



Investigating the effect of dyslexia on writing disabilities in spelling lessons and its relationship with phonological awareness

(Case study: second and third-grade students in Isfahan, Iran)

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Abstract

Reading and writing disorders cause many problems for people and affect their future. Therefore, timely identification of each of these disorders can prevent many negative consequences in individuals, family, and social life of these people, which requires accurate knowledge of the factors affecting the development of these disorders. This paper aimed to investigate the effect of phonological awareness and reading disorders on students' writing disabilities in spelling lessons. The research type was causal-comparative method. The population of this study included all girl and boy students in the second and third grades of an elementary school in Isfahan city of Iran in the academic year 2019-2020. A sample of 80 were selected and studied in two groups of normal and dyslexic. Phonological awareness tests and spelling tests were used to collect data. The obtained data were analyzed at both descriptive and inferential levels using independent t-test and Pearson correlation coefficient. Findings showed that misspellings of dyslexic students are higher than normal students. The study of three components, phonological awareness, reading disorder, and misspellings, showed that weakness in phonological awareness tests leads to reading disorders. As a result, it increases misspellings. This study also showed that among the three components of phonological awareness, including phonological awareness, Syllable awareness, and intra-Syllable awareness, misspellings are inversely related to phonological awareness but have no significant relationship with the other two components.

Keywords: dyslexia, writing disabilities, spelling, phonological awareness.

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1. Introduction

Learning Disabilities were first introduced in the 1960s as the newest sub-domain in exceptional children and have the highest incidence among this group of children. Almost half of all children enrolled in special education programs have learning disabilities (Kirk and Gallagher, 2008: 206).

Learning disabilities are among the disorders that may first be diagnosed in childhood or adolescence. Children with learning disabilities have a normal appearance. Their physical growth, height, and weight indicate normal. Their intelligence is normal. They speak well, play like other children, and have no problem communicating with others (Ahadi and Kakavand, 2013: 30). However, they are constantly failing in their homework. Therefore,

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according to the general characteristics of these students, they can be placed in a new group called students with learning disabilities. This disorder may occur in the form of severe difficulties in acquiring and using listening, speaking, reading, writing, reasoning, or mathematical ability (Shahni, 2012: 130).

Reading and writing are skills that children acquire in the early years of school. Many children do not have much difficulty learning to read and write and learn it naturally. However, this requires much energy and special and planned training (Cassar and Treiman, 2004: 627). These people suffer from reading and writing disorders. Their lack of timely diagnosis and treatment will lead to many problems in adulthood.

Among learning disabilities, reading, and writing disorders are the most essential and common learning disorders. Dyslexia or reading disorder is a term used for the inability to read. It is related to the brain's ability to process and recognize information (Afrooz, 2016: 47). In other words, dyslexia occurs when a child cannot learn to read correctly despite having an average or higher IQ and attending classes in normal schools (Afrooz, 2016).

Inability to learn to write is another learning disorder related to understanding or using written language (Shahni, 2012: 129). The main symptom of this disability is lack of writing skills, which is measured by standardized tests and according to the calendar age, intelligence and level of education are significantly lower than expected (Shahni, 2012: 131).

Estimates of the prevalence of learning disabilities range from 1 to 30%. If we accept the lowest figure reported, we will see a significant population of school students with learning disabilities. Among these, the prevalence of reading disorders in Persian-speaking people, according to Sedaghati (2009) in the second and third grades of elementary school, is 8.10% and 9.5%, respectively, which is more prevalent among boys than girls. Also, the prevalence of writing disorders in these two grades in Tehran has been reported at 6% (Shahni, 2012: 132).

Identifying the factors affecting learning to read and write can play an essential role in treating children with learning difficulties. One of these influential factors, which the researcher has addressed in this study, is phonological awareness. Phonological awareness is a part of four multilingual skills. The four metalanguage skills are phonological awareness, vocabulary awareness, syntax awareness, and language usage awareness. Phonological awareness is a clear example of language function that grows simultaneously with language and is the basis of speech and listening skills. Phonological awareness is the knowledge of

the phonetic structure of language that enables the child to relate each letter to the sound associated with it (Riper and Erickson, 2018).

