

The Effectiveness of the Intervention Program on the Attitude and Self-Concept of Students with Dyslexia

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Abstract: The purpose of this study is to investigate the effect of the Barton Intervention Program on the attitude and self-concept of dyslexic students. The Dyslexia Screening Instrument (DSI), and Reading Text were employed in order to identify the dyslexic students in schools in Ilam, Iran. The population of the study included 138 dyslexic students studying in elementary schools in Ilam, Iran and from this population, 64 students were selected randomly and assigned equally to an experimental group and a control group (32 students in each group). The experimental group was taught for 36 sessions using the Barton method, in two levels, and ten lessons were provided to improve their reading skills. Reading attitude and self-concept to read instruments were employed to measure their attitude and self-concept, before and after the intervention program. The reliability of the reading attitude and self-concept were confirmed. The content validity of the scales was investigated using the judgment of 10 psychology experts. The analysis of the finding through independent t-test showed a significant difference between the control group and the experimental group after the intervention, at $p < 0.000$.

[Zeinab, Mihandoost, Prof. Habibah Elias, Prof. Sharifah Nor, Dr. Rosnaini Mahmud. **The Effectiveness of the Intervention Program on the Attitude and Self-Concept of Students with Dyslexia**. Journal of American Science 2010;6(12):1181-1191]. (ISSN: 1545-1003). <http://www.americanscience.org>.

Keywords: Intervention program; attitude; self-concept; dyslexia

1. Introduction

Most students with learning disability have problems in one or several basic skills. Dyslexia is one of the learning disability affecting these students in their basic skills (1), where dyslexia students were found to hold more negative self-concept (2), feel more helpless (3) and have negative attitudes about school learning (4). Attitude toward reading has been defined by Smith (5) "as a state of mind, accompanied by feelings and emotions, that make reading more or less probable" (p.125). A student's attitude toward reading is an essential factor affecting reading performance. Positive attitudes can compensate for relatively weak skills, while negative attitudes can prevent a student from applying existing knowledge (6). Reading attitude fulfills a pivotal role in the development and use of lifelong reading skills.

Richeck, List and Lerner (7) declared that "the final success of education is strongly affected by the reader's attitude". Lipson and Wixson (8) concluded that "the student's attitude toward reading is an essential factor affecting reading performance". A number of researchers have postulated that attitudes affect one's motivation and consequently reading achievement by increasing or decreasing the amount of time that learners spend engaged in reading (9).

The result of studies by Polychroni, Koukoura and Anagnostou, (10), as well as Lazarus and Callahan (11) showed that students diagnosed with learning disability in reading have negative attitudes toward reading. Attitudes can also consist of one's affinity for a particular activity. The importance of the affective characteristics of learning-disabled students has long been noted, and these students are often attributed with negative affective

characteristics. Despite this somewhat general acceptance in the field (12), it has not been definitively ascertained whether the negative affective variables cause the learning disability, are a consequence of it, are related in origin to the actual disability, or are simply behaviors which happen to occur concurrently with the difficulty in learning. There seems to be a general agreement nevertheless, that the prolonged failure experiences of learning disabled children have a profound and lasting effect (13). Students' attitudes toward reading are positively linked to reading improvement. When students are interested in what is being taught and have access to materials that interest them, then learning, and attitudes improve (14). Reading attitude is typically viewed as a multidimensional concept related to the functions of reading. A number of attitudes to reading models of have been proposed (15-16). Across all models, the decision to read is viewed as largely determined by attitudes toward reading. Mathewson (16) supported that attitudes function as a causal agent upon the reading process. The factors that may influence children's positive attitudes toward reading are what the child believes about others' expectations; and what the child believes about his or her reading outcome and the type of prior reading experience. Thus, children's prior beliefs and cognitive-affective knowledge may affect their reading comprehension (17).

Comparisons with low-skilled, without disability students suggest that students with learning disability have negative attitudes toward reading, and some studies exist to support these inferences (10, 18). Nevertheless, there are studies which have documented that students with dyslexia who received reading instruction in special education and resource rooms expressed attitudes to academic and recreational reading that equaled or exceeded those expressed by low and average without disability students, implying that perceptions of ability are important (11). Moreover, when individuals with dyslexia get involved in voluntary reading in areas of personal interest, they improve their reading ability (19).

