

**Original Research****Functional Vocabulary Measurement****Hafidz Triantoro Aji Pratomo<sup>1\*</sup>, Arif Siswanto<sup>2</sup>, Windiarti Dwi Purnaningrum<sup>3</sup>**<sup>1,2,3</sup> Department of Speech Therapy Poltekkes Kemenkes Surakarta, Indonesia**ABSTRACT**

**Background:** Vocabulary is an essential component in child and individual communication performance. This ability is an indicator of language problems or disorders that may be experienced. Measuring receptive and expressive vocabulary areas is necessary to value the children's abilities comprehensively. The provision of a vocabulary problem-examining instrument is a condition needing immediate investigation. This research aims to evaluate the validity and reliability of the Functional Vocabulary Ability Measurement instrument.

**Methods:** This study was quantitative research. Forty (40) respondents were involved in this research with varying language problem backgrounds. The instrument trial involved clinicians with speech therapist and non-therapist backgrounds. The test-retest method was used to analyze the reliability of the instrument.

**Results:** The result of the validity test shows a rho value for receptive and expressive vocabulary subtests with a total value  $> 0.800$  at a significance level  $\leq 0.001$ . The reliability value of Cronbach's alpha test result is 0.980 for receptive vocabulary and 0.986 for expressive vocabulary components, for a total value of 0.991. The relation of the test-retest result indicates that the value of relation in the first and second measurements is 0.93 for receptive vocabulary, 0.945 for expressive vocabulary components, and a total value of 0.936.

**Conclusion:** This research instrument has qualified validity and reliability values. Clinicians can use this instrument as one option in the child's vocabulary ability assessment process. Further research is necessary to see the impact of the instrument more broadly.

**ARTICLE HISTORY**Received: May 12<sup>th</sup>, 2023Accepted: December 20<sup>th</sup>, 2023**KEYWORDS**

evaluation, functional, language, validity, vocabulary;

**CONTACT**

Hafidz Triantoro Aji Pratomo

[pratomo.hafidz@gmail.com](mailto:pratomo.hafidz@gmail.com)Department of Speech Therapy  
Poltekkes Kemenkes Surakarta. Jln.  
Letjen Sutoyo, Mojosongo,  
Surakarta, Indonesia 57127.

**Cite this as:** Pratomo, H. T. A., Siswanto, A., & Purnaningrum, W. D. . (2023). Functional Vocabulary Measurement. *Interest : Jurnal Ilmu Kesehatan*, 12(1), 51–60. <https://doi.org/10.37341/interest.v12i1.565>

**INTRODUCTION**

Language disorder, or language problem, is a problem with a long history in speech therapy (Leonard, 2020). As we know, today, language disorders are referred to by several terms, including language disorder, developmental language disorder, and specific language impairment (American Psychiatric Association, 2013; Bishop et al., 2017; Leonard, 2020). Language problem is a term used for clients with language limitations who potentially may have basic problems in other neurodevelopmental

disorders. For example, a child with *Autism Spectrum Disorder* has limited language ability; this is called a language problem in *Autism Spectrum Disorders*.

Developmental language disorder is a field of speech therapy with the highest problem intensity among other communication problems (American Speech-Language-Hearing Association (ASHA), 2013). This field is the one that attracts clinicians' attention in Central Java (Pratomo & Siswanto, 2020). The prevalence of language problems shows a sufficiently high rate.

About 7% of populations are estimated to encounter a problem called developmental language disorder (Bishop et al., 2017). About 13% of children have performance below 1 SD in the measurement of preschool-age language ability (McLeod & Harrison, 2009). Another finding shows that children with combined language and speaking problems have a higher percentage, 17% (Oyono et al., 2018).

Language disorder is a problem characterized by limitations in language (Bishop et al., 2017). Language problems are characterized by problems in language form (phonology, morphology, and syntax), language content (semantics), and language use (pragmatics) (Paul & Norbury, 2012). Furthermore, the *American Psychiatry Association* (APA) (2013) explains that language disorder is a condition characterized by vocabulary limitations, problems in grammar and sentences, and difficulty in the discourse aspect.

