Relationship between visual perception and reading disability in primary students (first, second, third grade) of Ahwaz city

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ABSTRACT: This study was done to determine the relationship between visual perception and reading disability in primary students (first, second, third, grade) of Ahwaz city. From the total population of students with reading disability who referred to learning disabilities center and counseling & psychological service center of education organization 50 students (30 boys and 20 girls) were selected via aimed sampling. The main hypotheses were based on the relationship between eye-motor coordination figure ground form constancy position in space spatial relations and reading disability. To verify the hypotheses Marianne frostig developmental tests on visual perception and standardized collection of fallah chai tests were to analyze the data descriptive statistics simple and pearson correlations were used. The correlation between visual perception and it's subscale and reading disability was negative. except second hypothe (eye-motor coordination and reading disability) and fifth hypothe (spatial relations and reading disability) the relationship is negative and significant.

Keywords: Reading disability, learning disability, visual perceptional

INTRODUCTION

Reading is a complex skill that success in society is dependent on it. In a society like our society that much of our information is communicated in a written form and reading is the process of written language, research about such a skill is so important.

Most children learn to read skillfully but some children are not very successful in reading and even some of them grow up without gaining skill in reading. One of the issues that have an important role in educational abilities of developmental stages is visual perception. Among developmental learning disabilities visual perception difficulties have gained the most attention. Questions related to association between visual perceptions deficiencies and reading disabilities has a long history. In the past fifty years researchers have attempted to determine an association between developmental disabilities and educational success. As Weiler have determined individuals with special learning abilities are different from children without learning disability diagnosis in perception. Specialists and teachers have reported that they find children who aren’t successful in education because they have related psychological disabilities. This has been approved by several studies. Learning disabilities teachers believe that researches will approve their personal experiences that developmental learning disabilities should be considered in children with educational disabilities. Same Siahklerody et al determined in their research the visual perception skills will improve reading skills of reading disabled children. Also improving visual perception skills can improve abilities of reading disabled student in reading perception and word recognition.

Most of these researches have considered relation between developmental learning and reading learning process. Among developmental learning, visual perception difficulties have obtained most attention. So questions related to association between visual perception and learning disabilities have long history.

Visual perception not only include details of shape and color but also include issues such as spatial orientation, location recognition, shape perception, visual memory, visual discrimination and other difficulties related to them. All these issues are considered in study of causes and factors affecting learning disability specially severe learning disabilities.
From 1920, many researchers have attempted to explain learning disabilities by approving existence of efficiency in one or several perception processes. Results of these researches have been uncertain and have led to considering what is called “perception hypothesis”.

Visual perception as a developmental learning disability is one of blocks of learning reading. Many researches have approved this issue. On the other hand authors such as volotino believe that reading disability is caused by a deficiency in vocal association rather than visual perception deficiency.

Results of a research by Kushesh et al showed that reading disabled children have visual perception difficulties when compared with normal children. A research by Delrosurio, Rodrigo determined that learning disability is associated with difficulties in perception.

Ridington and Cameron considered 17 children with reading disabilities and 17 normal children at the same age. Results indicated that there is significant difference between groups in shape constancy that is one of the subscales of advanced visual perception test. A negative association was determined between these measurements and reading disability. A study by Catherine Boden and Giaschi who were considering mental flow and visual communication processes determined that perception processes is related to reading difficulties.

A study by Bravo et al titled visual and auditory problems in children with reading disability considered 64 children in four groups at ages 8 and 9 and 10 and 11. Results showed that there is significant difference in reading decoding and perception in normal and disabled children, this hypothesis shows relation between visual difficulties and reading disability.

In order to determining association between perception and visual and auditory processing and reading Amitay et al considered vocal perception by mediating each one. This measurement was performed in kindergarten so that perception status is considered before formal reading. This study indicated that perception is determined based on phonemics ability sequence. Although we expect that vocal perception can effect phoneme awareness and names are named automatically and vocal short term memory be determined based on vocal disability this study predicts that reading disability can effect visual perception disability. In 1990 a study by Piterson was done for determining relation between visual perception and cognitive skills and dyslexia using a new motor test. In this study 80 dyslexic children, 15 adult dyslexic student and 140 normal student were used. Subscales for measuring recognition, geometry images, writing and words was performed on sample group and control group. Results after statistical analysis showed that two groups are different by considering age and gender and there is relation between dyslexia and visual perception disability. Researches by Amitary, Ramous and Kron Bichler found out that auditory and visual processes are desirable predators for dyslexia. Results showed that developmental difficulties of dyslexic children improves during time that determined that visual perception has the highest impact on learning in lower ages. Another study states that eye movement is associated with reading in children and adolescents.