Many studies have examined differences between students with and without learning disability across multiple domains of functioning and these studies have revealed that their academic failure may affect their self-concept, and adjustment (20-22). Results of these studies have shown that, when compared to peers without learning disability, students with learning disability have lower level of social-emotional difficulties.

Research has been fairly consistent in demonstrating that students with learning disability

have a lower self-concept than other categories of students (Bryan, Burstein, & Ergul, 2004). However, studies regarding lower self-concept among students with learning disability are somewhat equivocal (23). There is general consensus that students with learning disabilities show lower self-concept, in particular on school-specific tasks associated with their disability, such as reading (24). Research among students with learning disability particularly has shown that these students tend to attain lower school specific self-concept scores. Bender and Wall (25) suggested that there may be a developmental trend in which students with learning disability demonstrate a lower self-concept, and these students, as they grow up, may learn to think more highly of themselves in general but are predisposed toward maintaining a lower self-concept relative to academic tasks (Bender, 2008).

Several researches have shown that students with learning disability display poorer self-concepts and poorer perceived academic skills than those without disability (Bender & Wall, 1994; Elbaum & Vaughn, 2003a). Furthermore, research suggests that poorer self-concept affects social and academic achievement. Since students with learning disability experience repeated academic failure, disappointments, and frustrations, it is not surprising that many of them have low feelings of self-worth. Some students may even refuse to try a task due to fear of failure. Bryan and Pearl (13) found that the self-concepts of students with learning disability with regard to their academic performance are more negative than those without disability, while their general feelings of self-worth are equivalent to those without disability. Montgomery (26) and Kloomok, and Cosden (27) in their research found that the students with learning disability exhibited self-concepts similar to those students without disability in nonacademic areas, but displayed significantly more negative self-concepts in the areas of academics and skills. A current comprehensive meta-analytic review by Zeleke (28) showed consistent evidence that the school self-concept of students with learning disability is more negative than that of students without disability. However, empirical support on the self-concept of children with learning disability has been less than straightforward, mainly due to methodological difficulties that are reported below.

1. Given the heterogeneity of the dyslexic population and the lack of agreement on the criteria used in identifying students with learning disability, the comparisons across studies are difficult. Furthermore, the selection criteria for the low-achievement groups are also varied, including using the 25th percentile point as a cut-off score to differentiate students with learning disability from those students without

learning disability, or simply using teachers' ratings (28). 2. The majority of studies about learning disability have examined the association between general self-esteem as opposed to specific school self-esteem and achievement. Taking into consideration the multidimensional and hierarchical models of the self (29), it has been supported that this association is stronger when school self-esteem is examined in relation to children with difficulties in literacy. School self-concept is also multidimensional, having components in several academic subjects. In addition, studies on different school settings, for example mainstream schools and special schools have demonstrated that dyslexic children in special schools typically have higher school self-concept as compared to dyslexic students in mainstream schools, consistent with the social comparison theory (30-31). However, this difference is less evident in other areas of self-concept (32).

The aim of this study was to compare dyslexic students in the experimental and control group after the Barton Intervention Program. The research questions are as follows:

1. Does the Barton Intervention Program improve the reading attitude of the dyslexic students in the experimental and control group?
2. Does the Barton intervention program improve the reading self-concept of the dyslexic students in the experimental and control group?

This study is guided by the following research hypotheses:

1. There is a statistically significant difference in reading attitude between the dyslexic students in the control group and the dyslexic students in the experimental group after the Barton Intervention Program.
 - 1.1 There is a statistically significant difference in recreational reading attitude between the dyslexic students in the control group and the dyslexic students in the experimental group after the Barton Intervention Program.
 - 1.2 There is a statistically significant difference in academic reading attitude between the dyslexic students in the control group and the dyslexic students in the experimental group after the Barton Intervention Program.
2. There is a statistically significant difference in reading self-concept (RSC) between the dyslexic students in the control group and the dyslexic students in the experimental group after the Barton Intervention Program.
 - 2.1 There is a statistically significant difference in RSC-competence between the dyslexic

students in the control group and the dyslexic students in the experimental group after the Barton Intervention Program.

- 2.2 There is a statistically significant difference in RSC-difficulty between the dyslexic students in the control group and the dyslexic students in the experimental group after the Barton Intervention Program.
- 2.3 There is a statistically significant difference in RSC-attitude of the dyslexic students in the control group and the dyslexic students in the experimental group after the Barton Intervention Program.