Ironically, the early warning system in Indonesia related to this language disorder is still weak and often delayed. Adlof & Hogan (2019) suggest that children with language disorders are often unidentified because the school cannot measure oral language development systematically. For that reason, the school should begin to pay attention to their students' language development, aiming to prevent language problems from arising by identifying and recommending interventions in the beginning stages. Measuring language ability earlier and frequently is beneficial not only to those with language disorders but also to all children.

Examination and appropriate intervention give an individual with a language disorder an opportunity to reduce the gap between performance and the competency expected. Assessment, which we know as the process of collecting data to explore the problem validly and reliably (Shipley & McAfee, 2021), allows clinicians to give appropriate recommendations. The assessment procedure involving formal and informal examinations provides a higher level of accuracy (McLeod & Verdon, 2014).

Although the instrument for examining language ability is widely available, the test or examination construct should be adjusted to the client's needs. Linguistic needs and cultural background are important points in the assessment of language ability (Shipley & McAfee, 2021). The assessment factor, particularly in the aspect of selecting an appropriate assessment, determines whether or not the language examination can meet the client's needs contextually (Thomas et al., 2019). The need for language ability assessment in Indonesian is the responsibility of clinicians, researchers, and instructors (teachers). No standardized instrument found in the Indonesian language (McLeod & Verdon, 2014) makes the informal examination use more preferred.

Considering the data and assumptions, an attempt needs to be made to investigate how to examine language disorders and problems in Surakarta. Speech therapists on the front lines of managing developmental language disorders need an instrument to help the clinicians' actions. The examination model will help with early assessment or re-evaluation in dealing with language disorder cases. This research aims to determine the

validity and reliability of the functional vocabulary measuring instrument for children with communication problems.

## MATERIALS AND METHOD

This study is quantitative research. The data collection was conducted cross-sectionally. It means that the data on vocabulary performance is collected at the same time. The research was carried out to evaluate the validity and reliability of functional vocabulary measurement instruments.

Data collection was carried out by means of asking the clinicians to take the test based on the observations conducted. The research took place at the Language and Speaking Learning Center located in Mojolaban Sub District, Sukoharjo Regency. The research was conducted for six months, from May to October 2022.

The sample size involved in this research consisted of 40 respondents. The respondents were children with language disorders. Data collection was carried out through direct observation of the children. The aspects observed were receptive and expressive vocabulary aspects. The observer was the clinician. The instrument used was a functional vocabulary questionnaire developed using a rating scale approach with seven assessment levels. Table 1 explains each of the scale stages in detail.

**Table 1.** Assessment Rating Scale

Scale	Explanation
1	Incapable
2	Capable with maximum assistance
3	Capable with moderate-to-maximum assistance
4	Capable with moderate assistance
5	Capable with minimum-to-moderate assistance
6	Capable with minimum assistance
7	Independent

The receptive vocabulary subtest contains 17 items with a total value of 119. The expressive vocabulary subtest has 17 items with a total value of 19. The total, or combined, value is 238.

Data analysis was carried out using statistical descriptive and statistical correlational tests. To find out the validity of the instrument, the author used Spearman's statistical test. Cronbach's alpha test is used to see the reliability of the instrument. The author used a test-retest strategy with every child.

## RESULTS

Data collection was carried out in the Language and Speaking Learning Center Clinic. The data was collected by an enumerator. The enumerator involved in this research was the clinician working in the Language and Speaking Learning Center Clinic. The data was collected twice from the same child. It was intended to show the test-retest results. Table 3 presents the descriptions of the respondents involved in the research.

