

Relationship Of Phonological Awareness With Reading Ability Among Third Grade Elementary Students With Dyslexia

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Received: 16/09/2023 ; Accepted: 12/01/2024 ; Published: 27/01/2024

Abstract:

The study aimed to investigate the relationship between phonological awareness and reading ability among third-grade students with reading difficulties. To achieve the study's objectives, a descriptive correlational approach was adopted, and a sample of 36 male and female students in the third grade with reading difficulties was included. The following instruments were used: Raven's Matrices Test, Reading Test (high-frequency words, low-frequency words, pseudo-words), and Phonological Awareness Test. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) software, employing the correlation coefficient "eta-squared." The study's results revealed a statistically significant correlation between phonological awareness and reading ability among third-grade students with reading difficulties across all levels (high-frequency words, low-frequency words, pseudo-words).

Keywords: Phonological awareness; dyslexia; Word reading.

I- Introduction:

Language is one of the most important early acquisitions for children in early childhood. Despite its complexity, children learn it gradually within environmental, cognitive, and physical factors. In order for a child to master the process of reading, they must first learn letter recognition, phonological units, and words as a preliminary step towards achieving the learning process. However, they may face numerous problems and difficulties that hinder their acquisition of reading skills, which can be attributed to a weak phonological awareness.

Phonological awareness refers to the ability to perceive and mentally analyze the components of oral language at various levels, such as sounds, syllables, words, etc., through processes of segmentation, blending, substitution, and transformation between these components. Oral language is not only a means of communication but also a subject for analysis. In this context, individuals with reading difficulties (referred to as "dyslexics") encounter significant challenges in

performing these processes compared to typical readers of the same age (Al-Issa, 2005).

It is worth mentioning that the development of reading skills highly depends on the development of phonological awareness in children, as it forms a fundamental and necessary skill for word recognition and understanding its phonological elements. Assessing the child's phonological system level enhances the identification of the difficulties they face. If a child struggles with phonological awareness, it predicts or indicates dyslexia through difficulties in recognizing, comprehending, and producing written and spoken symbols. Reading difficulties, especially dyslexia, are common problems in educational settings, and they manifest due to the student's inability or incapacity to perform the reading process. Therefore, it is essential for educational and pedagogical staff to pay attention to this group, especially in the early stages. To identify this group, it is necessary to provide and conduct tests that identify individuals with reading difficulties for proper care and attention.

Based on the aforementioned, this study aims to investigate the relationship between phonological awareness and reading ability among third-grade students with reading difficulties.

2- Problem Statement:

The acquisition of language in early developmental stages heavily relies on all senses. These stages are crucial for children, and they require attention and careful planning. Children need to consolidate their acquisitions in order to overcome various difficulties they may encounter during their learning process. During this period, children should focus on reading and writing by mastering letter recognition and pronunciation, as well as reading individual words correctly. Additionally, they should be able to link sounds with letters and distinguish between similar sounds in pronunciation. This is known as phonological awareness, as defined by Kashmir (2019, p. 18), which refers to "knowledge of language sounds and their meanings. This knowledge includes awareness of word structures and the ability to control their components, as well as the ability to make different changes to the word that is intended to be pronounced. This requires separating the word from its meaning and the reference it represents, considering it as a composite template composed of several parts, syllables, and sounds." Experts also agree that the learner possesses a set of intrinsic factors, including physiological abilities such as speech and voice integrity, as well as the soundness of neural tissues, which contribute to the continuity of the learning process.

Phonological awareness is considered a significant indicator in language acquisition and learning, as its development leads to improving children's abilities in the early stages of their learning. During these initial educational stages, children begin to retrieve previously perceived experiences and employ them by connecting auditory memory with letter forms, attempting to translate written language into spoken language, which is known as reading text or words. This process is referred to as a cognitive mental process that involves the ability to convert written symbols into spoken language (Saadawi, 2018, p. 16). This is known as reading ability. However, during the acquisition of this

skill, children may face various difficulties such as difficulty in accurately and fluently recognizing words, decoding them, and spelling them. Additionally, they may encounter problems in processing or comprehending what they read or hear. These difficulties are known as reading difficulties or dyslexia, which refers to the inability to comprehend and perceive written symbols. It involves difficulties in the fundamental phonological skills necessary for perceiving the relationship between letters as symbols and their sounds (Montaser, 2016, p. 115). Many studies and research confirm a significant correlation between phonological awareness and reading, as phonological awareness serves as a good indicator for acquiring and learning reading skills. Its development leads to improving children's reading ability, especially in the early grades. Several previous studies have shown a relationship between phonological awareness and reading difficulties among dyslexic students, including a study by Montaser, Al-Shaib, and Al-Ayees (2014), which indicated a statistically significant relationship between reading difficulties and the level of phonological awareness. Students who have weak phonological awareness experience reading difficulties. This was also addressed by Al-Ayees (2009) in his study on identifying the relationship between phonological awareness and dyslexia among elementary school students with reading difficulties. (Bouakaz, 2020, p. 16).

Based on the preceding information and the findings of previous studies, the following question arises:

- Is there a statistically significant relationship between phonological awareness and reading ability among third-grade elementary students with dyslexia?

3- Research Hypotheses:

3-1- General Hypothesis: There is a statistically significant relationship between phonological awareness and reading ability among third-grade elementary students with dyslexia.

3-2- Specific Hypotheses:

- There is a correlational relationship between phonological awareness and the ability to read common words among third-grade elementary students with dyslexia.

- There is a correlational relationship between phonological awareness and the ability to read unfamiliar words among third-grade elementary students with dyslexia.

- There is a correlational relationship between phonological awareness and the ability to read pseudo-words among third-grade elementary students with dyslexia.

4- Study Significance:

The study derives its significance from the importance of its subject matter, which is reading ability among students with dyslexia, through examining its relationship with phonological awareness. Additionally, there has been a noticeable increase in the prevalence of reading difficulties in educational settings, especially in the primary education phase.

5- Study Objectives:

- To uncover the relationship between phonological awareness and reading ability among third-grade elementary students with dyslexia.

