



# The Effects of Phonemic Plays on Reducing the Reading Errors in Boy Students with Dyslexia

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## ABSTRACT

The current study was conducted with the goal of considering the effectiveness of phoneme plays on reducing the reading errors (accurate reading) on third grade elementary boy students with dyslexia. The method used was experimental and pre-experiment/post-experiment, control group scheme was also used. The statistical population for this study included all the third grade elementary boy students of the city of Esfahan. To carry out this project, 30 boy students with dyslexia were selected using multi-stage sampling and random selection method and then were divided into two groups of experiment and control. The tools used included error reading checklist and a reading and dyslexia test. The data acquired was then analyzed using the covariance analysis statistical method. The results showed that there is a significant difference between the accurate reading of the experiment and control groups with  $P < 0.001$  significance level. Subsequently, we can conclude that phonemic plays can effectively improve reading accuracy in students with dyslexia and can be used as an educational and therapeutic method.

**Keywords:** Phonemic Plays, Accurate Reading, Dyslexia, Student

## INTRODUCTION

Dyslexia is related to some problems in some functions like phoneme recognition problem (Snowling, 2001), visual cognition, attention span, and memory problems (Swanson and Jerman, 2007). The main sign for dyslexia is weak reading. Theory of phoneme recognition (like problems in processing and understanding phoneme information) was widely used to explain the dyslexia problem. Nevertheless, there are people with dyslexia who have good performance in recognizing phonemes in standard word tests but still cannot achieve fluency in reading (McBird et al., 2008). Dyslexia remains a problem all throughout life with a person and interferes with his or her educational progress or other daily activities which demand having reading skills (Shaywitz et al., 2003).

Accurate reading and dyslexia reflect the roles of the three fundamental systems: Phonology, Semantics and vision (Crisp and Ralph, 2004). In this study we have focused on the phonology system.

The existing evidence and the documents show that insufficient fluency in phoneme recognition, in most cases, is the result of more fundamental deficiencies in alphabetic encoding and in fact this is the most important problem in learning how to read (Vellution, 2004). In addition, it has been suggested that letter-recognition has the highest correlation with reading (Gijssel et al., 2006). In various texts regarding reading learning stages, the phoneme recognition has been among the basic and essential stages. Researches show that phoneme recognition awareness is involved in phoneme processing, grammar, and language acquisition and non-repetitive phoneme, word remembrance and number remembrance tests can be used in learning evaluations (Baddeley, 2002; Gathercole, 2004; Hakim, 2004; Anderson, 2006; Bajaj, 2007; Briscoe, 2009). Reading is a very complicated task which is based on the visual and dictation combination. Processing phonemes and semantics justifies this complexity (Rastle et al., 2001; Perry et al., 2007). Plaza and Cohen (2003) studied the role of phoneme structure in explaining the reading errors. Their findings show that people with reading disorders have lower awareness of their language's phonemes and words. Although in describing the dyslexia, there has been emphasis on letter inversion (dyslexia), but the more recent studies emphasize on the effective role of the phoneme processing in manifestation of reading difficulties (Kronenberger and Dunn, 2003).

Since dyslexia, in comparison with other learning disabilities, has higher proportion, this question always remains: How can we educate, correct, improve and reduce the reading problems of students with this problem? And since the theories for dyslexia problems are so many, there are several therapeutic approaches for dyslexia. Among these approaches we can refer to the Fernald, Glingham and Davis Educational Method. Another approach is the Phonemics plays method which is based on phonemics awareness. Multiple studies show the success of phoneme teaching in children with reading difficulties, so much that this basic education is considered for curing reading difficulties (Ehri, 2001; Gonzalez, 2002). In addition, many studies have

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emphasized on the effect of this education in preventing the children at risk (Forman, 1998; Alexander and Slinger, 2002; Elbro and Peterson, 2004). It is important to mention that besides recognizing phoneme recognition awareness as a source of dyslexia, it is also effective in clinical diagnosing of these problems (Plaza and Cohen, 2003).

Considering the theoretical foundations, the main problem of the current study is whether phoneme plays are effective for reducing the reading errors in third grade students with reading difficulties. Having this in mind, the theory of "phonemic plays are effective on reducing reading difficulties in boy students of third grade" was examined.

## METHODOLOGY

Considering the nature and goals of the study, this study was conducted by the experimental research method, and among the existing research methods, the pre-experiment/post-experiment scheme with a control group was used.