2. Method and Procedure

In this study, the students in the fourth and fifth grades with dyslexia were identified by first using a questionnaire called the "Dyslexia Screening Instrument". Two 100-word passages with 10 comprehension questions from the students' textbooks were selected and were assigned to the students to read. Their marks were also scrutinized in the first semester and it was found that their marks in the reading skills were lower than the marks of the students without dyslexia. To examine their IQ, Raven's test was performed, and the students with the average IQ higher than 90 made up the population of this research. Finally, 138 dyslexic students in the fourth and fifth grades in elementary schools in Ilam, Iran were selected. The population of the dyslexic students for this study consisted of 40 male and 38 female fifth grade students, and 37 male and 22 female fourth grade students. Their age ranged from 10 to 12 years. The researcher used the table of random numbers to select 64 dyslexic students from the population and assigned them equally into a control and an experimental group, with each group comprising of 32 students. "Reading Attitude" and "Reading Self-Concept" Scales were conducted on both groups. The dyslexic students were given verbal instructions on how to complete the Reading Attitude Scale (33) and Reading Self-Concept Scale (34). The items were read aloud and the students' understanding of the instrument was observed. Assistance was provided when necessary. Demographic variables such as age, gender, and IQ were obtained as well. When the students had completed answering the questionnaire (approximately 40 minutes later), they returned to their respective classrooms.

3. Intervention

The Barton Intervention Program (35) was used in this study. The Barton Reading and Spelling System includes ten levels. Each level is broken into

lessons and each lesson, in turn, is further broken into procedures. In this study, only level one and two were taught with some adjustments. Considering the fact that in the Persian language, there are 26 consonants, 6 vowels, and one digraph, 6 lessons were specified for level two. Like Barton's (2000) program, in the adjustment program, teaching procedures started with the easy level and gradually became more difficult. Since instruction tools were not available in Persian, the researcher provided the necessary tools based on the Barton program. Instruction tools included: 1) color coded letter tiles, 2) word lists, 3) cards, on which one word is written in blue consonants and red vowels respectively, 4) whiteboard, 5) blue and red markers, and 6) a notebook for dictation along with red and blue pencils, erasers and sharpeners. According to Barton's program (2000), level one is taught first. Then, 6 consonants, and one vowel were taught in each session of level two. Sometimes, due to the difficulty of some consonants or vowels, some lessons were repeated for 2 to 4 sessions. Therefore, one by one instruction was done for 36 sessions in 12 weeks, each week with three sessions and each session lasting 45 minutes. It seems necessary to note that students received the intervention in their respective schools, one to one. Instruction time was set by the tutors. If the students could not learn a lesson properly, the lesson would be repeated till she/he learned it.

4. Pilot study

The purpose of carrying out the pilot study was to evaluate the suitability and appropriateness of the use of the instruments. For the pilot study, 30 dyslexic students from Ilam, Iran with similar characteristics were selected randomly to be the participants. The students consisted of 19 males and 11 females in the fourth and fifth grades. This study was carried out from 1st March to 5th March, 2010. Then, the data was entered into SPSS version 17 Windows software to determine the reliability of the scales. The reliability test was applied by calculating the Cronbach's alpha on the variables to measure the inter-item reliability. There was consistency in the following variables: reading attitude and reading self-concept. Internal consistency is usually measured with Cronbach's alpha, a statistic calculated from the pair-wise correlation between items. Internal consistency ranges between zero and one. Cronbach's alpha coefficient of reliability and alpha of 0.70 is normally considered to indicate a reliable set of items (36). Cronbach's alpha reliabilities of the Reading Attitude and Reading Self-Concept Scales were 0.79 and 0.80 respectively. The results of the reliability

coefficient showed that there is a high reliability for these instruments, so these instruments were considered appropriate to be employed in this study.

5. Validity

In this study, to ascertain the validity of the Reading Attitude, and Reading Self-Concept Scales, ten psychology experts were asked to grade the scales from 1 to 5. The acceptable degree figures are shown in Table 1 below. Although there is no statistics for content validity, a statistical figure, namely mean was introduced in Table 1. It should be stated that what has been put forward in Table 1 is the acceptability degree criteria among the judges.

