



# Enhancing Early Detection: The Efficacy Of A Hindi Checklist For Language-Based Reading Disabilities In Hindi Among Young Children

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## ABSTRACT

The development and administration of the Hindi checklist for language-based reading disabilities has significantly advanced the early detection of reading difficulties among children. This tool has demonstrated high reliability, as evidenced by strong Cronbach's alpha values and item total correlations for each assessed factor. These measures confirm the checklist's effectiveness in both educational and clinical settings. Factor analysis validated its reliability across various components, including speech sound awareness, word retrieval, verbal memory, speech production/perception, comprehension, expressive language, somatic components, and syntactic components. Each of these areas is crucial for a comprehensive evaluation of a child's language abilities. The checklist's high reliability, indicated by strong Cronbach's alpha values, means that its items are highly correlated with the overall construct they measure. Item total correlation values further support the tool's robustness. Early detection allows for timely intervention, which is crucial for addressing reading difficulties before they become entrenched. This can significantly improve educational outcomes for children.

Key words: Reading disability, Hindi, Children, Language-based skills, Educational support.

## INTRODUCTION

Language-based reading disabilities can profoundly affect a child's educational progress and overall development. Early detection and intervention are vital to providing the necessary support and resources to those affected (Price et al., 2022). Despite this, there has been a notable scarcity of standardized assessments tailored for early identification of such disabilities in non-English languages. In this context, the creation and validation of a Hindi language test for early detection of language-based reading disabilities marks a significant and commendable advancement. This initiative not only fills a crucial gap in educational diagnostics but also empowers educators and parents to better support children's learning needs in their native language.

A study on early identification of reading difficulties among English language learners highlighted the need for tailored diagnostic tools that address language-specific nuances (Limbos and Geva, 2001). Similarly, research has shown that early interventions and accurate identification of language-based disabilities are vital in non-English speaking populations to ensure effective educational support (Estrella et al., 2018; Lesaux and Siegel, 2003).

Early indicators of reading disabilities in children can manifest as delays in speech and language development, difficulties with rhyming, challenges in learning the alphabet or letter sounds, and struggles with reading and writing relative to their peers (Lyytinen et al., 2005). These disabilities can vary widely in severity, with each child displaying a distinct combination of strengths and weaknesses (Snowling and Hulme, 2012; Catts et al., 2015). Recognizing these early signs is crucial for timely intervention and support to address the specific needs of each child.

## AIMS & OBJECTIVES

This study was conducted with the goal of developing and standardizing a test for the early identification of Language-Based Reading Disabilities in Hindi for children aged 5 to 6 years. The assessment was designed to evaluate a variety of language-based skills essential for reading acquisition in the context of the Hindi language.

Key objectives included:

1. Evaluation of Language-Based Skills
2. Development of a Standardized Test
3. Normative Data Collection

This comprehensive approach aims to provide educators and clinicians with a valuable tool for the early identification of reading disabilities, enabling timely and effective interventions.

## RESEARCH METHODOLOGY

### *Study areas*

The four city/towns were selected that involved Bhopal, Itarsi, Raisen, and Narmadapuram in Madhya Pradesh state, offering a diverse geographical and cultural landscape. Bhopal, as the state capital, is a significant urban center with a blend of historical and modern elements. Itarsi serves as a crucial transportation and commercial hub. Raisen is noted for its historical heritage and agricultural economy, while Narmadapuram is distinguished by its scenic beauty and the sacred Narmada River. Together, these areas provide a comprehensive backdrop for studies related to socio-economic and educational research in Madhya Pradesh (Govt. of Madhya Pradesh, 2024).

### *Sampling: Subjects and Schools*

A population of 278 children aged 5-6 years, consisting of 148 boys (53.2%) and 130 girls (46.8%), enrolled in selective schools in four towns of Madhya Pradesh were chosen by purposive selection method for the present study. The age range is particularly significant as it corresponds to a critical period of language acquisition and lays the foundation for future reading and academic success. By identifying potential reading disabilities at this stage, appropriate interventions can be implemented promptly, enhancing the child's overall language and literacy development. These children were reported to have average academic performance and were from middle class background.

