CONSTRUCT VALIDITY OF THE MOTOR-FREE VISUAL PERCEPTION TEST

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ABSTRACT

The purpose of this study was to determine if the Motor-Free Visual Perception Test (MFVPT) is a sufficient test to identify childeren as visual perceptually learning disabled. A comparison was made between the MFVPT and other, more extensive motor and non-motor visual perception tests. Tests chosen for comparison were those that most closely corresponded to the subtests of the MFVPT. Children from an already defined learning disabled population were chosen for this study to determine if visual perception was the reason for their placement in this setting and if the MFVPT would depict this. Results indicate that, although not appropriate as a diagnostic test, the MFVPT may be useful as a screening device.

KEY WORDS: visual perception, spatial relationships, visual discrimination, figure ground, visual closure, visual memory, learning disability

Visual perception is the extraction and comprehension of information from the environment that is received through the eyes. It requires reconstruction of this information into meaningful verbal, motor, and cognitive responses.(1) The development of visual perception begins at birth, with maturation of specific skills occuring by nine years of age.(2) These specific skills include such things as visual form discrimination, visual closure, figure-ground perception, visual-motor integration, spatial orientation, and visual memory. Processing of visual stimuli requires these skills for a functional visual perceptual system. If for any reason, there is a disruption within this visual perceptual process, a learning disability may result even though the child may be of normal intelligence.

In order to remediate a learning disability, it is necessary to determine its underlying cause. If a learning disability results from a problem within the visual perceptual system, then an attempt must be made to retrain how the child interprets the information he or she receives. A number of tests have been developed in attempt to quantify visual perception in hopes of isolating those individuals who may have difficulty in this area. Many of these tests require motor involvement on the part of the child. The Motor-Free Visual Perception Test (R. Colarusso, D. Hammill, 1972) eliminates this confounding variable of motor activity, and therefore, may provide a more accurate assessment of visual perception.(3)

Two studies claim that the Motor-Free Visual Perceptual Test (MFVPT) is appropriate for assessing visual perception for both motorically disabled (4) and mentally retarded children.(5) There is yet another study that suggests that the MFVPT is useful as a screening device.(6)

The MFVPT contains thirty-six items divided into 6 subtests and is designed to examine various aspects of visual perception, including spatial relationships, visual discrimination, figure ground, visual closure, and visual memory. This is a multiple choice test that simply requires the subject to point to the alternative of his or her choice. The raw score is the total number of correct responses. This scoring method may be a disadvantage in that each subtest is not scored separately to determine weakness in a particular area of visual perception.

Other tests used for comparison in the study were chosen to correspond to the various subtests of the MFVPT. The Matching Familiar Figures Test (Kagan, 1964) for visual discrimination; the Visual Aural Digit Span (E. Koppitz, 1977), for visual memory; and the Children's Embedded Figures Test (H. Witkin, et. al., 1971) for figure ground. The Test of Visual Perceptual Skills (M. Gardner, 1982), was included as another non-motor test of visual perception. The Visual-Motor Integration Test (K. Beery, 1967) was included as a recognized and accepted test of visual perception.

The purpose of this study was to assess the reliability of the MFVPT to identify learning disabled children, specifically with difficulty in visual perception.

METHODS

Subjects

Seventeen children between the ages of 6-4 and 7-2 from an intermediate grade between kindergarten and first grade, were used in the study because they had already been identified as learning disabled. Whether or not the learning disability was a result of visual perception was unknown by the testers.

Procedure

In an attempt to relieve possible anxiety from a testing situation, each child was first told he/she was simply going to play some games. They were then asked to write their numbers from one to ten (necessary for the Visual Aural Digit Span) and perform the Children's Embedded Figures Test warm-up exercise. A random test order was given to each child to eliminate the possibility of fatigue as a factor affecting the results. Three of the six tests were given after which the child took approximately a fifteen minute break and then returned to finish the last three tests. Testing was performed in a small quiet room to eliminate distractions.

RESULTS

Sixteen of the seventeen children passed the MFVPT within one standard deviation of the mean. Passing relationships between tests were found and are shown in Table 1. Each value represents the number of children that passed each of the two tests in the respective row and column of the table. It is intersting to note that only 8 children passed both the MFVPT and the Motor-Free Visual Perception Test (MFFT).