Sum of above researches shows that most of visual difficulties is associated with learning disability and it seems that failure in eye abilities interferes with performance in a regular system in individual performance.

Research method
Resent research is a association research.
A: statistical universe and sampling method
Statistical universe of universe includes all elementary school students who went to learning disabilities centers and psychological centers of Ahvaz. Research sample included all statistical universes which mean 50 individuals that were selected by goal-directed sampling.
B: research tools
Developed test of visual perception: this questionnaire is developed by one of the most popular individuals in learning disability field called Marian Frostig in 1961. Its aim is measuring development of visual perception skills such as visual motor skills, figure ground discrimination, shape constancy and spatial relation perception. Test has a booklet, 11 demonstration cards and scoring papers. This test has 72 articles that is standardized on 2116 individuals. Frastig has stated in his researches that validity of test is in a range of 1.69 to 1.98. this test is correlated with other visual perception tests in a range of 0.52 to 75%.
In recent study validity was determined to be 0.49 in p=0.01. also reliability was determined by retest that was obtained in p=0.01.
Falah chai reading tests: these tests were developed in 1374 by meeting psychometry principles. For normalizing a sample of 341 testee was selected. In reading test, paragraphs were selected in a way that difficulty level and number of words be appropriate for any level. This test has high validity in 0.001 level.
Most important goal of this research is determining that whether or not there is an association between visual perception variables as a candidate of developmental disability and reading disability as a educational disability.
Given to aforementioned goal six hypotheses were considered:
1. There is association between visual perception and reading disability.
2. There is association between visual motor coordination and reading disability.
3. There is association between figure ground perception and reading disability.
4. There is association between shape constancy and reading disability.
5. There is association between spatial discrimination perception and reading disability.
6. There is relation between spatial relations and reading disability.

Research findings
- Descriptive findings
  In table 1 it is shown that average and standard deviation of each subtests of visual perception quotient, perception quotient and reading disability in relation to male and female testees with reading disability is as follow: visual motor coordination 11.76 and 1.55, figure ground 7.42 and 1.42, shape constancy 8.3 and 2.9, spatial statue 6.8 and 1.07, spatial relation 7.62 and 1.12, perception quotient 81.9 and 11.02, reading disability 56.7 and 15.41. Also minimum and maximum of scores were 14.9, 13.6, 12.5, 10.5, 66, 104, 25, 85 respectively.

Table 1. Mean, standard deviation, minimum and maximum of score of perception quotient and reading disability of children with reading disability

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Reading disability</th>
<th>Perception quotient</th>
<th>Spatial relations</th>
<th>Statues in space</th>
<th>Shape constancy</th>
<th>Figure ground</th>
<th>Visual motor coordination</th>
<th>Statistical index</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>56/7</td>
<td>81/9</td>
<td>7/62</td>
<td>6/8</td>
<td>8/3</td>
<td>7/42</td>
<td>11/76</td>
<td></td>
</tr>
<tr>
<td>15/41</td>
<td>11/02</td>
<td>1/12</td>
<td>1/07</td>
<td>2</td>
<td>1/43</td>
<td>1/55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>66</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>9</td>
<td></td>
<td>min</td>
</tr>
<tr>
<td>85</td>
<td>104</td>
<td>10</td>
<td>9</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td></td>
<td>max</td>
</tr>
</tbody>
</table>

Findings related to research hypothesis
- Findings related to hypothesis are provided in table number 2. In this table correlation coefficient between predicting variables and criteria related to six hypothesis are shown.

Table 2. correlation coefficient between visual perception quotient, visual perception quotient sub tests and reading disability

<table>
<thead>
<tr>
<th>Visual perception quotient</th>
<th>Spatial relations</th>
<th>Spatial statue</th>
<th>Shape constancy</th>
<th>Figure ground</th>
<th>Visual motor coordination</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>-0/48</strong></td>
<td><strong>-0/32</strong></td>
<td><strong>-0/002</strong></td>
<td><strong>-0/043</strong></td>
<td><strong>-0/040</strong></td>
<td><strong>-0/027</strong></td>
<td>Reading disability</td>
</tr>
</tbody>
</table>

As it is shown in table 2 hypothesis 1, 3, 4 and 6 are approved and hypothesis 2 and 5 are disapproved. In another word results indicates that there is relation between visual perception and reading disability. On the other hand there is significant association between visual perception, shape constancy and spatial relations with reading disability and hypothesis are approved but other two tests don’t have association with reading disability and hypothesis are disapproved.

