABFW is an instrument composed of 4 tests, in some studies the test used was not that of vocabulary, but phonology or pragmatics - the latter appearing more frequently. All articles were excluded after the application of the exclusion criteria.

Because of the absence of studies meeting the inclusion criteria, we moved to Study 2, in which the age criterion has been extended to pre-school and pre-adolescent children and the typical developmental criterion has been removed. Thus, we reviewed 24 papers, most of which were published in the field of Speech Therapy and concentrated in the South and Southeast regions. Most of the researchers were female, which shows that research in children (especially educational variables) still suffers this influence in Brazil (also guided by the feminization of the professions in Psychology, Speech Therapy, and Child Education)[38]. In general, the articles analyzed sought to characterize the performance of children in a specific group, such as developmental disorders, with or without a comparison of performance with control groups.

The results indicated that Brazilian researchers concentrated their investigations in the vocabulary area (with the revised instruments) in the evaluation of young children and with some disorder (for example, hearing problems) or illness. This may be explained by the large concentration of researchers in the field of Speech Therapy, with the absence of studies focusing on Education or Psychology (noting the absence of longitudinal and intervention studies). This highlights the lack of vocabulary research focused on the population of school-age children with typical development, specifically attending cycle 1 of elementary school. By demonstrating these results, this research aims to draw attention and at the same time encourage Brazilian researchers to turn their research interests to the area highlighted here.

It is noteworthy that none of the studies reviewed carried out psychometric investigations with the instruments under analysis, that is, there were no studies that investigated temporal reliability, construct validity, item analysis or to perform other analyzes that indicated that the test content was related to children's vocabulary in the studied age groups. This implies that the validation of these instruments may be restricted to the information contained in their respective manuals, with no studies providing cross-validation indicators[39]. This fact is particularly worrying because of the research interests of the articles found, which use instruments to separate groups, investigate the effect of therapeutic interventions, identify neuropsychological profile, among other objectives that to be successfully achieved, they require the use of instruments with indicators of validity and precision.

CONCLUSION

Brazilian studies from 2007 to 2018 with the three vocabulary assessment instruments selected from the review by Tiberius[7] (ABFW, EVT, Peabody) indicate a preference for investigations with a cross-sectional design and with populations that have some type of disorder or developmental problem (for example, autism). We found no studies with school-age children with typical development, nor observed studies seeking to investigate the psychometric qualities of these instruments, which are used both in vocabulary and clinical research by professionals. The results may indicate a field of action for future research in the area.