**Table 2.** Characteristics of Respondents

Gender	Age	Condition
Female	49	Attention Deficit Hyperactive Disorders

Gender	Age	Condition
Male	85	Speech Sound Disorder
Male	149	Intellectual Disability
Female	40	Language Delay
Female	29	Language Delay
Female	42	Down Syndrome
Male	60	Language Delay
Male	37	Language Delay
Female	63	Cleft Lip Palate
Male	73	Language Disorder
Male	159	Autism Spectrum Disorder
Male	100	Language Disorder
Male	65	Other growth and developmental disorders
Male	76	Speech Sound Disorder
Female	48	Language Delay
Male	31	Attention Deficit Hyperactive Disorders
Male	85	Attention Deficit Hyperactive Disorders
Female	36	Down Syndrome
Female	94	Cerebral Palsy
Male	38	Language Delay
Male	31	Attention Deficit Hyperactive Disorders
Male	65	Attention Deficit Hyperactive Disorders
Male	80	Attention Deficit Hyperactive Disorders
Male	74	Language Disorder
Female	37	Language Disorder
Male	24	Language Delay
Female	48	Language Disorder
Male	32	Other growth and developmental disorders
Male	24	Language Delay
Male	63	Attention Deficit Hyperactive Disorders
Male	48	Attention Deficit Hyperactive Disorders
Male	32	Language Disorder
Female	121	Down Syndrome
Male	24	Attention Deficit Hyperactive Disorders
Female	34	Language Disorder
Male	53	Attention Deficit Hyperactive Disorders
Male	74	Cerebral Palsy
Male	43	Language Disorder
Male	41	Autism Spectrum Disorder

The result of the instrument validity test on the receptive aspect shows that all items are valid. The validity test was carried out using Spearman's test. The result of the validity test can be seen from the score of the receptive subtest and the total combined score of the receptive and expressive vocabulary subtests. The result of the validity test on the receptive vocabulary subtest is presented in Table 3.

**Table 3.** Result of Validity Test on Receptive Vocabulary

<b>Item of Receptive Vocabulary</b>	<b>Validity of Subtest Score</b>	<b>Validity of Total score</b>
Capable of designating an object when others mention it	0.868**	0.876**
Capable of equating identical objects or things.	0.852**	0.836**
Understanding Noun.	0.922**	0.925**
Understanding verb.	0.910**	0.901**
Understanding types of emotion	0.854**	0.856**
Understanding adjective	0.833**	0.841**
Capable of equating identical figures	0.829**	0.806**
Capable of equating object and figure	0.804**	0.783**
Capable of designating or taking object when it is mentioned	0.900**	0.900**
Capable of designating word still having relation (e.g. hair and hat, cloud and rainbow, chair and table or desk, etc.)	0.855**	0.839**
Capable of sorting figure/object/thing by category.	0.866**	0.858**
Understanding spatial concept (on, under, beside, front, middle	0.845**	0.835**
Understanding attribute concept (big, small, long, short, wide, narrow, etc.)	0.846**	0.847**
Understanding quantitative concept (many, a little, more, increase, etc.)	0.842**	0.843**
Understanding temporal concept (before, after, morning, afternoon, night, etc.)	0.844**	0.844**
Capable of choosing antonym	0.792**	0.794**
Capable of choosing synonym	0.784**	0.786**

The result of the instrument validity test in the expressive aspect shows that all items are valid. The validity test was conducted using Spearman's test. The result of the validity test can be seen from the score of the receptive subtest and the total combined score of the receptive and expressive vocabulary subtests. The result of the validity test on the expressive vocabulary subtest is presented in Table 4.

**Table 4.** Result of validity test on Expressive Vocabulary

<b>Item of Expressive Vocabulary</b>	<b>Validity of subtest score</b>	<b>Validity of total score</b>
Capable of naming a familiar word spontaneously familiar	0.904**	0.849**
Capable of pronouncing word according to the context of activity	0.935**	0.913**
Using noun spontaneously	0.926**	0.892**
Using verb spontaneously	0.917**	0.891**
Using adjective spontaneously	0.898**	0.863**
Using conjunction spontaneously	0.835**	0.809**
Naming the types of emotion spontaneously	0.863**	0.839**

Capable of mentioning the name of object when its function is mentioned	0.911**	0.888**
Capable of mentioning the function of an object	0.881**	0.848**
Capable of mentioning name of object still having association	0.869**	0.841**
Capable of mentioning object category	0.863**	0.834**
Pronouncing spatial concept (on, under, beside, front, middle, etc.)	0.867**	0.848**
Pronouncing attribute concept (big, small, long, short, wide, narrow, etc.)	0.867**	0.848**
Pronouncing quantitative concept (many, a little, more, increase, etc.)	0.867**	0.848**
Pronouncing temporal concept (before, after, morning, afternoon, night, etc.)	0.859**	0.840**
Naming antonym	0.815**	0.796**
Naming synonym	0.833**	0.808**

The reliability test was carried out using Cronbach's alpha test. In this research, the author compares reliability values in each of the vocabulary subtests and in a whole or total value or score of vocabulary. Table 5 presents the comparison of reliability scores in each of the groups.