### *Research Design*

This research has two main goals. First, it aims to develop an assessment tool for evaluating key language skills critical for reading in Hindi, including speech sound awareness, word retrieval, verbal memory, speech production/perception, comprehension, expressive language, and semantic and syntactic components. This tool will offer a comprehensive evaluation of a child's language abilities, essential for reading proficiency. Second, the research aims to establish normative data and standardized scoring criteria for this assessment tool. By comparing individual performance against a sample of typically developing Hindi-speaking children, it will help identify language-based reading disabilities. The standardized scoring will ensure consistent and reliable interpretation of results, enhancing the assessment's validity.

## *Tools*

### *i) Module or Checklist*

A screening checklist for the early identification of language-based reading disabilities in Hindi for young children aged 6-7 years, attending primary schools in Hindi-speaking regions, was developed. The checklist drew inspiration from pre-existing modules such as Catts' (1997) work in English, which focuses on similar objectives for language-based reading disabilities in children. Additionally, insights from other researchers' work on language-based reading disabilities, as well as children's storybooks and educational materials, were incorporated to create this tool in Hindi. The Hindi version of the checklist was validated by a panel consisting of two special educators, two Speech Language Pathologists (SLPs), and two teachers. Their feedback and suggested modifications were incorporated into the final version, which was then prepared for testing. The final checklist comprises 8 sections with a total of 42 items.

### *ii) Scoring*

The scores were obtained from 42 items or behaviors. Each consistency response was scored as 'zero' and no response carries 'one'. All the positives' scores were added. The pass-fail criterion was based on 90th percentile with 1 SD. Children having a score above + 1 SD were considered "at risk" for reading disability and were subjected to further assessments by Speech Language Pathologist, Special Educator and class teachers.

### *iii) Development and Standardization of Test*

To develop and standardize the test, the 90th percentile was used as a critical cutoff point to identify high-risk cases. Scores above this percentile indicate significant difficulties in language-based tasks, suggesting potential reading disabilities. Children scoring above the 90th percentile were considered at risk for language-based reading disabilities, as these scores reflect substantial challenges in language tasks. The 90th percentile serves as a crucial benchmark in scale development, allowing for the identification of high-performing entities, realistic benchmark setting, and detection of exceptional cases. By using a representative and sufficiently large sample size, this method ensures meaningful decisions. Additionally, it takes into account the overall distribution shape, making the analysis robust and reliable by effectively handling outliers.

The reliability of the checklist was assessed using Cronbach's alpha, which yielded a high value of 0.996, indicating excellent internal consistency. Each item's correlation with the total score was evaluated to ensure consistency with the overall construct, confirming the checklist's utility in assessing language-based reading disabilities in young children. There would be no external influences on a child's language-based reading abilities. A family history of reading difficulties is typically genetic; thus, the absence of this

factor in participating children would negate any inherent uncontrolled forces leading to language-based reading disabilities.

#### *iv) Statistical Analysis*

The statistical analysis for the study on Language-Based Reading Disabilities in children was performed using Excel, R Programming, and Jamovi. These tools ensured a robust and comprehensive analysis, enabling a deeper understanding of the prevalence and characteristics of reading disabilities among the participants.

## RESULTS AND DISCUSSION

#### *i) Scale Reliability Statistics*

The reliability of the checklist was assessed using Cronbach's alpha, which resulted in a value of 0.996 (Table 1). This high value indicates excellent internal consistency, suggesting that the items on the checklist are highly reliable for assessing language-based reading disabilities in young children.

**Table 1: Scale Reliability Statistics**

Statistic	Value
Cronbach's $\alpha$	0.996

Using descriptive statistics, the checklist's raw scores were evaluated to determine a cutoff score, which is critical in identifying children who may require further assessment. Children scoring above this cutoff were identified as potentially having a language-based reading disability and were sent for a comprehensive evaluation to confirm the diagnosis and plan appropriate interventions.