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REFERENCES

1. Read J. Assessing Vocabulary. 1.ed. Cambridge: Cambridge University Press; 2000.
2. Armonia AC, Mazzega LC, Alcântara Pinto FC, Souza ACR, Perissinoto J, Tamanaha AC. Relação entre vocabulário receptivo e expressivo em crianças com transtorno específico do desenvolvimento da fala e da linguagem. Rev. CEFAC. 2015;17(3):759-65. https://doi.org/10.1590/1982-021620156214.
3. Baumann JF. Vocabulary and reading comprehension: The nexus of meaning. In: Israel SE, Duffy GD. Handbook of research on reading comprehension. Routledge; 2014;347-370.
4. Biemiller A. Vocabulary: needed if more children are to read well. Reading Psychology. 2003;24(3-4):323-35. https://doi.org/10.1080/02702710390227297.
5. Tunmer WE, Chapman JW. The simple view of reading redux: Vocabulary knowledge and the independent components hypothesis. J. Learn. Disabil. 2012;45(5):453-66.
6. Quinn JM, Wagner RK, Petscher Y, Lopez D. Developmental relations between vocabulary knowledge and reading comprehension: A latent change score modeling study. Child Dev. 2015;86(1):159-75.
7. Tibério, CDR. Vocabulário receptivo de crianças de 2 a 6 ano de idade. Uma análise com o teste de vocabulário por imagens Peabody. [Dissertação de Mestrado]. São Paulo (SP): Pontifícia Universidade Católica de São Paulo; 2017.
8. Andrade CRF, Béfi-lopes DM, Fernandes FDM, Wertzner HF. ABFW: teste de linguagem infantil nas áreas de fonologia, vocabulário, fluência e pragmática. 2 ed. Carapicuíba: Pró-Fono; 2004.
9. Dunn LM, Dunn LM. Peabody Picture Vocabulary Test. revised. Circle Pines: American Guidance Service; 1981.
10. Williams K. Expressive Vocabulary Test. 1.ed. Circle Pines: American Guidance Service; 1997.
11. Befi-Lopes DM. Vocabulário. In: Andrade CRF, Befi-Lopes DM, Fernandes FDM, Wertzner HF. ABFW Teste de Linguagem Infantil nas áreas de Fonologia, Vocabulário, Fluência e Pragmática. Carapicuíba: Pró-Fono; 2004;41-60.
12. Capovilla F. Capovilla A. Nunes L. Araújo I. Nunes D. Nogueira D. Bernat AB. Versão brasileira do teste de vocabulário por imagens peabody: dados preliminares. Distúrbios da Comunicação. 1997;8(2):151-162.
13. Capovilla FC. Macedo EC. Capovilla AG. Thiers VO. Duduchi M. Versões computadorizadas de testes psicométricos tradicionais: estendendo as fronteiras da psicometria para abarcar populações especiais. Boletim de Psicologia. 1997;47(106):1-19.
14. Capovilla FC. Thiers VO. Macedo EC. Avaliação cognitiva de crianças com severos distúrbios motores: versões computadorizadas normatizadas e validadas de testes de vocabulário, compreensão auditiva, leitura e inteligência geral. In: Capovilla FC. (Org.). Neuropsicologia e aprendizagem: uma abordagem multidisciplinar. 2. ed. São Paulo: Memnon. 2002:205-218.
15. Athayde ML, Carvalho Q, Mota HB. Vocabulário expressivo de crianças com diferentes níveis de gravidade de desvio fonológico. Rev. CEFAC. 2009;11(2):161-8. https://doi.org/10.1590/S1516-18462009000600005.
16. Athayde ML, Mota HB, Mezzomo CL. Vocabulário expressivo de crianças com desenvolvimento fonológico normal e desviante. Pró-Fono R. Atual. Cient. 2010;22(2):145-50. https://doi.org/10.1590/S0104-56872010000200013
17. Bandini, HHM, Santos FH, Souza DG. 2013. Levels of Phonological Awareness, Working Memory, and Lexical Knowledge in Elementary School Children. Paideia. 2013;23(56):329-38. https://doi.org/10.1590/1982-43272356201307.
18. Befi-Lopes DM, Nuñes CO, Cáceres AM. Correlação entre vocabulário expressivo e extensão média do enunciado em crianças com alteração específica de linguagem. Rev. CEFAC. 2013;15(1):51-7. https://doi.org/10.1590/S1516-18462012005000017.
19. Brancalioni A, Zaura A, Karlinski CD, Quitaiski LF, Thomaz MFO. Desempenho do vocabulário expressivo de pré-escolares de 4 a 5 anos da rede pública e particular de ensino. Audiol. Commun. Res. 2018;23:1-9. https://doi.org/10.1590/2317-6431-2016-1836.
20. Colalto CA, Goffi-Gomez MVS, Magalhães ATM, Samuel PA, Hoshino ACH, Porto BL, Tsuji RK. Vocabulário expressivo em crianças usuárias de implante coclear. Rev. CEFAC. 2017;19(3):308-19. https://doi.org/10.1590/1982-021620171937216.
21. Costa RCC, Ávila CRB. 2010. Competência lexical e metafonológica em pré-escolares com transtorno fonológico. Pró-Fono R. Atual. Cient. 2010;22(3):189-194. https://doi.org/10.1590/S0104-56872010000300006.
22. Dias APBH, Vasconcelos MM, Maia Filho HS, Brito AR, Vairo GPT, Souza LBR. Assessment of pragmatic language in verbal and nonverbal autistic children. Rev. Logop. Foniatr. Audiol. 2016;36(1):15-22. https://doi.org/10.1016/j.rlfa.2015.02.001.
23. Ferreira MIO, Dornelas SA, Teófilo MMM, Alves LM. Avaliação do vocabulário expressivo em crianças surdas usuárias da língua brasileira de sinais. Rev. CEFAC. 2011;14(1):09-17. https://doi.org/10.1590/S1516-18462011005000059.
24. Ferreira-Vasques AT, Abramides DVM, Lamônica DAC. Consideração da idade mental na avaliação do vocabulário expressivo de crianças com Síndrome de Down. Rev. CEFAC. 2017;19(2):253-9. https://doi.org/10.1590/1982-0216201719216516.
25. Fortunato-Tavares T, Andrade CRF, Befi-Lopes, DM, Hestvik A, Epstein B, Tornyova L, Schwartz RG. 2012. Syntactic Structural Assignment in Brazilian Portuguese-Speaking Children with Specific Language Impairment. J. Speech. Lang. Hear. Res. 2012;55(4):1097-112. https://doi.org/10.1044/1092-4388(2011/10-0215).
26. Granzotti RBG, Negrini SFBM, Fukuda MTH, Takayanagui OM. Aspectos da linguagem em crianças infectadas pelo HIV. Rev. CEFAC. 2013;15(6):1621-6. https://doi.org/10.1590/S1516-18462013005000017.
27. Kaminski TI, Mota HB, Cielo CA. 2011. Consciência fonológica e vocabulário expressivo em crianças com aquisição típica da linguagem e com desvio fonológico. Rev. CEFAC. 2011;13(5):813-25. https://doi.org/10.1590/S1516-18462011005000019.
28. Lamônica DAC, Ferreira-Vasques AT. Habilidades comunicativas e lexicais de crianças com Síndrome de Down: reflexões para inclusão escolar. Rev. CEFAC. 2015;17(5):1475-82. https://doi.org/10.1590/1982-021620151756015.
29. Medeiros VP, Valença RKL, Guimarães JATL, Costa RCC. Vocabulário expressivo e variáveis regionais em uma amostra de escolares de Maceió. Audiol. Commun. Res. 2013;18(2):71-7. https://doi.org/10.1590/S2317-64312013000200004.
30. Misquiatti ARN, Nakaguma PG, Brito MC, Olivati, AG. Desempenho de vocabulário em crianças pré-escolares institucionalizadas. Rev. CEFAC. 2015;17(3):783-91. https://doi.org/10.1590/1982-0216201513814.
31. Mota HB, Kaminski TI, Nepomuceno MRF, Athayde ML. Alterações no vocabulário expressivo de crianças com desvio fonológico. Rev. Soc. Bras. Fonoaudiol. 2009;14(1):41-7. https://doi.org/10.1590/S1516-80342009000100009.
32. Passaglio NJS, Souza MA, Souza VC, Scopel RR, Lemos SMA. Perfil fonológico e lexical: inter-relação com fatores ambientais. Rev. CEFAC. 2015;17(4):1071-8. https://doi.org/10.1590/1982-0216201517419813.