Table 1. Judges Rank

Judges	Mean Self-concept	Mean Attitude
1	4.21	4.40
2	4.22	4.40
3	4.19	4.45
4	4.23	4.50
5	4.24	4.50
6	4.29	4.40
7	4.26	4.15
8	4.27	4.35
9	4.32	4.20
10	4.29	4.30

Table 1 show that Juror Rank given by experts based on Cohen (37)

6. Measures

Five instruments were utilized in this research. They are as follows: 1) the Dyslexia Screening Instrument (DSI), 2) Reading Text, 3) Reading Self-Concept Scale (RSCS), 4) Reading Attitude and 5) Raven's Progressive Matrices.

Reading Self-concept Scale: The Reading Self-Concept Scale (RSCS) (34) was used as a measure of reading self-concept. The RSCS contained 30 questions, which were read aloud individually to the dyslexic students who responded on a 5-point Likert

scale (1. Never, 2. Seldom, 3. Sometimes, 4. Often, and 5. Always). Response requirements were taught to the students by means of 4 examples and 10 practice items, which took approximately eight minutes to complete. The RSCS was developed as part of a series of experimental studies in which previous research and theory in the areas of self-concept and reading were drawn upon. The RSCS measures reading and is suitable for ages 6 and above. The Cronbach's alpha coefficient score for the scale is 0.80. The RSCS was individually administered and administration time varied between 15 and 30 minutes for each participant. Each response was scored from 1 (low reading self-concept) to 5 (high reading self-concept) with the total score calculated as the mean value of the 30 responses. Responses to the RSC-difficulty were reverse scored; this means difficulty is actually correlated to easiness in this study. Mean scores for each of the three subscales were calculated in the same manner with a total of four scores calculated; Total-RSCS, Competence, Difficulty and Attitude. In this study, scores on all RSCS sub scales show acceptable reliability (Total-RSCS $\alpha=0.88$; Attitude $\alpha=0.84$; Difficulty $\alpha=0.71$; Competency $\alpha=0.78$).

Reading Attitude: McKenna & Kear (33) defined the Elementary Reading Attitude Survey (ERAS) as a 20-item questionnaire that asks students to rate their attitudes toward reading; each item presents a brief, simply worded statement about reading followed by four pictures of the comic strip character, Garfield the Cat in varying pictorial poses. Percentile ranks can be obtained for two component subscales: recreational reading attitude and academic reading attitude. Recreation items focus on reading for fun outside the school setting and the academic subscale examines the school environment and reading of schoolbooks. A total reading attitude percentile rank can also be computed as an additive composite of the recreational and academic scores (33). Cronbach's alpha, a statistic developed primarily to measure the internal consistency of attitude scales (38) was calculated at each grade level for both subscales and for the composite score. These coefficients ranged from 0.74 to 0.83. The validity of the academic subscale was tested by examining the relationship of scores to reading ability. Teachers categorized norm-group children as having low, average, or high overall reading ability. The mean of the subscale scores for the high ability readers ($M=27.7$) significantly exceeded the mean of low ability readers ($M=27 < 0.001$); this gave the evidence that scores

were reflective of how the students truly felt about reading for academic purposes. In this research, scores on the scale have acceptable reliability (attitude=0.75).

Dyslexia Screening Instrument (DSI): The Dyslexia Screening Instrument (DSI) designed by Coon, Waguespack, and Polk in 1994 consists of checklists of basic neuropsychological skills. This instrument is a rating scale designed to describe the cluster characteristics associated with dyslexia and to discriminate between students who display the cluster characteristics and students who do not. It is designed to measure "entire populations of students or students who exhibit reading, spelling, writing, or language-processing difficulties" (39). The DSI is designed to be used with students in grades 1 through 12 (age 6 to 21). The internal consistency reliability coefficients is 0.99 for elementary students which was determined using Cronbach's coefficient alpha; and the inter rater reliability of the DSI for elementary students is 0.86 which was assessed by determining the homogeneity of the statements and consistency of ratings across examiners. Coon et al (39), stated that "content was based on an extensive review of relevant literature and on experts in the field of dyslexia". Construct validity was supported by the discriminate analysis classifications which placed the elementary and secondary students accurately (98.2% and 98.6% respectively). The DSI scale should be completed by a classroom teacher who has worked directly with the student for at least four months. This will result in a rating that will be more accurate because the teacher has observed the student over a longer period of time and can compare the student's performance to that of the students' classmates. For an elementary student, the preferred rater is the teacher who has instructed the student in a variety of subjects. The teacher should complete the DSI form based the questionnaire answers: Never exhibits, Seldom exhibits, Sometimes exhibits, often exhibits and always exhibits. In this study, the Cronbach's alpha reliability of the scale was 0.89.