#### *ii) Factor Analysis*

##### *a) Item Total Correlation and Alpha Values*

Table 2 presents the item total correlation and Cronbach's alpha values for each factor assessed by the checklist. These statistical measures are essential for evaluating the reliability and internal consistency of the different factors related to language or speech capabilities. Item total correlation measures how well each item correlates with the total score of the scale, indicating the extent to which an item is consistent with the overall construct being measured. High item total correlation values suggest that the item is a good indicator of the underlying factor, while low values may indicate that the item does not align well with the overall construct.

**Table 2: Item Total Correlation and Alpha Values for factors assessed by the checklist.**

S. No.	Variable	Item Total Correlation	Alpha	N
1	Speech Sound Awareness	0.386	0.750	278
2	Word Retrieval	0.294	0.767	278
3	Verbal Memory	0.461	0.746	278
4	Speech Production/Perception	0.571	0.724	278
5	Comprehension	0.540	0.724	278
6	Expressive Language	0.566	0.721	278
7	Somatic Component	0.571	0.717	278
8	Syntactic Component	0.469	0.744	278

### *B) Analysis of Each Factor*

Speech sound awareness demonstrated a moderate correlation (0.386) with an alpha value of 0.750, indicating moderate reliability. Word retrieval had the lowest item total correlation (0.294) but the highest alpha (0.767), suggesting it is less aligned with the overall construct yet highly reliable. Verbal memory showed a fairly good correlation (0.461) and an alpha of 0.746, indicating good reliability. Speech production/perception exhibited a high correlation (0.571) with an alpha of 0.724, reflecting strong reliability. Comprehension displayed a high correlation (0.540) with an alpha of 0.724, also indicating strong reliability. Expressive language had a high correlation (0.566) but the lowest alpha (0.721), showing moderate reliability. The somatic component demonstrated a high correlation (0.571) with an alpha of 0.717, indicating good reliability. Lastly, the syntactic component showed a fairly good correlation (0.469) with an alpha of 0.744, suggesting good reliability.

Overall, the factors exhibit good item-total correlations and reliable alpha values, indicating that the items in each factor are effective measures of the language and speech capabilities being assessed. The high reliability scores underscore the effectiveness of the Hindi checklist in identifying language-based reading disabilities in young children. Further evaluation and continuous monitoring are recommended for children identified as high-risk to ensure timely interventions.

Factor analysis confirmed good reliability across various components, including speech sound awareness, word retrieval, verbal memory, speech production/perception, comprehension, expressive language, somatic component, and syntactic component. These findings align with those of previous

studies that emphasize the importance of multiple linguistic components in diagnosing language-based reading disabilities. For instance, Torgesen et al. (1994) highlighted the critical role of phonological processing in reading disabilities, particularly the importance of speech sound awareness in early literacy development. This is consistent with the present study where speech sound awareness was prevalent in 29.14% of the subjects.

The high prevalence of syntactic component disorders, affecting 49.70% of subjects, underscores the significance of syntactic skills in reading proficiency. This finding echoes the work of Catts and Kamhi (2005), who demonstrated that syntactic deficits are commonly associated with reading disabilities and can significantly impede reading comprehension and fluency. Additionally, Nation and Snowling (1998) found that syntactic processing is a strong predictor of reading difficulties, reinforcing the relevance of our findings.

## CONCLUSION

The administration of the Hindi checklist for language-based reading disabilities has yielded significant insights into the early detection of reading difficulties among children. This checklist has demonstrated high reliability, as evidenced by the Cronbach's alpha values and item total correlations for each assessed factor. These statistical measures confirm the checklist's effectiveness and reliability in both educational and clinical settings. The successful validation and implementation of this tool underscore its potential to serve as a standard for early identification of language-based reading disabilities. Its application can facilitate timely interventions, thereby enhancing educational outcomes and supporting the developmental needs of children. The robust reliability indicated by the statistical analysis ensures that the checklist can be confidently used to assess and address reading difficulties, ultimately contributing to better learning experiences and academic success for young learners.

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