- To investigate the relationship between phonological awareness and reading words at three levels (common words, unfamiliar words, pseudo-words) among third-grade elementary students.

6- Procedural Definition of Study

Concepts:

6-1- Phonological Awareness: The ability to manipulate the speech units, such as dividing sentences into words, words into syllables, and syllables into sounds. It also includes the ability to add, delete, and substitute sounds. Phonological awareness is measured by the child's performance on the Phonological Awareness Assessment Scale.

6-2- Dyslexia: The inability to read words and written sentences fluently and accurately without any underlying medical, psychological, or cognitive causes hindering it. Dyslexia is assessed based on the student's performance on the reading

test at three levels (common words, unfamiliar words, pseudo-words).

6-3- Reading Ability: It refers to the student's capacity to read and recognize written words, comprehend sentences, and understand them.

7- Literature Review and Comments:

7-1- Munassar's Study (2016):

The aim of the study was to investigate the impact of a training program based on the working memory strategy (verbal and visual) in developing word reading ability among individuals with dyslexia. The study was conducted on a sample of 8 students who were deliberately selected and diagnosed with dyslexia. The study employed a quasi-experimental design and utilized the Reading Test at three levels (common words, unfamiliar words, pseudo-words) developed by Dr. Ismail Laiss. The "t-test" was used to calculate the significance of the differences in the results. The findings indicated that there were statistically significant differences between pre-test and post-test measurements in word reading ability, favoring the post-test measurements for students with dyslexia. Moreover, the program had a significant effect on their reading ability. (Munassar, 2016, p. 148)

7-2- Abu Al-Diyar and Al-Huweila's Study (2015):

The aim of the study was to explore the relationship between phonological awareness and visual-spatial memory, as well as to identify differences between males and females, Kuwaitis and non-Kuwaitis, with reading difficulties in the study variables. The study utilized a comparative descriptive approach and included a sample of 350 primary school students from grades 3-5, who had difficulties in learning to read. The sample consisted of 200 males and 150 females, Kuwaitis and non-Kuwaitis, ranging in age from 8 to 10 years. The study employed the phonological awareness test and the visual-spatial memory test, specifically the sequential and reverse visual-spatial memory tasks. The results of the study showed a statistically significant positive correlation between the components of phonological awareness (deleting

segments and sounds, accuracy of reading pseudo-words) and visual-spatial memory (sequential and reverse visual-spatial memory) in both males and females. There were no significant differences between males and females in phonological awareness skills (sound deletion test, accuracy of reading pseudo-words). It was also observed that females performed better in visual-spatial memory tasks (sequential and reverse visual-spatial memory) compared to males. Additionally, non-Kuwaitis showed better performance in phonological awareness skills (sound deletion test, accuracy of reading pseudo-words) compared to Kuwaitis, while non-Kuwaitis also demonstrated better performance in visual-spatial memory tasks (sequential and reverse visual-spatial memory) compared to Kuwaitis. The deletion of segments and sounds can predict performance in visual-spatial working memory, and both sound deletion and accuracy of reading pseudo-words have a predictive effect on performance in visual-spatial working memory. (Abu Al-Diyar & Al-Huweila, 2015)

7-3- Study by Munassar, Al-Shayb, and Al-Eiss (2014):

The aim of this study was to elucidate the relationship between dyslexia and the level of phonological awareness. The study was conducted on a sample of 30 male and female students from the fourth and fifth grades who were experiencing dyslexia. The study employed an exploratory descriptive approach, utilizing the phonological ability test to explore the extent of the relationship between their phonological level and the dyslexia they were facing. The results revealed a statistically significant correlation between the level of phonological awareness and dyslexia. Students with weak phonological awareness exhibited difficulties in reading. Additionally, determining the level of phonological awareness in children serves as a fundamental indicator for assessing their progress in reading skills. (Munassar, Al-Shayb, & Al-Eiss, 2014).

7-4- Study by Devoor et al. (2012):

The aim of this study was to explore the potential role of phonological awareness skills in reading

and spelling acquisition among Spanish speakers. The study included a sample of 85 fifth-grade students (with a mean age of 10 years and 9 months). Tests were administered to assess memory, phonological awareness, reading, and spelling skills. The study employed a descriptive approach, and the results indicated a significant positive relationship between phonological awareness and optimal reading and spelling performance among Spanish speakers. Furthermore, the sample participants demonstrated variations in phonological awareness, which corresponded to differences in reading and spelling abilities, with those possessing higher reading skills exhibiting greater phonological awareness. (Devoor et al., 2012)

7-5- Study by Laiss (2009):

This study explores the relationship between reading ability and phonological awareness among elementary school students aged 8 to 11 years. A sample of 101 male and female students was selected and divided into two groups: the first group consisted of 51 typically developing students, and the second group consisted of 50 students with dyslexia. A test was administered to assess phonological ability, and a comparison between the two groups was conducted using a T-test. Based on the results, the correlation between reading ability and phonological awareness was calculated. The study revealed a significant correlation between phonological awareness and students' reading ability. Additionally, the study confirmed statistically significant differences in phonological awareness test scores between typical readers and those with dyslexia. (Laiss, 2009).

8- Commentary on previous studies:

8-1- In terms of objectives: Munassar's study (2016) aimed to determine the impact of a training program based on working memory strategy (verbal and visual-spatial) on developing word reading ability in individuals with dyslexia. Abu Al-Diyar and Al-Huwailah's study (2015) aimed to investigate the relationship between phonological awareness and visual-spatial memory in dyslexic children. Meanwhile, the study by Munassar, Al-Shayb, and Al-Eiss (2014) aimed to examine the relationship between dyslexia and the level of

phonological awareness in individuals with reading difficulties. On the other hand, Devoor et al.'s study (2012) aimed to explore the potential role of phonological awareness skills in reading and spelling acquisition among Spanish speakers. As for Laiss's study (2009), it aimed to uncover the relationship between reading ability and phonological awareness among primary school students (ages 8-11). The current study aims to investigate the relationship between phonological awareness and reading ability in fourth-grade students with dyslexia. It aligns with the findings of Munassar, Al-Shayb, and Al-Eiss's study (2014) and Laiss's study (2009), while differing from the findings of Munassar's study (2016), Abu Al-Diyar and Al-Huwailah's study (2015), and Devoor et al.'s study (2012).