Raven's Progressive Matrices test: Raven's Standard Progressive Matrices (RSPM) test was constructed to measure the educative component of g (general IQ) as defined in Spearman's theory of cognitive ability (40). Kaplan and Saccuzzo (41) stated that "research supports the RSPM as a measure of general intelligence. The advanced form of the matrices contains 48 items, presented as one set of 12 (set I), and another set of 36 (set II). Items are presented in black ink on a white background, and become increasingly difficult as progress is made

through each set. These items are appropriate for those aged 5 to 65. Lynn and Vanhanen (42) summarized a number of studies based on normative data for the test which has been collected in 61 countries. The internal consistency reliability estimate for the Raven Progressive Matrices' total raw score was 0.85 in the standardization sample of 929 individuals. This reliability estimate for the revised RSPM indicates that the total raw score on the RSPM possesses "good" internal consistency reliability as provided in the guidelines of the U.S. Department of Education (43) for interpreting a reliability coefficient. The RSPM has been widely used for decades as a measure of educative ability, which is "the ability to evolve high level constructs which make it easier to think about complex situations and events" (44). In an extensive analysis of the cognitive processes that distinguishes between higher scoring and lower scoring examinees on the Standard Progressive Matrices and Advanced Progressive Matrices, Carpenter, Just and Shall (45) described the Raven's test "a classic test of analytic intelligence". In this research, the Cronbach's alpha reliability of the scale was 0.83.

Reading text: The reading texts were developed by the researcher based on the contents of the fourth and fifth grade textbooks. During the administration of the research, only 80 percent of the textbooks had been taught, and as such, the developed test was based on only 80 percent of the Persian text books. The tests were evaluated by the fourth and fifth grade teachers and after 3 times revisiting they evaluated it as convenient. The test included a story of one-hundred related words understandable to each education level and was followed by 10 questions which indicated the students' level of understanding. The students were required to read out the test aloud and answer the questions. The Cronbach's alpha was employed to determine reliability. The reliability coefficients for the fourth and fifth grades' reading tests are 0.87 and 0.90 respectively.

7. Findings

SPSS (version 17) was utilized for the analysis of the data. The findings of the study are presented in two parts: descriptive findings and findings related to the hypotheses. In Table 2 and 4, the means, standard deviations, and variables of attitude and self-concept are presented. In Table 2, the means and standard deviations for attitude, recreational reading attitude and academic reading attitude are shown for both the experimental group and control group, before and after the Barton

Intervention Program. The findings pertinent to the first research hypothesis are shown in Table 2.

Table 2. Mean and standard deviation for attitude

Test	Experimental Group		Control Group	
	Pretest	Posttest	Pretest	Posttest
Attitude				
M	47.25	67.51	47.66	48.06
SD	6.99	5.02	7.56	12.25
Recreational reading attitude				
M	10.71	35.45	10.73	24.63
SD	3.17	3.38	2.79	5.64
Academic reading attitude				
M	22.45	32.06	22.73	23.43
SD	4.16	2.81	4.87	6.87

The result in Table 2 shows the means and standard deviations to reading attitude, recreational reading attitude, and academic reading attitude, pre and post intervention program. This table shows that there is a significant difference in the posttest means of reading attitude, recreational reading attitude and academic reading attitude for the experimental group and the control group of students with dyslexia after the Barton Intervention Program.

Table 3. t-test results for attitude

	Test	t-value	df	sig
Pretest	Attitude	-0.219	59	0.828
	Recreation	-0.031	59	0.975
	Academic	-0.243	59	0.809
Posttest	Attitude	8.05	59	0.000
	Recreation	9.11	59	0.000
	Academic	6.45	59	0.000

The findings related to the first research hypothesis are shown in Table 3. The first hypothesis is: There is a statistically significant difference in attitude between the dyslexic students in the control group and the dyslexic students in the experimental group after the Barton Intervention Program. Independent t-test was employed to test the first

research hypothesis. As can be seen in Table 3, attitude and its subscales (Recreational and Academic Reading) after the intervention program are statistically significant ($t(-0.219, -0.031, -0.243) = 8.05, 9.11, 6.45$ and $p < 0.000$).