**Table 5.** Result of Reliability Test

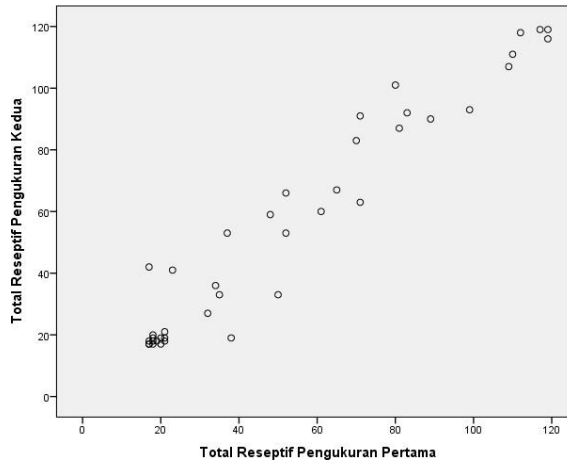
Variable	Cronbach's alpha
Receptive vocabulary	0.980
Expressive vocabulary	0.986
Total Vocabulary	0.991

To find out the instrument's ability to assess the respondents' vocabulary performance, the author used a test-retest approach. All children will be assessed by two observers or assessors separately. The second assessor or observer is not allowed to see the result of the previous observer or assessor's assessment. The score of the relationship between assessment times is presented in the table below.

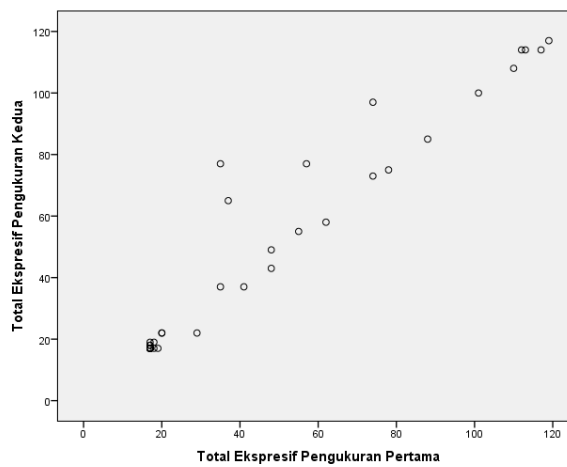
**Table 6.** Test-Retest Relation

Variable	Rho value	Significance value
Receptive vocabulary	0.931**	≤0.001
Expressive Vocabulary	0.945**	≤0.001
Total Vocabulary	0.936**	≤0.001

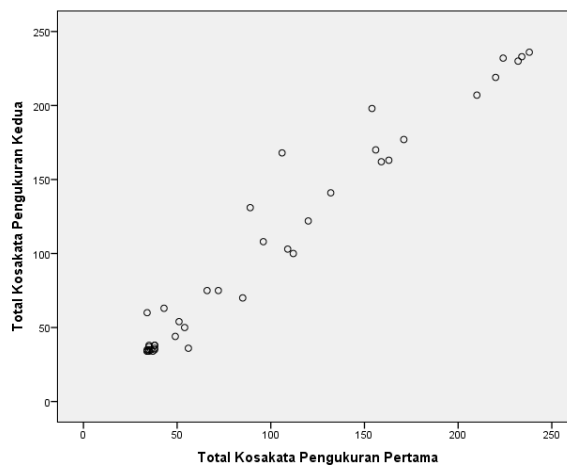
Data spread is explained in more detail in the scatter plot chart below.



**Figure 1.** Test Retest on Receptive Vocabulary



**Figure 2.** Test Retest on Expressive Vocabulary



**Figure 3.** Test Retest of Total Vocabulary

**DISCUSSION**

This research aims to assess the validity and reliability of the instrument for examining a child’s vocabulary ability functionally. Validity and reliability are important aspects an examining instrument should have in order to be able to assess the child’s ability objectively. The component is also a requirement of an examination

(Shipley & McAfee, 2021). The more valid and reliable an instrument is, the more credible it will be in the examination process.