8-2- In terms of methodology: Munassar's study (2016) followed a quasi-experimental methodology, while Abu Al-Diyar and Al-Huwailah's study (2015) employed a comparative descriptive approach. Munassar, Al-Shayb, and Al-Eiss's study (2014) utilized an exploratory descriptive methodology, and Devoor et al.'s study (2012) employed a descriptive approach. Laiss's study (2009) followed a correlational descriptive methodology. In the current study, the adopted methodology is a correlational descriptive approach. It aligns with Laiss's study (2009) in terms of methodology, while differing from Munassar's study (2016), Abu Al-Diyar and Al-Huwailah's study (2015), Munassar, Al-Shayb, and Al-Eiss's study (2014), and Devoor et al.'s study (2012).

8-3- In terms of sample: Munassar's study (2016) consisted of a sample of eight dyslexic students from the fourth and fifth grades. Abu Al-Diyar and Al-Huwailah's study (2015) included elementary school students from grades 3 to 5. Munassar, Al-Shayb, and Al-Eiss's study (2014) comprised a sample of 30 fourth and fifth-grade students with dyslexia. Devoor et al.'s study (2012) had a sample of 85 fifth-grade students. As for Laiss's study, the sample consisted of primary school students from grades 3 to 5 with reading difficulties. The current study relied on a sample of 36 third-grade students with dyslexia. Thus, the

study differs from all the previous studies in terms of the sample composition.

8-4- In terms of assessment measures:

Munassar's study (2016) relied on the reading test with its three levels (high-frequency words, non-high-frequency words, and pseudo-words) by Dr. Ismail Laiss. Abu Al-Diyar and Al-Huwailah's study (2015) utilized the phonological awareness test and the visual-spatial memory test. Munassar, Al-Shayb, and Al-Eiss's study (2014) used a phonological ability test. Devoor et al.'s study (2012) employed assessments for memory, phonological awareness, reading, and spelling. Laiss's study (2009) relied on a reading test and a phonological ability test. In the current study, the assessment measures included the Raven's Progressive Matrices test, a reading test, and a phonological awareness test. Thus, the study differs from all the previous studies in terms of the specific assessment measures used.

8-5- In terms of results: The results of Munassar's study (2016) indicated statistically significant differences between pre-assessment and post-assessment in the ability to read high-frequency words, favoring the post-assessment among students with reading difficulties. The program also achieved a significant impact on the reading ability of the study sample. Similarly, Abu Al-Diyar and Al-Huwailah's study (2015) found a statistically significant positive correlation between phonological awareness components, represented by tests of segment deletion, sound deletion, and accuracy in reading non-words, and visual-spatial memory components, represented by sequential and reverse spatial memory, among both male and female participants. Furthermore, Munassar, Al-Shayb, and Al-Eiss's study (2014) revealed a statistically significant relationship between the level of phonological awareness and reading difficulties. Devoor et al.'s study (2012) yielded results showing a positive relationship between phonological awareness and optimal reading and spelling performance among Spanish speakers. As for Laiss's study (2009), its results demonstrated a correlation between phonological awareness and students' reading ability. In the current study, the results showed a statistically

significant correlation between phonological awareness and reading ability among third-grade students with reading difficulties. The study aligned with Munassar, Al-Shayb, and Al-Eiss's study (2014) and Laiss's study (2009), while differing from the aforementioned previous studies.

Theoretical Aspect

I. Phonological Awareness

1-1- Definition of phonological awareness:

Phonological awareness is defined as the ability to perceive, produce, and manipulate non-meaningful units of oral language, such as syllables, rhymes, and sounds. (Belajal & Ghada, 2019, p. 32)

Phonological awareness represents conscious, direct knowledge that arises from a cognitive process in individuals regarding the properties of oral language. It reflects the capacity to interact with and process tangible units of language (phonemes) by performing specific operations on them. (Al-Eiss, 2009, p. 33)

Hamdi Al-Farmawi (200) defined phonological awareness as everything related to the individual's processing and perception of sounds and differentiating between verbal phonemes. The child attempts to establish connections between the letter, sound, and pronunciation of the written character. (Al-Masri et al., 2016, p. 530)

- Phonological awareness skills: These are a set of skills or activities that can be trained to develop phonological awareness. Some of the most important skills include:

- Phoneme Isolation: It involves isolating the initial phoneme in a word. For example, what is the sound that the word "باب" (door) starts with? The answer is "ب" (ba).

- Phoneme Blending: It involves blending phonemes together to form a word. For example, what word is formed by the sounds "ش-م-س" (sh-m-s)? The answer is "شمس" (sun).

- Phoneme Segmentation: It refers to separating the phonemes that make up a word. For example, what

are the sounds that make up the word "قلم" (pen)? The answer is "ق-ل-م" (q-l-m).

- Phoneme Deletion: It involves pronouncing a word after deleting a sound from it. For example, the word "فأر" (mouse), pronounce it without the sound "ف" (fa). The answer is "أر" (ar).

- Phoneme Substitution: It entails replacing one sound in a word with another sound. For example, if the sound "ق" (qaf) in the word "قط" (cat) is changed to "ب" (ba), what would be the word? The answer is "بط" (duck). (Al-Masri et al., 2016, pp. 533-534)

2-1. Levels of Phonological Awareness:

- **Surface Levels:** Children demonstrate sensitivity to sound patterns that repeat between words and within words themselves. For example, at this level, they may perceive the phonological similarities between the words "دار" (house) and "نار" (fire), but they may not notice the shared phonological features between the words "كأس" (cup) and "كرسي" (chair). However, they are unable at this stage to interpret the detected similarities in these words.