Table 3. regression analysis of predicting variables and criterion variables for determining best predictor

<table>
<thead>
<tr>
<th>Level of significance of</th>
<th>T</th>
<th>Beta</th>
<th>F(p)</th>
<th>Determined variance</th>
<th>Multi correlation coefficient</th>
<th>Predictor variable</th>
<th>Criterion variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/002</td>
<td>-3/27</td>
<td>0/43</td>
<td>10/7</td>
<td>(0/002)</td>
<td>0/18</td>
<td>0/43 Shape</td>
<td>Shape</td>
</tr>
<tr>
<td>0/012</td>
<td>-2/60</td>
<td>0/34</td>
<td>8/47</td>
<td>(0/001)</td>
<td>0/27</td>
<td>0/52 Shape constancy</td>
<td>Figure ground</td>
</tr>
<tr>
<td>0/026</td>
<td>-2/30</td>
<td>0/30</td>
<td>5/64</td>
<td>(0/002)</td>
<td>0/27</td>
<td>0/52 Shape constancy</td>
<td>Figure ground</td>
</tr>
<tr>
<td>0/0100</td>
<td>-1/68</td>
<td>-0/286</td>
<td>4/57</td>
<td>(0/003)</td>
<td>0/29</td>
<td>0/54 Shape constancy</td>
<td>reading disability</td>
</tr>
<tr>
<td>0/0062/027</td>
<td>-2/29</td>
<td>-0/30</td>
<td>5/64</td>
<td>(0/002)</td>
<td>0/27</td>
<td>0/52 Shape constancy</td>
<td>Figure ground</td>
</tr>
<tr>
<td>0/205</td>
<td>-1/29</td>
<td>-0/299</td>
<td>4/57</td>
<td>(0/003)</td>
<td>0/29</td>
<td>0/54 Shape constancy</td>
<td>Figure ground</td>
</tr>
<tr>
<td>0/025</td>
<td>-2/31</td>
<td>-0/30</td>
<td>4/57</td>
<td>(0/003)</td>
<td>0/29</td>
<td>0/54 Shape constancy</td>
<td>Figure ground</td>
</tr>
<tr>
<td>0/295</td>
<td>-1/06</td>
<td>-0/22</td>
<td>4/57</td>
<td>(0/003)</td>
<td>0/29</td>
<td>0/54 Shape constancy</td>
<td>Figure ground</td>
</tr>
<tr>
<td>0/266</td>
<td>1/13</td>
<td>0/18</td>
<td>4/57</td>
<td>(0/003)</td>
<td>0/29</td>
<td>0/54 Shape constancy</td>
<td>Figure ground</td>
</tr>
</tbody>
</table>
As is shown by table 3, predicting reading disability by shape constancy perception has the highest role among other variables and alone determines 0.18 dependent variable variance. When figure ground perception is added it adds 0.09 to dependent variable variance that together determine 0.27 dependent variable variance.

By adding spatial perception to previous variable no different is created and when perceptual skills reaches to four cases and also when we add visual motor coordination 0.29 dependent variable variance is determined. In total, all 5 perceptual skills determine 0.29 reading disability variance and best determinants are figure ground and shape constancy that determine 0.27 dependent variable variance.