This examination has two basic subtests: the examinations of receptive vocabulary performance and of expressive vocabulary performance. Comprehensively, a language process consisting of receptive and expressive aspects should be measured to determine the child's language performance. Language processing consists of a receptive process and expressive language, constituting important aspects that should be mastered in child communication (Pratomo, 2022). Vocabulary is an important aspect to be assessed. The aspect is an indicator of a child's language ability (Bishop et al., 2016). Limitation in vocabulary mastery is an indicator of long-term language problems (Carson et al., 2022; Muter et al., 2004; Weismer et al., 1993).

This research involves respondents with varying language problems. It is intended to prove that this instrument can be used with children with varying language backgrounds. Validity and reliability measurements involving varying samples provide more accurate outcomes (Gray et al., 2016; Mohajan, 2017). Validity measurement was conducted by valuing the relationship between each item in the subtest and the total value. The result of the validity analysis shows that the instrument used in this research has a strong validity value.

The reliability test was conducted using two basic approaches. Firstly, the author used Cronbach's alpha analysis, or test. The result of the test indicates that the instrument has strong reliability, with a score  $> 0.900$ . A test-retest approach was also employed to see the consistency of the instrument. Test-retest is a process of valuing the same individual by two raters over different periods of time, aiming to see the consistency of assessment outcomes (Taherdoost, 2018). The result of the analysis shows that the result of the test-retest on the functional vocabulary measurement instrument has a strong relationship with all examination subtests.

The result has two main implications: clinical implications and further research implications. The clinical implications of the research are, among others: 1) the result of validity and reliability tests on this instrument proves that the instrument is reliable; 2) this instrument can be used as assessment and evaluation material to see the performance and achievement of interventions made, particularly in children's vocabulary areas; and 3) clinicians have more options in doing assessments and valuing the achievement of interventions, particularly in children.

Although this research successfully answers the validity and reliability aspects of the instrument, it is noteworthy that the condition and diagnosis of respondents should be expanded. The assessment valuing the broader population coverage is necessary to obtain a result with stronger generalization. A variety of specific activities can be provided to better elicit responses.

## **CONCLUSION**

The vocabulary measurement instrument is desirable to assess the child's vocabulary ability. The vocabulary aspect measured in this instrument includes receptive and expressive vocabulary components. This instrument has seven rating scales to see a child's independence level. The research was conducted by involving respondents with varying conditions and diagnoses of language problems.

The result of the analysis shows that this instrument has good validity and reliability. The results of the research can be used as a reference for clinicians and researchers. For clinicians, it is good news to provide more varying measurement



instruments. The availability of varying instruments makes it very important for clinicians to choose contextual measurement instruments. Somehow, the research instrument still needs modification and adaptation, which requires further exploration.