### Participants

The statistical population of this study includes the community of third grade boy students with dyslexia of city of Esfahan during 2011-2012 academic years.

In this study, the method of multi-stage sampling was used to select the examinees. That is, among the 5 school district of the city of Esfahan, 2 districts and from each district 6 schools were selected randomly. Then 30 students were selected from among the sampling population based on the following criteria: a) no psychological problems b) no physical and sensing disability c) low performance in a given reading test; in other words, there is a wide gap between the student's general academic abilities and his reading abilities d) average to high IQ. They were then randomly divided into two groups of 15: the experiment group and the control group.

### Assessments

**Dyslexia Checklist:** this is a researcher-designed checklist used for identifying the students suspected for having dyslexia and its contents have been approved by the specialists. The permanency for this experiment based on the Cronbach Alpha method is equal to 0.85. This shows an acceptable permanency for the used tool. This form is completed by the teacher of the class. The teacher should mark the items in the list that has observed number of times in the student's performance. This checklist contains 14 items, and if more than 5 items are checked then the student is suspected for having dyslexia and is referred to the next stage for more examination.

**The Reading and Dyslexia Test:** This test has been constructed by Karami et al. (2005) and was proof tested on 1614 students (770 boy and 844 girl students) in 5 different grades in Tehran, Sanandaj and Tabriz. After collecting the data and doing statistical operations for each grade level in each city, the raw scores and the normal scores were calculated. The sub-scales used in the dyslexia test included word reading, reading comprehension test, word chain test, word comprehension test, rhyme test, phoneme elimination test, meaningless word reading, image calling test, letter sign test and word sign test. The alpha index of the reading and dyslexia test was determined as 0.81 (KaramiNoori and Moradi, 2005).

**Children Raven Matrix of Progressive Intelligence:** This test is to measure people's intelligence. This test has 2 forms. We used the special form for 5 to 9 year-old children intelligence measurement. In this test, the examinee must first discover the logic on which the question patterns is based and then choose an option among the possible visual options that completes the question pattern. The Raven test for children was first examined in Tehran on the school children by Barahani. The retest index range for this experiment was 0.69 to 0.91 and the final index range was from 0.81 to 0.83. On the whole, the Raven Test has sufficient validity and reliability (Ganji and Sabet, 2003).

Following the completion of sampling stage, the students were assigned into two 15-person groups (15 people in experiment and 15 people in control groups). Next, to intervene the phonemic plays, 10 educational sessions were designed and implemented. Each training session was 1 hour and 15 minutes and there were 2 sessions per week. The experiment group's training lasted for 2 months. The summary of the phonemic game interventions is: becoming familiar with the phonemic plays, letter pronunciation plays, visual and hearing comprehension plays, rhyme words plays, speed reading plays, reading comprehension game and alphabet letter phonic plays.

In this study, we used the data mean, standard deviation and for determining the effectiveness of the phonemic intervention plays, we used the covariance analysis test. To analyze the data we used the SPSS 18 software.

## RESULTS

In this section, the mean and standard deviation of the two groups regarding their reading abilities were calculated and then the data associated with the hypothesis testing was provided. The contents of table 2 shows the test results of the presumed covariance analysis of multi-variable (Mancova) which indicates the difference between the two control and experiment groups (interventions) in reading errors. Based on these results, there is a significant difference between the two groups in reducing the reading errors ( $P < 0.001$ ). In

other words, we can say that the difference between the scores of the two groups indicates the fact that phonemic plays have had positive effect on the improving the accurate reading of the students with reading difficulties. Considering the Eta squared, we can say the cause for 80% of these changes is because of the intervention. In addition, the power of the test shows the sufficiency of the sample size.

The results in table 3 shows that, by considering the pre-experiment scores as auxiliary variables, the intervention has been effective in the experiment group sub-test results for accurate reading in comparison with those in the control group. In other words, we can say that the difference between the two groups' scores is an indicator of the effectiveness of the phonemic plays on improving the performance of the students in the experiment group in sub-tests of word reading, word chains, elimination of phonemes and non-word reading.

