NEW APPLIANCES

Sheridan–Gardiner Test for Visual Acuity

Dr. MARY D. SHERIDAN, Honorary Consultant, Royal National Throat, Nose and Ear Hospital, London W.C.1, and Dr. PETER A. GARDINER, Ophthalmologist, Guy's Hospital, London S.E.1, write: Ophthalmologists, paediatricians, and child psychologists, particularly those working in the School Health Services, have found increasing need for vision-screening tests which are readily applicable to schoolchildren of 5 to 7 years and to handicapped children of every age and category. There are three main reasons for this. Firstly, it is generally accepted that the earlier the diagnosis of a visual disorder is established and treatment begun the more favourable is the outlook for improvement in function. Secondly, there is a higher than normal incidence of eye defects in children who have other handicaps, such as congenital malformations, particularly of the central nervous system and the heart (Gardiner and Joseph, 1968), cerebral palsy, epilepsy, mental handicaps (Gardiner, 1967), auditory impairment, and language disability. Thirdly, reduced visual acuity, visual field defects, and abnormal eye movements aggravate and may possibly be causal factors in some of the learning difficulties of young schoolchildren associated with delayed development of visual perception.

Although useful objective diagnostic procedures are now available for the assessment of structural and functional eye disorders (Wybar and Harcourt, 1968), these cannot provide adequate information concerning the use any individual child makes of the optical equipment he possesses; in other words they do not measure his subjective or "everyday" visual competence.

Many years ago, having personally tested several hundred normal and handicapped schoolchildren aged 5 to 7 years by using the illiterate E, Landolt's broken rings, the Sjögren "hand," and various picture charts, only to discover their serious shortcomings for large-scale screening of young children, one of us (M.D.S.) found it necessary to design new vision charts. These charts contained letters which had proved most suitable for naming or copying by young schoolchildren. The series of vision tests which later developed from these beginnings was given the name Stycar (screening tests young children and retardates).

STYCAR LETTER TESTS

The Stycar charts are composed of nine standard Snellen letters without serifs—that is, H L C T O X A V U—selected according to the well-established psychological finding that a child is normally able to copy a vertical line at 2 years, a horizontal line at 2½ years, a circle at 3 years, a cross at 4 years, a square at 5 years, and a triangle at 5½ years. On the wall charts the letters are spaced well apart, with not more than three to any line. The letters measure from 6/60 to 6/6 and the charts are intended for testing at 20 ft. (6m.). They have been in use for over 35 years and provide convenient and reliable material for vision screening of normal children of 5 to 7 years and for handicapped children of similar mental level. By using these letter charts it was readily demonstrable that the normal distant vision of 5-year-old school entrants is right 6/6, left 6/6 (Pugmire and Sheridan, 1957).

Later, in testing normal children *under* 5 years and handicapped children of all ages, three important findings emerged: (1) most of them found it difficult to maintain rapport for the necessary duration of time with an examiner using the chart at the full 20 ft. (6m.); (2) they responded more satisfactorily when tested with a series of cards 5 by 5 in. (13 by 13cm.), each containing a single letter, rather than with the whole chart; and (3) though most children under 5 years and many older handicapped children were unable to *name* or *copy* the letters, they could *match* them at much younger ages.

One obvious solution to the first problem was to test in a mirror at 10 ft. (3m.). This entailed discarding the two irreversible letters C and L of the original chart and presenting only the remaining seven symmetrical letters. In practice this procedure worked satisfactorily, but in many nurseries and schools a mirror of suitable size and position was not always available. To circumvent this difficulty it was decided to present the single-letter cards at 10 ft. (3m.), adding four specially engraved letters corresponding to 6/4.5 (two) and 6/3 (two) to give the equivalents of 6/9 and of 6/6 at 10 ft. (3m.). Normal children of 4 years and many of 3 years are quite capable of matching all seven letters down to 3/3—that is, equivalent to 6/6 (Sheridan, 1960). Useful procedures for testing the "everyday" vision of younger children employing fewer letters, miniature toys, and a set of 10 graded balls has been described elsewhere (Sheridan, 1969 a, 1969 b).

SHERIDAN–GARDINER TEST

This was a later development of the original Stycar material. To further the research into the problem of visual defects in mentally and physically handicapped children, in addition to the more routine work with young schoolchildren, one of us (P.A.G.) realized the need for an inexpensive portable vision-screening test readily applicable under school conditions and suitable for the assessment of distant and near vision. Many of the children with whom he was concerned could not be tested with the ordinary letter charts or with the prose near-vision tests available. The new block of single-letter cards and seven-letter key card for distant-vision testing, which we eventually designed in consultation, is merely a convenient rearrangement of the Stycar symmetrical letters. They measure from 6/60 to 6/6 and are intended for use at 20 ft. (6m.) or at 10 ft. (3m.) in a mirror.

The near-vision test was designed by P.A.G. to provide a finely graded single-letter screening test which could produce reliable results, particularly in the detection of astigmatism and hypermetropia. It comprised both standard "reduced" Snellen and "reduced" roman type from 6/60 down to 6/6 and N 18 to N 5 respectively. In practice it has more than fulfilled its promise.

PROCEDURE

The child is comfortably seated at a low table at a measured distance of 20 ft. (6m.) (or 10 ft. (3m.) if a mirror is used) with his seven-letter key card in front of him. Preferably his mother or other familiar adult sits beside him. This physical nearness not only gives him comfort and confidence but also at 20 ft. assists the examiner, since she can indicate by an unobtrusive nod or shake of the head whether or not the child is matching correctly. If he must work alone, the examiner soon learns to interpret the child's response from the position of his index finger on the key card. With suitably placed illumination behind the child it is often possible to see the silhouetted letter and finger through the matching card.