Therefore, the importance of reading and writing disorders, and their effect on the success of students with learning disabilities, has led the researcher to investigate the effect of phonological awareness on dyslexia and the relationship between dyslexia and writing disabilities in spelling lessons. Frequent failures in spelling undermine students' self-esteem. Suppose no solution is found in the long run. In that case, it will lead to academic failure or even dropout, with adverse social and personal consequences. It becomes the family and society (Nazari et al., 2015: 48).

Given that reading and writing skills are fundamental skills for other educational activities, any delay in addressing these children's problems will have detrimental effects. Also, due to the high prevalence of reading and writing disorders in the second and third grades of elementary school and their negative effects on the child's future, it is necessary to conduct more and more complete research in this field to provide a basis for diagnosis and educational planning to fix this problem. Therefore, in this study, the researcher intends to investigate the effect of phonological awareness on reading and, consequently, on the misspellings of dyslexic students (boys and girls) in the second and third grades of elementary school and evaluate the effect of this factor in these two disorders. N. In addition, find out if people who have dyslexia necessarily have a writing disorder; in other words, whether these people in the spelling lesson are one of the types of writing disabilities examined in this study.

2. Hypotheses

- 1- Dyslexia in people causes dysgraphia.
- 2- Weakness in phonological awareness leads to dyslexia and dysgraphia.

3. Theoretical Foundations

P Dyslexia: According to the DSM, reading disorder or dyslexia is defined as reading progress below the expected level, according to the child's age, education, and intelligence (Sadock and Kaplan, 2017: 419).

Inability to write: It is the shortcomings of writing, i.e., the student with writing disabilities, despite the average or medium to high intelligence in spelling skills, placement, inversion, removal of some syllables and letters, etc. He is behind his peers (Razzaqi, 2011: 9).

Spelling: The ability to use written signs against phonetic signs (Kolainejad, 2015: 93).

Phonological awareness: Awareness and knowledge of the phonetic, phonological, and

Syllable structure of words without recourse and reliance

On the meaning of the word. That is, knowing how many syllables a word is made of or what its first sound is? In other words, knowledge of the phonetic structure of words has three levels of phonology, syllable, and intra-syllable (intermediate between phoneme and syllable) (Dastjerdi Kazemi and Soleimani, 2013: 934).

4. Type of research and method of implementation

The present study is descriptive and used a post-event (causal comparative) research method. In this research, the completion of the theoretical foundations of the research is based on the library method. For this purpose, library, and Internet resources, including articles, books, and case studies, have been used. Also, the field studies method was used to prove or disprove the hypotheses. We selected a sample of 80 girl and boy students (with same size) in grade two and three in an elementary school to conduct our research. The instruments used in this study are the phonological awareness test and dictation test. Finally, independent t-test and Pearson correlation coefficient was used to analyze the data.

5. Findings

This study aimed to investigate the effect of dyslexia on writing disabilities in spelling lessons and their relationship with phonological awareness, and it used a causal-comparative method. It should be noted that 80 subjects in two groups of normal and dyslexic girls and boys in the second and third grades of the elementary school in Isfahan were studied. In this section, an attempt is made to discuss and analyze the results of the study of hypotheses with an overview of the achievements of this research. Then the frequency of different types of misspellings will be compared. Learning Disabilities is a general term that includes a heterogeneous group of learning disabilities that manifests itself in various ways and makes it difficult for many students to learn the curriculum each year. These students usually have moderate or higher intelligence. However, in almost the same

educational conditions, they have poorer academic performance than other students. Despite being in a suitable educational environment and the lack of apparent biological waste and no social problems, acute mental and moderate intelligence cannot learn in certain areas. Dyslexic and dyslexic children make up the majority of children with learning disabilities.

Reading disorder is the most essential learning disorder because reading is the basis of all types of learning. Reading is a complex skill that involves recognizing words, understanding the meaning of words and phrases, and aligning that meaning with the text's overall theme. This requires processes that operate at different levels of representation, such as letters, phrases, sentences, and larger units of text. Reading difficulties include difficulty recognizing or understanding writing.

Another common learning disorder in students is writing disorder, which is a clear manifestation of spelling. The ability to write content requires skills such as word comprehension, reading, and grammar. In spelling, the student must learn to create the necessary harmony between the sounds or letters he hears and what he brings to the paper. Phonological awareness is one of the factors affecting learning to read and write. In phonological awareness, a person can remember and move the components of a phrase into words and sounds, regardless of the word's meaning.

