

A SCREENING FOR VISUAL PROCESSING DISABILITIES
IN PRE-SCHOOL CHILDREN

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Introduction

Presently visual screenings are performed on school aged children as mandated by state law. These screenings do a good job in detecting youngsters with abnormal amounts of hyperopia, myopia, astigmatism, phoric postures and stereopsis; however, it is possible for youngsters to have good visual acuities and proper binocular alignment, but be unable to process the visual information properly.

Kirk and Chalfrant describe two such children. (1) Tony at age nine and in the fourth grade was not learning to read. Examinations eliminated mental retardation, auditory impairment and a visual defect as explanations for the child's inability to read. The question was why, after regular schooling for three years and with average intelligence and intact sensory acuity he was unable to decode words and sentences. Further testing revealed that Tony had a problem with visual memory. He was unable to reproduce a visually presented word from memory. The word "horse", for example was written on the board. Tony was told that the word was horse. The word was erased and he was asked to write the word on the board from memory. Seven repetitions were required before he was able to perform this task. Tony was taught to use visualization in recognizing sight words and thus learned how to read. Another six-year-old child had difficulty identifying objects seen, even her classmates, though she had normal visual acuity. This girl, like Tony had a visual perceptual disability that would go undetected during the standard visual screening.

The purpose of this study is to establish baseline data from a simple screening test designed to detect visual perceptual problems in preschool children. It is the hope that the test may someday be helpful in the early detection of visual perceptual problems before they affect later learning, particularly reading.

Method

The test consisted of ten cards with various geometric figures. In cards one through three the child matches similar figures (diagram 1.1). In cards four through seven the front of the card is presented for two to three seconds then turned so the child has to match similar figures from visual memory (diagram 1.2). In cards eight through ten the child points to the figure which is not like the others.

The test was run on twenty-three pre-school children. The group consisted of children between the ages of three years and eleven months to five years and two months. Twelve of the subjects were male and eleven were female. The children were of middle-class socio-economic status and came from a mid-western town with a population of about twelve

thousand.

A complete visual screening was performed on each child to rule out any ocular conditions which may have affected the test results. All the children exhibited normal visual acuity (at least 20/30), refractive status, ocular alignment, oculomotility and stereopsis.

Results

The time to test each child was less than one minute. All the children understood the procedure and were able to perform the test. The results of the testing are presented in table 1.1. The mean score was 8.17 with a standard deviation equal to 1.99. The mean score for males was 8.66 compared to 7.64 for females. Six children scored one standard deviation from the norm (below 6.18), while one child scored two standard deviations below (below 4.19).

Discussion

Will the children scoring below average on this test later have problems in learning to read. A longitudinal study is needed to shed light on the answer to this question; however, one must keep in mind the limitations of this test to detect future problems in cognitive development. For one, visual discrimination, visual perceptual and visual memory problems are but only a few of the developmental problems that can affect the ability to learn how to read. Attentional disorders, and auditory perceptual disorders, general memory disorders and physical factors can also contribute.

Secondly, some authorities look lightly toward the theory that perceptual disabilities need to be corrected before academic achievement can occur. For example, the usual method of research on visual memory and reading disability is to test the visual memory of a group of poor readers and compare them to a group of good readers controlling such factors as age and intelligence and age. Suffice it to say that some of the studies (2) show a relationship between visual memory and reading problems and some do not. These contradictions are not all that surprising. The discrepancies in the conclusions of the research can be explained by factors inherent in most any psychologically based research.

The fact does remain that visual perceptual problems can, at least in part, contribute to learning disabilities. The test described in this paper has been proven to be efficient and easily administered. If the test is shown to have the ability to discover visual perceptual problems at an early age so that treatment can be instituted before learning problems develop, it's value is very evident.



1.1 An example of cards 1-3.



Front of Card



Back of Card

1.2 An example of cards 4-7.

O O O Q

1.3 An example of cards 8-10.

Table 1.1

	Age (years, months)	Sex	Score (# correct out of 10)
1.	4,11	M	10
2.	4,8	M	10
3.	4,5	M	10
4.	4,5	M	10
5.	4,1	F	10
6.	3,11	M	10
7.	4,8	M	10
8.	4,8	M	10
9.	5,2	F	10
10.	4,8	M	09
11.	4,8	F	09
12.	4,7	F	09
13.	4,3	F	09
14.	4,1	M	09
15.	4,2	F	08
16.	4,9	F	07
17.	4,8	F	06
18.	4,8	F	06
19.	4,6	F	06
20.	4,7	M	06
21.	5,2	M	05
22.	4,1	M	05
23.	4,6	F	04

Mean = 8.17

Standard of deviation = 1.99