- **Deep Levels:** When children reach the deep levels of phonological sensitivity, they become capable of comparing phonological units, interacting with them, and controlling them. Using the previous example, at the deep levels, a child can compare the phonemic structure of the words "كأس" (cup) and "كرسي" (chair) and infer their sharing of a common phoneme. Furthermore, at these levels, children acquire the ability to consciously manipulate words, such as deleting sounds or modifying words. As this skill develops further, the child can analyze words or syllables into their phonological components, recognizing that each word or syllable is composed of a sequence of separate phonemes. (Belajal & Ghada, 2019, p. 42)

The levels of phonological awareness can also be defined as awareness of similar rhythmic or rhyming words, awareness of the syllables that make up a word, blending audible sounds to form words, segmenting words into sounds, and

manipulating sounds by deleting or substituting them to form new words. (Al-Sayed, 2019, p. 340)

3- The Relationship between Phonological Awareness and Reading/Writing Acquisition:

The relationship between phonological awareness and reading is not always unidirectional; rather, it is reciprocal in nature. Each one influences and is influenced by the other. Early reading relies on understanding the internal structure of words. Therefore, working on developing children's phonological awareness skills greatly contributes to the development and reinforcement of early reading. Thus, there is a strong relationship between phonological awareness and the acquisition of reading and spelling skills. Phonological awareness skills are linked to encoding skills and the initial ability to read. Therefore, phonological awareness implies possessing abilities beyond language, such as the ability to perceive rhythm, segment sentences into words, words into syllables, and syllables into sounds, as well as blending sounds to form words. Based on this, we can conclude that the relationship between phonological awareness and reading/writing difficulties is determined by three dimensions:

1. Causal Dimension: Weak phonological awareness leads to difficulties in reading and writing.

2. Predictive Dimension: The level of phonological awareness in early childhood serves as an indicator of reading development in later stages.

3. Remedial Dimension: Supporting children's auditory skills and engaging in necessary activities and training significantly contributes to addressing reading and writing difficulties.

According to Stanovich and others, tasks involving matching initial and final consonants, deleting and replacing initial consonants, identifying different initial and final consonants, and naming the missing initial consonant are the best indicators of reading ability based on global knowledge measures and reading readiness tasks.

Furthermore, there is a significant relationship between phonological analysis skills and reading ability, considering that these skills contribute to decoding unfamiliar words and sound recoding. They are responsible for the effectiveness and quality of auditory representations stored in memory (Ryan, 2003, pp. 61-62).

2- Dyslexia:

2-1- Definition:

The Child Growth Evaluation Center, affiliated with the Medical Center at Indiana University, defines dyslexia as a condition characterized by a deficiency in the ability to read accurately at the level achieved by children of the same age and educational stage. It occurs due to organic or genetic neurological factors during the developmental stage, resulting from impaired growth of the central nervous system, particularly in the formation of cortical cells. This impairment occurs between the eighth and fifteenth weeks of gestation, during which the cells are damaged due to factors such as viral or bacterial infections, exposure to chemical substances (such as lead or mercury), radiation, certain medications, or passive smoking.

In another definition by dyslexia expert G. Pavilidis, dyslexia is described as a disability characterized by deficiencies in linguistic communication skills, both expressive and receptive, whether in oral or written form. It is evident in reading, writing, spelling, and verbal or interpersonal communication processes (Abdul Kareem, 2008, pp. 53-54).

Smyth (2004) defines dyslexia as the failure of the word recognition, reading, or spelling processes to develop automatically, or when these abilities develop incompletely or with great difficulty (Al-Sa'idi, 2009, p. 33).

Akil (1988) defines dyslexia as the inability to read or a dysfunction in the reading function (Hamza, 2008, p. 12).

2-2- Symptoms of Dyslexia:

Dyslexia can be divided into two types: specific reading difficulties and associated symptoms (cognitive, physical, behavioral).

Reading Performance: Individuals with dyslexia experience various impairments in different aspects of reading, including phonological processing, grammar and syntax, rhythm and fluency, and comprehension. The following are some of the most common difficulties:

- **Grammar and Syntax:** Errors in grammatical structure and word endings, as well as conversion errors (masculine/feminine, singular/plural, etc.).

- **Phonological Processing:** Difficulties in segmenting words, including omissions, reversals, substitutions, or additions of sounds. Confusion between similar auditory (ت، ط، د) and visual (س، ز) letters is also observed (Al-Ayish, 1997).

- **Rhythm and Fluency:** Reading may be excessively fast, disregarding punctuation marks, skipping words, jumping between lines, or going back to previously read lines. Alternatively, reading may be very slow with word segmentation, such as reading "الشمس محرقة" as "الشمس م ح ر ق" (Al-Ayish, 1997).

- **Comprehension:** Difficulties in understanding the meanings of words, as well as significant deficits in overall comprehension. Individuals with dyslexia may struggle to answer questions accurately after silent or oral reading. When asked to retell or summarize a story they have read, they often demonstrate clear weaknesses in this process. It is worth noting that dyslexia is often accompanied by dysgraphia (writing difficulties), and similar errors found in reading tend to appear in writing as well (Al-Husson, 1996).

2-3- Types of Dyslexia:

- **Acquired Dyslexia:** Acquired dyslexia refers to reading difficulties resulting from brain damage in individuals who previously had reading abilities. It includes the following types:

- **Deletion and Neglect Dyslexia:** This type of dyslexia clearly indicates attention-related

difficulties or specific problems related to attention deficit. However, it is a specific form of deficit where the problem lies in the failure to attend to the left side of the word specifically (Karkoush & Lattarsh, 2020, p. 26).

- **Attentional Dyslexia:** Attentional dyslexia is a type of acquired dyslexia that shares an attentional nature with deletion dyslexia. However, it is less disruptive than deletion dyslexia. Individuals with attentional dyslexia read individual letters and isolated words proficiently, unlike in the case of deletion and neglect dyslexia.

- **Surface Dyslexia:** The term "surface dyslexia" refers to a disorder resulting from damage to the visual analysis system itself, leading to a disturbance in perceiving letter forms within words.

