

## Assessing Reading Difficulties in Algerian Fourth Graders with Dyslexia

kheira HABI <sup>\*1</sup> , Ahmed KHAROUBI <sup>2</sup>

<sup>1</sup> University of Djilali liabes sidi Bel Abbes (Algeria),  
e-mail : kheira.habi@univ-sba.dz

<sup>2</sup> University of Kasdi Merbah Ouargla (Algeria),  
e-mail : kharoubi.ahmed@univ-ouargla.dz

**Submitted**

27/09/2025

**Accepted**

12/01/2026

**Published**

01/06/2026

**Abstract:** This study explores reading performance in Algerian fourth-grade students diagnosed with dyslexia, using an adapted Arabic version of the L'Alouette Reading Test. Informed by a quantitative descriptive design, the research assesses both quantitative indicators (total words read, correct words, accuracy index, speed, and number of errors) and qualitative markers (phoneme-letter errors, unfamiliar word decoding, and compensatory strategies). The results revealed significant reading deficits, students read far below the normative average, with accuracy and speed indices averaging only 58%. All participants demonstrated phonological processing challenges, particularly with unfamiliar words and harakat usage, core difficulties aligned with dyslexia's phonological basis. Despite these challenges semantic comprehension appeared relatively preserved, and students frequently employed adaptive strategies such as finger-tracking and contextual guessing.

**Keywords:** *Dyslexia; L'Alouette Test; Fourth Grade Students.*

### 1. INTRODUCTION

Reading is a cornerstone of academic achievement and a vital skill for lifelong learning. For many children the ability to read fluently and with comprehension develops steadily through early schooling. However, for students with dyslexia neurodevelopment disorder that affects word recognition, decoding, spelling, and reading fluency this process is often disrupted, leading to significant academic and emotional consequences if left unaddressed (Lyon et al., 2003; Shaywitz, 2003; Snowling & Hulme, 2012).

By fourth grade students are expected to shift from “learning to read” to “reading to learn.” This stage places higher cognitive demands on reading skills such as comprehension, vocabulary access, and the ability to read across subjects.

---

**\*Corresponding author**

For children with dyslexia this transition is particularly challenging, as their persistent difficulties with phonological processing and automatic word retrieval may hinder broader academic performance (Shaywitz, 2003; Vellutino et al., 2004).

Early and accurate assessment of reading performance is essential not only for identifying dyslexia but also for informing effective targeted interventions. A comprehensive evaluation should go beyond surface-level fluency or accuracy measures and consider multiple reading indicators such as phonological awareness, decoding ability, reading speed, error types, and comprehension offering a multidimensional understanding of the learner's profile (Ehri et al., 2001; Torgesen, 2000).

In the Algerian educational context, research on dyslexia remains limited, particularly in the upper primary grades where the demands of independent reading intensify. This study contributes to addressing that gap by assessing fourth-grade students in Algeria using an adapted diagnostic tool.?

### 2. Objectives of the study

- To assess the quantitative indicators of reading performance in Algerian fourth-grade students with dyslexia, including reading accuracy, speed, number of words read, and error frequency.
- To assess the qualitative indicators of reading performance in Algerian fourth-grade students with dyslexia, focusing on error types, phoneme–grapheme correspondence difficulties, decoding of unfamiliar words, and the compensatory strategies used during reading

### 3. Method

#### 3.1 Research Design

This study employed a quantitative descriptive research design to examine reading performance and dyslexia-related indicators among fourth-grade students. The assessment tool used was an adapted version of the L'Alouette Reading Test, originally developed in French and later modified for Arabic-speaking learners by Dr. Ben Sadoon.

#### 3.2 Demographic Characteristics of the Study Sample

The total number of diagnosed dyslexia cases across all schools in the sample is 30. The sample includes 18 males and 12 females, indicating a higher

representation of males (60%) among diagnosed cases.

