

## VOCABULARY ASSESSMENT IN PORTUGUESE CHILDREN AGED 3 TO 7 YEARS WITH AND WITHOUT DEVELOPMENTAL LANGUAGE DISORDER: PRELIMINARY RESULTS<sup>1</sup>

### Hodnotenie slovnej zásoby u portugalských detí vo veku od 3 do 7 rokov s a bez vývinovej poruchy jazyka: predbežné výsledky

Sandra Ferreira,<sup>2</sup> Anabela Cruz-Santos,<sup>3</sup> Suzel Bilber,<sup>4</sup> Sandra Filipa Gonçalves<sup>5</sup>

**Abstract:** Vocabulary is one of the language components that is most evident at an early age. Therefore, this research aims to analyse the vocabulary assessment from the application of the vocabulary measure of the Brazilian Portuguese ABFW Child Language Test (Andrade, C., Befi - Lopes, D., Fernandes, F., & Wertzner, H., 2004), adapted to European Portuguese. The participants of this study are 480 children, aged 3 to 7 years, male and female, with and without Developmental Language Disorder (DLD), from the northern region of Portugal. The objectives are a) to analyse vocabulary performance in relation to age, b) to analyse vocabulary performance in relation to gender, c) to analyse vocabulary performance in children with and without DLD, and d) to present the internal consistency of the ABFW Vocabulary Measure (European Portuguese Version). The results show that: a) performance on the vocabulary measure is progressive and proportional to age; b) boys show higher vocabulary performance than girls; c) typical children show slightly higher vocabulary performance than DLD; d) the measure has very good levels of internal consistency, with Cronbach's Alpha .95. The ABFW Vocabulary Measure (European Portuguese Version) shows potential as a vocabulary assessment tool and may contribute to the identification of Portuguese children at risk for language disorders.

**Key words:** ABFW- Vocabulary Measure (European Portuguese Version), assessment, developmental language disorder, vocabulary.

**Abstrakt:** Slovná zásoba je jednou z jazykových zložiek, ktorá sa najviac prejavuje v ranom veku. Preto cieľom tohto výskumu je analyzovať hodnotenie slovnej zásoby na základe aplikácie slovnej zásoby The Brazilian Portuguese ABFW Child Language Test (Andrade, C., Befi - Lopes, D., Fernandes, F., & Wertzner, H., 2004), ktorý bol adaptovaný na európsku portugalčinu. Účastníkmi tejto štúdie bolo 480 detí vo veku od 3 do 7 rokov, chlapcov a dievčat, s a bez vývinovej poruchy jazyka (VPP), a to zo severného regiónu Portugalska. Cieľom výskumu bolo: a) analyzovať slovnú zásobu vzhľadom na vek, b) analyzovať slovnú zásobu vzhľadom na pohlavie, c) analyzovať slovnú zásobu u detí s VJP a bez VJP a d) prezentovať vnútornú konzistenciu ABFW - Meranie slovnej zásoby (verzia európskej portugalčiny). Výsledky výskumu poukazujú na to, že a) výkon v meraní slovnej zásoby je progresívny a úmerný veku;

<sup>1</sup> Prijaté do redakcie/Paper submitted: 19. 05. 2023

<sup>2</sup> Sandra Ferreira, Dr., University of Minho, Portugal, Institute of Education, Research Centre on Child Studies (CIEC), (orcid.org/0000-0002-5088-054X). E-mail: sandracris3180@gmail.com. Personal information published with the written consent of the author.

<sup>3</sup> Anabela Cruz-Santos, assoc. prof., Dr., University of Minho, Portugal, Institute of Education, Research Centre on Child Studies (CIEC), (orcid.org/0000-0002-9985-8466). E-mail: acs@ie.uminho.pt. Personal information published with the written consent of the author.

<sup>4</sup> Suzel Bilber, MSpED, University of Minho, Portugal, Institute of Education, (orcid.org/0009-0001-2245-2302). E-mail: suzybilber@sapo.pt. Personal information published with the written consent of the author.