Table 4. Mean and standard deviation for self-concept

Test	Experimental Group		Control Group	
	Pretest	Posttest	Pretest	Posttest
self-concept				
M	82.64	104.06	83.63	86.63
SD	14.21	13.12	13.71	26.06
Competence				
M	28.74	35.45	28.86	29.56
SD	5.11	5.56	7.13	8.16
Difficulty				
M	26.35	29.79	26.43	27.63
SD	5.48	5.96	3.83	9.14
Attitude				
M	27.54	38.77	27.76	29.41
SD	6.77	5.70	5.39	9.71

Table 4 shows the means and standard deviations for self-concept, competence, difficulty, and attitude pre intervention program and post intervention program. This table shows that there is a significant difference in the posttest means of self-concept, competence, difficulty, and attitude for the experimental group and the control group of students with dyslexia after the Barton Intervention Program.

Table 5. t- test results for self-concept and self-concept subscale

		t-value	df	sig
Pretest	Self-concept	-0.276	59	0.783
	Attitude	0.747	59	0.458
	Competence	-0.227	59	0.821
	Difficulty	-1.888	59	0.064
Posttest	Self-concept	3.316	59	0.002
	Attitude	4.776	58	0.000
	Competence	3.307	58	0.002
	Difficulty	0.396	58	0.694

The findings for the second research hypothesis are presented in Table 5. The second research hypothesis is: There is a statistically significant difference in self-concept between the dyslexic students in the control group and the dyslexic students in the experimental group after the Barton Intervention Program. As can be seen in Table 5, self-concept, competence, difficulty, and attitude are statistically significant [Self-concept ($t(0.276=3.316$ and $p < 0.002$)), [Competence ($t(-0.227=3.307$ and $p < 0.002$)), [Difficulty($t(-1.88=0.396$ and $p < 0.694$)), and [Attitude($t(-0.747=4.77$ and $p < 0.000$))]. Based on these results, the second research hypothesis is accepted but the subscale of difficulty is not accepted.

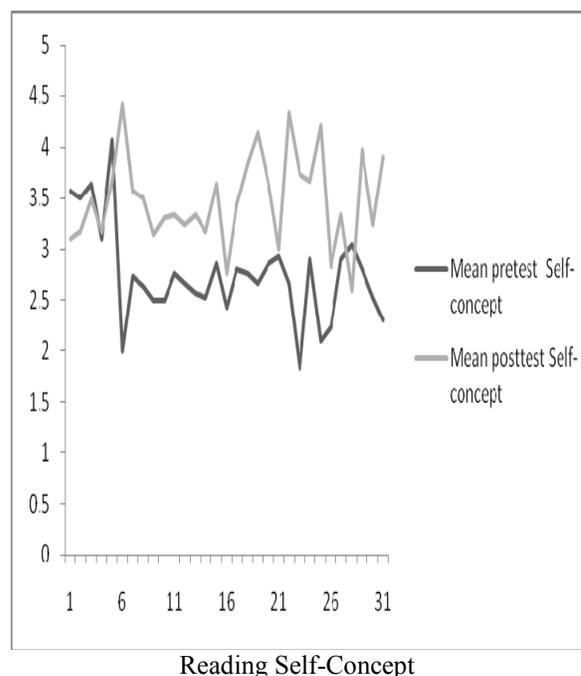


Figure 1. The pretest and posttest mean scores for self-concept. The mean score for self-concept in the pretest is lower than that of the posttest in the Standard Self-Concept Scale (Chapman & Tunmer, 1995).

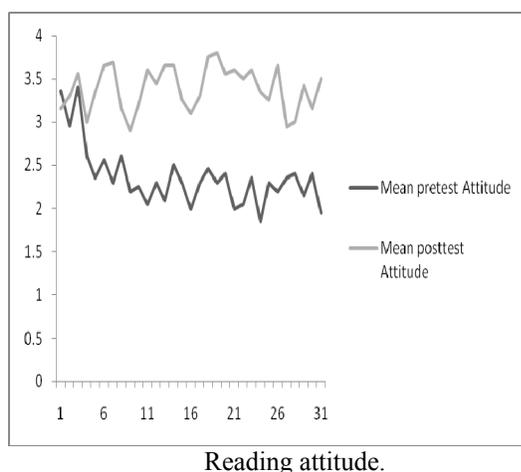


Figure 2. The pretest and posttest mean scores for reading attitude. The mean score for reading attitude in the pretest is lower than that of the posttest in the Standard Reading Attitude (McKenna & Kear, 1990).