**Table 1**

*Demographic Characteristics of the Study Sample.*

| Primary School                   | Diagnosed Dyslexia Cases | Male      | Female    |
|----------------------------------|--------------------------|-----------|-----------|
| Abi Mahdi Issa                   | 0                        | 0         | 0         |
| Sheikh Ahmed Farsous             | 2                        | 0         | 2         |
| Sheikh Baabd Al-Rahman Al-Kurthi | 2                        | 1         | 1         |
| Noah Aisha                       | 3                        | 0         | 3         |
| Sheikh Abi Yaqub                 | 2                        | 2         | 0         |
| Abi Ishaq                        | 3                        | 3         | 0         |
| Abdullah Bouras                  | 1                        | 1         | 0         |
| Hassiba Ben Bouali               | 3                        | 2         | 1         |
| Qabbani Mohamed                  | 1                        | 1         | 0         |
| Abi Ammar Abdul Kafi             | 2                        | 1         | 1         |
| Mamane Suleiman                  | 3                        | 1         | 2         |
| Sheikh Hamo Fakhar               | 1                        | 1         | 0         |
| Aisha Umm al-Mu'minin            | 2                        | 0         | 2         |
| Sheikh Hamo Issa Al-Nouri        | 2                        | 2         | 0         |
| Sheikh Saleh Dawoudi             | 3                        | 2         | 1         |
| <b>Total</b>                     | <b>30</b>                | <b>18</b> | <b>12</b> |

**Source:** Prepared by the researchers based on the outputs of the SPSS software.

### 3.3 Sampling Method

A purposive sampling method was used to ensure participants met the specific criteria for studying dyslexia.

### 3.4 Tools / Materials

The study utilized the L'Alouette Reading Test, adapted to the Algerian context by Ben Saadoun Fatiha (2015) as part of her doctoral research in Developmental Psychology at the University of Tlemcen. The test assesses both quantitative indicators such as total words read, correct words, errors, accuracy index, and speed, and qualitative indicators, including unfamiliar words, phoneme-letter errors, verbal similarity, and semantic interference, providing a comprehensive profile of reading difficulties associated with dyslexia.

### 3.5 Psychometric Properties of the Test

#### 3.5.1 Discriminant Validity

Quantitative Indicators: Statistical comparisons between upper and lower performance groups ( $p < 0.01$ ) confirm strong discriminant validity. Indicators

such as Correct Words Read, Time Taken, Errors, and Speed Index show significant differences (high T-values), effectively distinguishing performance levels.

Qualitative Indicators: Qualitative metrics ( $p < 0.001$ ) also exhibit excellent discrimination. Phoneme Errors, Verbal Similarity, and Semantic Interference show large T-values, indicating strong validity in assessing linguistic and cognitive processing.

### 3.5.2 Test-Retest Reliability

Quantitative Indicators: High correlations ( $r = 0.81\text{--}0.87$ ,  $p < 0.001$ ) confirm strong temporal stability across measures like Correct Words Read and Speed Index, which showed the highest reliability ( $r = 0.87$ ). Narrow confidence intervals support precision.

Qualitative Indicators: Exceptional consistency ( $r = 0.81\text{--}0.97$ ,  $p < 0.001$ ) across all indicators. Phoneme Letter Errors ( $r = 0.97$ ) and Semantic Interference ( $r = 0.96$ ) demonstrate near-perfect stability, confirming the test's strong reliability in assessing linguistic and cognitive skills.

### 3.6 Procedure

Following approval from school authorities, the study was conducted in two phases over a five-week period (April 6 – May 8, 2025). The process included administering reading assessments, observing classroom behaviors, and documenting student performance systematically.

Data were securely recorded and analyzed using SPSS, with full adherence to ethical and confidentiality standards.

## 4. Results

### 4.2 Descriptive Statistics of Test Scores for the Study Sample

#### 4.2.1 Descriptive Statistics of Dyslexia Test Quantitative Scores in the Study Sample

Table 2

*Descriptive Statistics of Dyslexia Test Scores in the Study Sample.*

| Reading Performance Variable | N  | Min  | Max  | Mean  | SD    |
|------------------------------|----|------|------|-------|-------|
| Total Words Read             | 30 | 4.0  | 143  | 65.67 | 44.39 |
| Number of Errors             | 30 | 3.0  | 57   | 21.47 | 14.24 |
| Correct Words Read           | 30 | 1.0  | 128  | 44.20 | 35.57 |
| Accuracy Index (%)           | 30 | 21.4 | 89.5 | 58.05 | 20.06 |
| Speed Index                  | 30 | 1.0  | 128  | 44.20 | 35.57 |

Source: Prepared by the researchers based on the outputs of the SPSS software.