## REFERENCES

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders : DSM-5* (5th Editio). American Psychiatric Association.
- Bishop, D. V. M., Snowling, M. J., Thompson, P. A., Greenhalgh, T., Adams, C., Archibald, L., Baird, G., Bauer, A., Bellair, J., Boyle, C., Brownlie, E., Carter, G., Clark, B., Clegg, J., Cohen, N., Conti-Ramsden, G., Dockrell, J., Dunn, J., Ebbels, S., ... Whitehouse, A. (2016). CATALISE: A multinational and multidisciplinary Delphi consensus study. Identifying language impairments in children. *PLoS ONE*, *11*(7), 1–26. <https://doi.org/10.1371/journal.pone.0158753>
- Bishop, D. V. M., Snowling, M. J., Thompson, P. A., Greenhalgh, T., Adams, C., Archibald, L., Baird, G., Bauer, A., Bellair, J., Boyle, C., Brownlie, E., Carter, G., Clark, B., Clegg, J., Cohen, N., Conti-Ramsden, G., Dockrell, J., Dunn, J., Ebbels, S., ... Whitehouse, A. (2017). Phase 2 of CATALISE: a multinational and multidisciplinary Delphi consensus study of problems with language development: Terminology. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *58*(10), 1068–1080. <https://doi.org/10.1111/jcpp.12721>
- Carson, L., Baker, E., & Munro, N. (2022). A Systematic Review of Interventions for Late Talkers: Intervention Approaches, Elements, and Vocabulary Outcomes. *American Journal of Speech-Language Pathology*, *31*(November), 1–14. [https://doi.org/10.1044/2022\\_ajslp-21-00168](https://doi.org/10.1044/2022_ajslp-21-00168)
- Gray, H. L., Koch, P. A., Contento, I. R., Bandelli, L. N., Ang, I., & Di Noia, J. (2016). Validity and Reliability of Behavior and Theory-Based Psychosocial Determinants Measures, Using Audience Response System Technology in Urban Upper-Elementary Schoolchildren. *Journal of Nutrition Education and Behavior*, *48*(7), 437-452.e1. <https://doi.org/10.1016/j.jneb.2016.03.018>
- Leonard, L. B. (2020). A 200-Year History of the Study of Childhood Language Disorders of Unknown Origin: Changes. *SIG 1 Language Learning and Education*, *5*(1), 6–11. [https://doi.org/https://doi.org/10.1044/2019\\_PERS-SIG1-2019-0007](https://doi.org/https://doi.org/10.1044/2019_PERS-SIG1-2019-0007)
- McLeod, S., & Harrison, L. J. (2009). Epidemiology of Speech and Language Impairment in a Nationally Representative Sample of 4- to 5-Year-Old Children. *Journal of Speech, Language, and Hearing Research*, *52*(5), 1213–1229. [https://doi.org/https://doi.org/10.1044/1092-4388\(2009/08-0085\)](https://doi.org/https://doi.org/10.1044/1092-4388(2009/08-0085))
- McLeod, S., & Verdon, S. (2014). A Review of 30 Speech Assessments in 19 Languages Other Than English. *American Journal of Speech-Language Pathology*, *23*(4), 708–723. [https://doi.org/https://doi.org/10.1044/2014\\_AJSLP-13-0066](https://doi.org/https://doi.org/10.1044/2014_AJSLP-13-0066)

- Mohajan, H. K. (2017). Two Criteria for Good Measurements in Research: Validity and Reliability. *Annals of Spiru Haret University. Economic Series*, 17(4), 59–82. <https://doi.org/10.26458/1746>
- Muter, V., Hulme, C., Snowling, M. J., & Stevenson, J. (2004). Phonemes, rimes, vocabulary, and grammatical skills as foundations of early reading development: Evidence from a longitudinal study. *Developmental Psychology*, 40(5), 665–681. <https://doi.org/10.1037/0012-1649.40.5.665>
- Oyono, L. T., Pascoe, M., & Singh, S. (2018). The prevalence of speech and language disorders in french-speaking preschool children from yaoundé (Cameroon). *Journal of Speech, Language, and Hearing Research*, 61(5), 1238–1250. [https://doi.org/10.1044/2018\\_JSLHR-L-16-0400](https://doi.org/10.1044/2018_JSLHR-L-16-0400)
- Paul, R., & Norbury, C. F. (2012). *Language Disorders from Infancy Through Adolescence: Listening, Speaking, Reading, Writing, and Communicating* (Fourth Edi). Mosby Elsevier Inc.
- Pratomo, H. T. A. (2022). *Strategi Intervensi Gangguan Bahasa Perkembangan*. Polkesta Press.
- Pratomo, H. T. A., & Siswanto, A. (2020). Penggunaan Non Speech Oral Motor Treatment (NSOMT) Sebagai Pendekatan Intervensi Gangguan Bunyi Bicara. *Jurnal Keterapian Fisik*, 5(2), 109–121. <https://doi.org/10.37341/jkf.v5i2.213>
- Shipley, K. G., & McAfee, J. G. (2021). *Assessment in speech-language pathology: a resource manual* (Sixth edit). Plural Publishing, Inc.
- Taherdoost, H. (2018). Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. *SSRN Electronic Journal*, January 2016. <https://doi.org/10.2139/ssrn.3205040>
- Thomas, S., Schulz, J., & Ryder, N. (2019). Assessment and diagnosis of Developmental Language Disorder: The experiences of speech and language therapists. *Autism & Developmental Language Impairments*, 4, 239694151984281. <https://doi.org/10.1177/2396941519842812>
- Weismer, S. E., Murray-branch, J., & Miller, J. F. (1993). *Comparison of Two Methods for Promoting Productive Vocabulary in Late Talkers*. 36(October), 1037–1050.