

SENIOR PROJECT

Advisor: Dr. Shansky
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Frances J. Saboo

I have had an exceptional educational experience as a student at Ferris College of Optometry. I have had the opportunity to work in a number of different specialty areas within the profession. My opportunity to work as an instructor, for one school year, with two high school students who were interested in learning about optometry has not only provided me with the experience of teaching but has also led to the completion of a research project entitled Validity of the Test of Visual-Perceptual Skills.

Initially, this project began as an investigation of the profession of Optometry. My students wanted to learn what tasks were involved in becoming an optometrist. They were exposed to experts in the field, we held discussions on chosen topics and they learned how to use instrumentation which assesses ocular health. Eventually, their interests turned to a research project. We enlisted the instruction of Dr. Cron and Dr. Wrubel and launched a study to assess the validity of a battery of developmental tests which had recently become the focus of much clinical use. This project required a great deal of planning and my students were involved in the development of this project every step of the way. Their experiences include meeting with the school superintendent and school principle to explain our intentions, they were also involved in composing an abstract of the project that was sent to the Human Subjects Committee at Ferris State University. Weekly meetings were held prior to data collection at which time research issues were discussed. Data collection involved going to a local elementary school two to three times a week, at which time a 40 minute session of pencil and paper tasks was conducted with each subject. This was a rich experience because not only did it expose my students to the obvious steps needed to get a research project started, but it also revealed the tedious aspects of research, for example scheduling conflicts and time constraints. We were fortunate in that our study produced significant results. Our results were presented at both The College of Optometrists in Vision Development (October 1995) and at the American Academy of Optometry (December 1995). The following paragraphs will describe the information provided at these poster board presentations.

ABSTRACT:

The Test of Visual-Perceptual Skills (TVPS) is an instrument designed to determine a child's visual-perceptual strengths and weaknesses based on non-motor visual-perceptual testing. Even though this instrument is widely used, aspects of its validity have yet to be determined. Thirty-nine regular elementary school children were administered the TVPS and a battery of additional standardized test of visual information processing and perceptual skills. The Visual Discrimination subtest was the only subtest of the TVPS to correlate significantly with age and the standard discrimination test. This study raises questions about the validity of the TVPS. For the present, caution is urged if diagnostic decisions are resting significantly on evidence from TVPS testing alone.

INTRODUCTION:

The Test of Visual-Perceptual Skills (TVPS) is a battery of developmental subtests which has recently become the focus of much clinical use. The TVPS is to be used as a tool to assist professionals in learning how a child visually perceives various forms and the way these forms are interpreted.

From a review of the literature, the subtests were established by identifying seven factors important to the comprehensive assessment of visual perception. Table 1 contains a listing of the seven subtests.

The TVPS utilizes non-motor testing to determine the visual-perceptual strengths and weaknesses of children ages 4 years through 12 years 11 months. Remediation, based on the results of this testing, is to be provided by specialists within specific areas of expertise.

The author states that criterion-related validity of the battery was determined by correlating the TVPS with two visual-motor tests (Developmental Test of Visual-Motor Integration and Bender Gestalt) and the Picture Completion subtest of the WPPSI and WISC-R. The correlations were low to moderate, in part because the TVPS is based on non-motoric testing and would logically not be expected to be correlated highly with a motor task.

While on the face the subtests of the TVPS appear to have content validity based on the content and format, evidence of construct and criterion-related validity has yet to be presented.

TABLE 1

TVPS Subtests

Visual Discrimination - identify which of five forms exactly match a sample form.

Visual Memory - identify which of five forms are identical to a form exposed for a short amount of time and then removed.

Visual-Spatial Relationships - identify which one of five forms is facing a different way or part of one of the forms is facing a different way.

Visual Form Constancy - identify a form that is embedded in one of five forms. The sample form may be smaller, larger, darker, turned or upside down.

Visual Sequential Memory - A sequence of forms of varying length is exposed for a specified amount of time. The task is to identify the sequence from among four different sequences.

Visual Figure-Ground - Identify which of four foils contains the

stimulus form at the top of the page.

Visual Closure - Identify which of four incomplete forms at the bottom of the page would be identical to the stimulus form at the top of the page if it were completed.

METHOD:

The Test of Visual-Perceptual Skills (TVPS) assesses strengths and weaknesses of a child's visual perception by using non-motor visual-perceptual testing.

Thirty-nine regular elementary school children (ages 100 to 133 months; mean 116 months; 18 males, 21 females) were administered the TVPS and a battery of additional standardized tests of information processing and perceptual skills. These tests are outlined in Table 2.

The order of testing, either TVPS or additional tests, and the sequencing of the additional tests were randomized to control for the potential confounding effects of learning or fatigue.

TABLE 2

Matching Familiar Figures Test (MFFT)

Woodcock-Johnson Psychoeducational Battery-Revised (W-J)

Visual Closure - Measures the ability to identify a drawing or picture that is altered in one of several ways. The picture may be distorted, have missing lines or areas, or have a superimposed pattern. This test measures visual processing.

Spatial Relations - This test measures the ability to match shapes visually. The subject must select, from a series of shapes, the component parts needed to make a given whole shape. This test is a mixed measure of fluid intelligence and visual processing

Kaufman Assessment Battery for Children (K-ABC)

Gestalt Closure - The examiner exposes a partially complete "inkblot" drawing and the child names the object pictured.

Detroit Test of Learning Aptitude - 2

Letter Sequences

RESULTS:

Only one of the seven subtests of the TVPS, Visual Discrimination, correlated significantly with age ($r = .344$, $p = .03$). In comparing TVPS subtests with other standardized tests, Visual

Discrimination correlated significantly with errors on the MFFT ($r = -.43$, $p = .006$). Neither the Visual Memory or the Visual Sequential Memory correlated significantly with the Letter Sequences test, and the Visual Closure subtest did not correlate significantly with either the W-J or the K-ABC closure tests. The Visual-Spatial Relationships subtest did correlate significantly with the W-J Spatial Relations test ($r = .482$, $p = .002$), but the W-J Spatial Relations test also correlated significantly with all the other subtests as well except for Sequential Memory.

CONCLUSIONS:

While on the face the subtests of the TVPS appear to have content validity based on the content and format, other aspects of validity are called into question by the results of these subjects. This study raises questions about the concurrent validity aspect of criterion-related validity because of the lack of agreement between TVPS scores and other valued tests of similar characteristics. Construct validity is also suspect because of the lack of a clear developmental trend in performance. For the present, caution is urged if diagnostic decisions are resting significantly on evidence from TVPS testing alone. Further investigation is needed to determine if the TVPS is not truly measuring the stated aspects of visual information processing, or is measuring some visual skill distinct from those assessed by the accepted standardized tests.