Descriptive statistics revealed considerable variability in reading performance among participants. On average, students read 65.67 words (SD = 44.39), with 44.20 correct words (SD = 35.57) and 21.47 errors (SD = 14.24). The accuracy index averaged 58.05% (SD = 20.06), while the speed index aligned closely with correct word count, reflecting the connection between fluency and accuracy. These results highlight diverse reading skill levels, forming a foundation for further analysis of related cognitive factors.

#### 4.2.2 Descriptive Statistics of Dyslexia Test Quantitative Scores in the Study Sample

**Table 3**

*Frequency and Percentage of Error Types in the Dyslexia Test (Qualitative Section).*

| Behavior / Error Type                   | Number of Students | Percentage (%) |
|-----------------------------------------|--------------------|----------------|
| Unfamiliar Word Errors                  | 30                 | 100%           |
| Phoneme/Letter Errors                   | 30                 | 100%           |
| Verbal Similarity Errors                | 20                 | 66.7%          |
| Semantic Interference Errors            | 0                  | 0%             |
| Exceeded Normative Reading Time (>3:19) | 30                 | 100%           |
| Use of Compensatory Strategies          | 30                 | 100%           |

**Source:** Prepared by the researchers based on the outputs of the SPSS software.

Analysis of the qualitative section of the dyslexia test revealed consistent patterns of reading difficulties among all participants. All 30 students (100%) struggled with decoding unfamiliar words, often mispronouncing, skipping, or replacing them with more familiar alternatives. Phoneme-letter errors were also universal, including additions, omissions, transpositions, and confusion between visually similar letters (e.g., ب and ت). Harakat-related issues were frequent, with students either omitting or misapplying vowel markings, which disrupted phonological accuracy in Arabic reading.

Two-thirds of the students (66.7%) showed verbal similarity errors, such as confusing visually similar words or misreading familiar ones. Notably, no semantic interference errors were observed, suggesting that while decoding was impaired, deeper semantic comprehension was relatively preserved.

All students exceeded the standard reading time, indicating reduced fluency. Moreover, each employed compensatory strategies, including finger-tracking, leaning closer to the text, guessing from context, hesitating before difficult words, and emphasizing certain letters. These behaviors reflect conscious efforts to cope with decoding challenges, emphasizing that dyslexia affects not only performance

but also how students engage with reading tasks in real time.

### 5. Discussion

This study employed a quantitative descriptive research design to examine reading performance and dyslexia-related indicators among fourth-grade students. The assessment tool used was an adapted version of the L'Alouette Reading Test, originally developed in French and later modified for Arabic-speaking learners by Dr. Ben Sadoon.

This study aimed to assess reading performance in Algerian fourth-grade students diagnosed with dyslexia, using an adapted version of the L'Alouette Reading Test. The results present a clear and concerning picture of how dyslexia manifests in this context, both quantitatively and qualitatively highlighting the urgent need for culturally responsive identification and intervention strategies.

The mean number of total words read (65.67) and correct words (44.20) fell significantly below the standard norm of 178, and the average accuracy and speed indices (both  $\approx 58\%$ ) were far from the expected benchmark of 100. These findings align with international research showing that children with dyslexia experience persistent struggles with fluency and decoding (Shaywitz, 2003; Torgesen, 2000). Such gaps, especially by the fourth grade, are particularly worrisome, as this is the stage when students are expected to "read to learn" rather than continue learning to read.

All students made errors with unfamiliar words and phoneme-letter mapping. This confirms longstanding evidence that phonological processing deficits are the hallmark of dyslexia (Ehri et al., 2001; Vellutino et al., 2004). In the context of Arabic, this challenge is further complicated by the role of harakat (vowel markers), which were frequently omitted or misused. These issues underscore the importance of tailoring dyslexia assessments to script-specific features (Ziegler & Goswami, 2005).

Interestingly, although phonological and visual-perceptual errors were widespread, no semantic interference errors were observed. This suggests that while surface-level decoding is impaired, deep semantic understanding may remain relatively intact, especially when children can rely on contextual or background knowledge. This finding supports the view that dyslexia affects form more than meaning, and that comprehension can be leveraged as a strength in interventions (Snowling & Hulme, 2012).