<sup>5</sup> Sandra Filipa Gonçalves, MSpED, University of Minho, Portugal, Institute of Education, (orcid.org/0009-0005-5953-5012). E-mail: s.filipagoncalves29@gmail.com. Personal information published with the written consent of the author.

b) chlapci vykazujú vyšší výkon v slovnej zásobe ako dievčatá; c) neurotypické deti vykazujú mierne vyšší výkon v slovnej zásobe ako deti s VJP; d) meranie má veľmi dobrú úroveň vnútornej konzistencie s Cronbachovým alfa .95. ABFW- Meranie slovnej zásoby (verzia európskej portugalčiny) vykazuje potenciál ako nástroj na hodnotenie slovnej zásoby a môže prispieť k identifikácii portugalských detí s rizikom jazykových porúch.

**KLúčové slová:** ABFW - Meranie slovnej zásoby (verzia európskej portugalčiny), hodnotenie, vývinové poruchy jazyka, slovná zásoba.

## **Introduction**

Language acquisition is fundamental to a child's overall development. Thus, any language disorder can have a major impact on social and cognitive development (Fogle, 2019; Owens, 2016). Given the high prevalence of children with language difficulties, it is therefore essential to understand the mechanisms of language acquisition and gain in-depth knowledge about their performance in this domain (Hoff, 2009; Prelock & Hutchins, 2018).

Vocabulary learning and development is one of the most evident aspects of language development at early ages, and it is necessary to outline the clear importance of vocabulary knowledge in language acquisition. Vocabulary is a key predictor of overall language proficiency (González-Fernández & Schmitt, 2017; McGregor et al., 2002; Weismer & Evans, 2002). Studies in this area currently allow for a more accurate description of how vocabulary development should be processed, and which variables influence this development, as well as what can be considered an alteration or a delay (Gândara & Befi-Lopes, 2010; González-Fernández & Schmitt, 2017; Prelock & Hutchins, 2018). Therefore, a language assessment of preschool and school-age children must inevitably encompass the vocabulary area, using valid and accurate assessment tools that allow recognizing risk situations.

The vocabulary test of the ABFW Child Language Test (Andrade, Befi-Lopes, Fernandes & Wertzner, 2004), is an instrument widely used in research studies related to the assessment of vocabulary. Difficulties in vocabulary acquisition have been found in children with developmental language disorder, not only in Brazil, but also in Portugal with this measure (Bilber, 2012; Cáceres-Assenço et al., 2018; Ferreira, 2014; Ferreira & Cruz-Santos, 2018; Filgueiras et al., 2013; Gonçalves, 2017).

Thus, this research aims to study vocabulary acquisition and development in Portuguese children, according to the performance on the vocabulary measure of the ABFW Child Language Test- European Portuguese version (Cáceres-Assenço et al., 2018). This study had the following objectives: a) to analyze the vocabulary performance in children aged 3 to 7 years old in the North Region of Portugal, b) to analyze the vocabulary performance between males and females, c) to analyze the vocabulary performance in children with and without Developmental Language Disorder, and d) to present the internal consistency of the ABFW- Vocabulary Measure (European Portuguese Version).

## **Method**

### *Participants*

Participants recruitment was based on geographical criteria (Northern Region of Portugal) and according to availability of the children, and parent free consent to participate in the study.

The inclusion criteria established for this research were: a) enrolled in kindergarten or in the 1st cycle of basic education; b) age range between 3 and 7 years; c) monolingual in European Portuguese; d) to be a child with typical development or having an established diagnosis of Developmental Language Disorder, based on the child profile provided by schools/teachers.

After the recruitment process was finalized according to the inclusion and exclusion criteria, the sample included 480 children between 3 and 7 years old: 49 children aged 3 years, 97 children aged 4 years, 187 children aged 5 years, 110 children aged 6 years, and 37 children aged 7 years. Regarding the condition of the child, 82.3% were typical children and 17.7% children had DLD.

### *Instrument of data collection*

The vocabulary measure of the ABFW Child Language Test (Andrade et al., 2004), a standardized Language Test in Brazil was adapted to European Portuguese for this research study (see figure 1 with some pictures examples).