- **Central Dyslexia:** There is a distinct differentiation between peripheral dyslexia and central dyslexia. Peripheral dyslexia refers to a disorder caused by damage to the visual analysis system itself, while central dyslexia is a combination of various dyslexic impairments. Central dyslexia does not result from damage to the visual analysis system but rather from disruptions in the underlying processes. Ultimately, it leads to difficulties in reading comprehension.

- **Developmental Dyslexia:** The term "developmental dyslexia" or "specific reading difficulties" refers to difficulties manifested in oral language. It is considered one of the core manifestations of specific learning difficulties. It includes the following subtypes:

a) **Surface Dyslexia:** This subtype refers to an individual's impairment in reading whole words. It is characterized by disruptions related to the visual appearance of words and their pronunciation rules.

b) **Phonological Dyslexia:** This subtype presents a more severe form of surface dyslexia. Individuals with phonological dyslexia experience impairments in sublexical processes, indicating an improper connection between the visual analysis system and the phoneme level. Consequently, they are unable to phonetically read unfamiliar or non-

words, while real words are read aloud appropriately (Karkoush & Lattarsh, 2020, p. 26).

c) **Mixed Reading Difficulty:** This subtype combines phonological dyslexia and surface dyslexia. Children with mixed reading difficulty struggle with reading unfamiliar words, non-words, and irregular words. They have difficulty comprehending words as a whole. These children face significant challenges in reading because both the assembly and transmission pathways are affected. This subtype is often classified under the category of developmental reading blindness resulting from brain injury (Karkoush & Lattarsh, 2020, p. 27).

Secondly - Basic Study Procedures:

1. Study Methodology:

Curricula vary depending on the subjects, and each curriculum has its own functions and characteristics that researchers in their respective fields utilize. The methodology is defined as the approach taken by the researcher to reach a specific result and solve a particular problem (Bouhoush & Al-Dhaniban, 2007, p. 102). Due to the nature of the research, a descriptive correlational methodology was adopted as it aligns with the current study's topic, which focuses on phonological awareness and its relation to reading ability among third-grade students with dyslexia.

2. Study Sample:

A total of 36 students with dyslexia out of 86 third-grade students were selected from four primary schools: Ajimi Mohammed Al-Zawalia Primary School, Zahani Abdulaziz Primary School, Rizouk Bashir Primary School, and 05 July 1962 Primary School. The individuals were purposefully selected, ensuring they were of the same age and exhibited no differences in intelligence level, as determined by the Raven's Colored Progressive Matrices test. They were diagnosed with reading ability through a reading assessment, and they were selected based on the following exclusion criteria:

- The sample individuals should have a normal intelligence level (as determined by the Raven's Progressive Matrices test).
- They should not be repeating the academic year (as indicated in the student's academic file).
- They should not have any visual, sensory, or auditory impairments (as stated in the student's medical school file).
- They should not have any significant language disorders (as indicated in the student's medical and psychological school file).
- They should not have motor hyperactivity (as indicated in the student's medical and psychological school file).
- They should not have academic difficulties in all subjects (based on the results of achievement tests).

The sample individuals were identified based on the information obtained from the survey study and the initial assessment of individuals. The sample consisted of 36 students with dyslexia and 50 typically developing students.

- Classification Criteria for Sample Individuals:

The sample individuals were classified into two categories: typically developing and individuals with dyslexia, based on a statistical criterion used in non-standardized tests. This criterion involves converting raw scores into standard scores and comparing each individual's score to the group mean ($Z = 0$). If an individual scores -1 or lower, indicating a deviation from the mean in the overall score for word and pseudo-word reading, they are classified as having dyslexia. Otherwise, they are classified as typically developing. Typically developing students were excluded. The distribution of sample individuals is presented in the following table:

Table 01: Distribution of sample members

Category	Lifetime	Number
Ordinary individuals	8 Years	50
Asiri reading individuals	8 Years	36
Total		86

3- Spatial and Temporal Boundaries:

3-1- Spatial Boundaries of the Study:

The study was conducted in the following primary schools:

- Ajimi Mohammed Primary School.
- Zahani Abdulaziz Primary School.
- Rizouk Bashir Primary School.
- 05 July 1962 Primary School.

3-2- Temporal Boundaries of the Study:

The study was conducted within the timeframe from February 20th to April 28th, 2022.

4- Study Tools:

4-1- Raven's Colored Progressive Matrices Test: It is a non-verbal test consisting of 36 matrices divided into three sets, each set containing 12 matrices. It is designed to measure intelligence.

4-1- Components of the Test:

The test consists of three sets:

A- Set A: Success in this set depends on the individual's ability to complete a continuous pattern. At the end of the set, the pattern changes from one direction to two directions simultaneously.

B- Set AB: Success in this set depends on the individual's ability to perceive discrete shapes within a global pattern based on spatial relationships.

C- Set B: Success in this set depends on the individual's understanding of the rule governing logical or spatially related shape changes. It

requires the individual's ability for abstract thinking.

Each set consists of 12 matrices, and each matrix has six smaller matrices at the bottom. The examinee selects one matrix to complete the matrix above it. The three sets are arranged in a progressive order, providing a coordinated line of thinking and training method. This allows for measuring the intellectual growth of children until they reach the stage where they use standard thinking as a method of inference, which is the stage of mental maturity. The average performance of an 8-year-old child is close to the performance of an 80-year-old individual, indicating a decline in mental abilities during old age.

It is worth noting that these cards have been designed in different colors to effectively capture the attention of the examined child, thus minimizing their distraction towards other stimuli (Hamad, 2008, pp. 1-2).

For each correctly answered question, the examinee is awarded 1 point, while a score of 0 is assigned for unanswered questions.

The total score of the examinee in this test is calculated by summing up the correct scores obtained.

Next, we refer to the percentile norms.

After determining the appropriate percentile rank for the examinee's performance, we proceed to identify the corresponding description of their cognitive level and intelligence quotient (Zaghloul, 2018, p. 63).