**Table 1.** The mean and standard deviation of the two control and experiment groups in regard with reading errors

Items	Group	Freq.	Pre-experiment		Post-experiment	
			Mean	Std. Dev.	Mean	Std. Dev.
Reading words	Experiment	15	81.40	14.65	92.93	11.62
	Control	15	82.00	15.15	82.80	14.48
Word chains	Experiment	15	66.60	1.12	80.73	7.350
	Control	15	67.20	2.88	68.13	4.80
Elimination of Phonemes	Experiment	15	72.80	6.30	84.02	8.51
	Control	15	66.53	4.98	69.20	5.59
Reading non-words	Experiment	15	58.06	15.03	75.26	18.67
	Control	15	55.20	12.19	60.33	13.26

**Table 2.** The results of Vilks Lambda assumption test of the multi-variable covariance (Mancova) The difference of the two control and experiment groups in reading errors

Source	Statistical Index	Vilks Lambda	F	Significance Level	Eta	Power
Group		0.19	22.08	0.001	0.80	1.00

**Table 3.** The results of multi-variable covariance analysis test (Mancova) for the difference in the two control and experiment groups results in sub-tests for accurate reading

Sources	Dependent var. stat. index	Sum of squares	Deg. of Freedom	Mean of squares	F	Significance level	Eta <sup>2</sup>	Power
Group	Reading words	839.905	1	839.905	17.306	0.001	0.391	1
	Word chains	1309.828	1	1309.828	40.532	0.001	0.600	1
	Phoneme Elimination	592.996	1	592.996	17.201	0.001	0.389	0.979
	Reading non-words	1255.922	1	1255.922	6.779	0.015	0.201	0.709

## DISCUSSION

The multi-variant covariance analysis results showed that the phonemic plays are effective on reducing reading errors (accurate reading) in third grade boy students with dyslexia. The investigations show that the results of this research are compliant with other ones done domestically and internationally. Joanisse and Manis (2002) executed a study on some language deficiencies in children with dyslexia that concentrated on three aspects of language: speech comprehension, phonology and single-word recognition. Reading and other language assignments were executed by children with dyslexia of 8 and 9 years of age in two identical groups of same age and reading ability levels. During this research, three different categories of reading problems were identified: phoneme recognition deficiency, language development trauma, language delay trauma (total delay). Both groups showed a similar trauma pattern that was related to low phoneme recognition skills.

In addition, the research by Lorusso et al. (2004) showed that the individual's performance in quick and correct retrieval of phoneme recognition information can help correct and quick pronunciation of the words. The results by this research expresses that people with reading difficulties have problem with retrieval of phoneme recognition information associated with phonemes and writing-speech chains. This can lead to low accuracy in reading and long time spent on reading (lowering of speed). In another study by the title of "literacy ability and phoneme recognition processing skills" among Arabic speaking children with reading difficulties and without difficulties, Elbeheri and Everatt (2006), showed the relationship between literacy abilities with

decoding and phoneme recognition processing. In addition, this research supports the idea that the Arabic-speaking children with reading difficulties have suffered from some kind of phoneme recognition trauma and are weaker than the children of their own age. Another linear research studied the role of phoneme recognition in advanced educational success of children. In this study, it was shown that phoneme recognition knowledge can predict the performance of children (Wocaldo and Rieger, 2007). A review done on 38 different research projects performed on the field of phonology intervention in students with learning disabilities, who were weak in spelling, shows that almost all ordered methods can be helpful in these children (Zigler, 2005). In general, the children with reading difficulties, in a parallel comparison with the children in the control group, have more errors in phonological issues (Bogliottiet al., 2008).

In explaining this phenomenon, we can mention that skilled readers seem to use their phoneme processing skills when reading texts. This processing will cause the reader to identify the relationship between the words in the text. However, the students with reading difficulties have lower performance in doing this which results in reduction in reading speed. Phonemic plays help familiarize students with the language structures and this will indirectly help students to get mastery over using a language and written material. The higher the knowledge of the student of the structure and nature of his language, and the better they can break the speech to its words and spelling, and the more knowledgeable of the phonology of his or her language, the performance of his or her reading will improve. With this in mind, we can notice the importance of the phonemic plays whose aim is to help identify the word form and increase their phonological knowledge which eventually help to read a word.

## CONCLUSION

Despite the limitations of this research such as choosing the measurement tools, statistical sampling, time and duration of intervention, we can conclude that the level of mastery of students on phoneme processing and understanding the relation between the phonemes are powerful factors in improving the accurate reading of the students. Therefore, it is suggested that in clinical works and along with other common treatments for children with dyslexia, we should include other language skill evaluations, specially the grammatical skills and phonology. On the other hand, it is suggested that by offering a proper treatment program and designing a series of educational assignments to improve these skills in children with reading difficulties in the form of different plays suitable for their age, help them in improving their reading skills for their further progress at other school works.

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