The measure has nine conceptual categories: a) clothing (example figure 2), b) animals, c) food (example figure 3), d) means of transport (example figure 4), e) furniture and utensils, f) occupation (example figure 5), g) places, shapes and colors, and h) toys, and musical instruments. Each conceptual category is made up of different words, with a total of 118 words, each represented by a colored drawn picture. Considering socio-linguistic- cultural differences between Brazil and Portugal, 26 words were adapted from Brazilian Portuguese (BP) to European Portuguese (EP) (examples: BP – “Xícara” to EP- “Chávena”; BP – “Ónibus” to EP “Autocarro”), however all the original pictures of the vocabulary measure remained the same in the European Portuguese Version. Brazilian norms of the standardized ABFW Language Test for semantic performance indicated that more than 80% of the Brazilian Portuguese children could have their performance classified as adequate (Cáceres-Assenço et al., 2018). Given the homogeneity of the results of the Portuguese children with the results obtained in Brazil, the ABFW test revealed potentiality as an instrument for vocabulary assessment in Portugal (Ferreira & Cruz-Santos, 2018).

### *Procedures of data collection*

In each of the institutions/schools' children attended, a meeting was held with all parents and/or caretakers of the children, with the purpose of explaining the research objectives and to collect all parental written consent for the participation in the study.

After parental consent was obtained, a specific day was scheduled with each institution/school and teachers for the application of the measure to all children. All the assessments were carried out individually, in a quiet and adequate room at schools.

The average time for the assessment of each child ranged between 10 and 20 minutes, in one session. The answers given by the children during the application of the measure were recorded on audio file, and all responses later registered on the sheet for analyses and coding. All pictures are shown to each child at one time or in several sessions if needed, according to the severity and difficulties of the child. Pictures are shown to each child always in the same sequential order. Approximately 10 seconds should be waited in each picture for the child's response. All responses should be recorded, and the children's answers should be registered on a sheet.

*Coding of the ABFW- Vocabulary Measure (European Portuguese Version)*

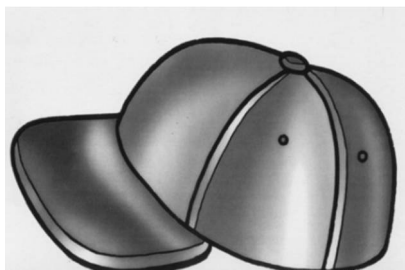
After all answers are registered the examiner will analyze each one of the response according to the following designations: designation of the usual vocabulary designation (UVD), when the child answer the correct word (score: 1 for correct; 0 for incorrect) ; non-designation (ND), when the child does not answer at all or answers "I don't know"; substitution process (SP), when the child uses a different designation for the word. After all answers are registered and analyzed the sum of the UVD is calculated, as well as the percentage for correct word responses (Cáceres-Assenço et al., 2018; Ferreira & Cruz-Santos, 2018).

Figure 1 ABFW Child Language Test & Examples of All Pictures of the Vocabulary Test



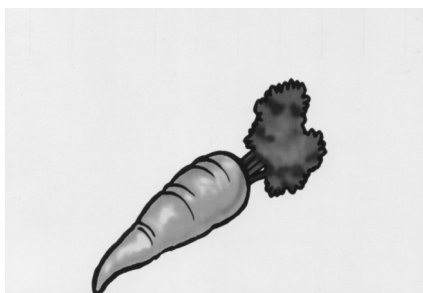
(Source: <https://profono.com.br/cases/teste-de-linguagem-infantil-abfw/>)

Figure 2 A Cap, Example of a Figure of the Category Clothing in the ABFW Child Language Test



(Source: Andrade et al., 2004)

Figure 3 A Carrot, Example of a Figure of the Category Food in the ABFW Child Language Test



(Source: Andrade et al., 2004)

Figure 4 A Helicopter, Example of a Figure of the Category Means of Transport in the ABFW Child Language Test



(Source: Andrade et al., 2004)

Figure 5 A Clown, Example of a Figure of the Category Occupation in the ABFW Child Language Test



(Source: Andrade et al., 2004)

#### *Procedures of data analyses*

The ABFW – Vocabulary Measure (European Portuguese Version) provides data to perform the analysis of each child performance in relation to acquired vocabulary, taking into account the words correctly said by the child (UVD), no

answers designated (ND) and the correct words replaced by other words (SP). In this paper, we will present data analyzed based on the children's performance in the measure, taking into account the total number of correct words (TNCW).

For this, the data were statistically analyzed using SPSS software version 26. In a descriptive analysis, the percentage, mean, and standard deviation were considered. In the inferential analysis, since the sample respects the normal distribution of data, parametric tests were used, the Analysis of Variance (ANOVA) for comparison between ages, and the T-test for independent samples, for comparison between gender and between children's condition (Typical/DLD). The significance level adopted was  $p \leq .05$ . Subsequently, the internal consistency of the measure was analyzed by determining Cronbach's Alpha.