4-2- Word Reading Test:

This test, developed by Dr. Aiss Ismail (2015), measures reading ability by directing students to read a set of words at three levels: High-frequency words, low-frequency words, and pseudowords. It is divided as follows:

- High-frequency words: This test consists of 40 words, categorized into simple words, which are the least difficult. The student is presented with a series of words and asked to read them in order. One point (1) is awarded for each correct word, and zero points (0) for incorrect words.
- Low-frequency words: This test consists of 40 words divided into two sections: simple and compound words. It includes 20 simple words and 20 compound words. It is more challenging for the child compared to high-frequency words. Similarly, one point (1) is awarded for each correct word, and zero points (0) for incorrect words.
- Pseudowords: This test consists of two parts:
 - Part One: It comprises compound letters forming a non-meaningful word.
 - Part Two: It consists of a meaningful word with mixed-up letters.

The child is instructed to read a series of words and awarded one point (1) for each correct word and zero points (0) for incorrect words (Montaser, 2016, p. 166).

4-3- Phonological Awareness Test:

This test aims to assess a child's ability to manipulate sound units (phonological awareness). The test consists of three parts as follows:

4-3-1- Deletion: The examiner says each word individually and asks the child to repeat it. Then, the examiner instructs the child to repeat the word after removing the sound "ق" (the child is not informed about the deletion of "ال ق").
Example: قمر (moon). "Repeat the word... Well done. Now, repeat the word without the sound "ق"... Good, "مر" (mar).

4-3-2- Blending: The examiner says to the child, "I will give you two words, repeat both words. Good. Now, delete the first letter of each word and combine them together."

Example: "عيد مبارك" (Eid Mubarak). What is the first letter of the first word? Well done, "ع" (A), and the first letter of the second word? Good, "م" (M). Combine "ع" with "م." What do you get? Excellent, "عم" (Am).

Note: It doesn't matter if the child's response includes accompanying sounds or not (the child can answer with "عم" or "عم" in this example).

4-3-3- Substitution: The examiner says a word to the child and asks them to repeat it. Then, the examiner instructs the child to repeat the word after replacing a specific letter in the word with another letter (the examiner provides the substitute letter).

Example: رمان (pomegranate). "Repeat the word... Well done. Now, repeat the word after replacing the first letter with the letter 'ز' (z)... Good, 'زمان' (zaman). (Laeis, 2020)

5- Psychometric Properties of the Study Instruments:

5-1- Psychometric Properties of the Raven's Progressive Matrices Test:

This standardized test demonstrates high reliability and validity, as evidenced by numerous previous studies that have utilized it. The reliability coefficients have ranged from 0.62 to 0.9 in some studies, while in others, they have ranged from 0.55 to 0.82 (Zaghloul, 2018, p. 66).

5-2- Psychometric Properties of the Word Reading Test:

Validity: The construct validity of the test in the National Project for Reading (PNR) utilized criterion validity, and the results of the factor analysis were as follows:

- High-frequency words (0.8).
- Low-frequency words (greater than 0.84).
- Pseudowords (0.86).

Reliability: The internal consistency reliability was calculated using Cronbach's alpha coefficient, according to the PNR project. The results were as follows:

- Comprehensive Reading Test: $\alpha = 0.87$ (Montaser, 2016, p. 167).

5-3- Psychometric Properties of the Phonological Awareness Test:

The reliability for sound blending was calculated using test-retest method and yielded a coefficient of 0.71 (Al-Eiss, 2020).

6- Statistical Methods:

The data analysis was conducted using the statistical software (SPSS) and the correlation coefficient (eta) was employed.

Fourthly - Results and Discussion:

1- Presentation and Discussion of the First Sub-Hypothesis: The first sub-hypothesis suggests a correlation between phonological awareness and the ability to read high-frequency words among third-grade students with reading difficulties. By examining the scatterplot (see Appendix), it can be observed that a linear relationship between phonological awareness and high-frequency words is not evident. The eta correlation coefficient was applied to test the validity of this hypothesis. The results are presented in the following table:

Table 02: Results of the first partial hypothesis

Statistical significance	Correlation coefficienteta η	Sample	Variables
0.01	0.54	36	Phonological awareness
			Frequently Spoken Words

Based on the results obtained in Table 02, considering phonological awareness as the independent variable and high-frequency words as the dependent variable, we find that the value of the eta correlation coefficient is 0.54. This value is statistically significant at a significance level of 0.01. Additionally, a scatterplot was constructed as shown in the appendix. Therefore, the first sub-hypothesis has been confirmed (refer to Figure 1 in the appendix).

Discussion: Through the presentation of the results, it becomes evident that there is a statistically significant correlation between phonological awareness and high-frequency words. This relationship can be interpreted by acknowledging the active role of phonological awareness in the ability of children with reading difficulties to recognize single-syllable words as well as words composed of two or more syllables. Furthermore, the effective utilization of phonological awareness skills by children with reading difficulties leads to their capability to read high-frequency words. If a child is able to read words accurately and proficiently, it signifies their

complete understanding and comprehension of those words, which is closely associated with their phonological ability (Liberman & Shanskweiler, 1977). According to Liberman and Shanskweiler (1977), individuals with reading difficulties struggle significantly with segmenting written and spoken words into separate sounds. This makes it challenging for them to learn word recognition through alphabet scanning and the synthesis of letter sounds, also known as phonological decoding or phonemic segmentation. This difficulty in phonemic segmentation is a manifestation of a broader problem in phonological encoding, which manifests in the inadequate storage of phonetic representations in memory (Al-Eiss, 2005, p. 31). The results of this first sub-hypothesis align with the findings of Montaser's study (2016), which indicated that verbal memory plays a crucial role in the word and letter recognition of students with reading difficulties. Through the training program, dyslexic children were able to utilize their cognitive symbolic and verbal memory capacities to enhance their reading abilities.

Presentation of the Results of the Second Sub-Hypothesis:

The second sub-hypothesis states that there is a correlation between phonological awareness and the reading of non-high-frequency words among third-grade students with reading difficulties.