33. Pupo AC, Esturaro GT, Barzaghi L, Trenche MCB. Perda auditiva unilateral em crianças: avaliação fonológica e do vocabulário. Audiol. Commun. Res. 2016;21:1-8. https://doi.org/10.1590/2317-6431-2016-1695.

34. Araújo MVM, Martelero MRF, Schoen-Ferreira TH. Avaliação do vocabulário receptivo de crianças pré-escolares. Estud. Psicol. 2010;27(2):169-76. https://doi.org/10.1590/S0103-166X2010000200004.

35. Lamônica DAC, Ferraz PMDP. Leucomalácia periventricular e diplegia espástica: implicações nas habilidades psicolinguísticas. Pró-Fono R. Atual. Cient. 2007;19(4):357-62. https://doi.org/10.1590/S0104-56872007000400006.

36. Oliveira CGT, Enumo SRF, Queiroz SS, Azevedo Jr RR. Indicadores Cognitivos, Linguísticos, Comportamentais e Acadêmicos de Pré-Escolares Nascidos Pré-Termo e a Termo. Psic.: Teor. e Pesq. 2011;27(3):283-91. https://doi.org/10.1590/S0102-37722011000300003.

37. Ferreira AT, Lamônica DAC. Comparação do léxico de crianças com Síndrome de Down e com desenvolvimento típico de mesma idade mental. Rev. CEFAC. 2012;14(5):786-91. https://doi.org/10.1590/S1516-18462011005000041.

38. Matos IB, Toassi RFC, Oliveira, MC. Profissões e ocupações de saúde e o processo de feminização: tendências e implicações. Athenea Digital. 2013;13(2):239-44.

39. Urbina S. Essentials of psychological testing. Hoboken, NJ: John Wiley & Sons.2014.

Authors contributions

JC – was responsible for data collection, data analysis and interpretation; manuscript writing; PSL was responsible for orientation, data analysis and interpretation, manuscript writing.