### Results

The results of the ABFW- Vocabulary Measure (European Portuguese Version) showed progressive age-related performance, with statistically significant differences found between the means of the different age groups (see Table 1).

Table 1 Performance on the ABFW- Vocabulary Measure (European Portuguese Version), Taking into Account the Total UVD, According to Age

Age	Percentage (%)	Mean	Standard Deviation	<i>p</i>
3 years	45.8	54.02	12.693	
4 years	68	80.27	16.260	<.001*
5 years	76	89.76	12.846	
6 years	76.6	90.39	10.091	
7 years	77.6	91.54	14.535	

(Source: own compilation)

Note: UVD – Usual Vocabulary Designation; *p* – significance value

\* statistically significant difference ( $p \leq .05$ ) – Analysis of Variance (ANOVA)

Regarding gender, males had a slightly higher percentage of correct answers (UVD) in the vocabulary measure compared to females. There was a statistically significant difference between the means of the two genders (see Table 2).

Table 2 Performance on the ABFW- Vocabulary Measure (European Portuguese Version), Taking into account the Total UVD, According to Gender

Gender	Percentage (%)	Mean	Standard Deviation	<i>p</i>
Male	73	86.20	15.675	.024*
Female	70	82.68	18.393	

(Source: own compilation)

Note: UVD – Usual Vocabulary Designation; *p* – significance value

\* statistically significant difference ( $p \leq .05$ ) – T test

In relation to the child's condition, the performance of the group of typical children was higher in relation with the group of children with Developmental Language Disorder. There was a statistically significant difference between the means of the two groups (see Table 3).

Table 3 ABFW- Vocabulary Measure (European Portuguese Version Taking into Account Total UVD, according to the Child's Condition)

Condition of the child	Percentage (%)	Mean	Standard Deviation	P
Typical Development	73	86.21	16.347	
Developmental Language Disorder	64.7	76.44	18.465	<.001*

(Source: own compilation)

Note: UVD – Usual Vocabulary Designation; p – significance value

\* statistically significant difference ( $p \leq .05$ ) – T test

Analysis of the internal consistency of all items of ABFW- Vocabulary Measure (European Portuguese Version) with Cronbach's alpha showed a value of .952, considered very good (Field, 2018). The analysis showed that no words (items) when removed, could improve this value. This analysis illustrates the consistency of all words/pictures of the original measure in Brazilian Portuguese when adapted to the European Portuguese Version and furthermore analyzed by the examiner.

### Discussion

The results obtained in the application of the ABFW – Vocabulary Measure (European Portuguese Version) demonstrate a progressive vocabulary performance proportional to age. It was possible to verify, through statistical analysis, that the percentage of correct answers increased gradually according to age, with 3-year-olds showing a lower percentage and 7-year-olds showing a higher percentage. This fact, the progressive development of vocabulary with age, is supported by numerous authors and research (Bernstein & Tiegerman-Farber, 2009; Hage & Pereira, 2006; Gierut & Morrisette, 2002; Owens, 2016; Puglisi & Befi-Lopes, 2016; Prelock & Hutchins, 2018; Reed, 2018). However, in the 5, 6, and 7 age groups, the performances are very similar, with percentages very close to each other. This can be explained by the literature, which indicates that, from the age of 5, a child's vocabulary is numerically similar to that of an adult in everyday life (Andrade et al., 2004; Bernstein & Tiegerman-Farber, 2009; Owens, 2016; Reed, 2018). This fact may effectively justify the closeness that was seen in the performance of the participants aged over 5 years, who comprised the sample of this study. This evidence demonstrates the sensitivity of the vocabulary measure of the ABFW language test, in its European Portuguese version, in relation to age.