6. Investigation of research hypotheses

In this section, research hypotheses will be examined by analyzing the collected data. Hypotheses have been examined from two perspectives of gender and baseline. However, the study of the relationship between research variables and gender is not questioned in this study. However, after collecting data and reviewing them, the researcher observed differences between the sexes of girls and boys in normal and dyslexic students. In this section, the results are reviewed.

Hypothesis 1: Dyslexia causes dysgraphia.

Grade

Table 1. Two samples of a t-test comparing the number of misspellings of normal and dyslexic students of the second and third grade

| Independent Sample Test | | | | | |
|-------------------------|---|-----|---------|-----------------|---|
| Components | T | DOF | p-value | Mean difference | confidence %95 interval difference from the upper and lower boundary averages |

| | | | | | | |
|--|------|----|------|-------|-------|-------|
| Ordinary and dyslexic students in the second grade | 9.80 | 38 | 0.00 | 18.10 | 21.84 | 14.36 |
|--|------|----|------|-------|-------|-------|

Table 2. t-test of two samples comparing the number of misspellings of normal students in the second and third grade

| Independent Sample Test | | | | | | |
|---|-------|-----|---------|-----------------|---|-------|
| Components | T | DOF | p-value | Mean difference | confidence %95 interval difference from the upper and lower boundary averages | |
| | | | | | | |
| Misspellings of normal and dyslexic second and third-grade students | -1.24 | 38 | 972.0 | 0.05 | 2.89 | -2.79 |

According to the results in Table 1, the number of misspellings of normal and dyslexic students in the second and third grades is different, so that the number of mistakes of normal students in each of the second and third grades of elementary school is much less than dyslexic students in these two grades. Is. On the other hand, according to Table 2, there is no significant difference between the

number of misspellings of normal second and third-grade students.

However, comparing the number of misspellings of dyslexic students in the second and third grades shows that the rate of misspellings of dyslexic students in the third grade is higher than the number of dyslexic students in the second grade.

Table 3. The average number of misspellings of dyslexic students in the third grade

| Group Statistics | | |
|--|-------|-------|
| Components | Mean | Std. |
| Mean misspelling of female dyslexic students | 44 | 11.80 |
| Mean misspelling of male dyslexic students | 72.10 | 19.17 |

According to Table 3, there is a significant difference between the misspellings of dyslexic male and female students in the third grade. As a result, in dyslexic third-grade students, boys have misspelling more than girls.

Conclusion: According to the results obtained from the above two sections, the hypothesis "dyslexia causes dysgraphia" is confirmed, and the frequency of misspellings due to dyslexia in boys is higher than girls. other researchers also found a significant relationship between dyslexia and the number of misspellings of students and that dyslexic children performed worse in writing spelling than normal students, meaning that their students' spelling scores were higher than those of normal students. Lower.

Hypothesis 2: Weak phonological awareness leads to dyslexia and dysgraphia.

The above hypothesis consists of two hypotheses that are examined separately, and finally in the final summary section, the results of these two sections will be expressed as a unit.

Hypothesis a) Weak phonological awareness leads to dyslexia.

Grade

Table 4. Two samples of a t-test comparing the score of phonological awareness test of normal and dyslexic students of second and third grade

| Independent Sample Test | | | | | | |
|-------------------------|--|--|--|--|--|--|
|-------------------------|--|--|--|--|--|--|

| Components | T | DOF | p-value | Mean difference | confidence %95 interval difference from the upper and lower boundary averages | |
|--|-------|-----|---------|-----------------|---|-------|
| | | | | | | |
| Score of phonological awareness test of normal and dyslexic students of second and third grade | 13.55 | 38 | 0.00 | 18.30 | 21.05 | 15.55 |

In the present study, there is no significant difference between the total score of the phonological awareness test of normal second and third-grade students. Also, the total score of phonological awareness of second and third-grade dyslexic students is not different, and the difference between the means of these two groups is random. However, the results of Tables 1 and 4 show that the total score of the phonological awareness test of

normal second and third-grade students is higher than dyslexic students of these grades. In other words, the total score of the phonological awareness test of normal students is higher than dyslexic students.