The universal use of compensatory behaviors, finger tracking, leaning close to text, guessing, demonstrates the adaptive intelligence of students trying to overcome decoding obstacles. These strategies, while not always effective, are creative attempts to scaffold reading. They also highlight how dyslexic students

remain engaged and motivated despite their struggles, reflecting a growth-oriented response that should be encouraged, not penalized.

The adapted Arabic version of the L'Alouette Test proved both reliable and discriminating. Its use in this study illustrates how important it is to contextualize diagnostic tools, particularly in languages like Arabic with deep orthographies. International tools must be linguistically and culturally adjusted to ensure validity and fairness in diverse populations (Landerl et al., 2013).

## 6. Conclusion

This study examined reading performance in Algerian fourth-grade students with dyslexia using an adapted Arabic version of the L'Alouette Reading Test. The findings revealed significant deficits in reading fluency and accuracy, with performance levels far below grade-level norms. These results indicate that dyslexic students continue to struggle with automatic decoding and reading speed at a stage when academic demands increasingly rely on independent reading.

Qualitative analysis showed universal phonological processing difficulties, particularly in phoneme-grapheme correspondence, decoding unfamiliar words, and correct use of harakat, reflecting the core phonological nature of dyslexia within the Arabic writing system. In contrast, semantic comprehension appeared relatively preserved, suggesting an important strength that can be utilized in intervention programs. The consistent use of compensatory strategies further highlighted students' active engagement and adaptive responses to reading challenges.

Overall, the adapted L'Alouette Test proved to be a valid and reliable tool for assessing dyslexia in the Algerian context. The study underscores the need for early identification, culturally appropriate assessment, and targeted interventions that address phonological weaknesses while building on preserved comprehension skills to support academic success for students with dyslexia

## 7. Bibliography List:

- Ehri, L. C., Nunes, S. R., Stahl, S. A., & Willows, D. M. (2001). Systematic Phonics Instruction Helps Students Learn to Read: Evidence from the National Reading Panel's Meta-Analysis. *Review of Educational Research*, 71(3), 393–447. <https://doi.org/10.3102/00346543071003393>
- Landerl, K., Ramus, F., Moll, K., Lyytinen, H., Leppänen, P. H. T., Lohvansuu, K., O'Donovan, M., Williams, J., Bartling, J., Bruder, J., Kunze, S., Neuhoff, N., Tóth, D., Honbolygó, F., Csépe, V., Bogliotti, C., Iannuzzi, S., Chaix, Y., Démonet, J., ... Schulte-Körne, G. (2013). Predictors of developmental dyslexia in European

- orthographies with varying complexity. *Journal of Child Psychology and Psychiatry*, 54(6), 686–694. <https://doi.org/10.1111/jcpp.12029>
- Lyon, G. R., Shaywitz, S. E., & Shaywitz, B. A. (2003). A definition of dyslexia. *Annals of Dyslexia*, 53, 1–14. <https://doi.org/10.1007/s11881-003-0001-9>
- Shaywitz, S. E. (2003). *Overcoming dyslexia*. vintage
- Snowling, M. J., & Hulme, C. (2012). Interventions for children's language and literacy difficulties. *International Journal of Language & Communication Disorders*, 47(1), 27–34. <https://doi.org/10.1111/j.1460-6984.2011.00081.x>
- Torgesen, J. K. (2000). Individual differences in response to early interventions in reading: The lingering problem of treatment resisters. *Learning Disabilities Research & Practice*, 15(1), 55–64. [https://doi.org/10.1207/SLDRP1501\\_6](https://doi.org/10.1207/SLDRP1501_6)
- Vellutino, F. R., Fletcher, J. M., Snowling, M. J., & Scanlon, D. M. (2004). Specific reading disability (dyslexia): What have we learned in the past four decades? *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 45(1), 2–40. <https://doi.org/10.1046/j.0021-9630.2003.00305.x>
- Ziegler, J. C., & Goswami, U. (2005). Reading Acquisition, Developmental Dyslexia, and Skilled Reading Across Languages: A Psycholinguistic Grain Size Theory. *Psychological Bulletin*, 131(1), 3–29. <https://doi.org/10.1037/0033-2909.131.1.3>