By examining the scatterplot (see appendix), it can be observed that there is no clear linear relationship between phonological awareness and non-high-frequency words. The eta correlation coefficient was applied to test the validity of this hypothesis. The results are presented in the following table:

Table 03: Results of the second partial hypothesis

Statistical significance	Correlation coefficient η	Sample	Variables
0.01	0.54	36	Phonological awareness
			Unspoken words

Based on the results provided in Table 03, considering phonological awareness as the independent variable and non-high-frequency words as the dependent variable, we find that the value of the eta correlation coefficient is 0.54. This value is statistically significant at a significance level of 0.01. Additionally, a scatterplot was constructed as shown in the appendix. Therefore, the second sub-hypothesis has been confirmed (refer to Figure 2 in the appendix).

Discussion: The presentation of the results indicates a significant correlation between the variables. This relationship can be explained by the fact that phonological ability in children with reading difficulties enables them to recognize non-high-frequency words. Through their phonological awareness, they can decode and comprehend new and unfamiliar words. If a child possesses strong phonological skills, they are more capable of mastering the reading of non-high-frequency words. Conversely, if they struggle with this task, it can be attributed to their weak phonological awareness.

The process of reading requires the utilization of phonological awareness, which involves the ability to perceive and mentally analyze the components of oral language, such as various levels of sounds, syllables, and words. This process involves segmentation, blending, substitution, and transformation operations between these units.

Oral language is not merely a communication tool but also a subject of analysis. Consequently, children with reading difficulties face significant challenges in performing these operations compared to typical readers of the same age (Al-Eiss, 2005, p. 29).

These findings align with the results of Mansour's study (2016), which demonstrated the positive impact of the training program. Children with reading difficulties were able to recognize non-high-frequency words, decode new and unfamiliar symbols, and encode these words successfully. This achievement can be attributed to the development of their verbal and symbolic memory.

Presentation of the results of Hypothesis 3: Hypothesis 3 states that there is a correlation between phonological awareness and the ability to read semi-high-frequency words among third-grade students with reading difficulties.

By examining the scatterplot (see Appendix), it can be observed that there is no presence of a linear relationship between phonological awareness and semi-high-frequency words. We applied the eta correlation coefficient to test the validity of this hypothesis.

The results of the hypothesis testing using the eta coefficient are presented in the following table:

Table 04: Results of the third partial hypothesis

Statistical significance	Correlation coefficient η	Sample	Variables
0.01	0.58	36	Phonological awareness
			Semi-words

Based on the results obtained in Table 04, considering phonological awareness as the independent variable and semi-high-frequency words as the dependent variable, we find that the eta correlation coefficient value is 0.58. This value is statistically significant at a significance level of 0.01.

In addition, a scatterplot was constructed as illustrated in the Appendix. Consequently, Hypothesis 3 has been confirmed (refer to Figure 3 in the Appendix).

Discussion: The presentation of the results demonstrates a significant correlation between the variables. This relationship can be explained by the fact that children with reading difficulties can utilize their phonological abilities to read semi-high-frequency words by connecting letters and forming meaningful or meaningless words. Reading semi-high-frequency words requires a high level of phonological proficiency, as these words consist of connected letters that need to be linked and read by the child. Despite having knowledge of sounds, children with reading difficulties often struggle with linking letters to their corresponding sounds. This indicates that their phonological abilities may be intact, but they experience difficulties in reading. This is particularly evident in their reading of non-frequent words and semi-high-frequency words.

In terms of the manifestations of the reading disorder, phonological reading difficulties are evident through challenges in reading semi-words or unfamiliar words. The most common errors in

this pattern include substituting read words with similar words in terms of sound or visual form, as well as word formation. Additionally, phonemic dyslexia, the formation of semi-words through deletion, substitution, or alteration of the sounds of original linguistic units, is also observed (Al-Eis, 2005, p. 29). These difficulties are also evident, to a greater extent, in writing. The results of this third partial hypothesis align with the findings of a study conducted by Montasser (2016), which demonstrated the role of utilizing verbal and symbolic memory strategies in recalling and recognizing letters as symbols within non-meaningful words. This enables children with reading difficulties to read such words, even if they do not comprehend their meaning. This was achieved through the training program received by children with reading difficulties.

4- Presentation of the General Hypothesis Results:

The general hypothesis states that there is a statistically significant correlation between phonological awareness and reading ability among third-grade students with reading difficulties.

Due to the absence of a linear relationship condition between the variables (as shown in the scatterplot), an alternative test was necessary to measure the relationship, which is the eta correlation test (correlation ratio).

To test the validity of this hypothesis, the eta correlation coefficient was used. The results are presented in the following table:

Table (05): Results of the General Hypotheses

Statistical significance	Correlation coefficient η	Sample	Variables
0.01	0.58	36	Phonological awareness
			Reading

Based on the results presented in Table 05, considering phonological awareness as the independent variable and reading as the dependent variable, we find that the eta correlation coefficient value is 0.58. This value is statistically significant at a significance level of 0.01.

As illustrated in the Appendix, through the scatterplot, it can be concluded that the first hypothesis has been confirmed (refer to Figure 4 in the Appendix).

Discussion: Through the presentation and analysis of the results, it is evident that there is a correlation between the variables. This relationship can be explained by the fact that children with reading difficulties experience challenges in phonological awareness. If there is a weakness in phonological awareness, it is accompanied by a weakness in reading. The lower the level of phonological proficiency, the fewer words the child is able to read. Numerous studies and research have focused on the association between phonological awareness and reading ability. They suggest that children with a high level of phonological awareness have good reading ability, unlike children who lack phonological awareness skills, resulting in reading difficulties. Several studies have shown variability in the source of the phonological awareness deficit responsible for reading difficulties within the phonological theory itself. In the classical theory, the significant difficulties in connecting written symbols with their corresponding sounds in individuals with reading difficulties are attributed to deficiencies in phonemic analysis and verbal short-term memory functions. Additionally, there are difficulties in rapidly and accurately completing the oral lexical repertoire. Some studies have linked phonological awareness disorder to auditory impairment or word perception

impairment, which hinders the rapid processing of auditory stimuli, whether linguistic or non-linguistic. This impairment adds to the ability to process rapid temporal features (Al-Eis, 2005, p. 31). The results of this general hypothesis align with the findings of a study by Montasser, Al-Shayeb, and Al-Eis (2014), which indicated a statistically significant correlation between reading difficulties and the level of phonological awareness. It was found that phonological awareness weakness leads to reading difficulties. These results are also consistent with the study conducted by Al-Eis (2009), which revealed a correlation between phonological awareness and reading ability in students.