The examiner first establishes friendly relations and makes sure that the child understands the procedure by presenting him close by with a few letter cards and requesting him, according to his capacity, to name the letter shown, to draw it in the air with his index finger, or to match it by pointing to the same letter on his key card. Children whose upper limbs are paralysed or missing are encouraged to use any method available to them, such as eye-pointing or touching large wooden letters with their noses or toes. The examiner then stations himself at 20 ft. (6m.), or beside the child if the letters are presented in a mirror. The letters should be shown at eye level

and in a good light and the child must be given adequate time to respond.

Since the primary need is to discover the child's everyday visual capacity at home, in the street, and in the classroom, the examiner may consider it advisable to begin by testing for distance with both eyes uncovered, lest the child will not accept monocular occlusion. If possible, however, each eye should be tested separately for distant and for near vision, with completely effective occlusion of the other eye, at the first interview.

Every child's manner of response is different and clinically most revealing so that the medical examiner would be wise to carry out the test personally or closely observe its application by an experienced assistant.

LATER EXTENSION OF TESTING MATERIALS

The portable pack was originally designed for screening of children only, but its potentialities in the testing of foreign or illiterate adults soon became apparent to workers in hospital ophthalmological outpatient departments. Finding that the number of letters provided, particularly those of the larger sizes, were too few for their particular purpose and that the cards were too flimsy to withstand the hard usage to which they were subjected, orthoptists began to request a bigger selection of letters, spongeable plasticized cards, and stronger hinges.

Consequently, two blocks of single-letter cards were prepared, comprising respectively three letters of each size from 6/60 to 6/18 inclusive and three letters of each size from 6/18 to 6/6 inclusive (the overlapping at 6/18 was deliberate). A near-vision block of cards containing to the page at least six letters of each size from 6/60 to 6/6 (reduced Snellen) and N 18 to N 5 (reduced roman) were also provided. In response to further demand an entirely new block of 6/6 to 6/3 letters for testing at 10 ft. (3m.) was added to the series—that is, three letters each of sizes 6/6, 6/5, 6/4, and 6/3. Eventually, a panel chart (6/60 to 6/6) for illumination in standard boxes was also prepared as was, in response to special request, a similar blank panel on which separate letters printed on Perspex squares can be hooked. Recently, a request from continental sources for permission to prepare lantern slides for projection has been received. M.D.S. has also found a cube with interior flashlamp illumination useful in nurseries and infant schools where ordinary lighting is inadequate

COMMENT

We are aware of the limitations as well as the advantages of this testing material. The letters used have been specially selected for easy visual recognition. But the inequality of difficulty in letter recognition is an inescapable problem for the designers of all letter charts. This subject has been admirably discussed by Bennett (1965). We have insufficient personal experience in applying the material to large numbers of normal and visually impaired *adults* to refute the frequent criticism that tests employing single letters or widely spaced letters are not always effective for the detection of the less severe forms of unilateral amblyopia. To some extent this is overcome by the use of the panel chart, but at the expense of portability. We can, however, say that this particular objection is invalid with regard to normal *children* under 7 years and handicapped children of comparable mental age; since, in M.D.S.'s experience, at this developmental stage they are characteristically impelled to concentrate on visual fixation of each letter on the chart as a separate entity, just as they are impelled when first learning to read previously unseen prose material to concentrate (with eyes, voice, and index finger) on single words in a sentence. The obvious solution to any doubt in this connexion, however, is for the examiner to record clearly the name of the test, the distance, and the results obtained, including, if necessary, a brief comment on the manner of performance. When used in this way the test has proved itself practical, informative, and repeatable.

Most young children greatly enjoy themselves during the test. Because it bears a positive relation to standard methods of testing visual acuity, transition to these methods is eased for handicapped children as their understanding and levels of scholastic performance improve. It also provides an acceptable link with conventional testing procedures for shy, inarticulate, or embarrassed normal children.

The Sheridan–Gardiner test materials are obtainable from Messrs. C. Davis Keeler, 21 Marylebone Lane, London W.1.

The Stycar vision tests are obtainable from the National Foundation for Educational Research, The Mere, Upton Park, Slough, Bucks.

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Simple Instrument for Testing the Sense of Taste

Dr. M. A. H. ROBERTSON, senior registrar in neurology, Dundee Royal Infirmary, writes: When a piece of copper and a piece of zinc, held together at one end, have their free ends applied to the tongue a bitter sour taste is experienced. This well-known phenomenon is an elementary demonstration of the voltaic cell.

A leaf of copper and one of zinc, each 3 in. long by ½ in. wide by 4/1000 in. thick (7·6 cm. long by 1·3 cm. wide by 0·1 mm. thick), placed in flat opposition to one another and soldered at one end, form a broad malleable forceps whose proportions are convenient for sandwiching the right or left edge of the protruded tongue. Preliminary studies have shown that an equally effective stimulus can be delivered simply by holding the two leaves of metal together and pressing their common edge against the tongue. Allowing the patient to hold the instrument and test himself allays apprehension and improves perception.

The instrument has the following electrical properties: theoretical current 0·625 mA; measured maximum current 0·45 mA, falling to 0·22 mA after one or two seconds due to polarization; normal current 0·4 mA falling to 0·2 mA. The peak current can be re-established by wiping the plates or moving the plates on the tongue. The maximum voltage appears to be 0·55.

Monrad-Krohn (1964), in describing the technique for testing galvanically the sense of taste, recommended a current of 0·2-0·4 mA. Peiris and Miles (1965), using the electrogustometric method of Krarup (1958) in their study of Bell's palsy, observed that in 90% of their cases the threshold of appreciation on the normal side of the tongue was 0·03 mA or less.

This simple instrument, with its advantages of compactness, intrinsic power supply, and ease of use, recommends itself as a clinical tool.

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