Gender

Table 5. t-test of two samples comparing the phonological awareness score of dyslexic students of male and female second grade

| Independent Sample Test | | | | | | |
|--|-------|-----|---------|-----------------|---|-------|
| Components | T | DOF | p-value | Mean difference | confidence %95 interval difference from the upper and lower boundary averages | |
| | | | | | | |
| Phonological awareness test score of male and female dyslexic students | -4.43 | 18 | 0.00 | -1 | -0.53 | -1.47 |

Table 6. Two samples of a t-test comparing the score of phonological awareness test of dyslexic students of male and female third grade

| Independent Sample Test | | | | | | |
|---|------|-----|---------|-----------------|---|-------|
| Components | T | DOF | p-value | Mean difference | confidence %95 interval difference from the upper and lower boundary averages | |
| | | | | | | |
| Phonological awareness test score of male and female students | 1.46 | 18 | 162.0 | 3.20 | 7.81 | -1.41 |

According to Table 5, there is a significant difference between the phonological awareness test scores of dyslexic male and female students in the second grade, i.e., the score of the phonological consciousness test is higher in girls than boys. However, according to Table 6, there is no significant difference between the phonological awareness test scores of dyslexic male and female students in the third grade.

Conclusion: The results of this study are consistent with the research of Adams (1990) and Wagner et al. (1997). These researchers have found that students with lower phonological awareness scores are more likely to have difficulty reading later in life. Male students outnumber female students.

Hypothesis b) Poor phonological awareness leads to dysgraphia.

Grade

A comparison between the total score of the phonological awareness test and the number of misspellings of students in the normal and dyslexic groups of the second and third grades of elementary school shows a significant and inverse relationship between the total score and misspellings. In other words, the higher the total score of the phonological awareness test, the lower the number of misspellings students have. However, there is no significant difference between the total score and misspellings of normal third-grade students. Also, the study of the total score of phonological and misspellings of dyslexic students of second and third grade and normal students of second grade shows a significant and inverse relationship between these two components with each other.

Gender

Table 7. Relationship between total score and misspelling

| | Components | correlation coefficient | p-value |
|--------------|---------------|-------------------------|---------|
| Second grade | Dyslexic girl | -0.640 | 0.046 |
| | Dyslexic boy | 0.412 | 0.237 |
| Third grade | Dyslexic girl | -0.674 | 0.033 |
| | Dyslexic boy | -0.585 | 0.047 |

According to Table 7, there is a significant and inverse relationship between the total score and misspellings of dyslexic female students.

In other words, the higher the total score, the lower the number of misspellings students have. But there is no significant relationship between the total score and misspelling of second-grade dyslexic male students. There is a significant and inverse relationship between the total score and misspelling of male and female dyslexic students in the third grade. Also, the correlation between the total and misspelled scores of girls is higher than boys.

Conclusion: According to the obtained results, it can be said that weakness in phonological awareness leads to more misspellings in dyslexic students, especially male dyslexics. According to research by Stanovich et al (1986), children with poor phonological awareness also have difficulty spelling. They believe a significant relationship between phonological awareness and spelling performance among normal and dyslexic students. Also, according to research conducted by Goswami and Bryant (1990) phonological information can help to spell words correctly. Overall, the available evidence suggests that phonological awareness is a prerequisite and predictor of dictation skills.

The final conclusion of Hypothesis 2

Phonological awareness is a person's knowledge of the phonological structures of speech that allows the person to extract meaning from the text. Accordingly, acquiring and using such knowledge helps a person read correctly. Weakness in it increases reading errors and makes reading difficult. Reading disorders also lead to more errors in spelling lessons. The results of Plaza and Cohen's (2004) research confirm this. In their research, study of 254 first- and second-grade children found that phonological awareness was strongly associated with predicting reading ability and dictation.

7. Conclusion

According to the results obtained from the hypotheses, the effect of phonological awareness as a modifying variable in this study on the two variables of reading disorder and misspellings is proved. Therefore, phonological awareness plays an essential role in reading and writing tasks and weakness in this component leads to reading and writing disorders and, as a result, the student's academic failure. Reading disorders also increase students' misspellings. In other words, phonological awareness predict reading accuracy, and spelling. Among these, the error of consonant shapes is the most common among normal and dyslexic students.

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