Below are two articles published on the subject of colorblindness. The first article was in the *Journal of the American Academy of Optometry*. It evaluates and validates a new pediatric color vision test. The other article was in the *Journal of the American Optometric Association* and tells how the new color vision test can be used to test for color deficiencies in the population of mentally handicapped patients.

**Evaluation of a New Color Vision Test:**

"Color Vision Testing Made Easy"

*Summary of Journal American Academy of Optometry vol. 76, no. 9, Sept. 1999 article.*

**PURPOSE:** Pseudoisochromatic plate tests such as the Ishihara and Dvorine, while very effective in screening for red green color deficiencies in adults, have limited effectiveness for young children. At present, there is no color vision test that is appropriate for children 3-6 years old that has good validity, is inexpensive, allows rapid assessment, and is commercially available. A new pseudoisochromatic color plate test specifically designed for young children, "Color Vision Testing Made Easy" (CVTME) has recently been introduced. Because of our interest in finding a suitable test that can be used to screen young children for color deficiencies, we evaluated this test's validity.

**METHODS:** Forty one subjects were predetermined to be color normal (n=20) or have hereditary color deficiency (n=21). A battery of color vision tests including the Ishihara, Panel D-15, and the anomaloscope were used for the diagnosis and classification of color deficiency. Each subject was then tested using the new pediatric color vision test, CVTME.

**RESULTS:** All 20 color normal subjects passed and 19 of 21 color deficient subjects failed CVTME. None of the deuteranopic, protanopic, and protanomalous subjects correctly identified any of the CVTME test plates. Five of seven deuteranomalous subjects failed CVTME. The two subjects who passed CVTME also passed the Ishihara and the Panel D-15. The two subjects had the mildest color deficiency (simple deuteranomaly) as evidenced by anomaloscopic testing.

**DISCUSSION:** The simple design of both parts of CVTME is excellent for young children. Most children by the age of 3 years can verbally identify and name a circle, square, and star. For children who can not or will not respond verbally, one can use the black and white replicas or colored demonstration plate to make the task one of matching.

**CONCLUSION:** Results of this validation study indicate that CVTME has a high degree of efficacy as a color vision test. CVTME was 100% compatible with the Ishihara with the same specificity and sensitivity. There were no false positives. The response patterns of normal and color deficient children were very clear-cut so that a diagnosis was easy and made with a high degree of confidence.

Additionaly, the selection of Part II (dog, boat, balloon) together with the demonstration replicas, allows most children 3 years of age or older to be easily tested. Verbal identification, drawing over the figure, or selecting the matching demonstration replica can be used. The three plates of Part II allows for rapid assessment which is critical considering a young child's limited attention span. In addition, it should facilitate color vision screening on a large scale.

**Note:** A copy of the complete study can be obtained by contacting Professor Susan Cotter, Southern California College of Optometry, 2575 Yorba Linda Blvd., Fullerton, CA 92631 USA (The authors have no financial interest in this product) or by referencing "Evaluation of a New Color Vision Test: Color Vision Testing Made Easy" in the Journal of the American Academy of Optometry, vol. 76, no. 9, Sept. 1999.
"Testability of a Color Vision Screening Test in a Population with Mental Retardation"  

By Graham B. Erickson, O.D., F.A.A.O., F.C.O.V.D. and Sandra S. Block, O.D., F.A.A.O.

**PURPOSE:** The purpose of this study was to determine if the new validated color vision test "Color Vision Testing Made Easy" would be an effective means to screen for color vision deficiencies in a population of individuals with mental retardation.

**METHODS:** "Color Vision Testing Made Easy" was administered as part of the vision screening sponsored by the American Optometric Association Sports Vision Section and Special Olympics International. The test was presented to Special Olympic Athletes, who are individuals with mental retardation or significant developmental delay, at four international sites: the world Winter Games in Toronto, Canada; the Regional European Swim Competition in Seville, Spain; and the Summer Games in Houston, Texas and Boston, Massachusetts, USA.

Nine test plates were presented sequentially, and at least 3 seconds were allowed per plate for the athlete to "find the circle". To pass the screening, the athlete had to correctly locate the circle on eight of the nine plates on the first trial. If fewer than eight correct responses were given, a second trial was conducted. To pass on the second attempt, the athlete was required to localize the circle on all nine test plates.

**RESULTS:** The overall rate of testability was 93.2% for the 1078 athletes screened. The frequency of individuals identified as color deficient (7.5% of the males and 0.6% of the females) was similar to that expected in the general population.

**DISCUSSION:** Until recently, commercially available color vision tests were not highly effective for screening young children, and therefore also presented problems for the mentally handicapped. The problem reported when using standard tests like the D-15, AO HRR, Ishihara Test, Dvorine Plates, and Anomaloscope to test mentally handicapped patients was a high level of false-positives (to many patients incorrectly identified as color deficient).

The primary difficulty for each of these color vision tests with mentally handicapped patients was trouble understanding the task required (e.g., understanding how to arrange the colored caps in the D-15 test).

The athletes tested using "Color Vision Testing Made Easy" during the world games in Canada represented many countries in which the primary language was not English. More than 95% of the athletes, however, were able to sufficiently understand the task required to complete the test. The testability was the same at the Regional European Swim Competition in Spain (95.7%), and even higher in the USA at the Houston, Texas games (98.7%).

**CONCLUSION:** The color vision test "Color Vision Testing Made Easy" was successfully completed by a very high percentage of Special Olympic Athletes. The results showed that the test was useful in screening this population for color vision deficiencies, and that the prevalence of color vision deficiencies was similar to the prevalence found in the general population.

**Note:** A copy of the complete study or literary references can be obtained by contacting Dr. Graham Erickson, Pacific University College of Optometry, 2843 College Way, Forest Grove, OR 97116 or reading the Journal of the American Optometric Association Article "Testability of a Color Vision Screening Test in a Population with Mental Retardation" Volume 70, Number 12, December 1999. The authors have no financial interest in this product.

Dr. Terrace Waggoner, the designer of the new test, e-mail address waggonert@aol.com