The subjects' test scores were also analyzed to assess the construct validity of the MFVPT through a bivariate correlational analysis. Raw scores for each test or subtest were computed and used in the analysis. Standard scores were not used due to the fact that not every test offered a standardization of scores. As shown in Table 2, correlation coefficients were computed for the MFVPT and each of the other standardized tests used in the study. A correlation coefficient of 0.70 or greater was used as the criterion for determing significance. Only the Test of Visual Perceptual Skills (TVPS) was found to meet this criterion. All other tests fell well below this and showed no significant statistical correlation with the MFVPT. It is interesting to note that the MFFT showed a negative correlation with the MFVPT. This can be explained by the fact that the MFFT raw score used represents total errors, whereas the MFVPT represents the total correct responses.

Although individual subtests of the MFVPT are not scored separately, this was done to provide a correlational analysis of these subtests with the corresponding tests as listed above. Results showed no significant correlation between subsections of the MFVPT and the other tests (Tables 3 and 4).

Furthermore, a composite score combining scores of the MFFT (total errors), the Visual Aural Digit Span (total raw score), the Children's Embedded Figures Test (total raw score), and the Visual Motor Integration test (total raw score) was computed and correlated with the MFVPT and the TVPS. A questionably significant correlation of 0.6877 was found for the TVPS and an even weaker correlation, 0.6171, was found for the MFVPT (Table 5).

CONCLUSIONS

Results of the testing showed that all but one child passed the MFVPT within one standard deviation. Excluding the possibility that the MFVPT is an invalid test of visual perception, two explanations may account for this high passing rate. First, testing was performed toward the end of the school year. The children hopefully received some benefit from this intermediate class and may be displaying this in the results of our testing. Second, the childrens' learning disabilities may be related to factors other than visual perception. It was not our intent to address these variables in this study, but to determine construct validity of the MFVPT as compared with other standardized tests.

The only truly significant correlation found was that between the MFVPT and the TVPS. The TVPS is much like the MFVPT with similar subtests, but is much more extensive with 105 items. Interestingly, however, analysis of individual subtests showed a lack of correlation for these two tests. This lack of correlation suggests that the subsections of the MFVPT are not pure tests for each area of visual perception, and the test must be looked at as a whole for total visual perception.

In general a lack of significant correlation was found between the MFVPT and all other tests used. Also, subsections of the MFVPT analyzed separately, showed insignificant correlations.

The comparison of the composite score (MFFT, VMI, VADS, and CEFT) with the MFVPT gave a correlational value of 0.6171 which may be arguably significant. This again suggests, that the MFVPT should be viewed as a test of the total visual perceptual system.

Therefore, the MFVPT appears to be inappropriate for use as a diagnostic tool, not only to identify specific visual perceptual deficits, but also to construct a treatment plan. Ideally, a complete battery of tests is more appropriate for this purpose. However, the MFVPT, may prove useful as a screening device, especially if time or motor involvement of concern.

TABLE 1

PASSING RELATIONSHIPS BETWEEN TESTS

	MFVPT	MFFT	VMI	VADS	TVPS	CEFT
MFVPT	16	8	15	12	13	16
MFFT	8	8	7	7	8	8
VMI	15	7	16	11	12	16
VADS	12	7	11	12	11	12
TVPS	13	8	12	11	13	13
CEFT	16	8	16	12	13	17

Passing Criteria For Each Test

MFVPT - Raw score within one standard deviation of the mean

MFFT - A positive E-score (E = effectiveness of information)

VMI - Standard score within one standard deviation of the mean

VADS - Total raw score within one standard deviation of the mean

TVPS - Sum of scaled scores within one standard deviation of the mean

CEFT - Total score within on standard deviation of the mean

TABLE 2

CORRELATIONS OF TESTS WITH MFVPT

TEST	r
Matching Familiar Figures Test	-0.3011
Visual Aural Digit Span	0.1736
Children's Embedded Figures Test	0.4470
Test of Visual Perceptual Skills	0.7786
Visual Motor Integration	0.5267

TABLE 3

CORRELATIONS OF SUBTESTS FOR TVPS
WITH CORRESPONDING SUBSECTIONS OF THE MFVPT

SUBTEST	r
Visual Discrimination	0.4466
Figure Ground	0.4300
Visual Memory	0.0889
Visual Closure	0.4818

TABLE 4

CORRELATIONS OF TESTS WITH CORRESPONDING SUBSECTIONS OF THE MFVPT

TEST	r
Matching Familiar Figures Test	-0.2392
Visual Aural Digit Span	0.2513
Children's Embedded Figures Test	0.4604

TABLE 5

CORRELATIONS OF TESTS WITH COMPOSITE (MFFT, VADS, CEFT, VMI)

TEST	r
Motor-Free Visual Perception Test	0.6171
Test of Visual Perceptual Skills	0.6877

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