Regarding the influence of gender on vocabulary performance, the results obtained in the application of the measure show that males had a higher performance in vocabulary than females. Most studies conducted in this area do not corroborate these results, stating that the influence of gender is not significant in the child's language performance (Befi-Lopes et al., 2007; Cáceres-Assenço et al., 2018; Medeiros et al., 2013). There are also some studies that point out a higher performance of the female gender over the male gender in the acquisition and development of language skills, but however, with small significant effects (Bornstein, 2004; Burman et al., 2008; Eriksson et al., 2012; Marjanovič-Umek & Fekonja-Peklaj, 2017). Some authors found that differences decrease with age (Lange et al., 2016), and others found that differences increase with age (Marjanovič-Umek & Fekonja-Peklaj, 2017). Rinaldi et al. (2021), state that whether or not there are gender differences in early language acquisition, this question remains controversial. Thus, the results obtained in this study can be explained, or may be related, to some specific vocabulary categories included in the measure, which refer to the influence of the context of social and cultural interaction, specific to each gender (Etchell et al., 2018; Markovic, 2007; Moretti et al., 2017; Rinaldi et al., 2021; Scopel et al., 2012; Wallentin, 2020).

With regard to the child's diagnosis, it was found that typical children showed superior performance in the vocabulary measure compared to children with Developmental Language Disorder. These results are supported by some research in this area, which suggests that vocabulary difficulties are one of the most common and earliest observed milestones in children with Developmental Language Disorders (Gândara & Befi-Lopes, 2010; Prelock & Hutchins, 2018; Puglisi & Befi-Lopes, 2016). These results indicate the potentiality of the ABFW-Vocabulary Measure (European Portuguese Version) for identifying children with language disorders or difficulties.

When assessing the internal consistency of the items of the vocabulary measure - European Portuguese Version, Cronbach's Alpha was very close to 1, which, according to Field (2018) is considered very good, thus ensuring the internal consistency of the measure.

Overall, the results of this study contribute to more knowledge of the vocabulary performance of Portuguese typical children and children with language disorders between 3 and 7 years old. Thus, taking into account all the evidence pointed out, the ABFW- Vocabulary Measure (European Portuguese Version), shows feasibility and reliability for vocabulary assessment of Portuguese preschool and school-age children. It also shows potential for identifying children at risk with language problems or difficulties who need to be referred for further assessment by specialized services. These conclusions are also supported by previous studies (Cáceres-Assenço et al., 2018; Ferreira & Cruz-Santos, 2018).

Further studies in this field are needed to understand the influence of other variables, namely social, cultural, and economic variables, on the development and acquisition of vocabulary and its impact on language in children that speak Portuguese living in other countries. Evidence based is needed in the field since there are very few tools to assess language development in Portuguese.



### **Conclusion**

This study allows deepening the knowledge about the vocabulary performance of Portuguese children, showing a progressive performance proportional to age and a higher performance by typical children compared to children with Developmental Language Disorder, and also a higher performance by males, highlighting gender differences as many other studies in a national and international overview.

Overall, all evidence suggests that the ABFW – Vocabulary Measure (European Portuguese Version) has potential as a vocabulary assessment tool for Portuguese children, which may indicate that properly adapted, it may be a potential instrument for vocabulary assessment for other countries, apart from Portugal, such as Africa and countries with speaking Portuguese residents.

### *Limitations*

One of the limitations of this study is related to the fact that results are not representative of the population because data was collected through a convenience sample and from one region of the country (despite being a region of the country with a high population density). So, this study entails all the limitations associated to a convenience sampling (Etikan et al., 2016). Another limitation is related to the fact that the children identified with Developmental Language Disorder were recruited for this study based on the diagnosis based on the school profile of the children.

### *Future research*

It would be of great importance to carry out studies to analyze the influence of other variables on the results of the ABFW- Vocabulary Measure (European Portuguese Version), such as family history of delays or problems in communication/language, prematurity, low birth weight, level of academic qualifications of parents, gestational age, socioeconomic status, etc. These studies would allow obtaining more information about the factors that influence the development of vocabulary at preschool ages, since vocabulary is an essential key for reading and writing skills, and future success in school. It would be interesting to use the vocabulary measure with the other measures of the ABFW Child Language Test (the ABFW Test has three other standardized measures: Phonology, Fluency or Pragmatics) in another study, and analyze if children have the same level of performance in all the measures or if they show differences in scores of the different measures.

Furthermore, the most pertinent study would be the standardization of the ABFW – Vocabulary Measure (European Portuguese Version) at a national level.

---

### **Acknowledgements**

This work was financially supported by Portuguese national funds through the FCT (Foundation for Science and Technology) within the framework of the CIEC (Research Center for Child Studies of the University of Minho) projects under the references UIDB/00317/2020 and UIDP/00317/2020.