Conclusion and Recommendations:

This study aimed to investigate the relationship between phonological awareness and reading ability among third-grade students with reading difficulties. The study revealed a statistically significant correlation between phonological awareness and reading ability in individuals with reading difficulties. Based on the results obtained in this study, it can be concluded that phonological awareness is a fundamental factor in acquiring reading skills, especially for individuals with reading difficulties, during the early stages of learning. Through the discussion and interpretation of the results of the current study, the following conclusions were reached, which provided answers to the aforementioned questions:

- There is a statistically significant correlation between phonological awareness and reading ability among third-grade students with reading difficulties.
- There is a correlation between phonological awareness and the ability to read high-frequency

words among third-grade students with reading difficulties.

- There is a correlation between phonological awareness and the ability to read non-high-frequency words among third-grade students with reading difficulties.

- There is a correlation between phonological awareness and the ability to read pseudo-words among third-grade students with reading difficulties.

Based on these findings, the following recommendations can be made:

1. It is important to incorporate phonological awareness training programs into the early stages of reading instruction, particularly for students with reading difficulties.

2. Teachers and educators should provide targeted interventions and support to enhance phonological awareness skills in students with reading difficulties.

3. Further research should be conducted to explore additional factors that may influence the relationship between phonological awareness and reading ability in students with reading difficulties.

4. Collaboration between teachers, speech therapists, and parents is crucial to create a comprehensive and effective support system for students with reading difficulties, focusing on phonological awareness development.

Finally, it can be concluded that this study has achieved its predetermined objectives. Therefore, the following recommendations can be proposed:

- ✓ Emphasize the development of reading proficiency for students with reading difficulties, as it forms the foundation of the learning process.
- ✓ Develop programs to rehabilitate students with reading difficulties and enhance their phonological awareness skills, as difficulties in phonological awareness directly impact their reading ability.
- ✓ It is essential to foster reading proficiency in students with reading difficulties, as it

directly influences their cognitive abilities and their capacity to process information.

- ✓ Early detection of students with reading difficulties is crucial to provide intervention at the earliest possible time.
- ✓ Educational and pedagogical staff should prioritize addressing the needs of students with reading difficulties, especially in the early stages.
- ✓ Provide specialized teachers who possess the competence to cater to students with reading difficulties.
- ✓ Propose educational and therapeutic programs that help alleviate the severity of reading difficulties in students.
- ✓ Develop advanced and effective assessments to identify individuals with reading disabilities, particularly focusing on phonological awareness.
- ✓ Establish resource rooms equipped with all the necessary educational materials for students with reading difficulties.
- ✓ Encourage parents to actively participate in implementing specialized intervention plans for their children with reading difficulties.

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Appendixes

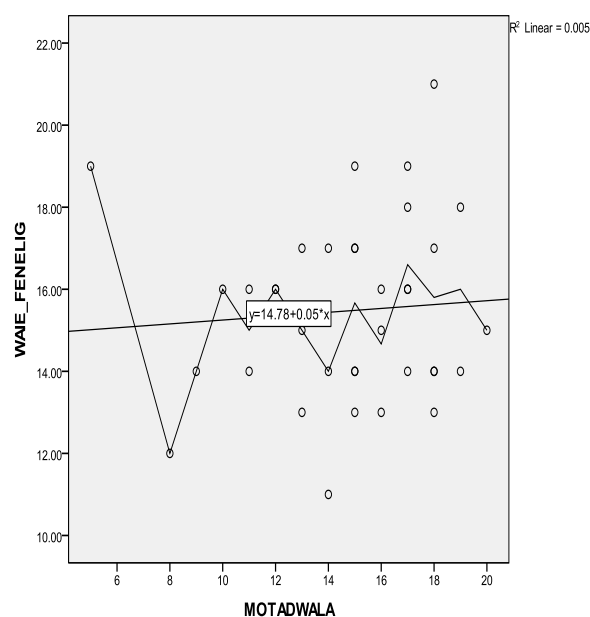


Figure (1): Represents a scatter plot illustrating the nature of the correlation between the phonological awareness variable and the common words.

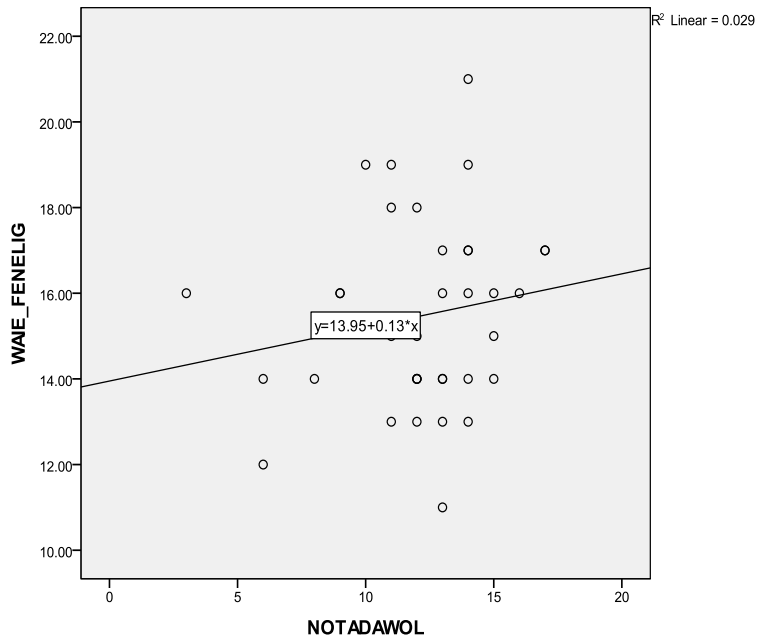


Figure (2): Represents a scatter plot illustrating the nature of the correlation between the phonological awareness variable and the non-common words.