8. Discussion

The present study aimed to investigate the effect of the Barton Intervention Program on the attitude and self-concept of dyslexic students studying at fourth and fifth grades in Ilam, Iran in the academic year 2010. The first research hypothesis is: There is a statistically significant difference in attitude between the students with dyslexia in the control group and the students with dyslexia in the experimental group after the Barton Intervention Program.

The first research hypothesis is confirmed at $p < 0.000$. The results of the study showed that the intervention program has been effective in increasing the dyslexic students' attitude towards reading. The results of this study are in line with researches such as (35, 46-47) that show intervention programs increase the academic skills of dyslexic students. Such studies show that attitude is an important factor in academic achievement.

According to Gage and Berliner (48), achievement is influenced by attitude as well as ability. "It is a well-known psychological principle that attitude influences a person's choice of activities as well as effort and persistence at tasks" (48). Alexander and Filler (49) identified several variables that seem to be associated with attitudes toward reading. These variables are achievement, the teacher and classroom, special programs and so on. As teachers attempt to improve students' attitudes toward reading, they should keep these ideas in mind; in other words, teachers need to have a positive feeling toward their students, and the students need to

be commended for their efforts. The teacher's awareness of the student's attitude toward reading is essential. A student's attitude toward reading materials affects comprehension of those materials. Teachers should be well-informed that students' attitudes toward reading are formed by parents and their home environment. Studies show that reading attitude is affected by academic achievement. As such, having a positive attitude toward reading may ensure a student's success in his academic endeavor.

According to Johnson (50), attitudes toward reading are arguably formed as a result of success achievement or failure with the task of reading; therefore, students with good reading ability may have positive attitudes toward reading, while students who are poor readers often have to overcome negative reading attitudes in order to improve their reading skills. The finding of the study suggests that since the intervention program results in academic achievement of the dyslexic students, therefore, participation of the dyslexic students on a one-to-one basis in the intervention program would increase the individual capabilities of this group of students.

The second research hypothesis is: There is a statistically significant difference in self-concept between the students with dyslexia in the control group and the students with dyslexia in the experimental group after the Barton Intervention Program. The second research hypothesis is confirmed at $p < 0.000$. In this study, it is shown that the use of the intervention program increased the self-concept of the dyslexic students; in comparison to the students with dyslexia in the control group, the dyslexic students in the experimental group performed better after the intervention program. This study is in line with researches (35, 46-47, 51-53) that show intervention programs would increase the skills and academic performance of dyslexic students. The result of the meta-analysis by Elbaum and Vaughn (54) showed that the intervention program could lead to beneficial changes in the self-perception of students with learning disabilities. The investigators noted that these findings are particularly important in light of the fact that the intervention lasted less than 12 weeks with sessions held only two or three times a week.

Studies such as Elbaum and Vaughn (55); Davis (47); Barton (35); Torgesen (46), have shown that academic failure of students with learning disability would result in negative feelings in these students. Since the intervention program increased the academic achievement of dyslexic students (35, 46-47, 51) and since academic achievement is related to self-concept (56), it is necessary to use the intervention program in order to increase the

academic achievement and consequently, the self-concept of dyslexic students. As mentioned above, dyslexic students need a special educational program to acquire sufficient skills to complete their school assignments. Therefore, it is suggested that before running any educational program, they should be investigated regarding their ability to use the Barton educational program.

9. Recommendation for future research

Future researchers are recommended to investigate the role of such variables, for instance perception, visual memory, auditory memory, movement harmony, finding spatial direction, accuracy, creativity, and innovation on dyslexic students. Since this study was conducted on dyslexic students only and its sample was just the fourth and fifth grade students, therefore, a similar study is suggested to be carried out on other groups of students with learning disorders and other school grades. Finally, it is recommended that education officials familiarize themselves with the Barton program and carry out this method with larger groups and in several educational centers so that if positive results are observed, this method could be utilized to overcome the learning difficulties faced by dyslexic students.

10. Conclusion

The data displayed showed that the Barton intervention program does increase the students' attitude and self-concept as a result of participation and, therefore, the hypothesis is accepted. The multisensory Barton Reading and Spelling System were used on the dyslexic students in the experimental group and it improved the attitude and self-concept of these students in comparison to those students in the control group. In the final analysis, the researcher advocates the use of Strategic Barton instruction and training programs for teachers because it would be beneficial for all students.

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11/7/2010