From data of above table following issues are determined. There is significant relation between visual motor coordination of dyslexic students and figure ground ad shape constancy in 0.01 of significance level and spatial relations in 0.05 significance level. It means that improving visual motor coordination affects on abovementioned variables and by increasing that other skills improves. There is significant relation between figure ground perception of dyslexic students and visual motor coordination in 0.01 significance level and shape constancy in 0.05 significance level. It means that ability in figure ground subtest is effective in visual motor coordination and shape constancy. Any increase in figure ground leads ti increase in mentioned variables. There is significant relation between shape constancy perception of dyslexic students and visual motor coordination and spatial relation in 0.01 significance level and figure ground in 0.05 significance level. It means that shape constancy is effective in visual motor coordination, spatial relation and figure ground. Its increase leads to improvement of other variables. There is significant relation between statue in space of dyslexic students and spatial relation in 0.01 significance level. Increase in statue in space leads to increase in spatial relation. There is significant relation between spatial relation of dyslexic student and shape constancy, statue in space in 0.01 significance level and visual motor coordination in 0.05 significance level. It means that ability in spatial relation affects on aforementioned variables and increase of that leads to increase in shape constancy, statue in space and visual motor coordination. There is significance relation between visual motor coordination, figure ground, shape constancy, statue in space and spatial relation of dyslexic students and visual perception quotient in 0.01 significance level. So based on above result increasing in these 5 sub tests, have lead to improve of visual perception quotient. It should be noted that with respect to this issue that test was executed on group with reading disability and however scores of subtests were low, but relation between subtests with each other and especially subtests with perception quotient is acceptable and logic. Reliability of test is shown spite execution of group with disability.
CONCLUSION

This research was done with the aim of determining relation between visual perception with reading disability of elementary school students who went to learning disability centers and psychological centers of Ahwaz. After data analyziz it was determined tat there is significant negative relation between visual perception, figure ground perception, shape constancy and space relation with reading disability but there is no relation between visual motor coordination and statue in space with reading disability.

Correlation coefficient related to first hypothesis shows that there is significant negative relation between visual perception and reading disability of dyslexic students in $P=0.01$. Results of this hypothesis show that as visual perception decreases their disability in reading increases. Such a results have indicate that failure in perceptual skills can lead to failure in reading skills.

Correlation coefficient related to third hypothesis shows that there is significant negative relation between figure ground perception and reading disability of dyslexic students. Findings of this hypothesis show that as figure ground perception becomes weaker reading disability increases. Given to above results it can be said that children with reading disability don’t concentrate on related stimuli and or don’t ignore background stimuli and discrimination of these two is difficult for dyslexic students. Improvement of such a condition can lead to organization of learning disability. In such a condition children should be faced with learning that concentrate on special shapes and be inattentive to unrelated stimuli in ground.

Fourth hypothesis indicates that there is significant negative association between shape constancy perception and learning disability of student of dyslexic students. Negative relation of this hypothesis shows that as ability of shape constancy perception decreases, learning disability increases. Results of this hypothesis indicate that dyslexic children have difficulty in recognizing any shape despite size, statue or color. Such a problem makes gaining skill in word recognition difficult despite size and being printed or unprinted.

Correlation coefficient related to sixth hypothesis indicates that there is significant negative relation between spatial relation perception and learning disability in $P=0.01$. these findings states that as spatial relation perception of students becomes weaker, their disability in reading becomes worse. According to results of this hypothesis children have difficulties in recognizing objects statue and shapes in relation to each other and relation with observer. Such problems leads to failure in obtaining skills related to reading that eventually leads to reading disability.

Above findings are consistent with findings of Samee siahklerody et al, Kushesh et al, Azizan, Rzarico, Rodrigi and researches of Amitary, Ramus, Kron Bichler, Catherin Boden and Giaschi, Ridingtoin and Cameron. As it is shown in table 2, there is no association between visual motor coordination of dyslexic students and reading disability. Obtained number is negative and it can be said that its disapproval can be a result of small sample. On the other hand it can indicate higher relation of this subscale with writing.

Given to obtained results of second hypothesis in table 2, there isn't significant association between deficiency in statue in space and reading disability of dyslexic students. However it is a fact that children with dyslexia have problems in recognizing verbal signs that their orientation is different.

Given to obtained results for improving this condition, providing visual perception experiences in preschool ages, can decrease future problems resulted from this disability. On the other hand correcting disability in visual perception in dyslexic students along special educational instruction can correct a large part of learning disability. Frostig researches indicated that visual perception difficulties improve later through education. Determining levels of visual perception difficulties is needed in designing most effective programs for solving disabilities. If children learn these skills from preschool years these problems occur less.

Children with developmental learning disabilities are neglected. Given to that development occurs in growth years especially preschool and elementary school it is recommended that required actions for determining and treating developmental disabilities in children are designed so it doesn’t affect all educational abilities. Planning for solving disabilities with respect to this issue that there is relation between visual perception and reading disabilities should focus on solving

REFERENCE

