

DELACATO  
STEREO-READER  
SERVICE

**INSTRUCTION MANUAL**

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## **THE DELACATO STEREO-READER SERVICE**

(Designed to be used for both developmental-and remedial-reading activities by Carl H. Delacato, Ed.D. Director, The Chestnut Hill Reading Clinic, Chestnut Hill Philadelphia, PA Assistant Headmaster, Chestnut Hill Academy, Philadelphia, PA Director, Psychological Services, The Rehabilitation Center at Philadelphia, PA)

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## General Statement

Historically, vision and vision in reading have both been subjected to great investigative variations. At the outset the eyes were studied physiologically and peripherally. The investigations centered on the eye and somewhat later, on the optic nerve. Brilliant strides were made in gathering knowledge of the eye. Another area of investigation was the field of optics. The discovery and the utilization of the laws of refraction, plus new insights into the nature of light, added new dimensions of treating eyes.

These two schools of investigation and treatment then moved into the more complex area of binocularity and fusion. Now a new and more elusive variable came into play: the brain. No longer could workers in the field be interested in eyes alone; they now had to take into consideration the entire nervous system. Functional neurology was in its infancy, thus further complicating the problem. Out of this arose the fact that the workers in the field had to change from dealing with the eyes to dealing with vision.

All of the old knowledge fell into a new perspective because, suddenly, eyes were no longer the subjects of investigation; but vision as a part of the whole organism became the subject. There now entered the picture an even more complex variable. Since vision, as a part of the whole organism was a dynamic and constantly changing human function, human development became the new area of investigation. This ontogenetic investigation was fruitful and its findings were buttressed by the phylogenetic data, which were available. We had now progressed from the detailed study of the eye to a wholistic and developmental approach to vision.

Eyes could no longer be evaluated or treated as separate entities. Evaluation and treatment had to be developmentally oriented and had to be related to the complete organism. Eyes do not function independently. They cannot be evaluated independently, nor can they be treated independently. Eyes had now become vision. Vision must be evaluated and treated as a part of the total neurological organization of the individual.

Concurrent with this activity and following Orton, educators and some neurologists began to investigate vision as it related to reading. It was their premise that, although we knew that physiology of the eye, although we knew how to correct refractive errors, and although we knew some of the neural components of fusion, we did not know the function of vision in the reading process. This investigation studied the relationship between the two eyes in the reading process: the cortical representation of these unknown intra-visual relationships.

By this time, "dominance" had been put into the literature meaning cortical hemispheric dominance, and the relationship between the two eyes were investigated in terms of a dominate- subdominant relationship.

The first great error of this investigative activity resulted in having the sighting eye termed the dominant eye. This was accepted for a short time, but further investigation, primarily by educators, proved this premise erroneous. The concept of dominance and the dominate eye as it related to reading fell into disrepute because sighting was used synonymously with dominance. The error was the result of dealing with the eye instead of the hemisphere that it represented. Although there seemed to be some obvious relationship between visual patterns and language patterns, there was no way in which to validate or use the relationship.

Some investigators faced with this difficulty of validating the eye-brain relationship and the intra-visual relationships moved toward the periphery and studied the eye-hand relationship. Although this investigation made very significant contributions to the field, it represented lower neural levels, both ontogenetically and phylogenetically. Eye-hand co ordinations are initiated at a sub cortical level and are essentially developed at the midbrain stage of mobility, which takes place at about nine months of age in the normal child. Eye-hand relationships are prerequisite to language development, but the important factor is which eye and which hand and what neural level and hemisphere do they represent.

What was needed was a central neuro-visual approach based on the premise that we do not evaluate or train eyes, but that we evaluate and train neuro-visual patterns and that these patterns are developmental in nature; hence, treatment must be based upon a developmental rationale.

The Berners' investigation took a new tack. It operated on the premise that perhaps there might be a better way to study the relationship of the two eyes to each other, which was more reliable than was sighting. This lack of reliability had led educators to frown on the concept of the dominant eye. The Berner rationale attempted to study the relationship of the eyes to each other in a functional visual situation. This also implied that inference could be drawn for the cortical factors involved. The Berners

evaluated the vision of each eye while both eyes are seeing. They tested monocular function in a binocular visual situation and found a relationship between the two eyes and were able to use this relationship to diagnose, predict, and treat language problems. Because they were dealing with the eye that controlled the binocular visual situation, they called it the controlling eye.

One objective of all of this investigation was to find the implications for reading resulting from the new knowledge of the relationship of vision to reading and the relationship of vision to neural activity. It can be assumed that eyes do not work independently and that the brain must control them. Therefore, it must follow that knowledge relative to the eyes as they form the concept of vision must give us knowledge relative to the brain. If we add to this knowledge that which we know, working ontogenetically from the neural development to visual development, we can set up a visual schema that, in reality, gives us the data on which we can decide what is the dominant hemisphere visually and what we shall call in this manual the "predominant eye." This schema would give us the following criteria for ascertaining the predominant eye.

### **Predominant Eye**

- |             |  |
|-------------|--|
| Sighting--  | 1. Far-point sighting (binocular)<br>2. Far-point sighting (monocular)<br>3. Near-point sighting (binocular)<br>4. Near-point sighting (monocular) |
| Control--   | 5. "Controlling Eye"-far-point (Telebinocular)(r)<br>6. "Controlling Eye" - far-point (Telebinocular)(r)   |
| Function -- | 7. Eye that reads better (function)<br>8. Eye used for writing (function)  |

The predominant eye is evaluated in terms of, and is composed of, sighting, control, and function.

The predominant eye is merely the visual reflection of the dominant cortical hemisphere.

When evaluating or training a predominate eye, we are in reality evaluating and training neural patterns via vision. We do not evaluate and change the eye. We evaluate and change the neurological organization of the subject.

The great importance of the establishment of the predominant eye on the side of neurological dominance has been authenticated through much research. 1 The lack of complete unilaterality (one-sidedness) inhibits language and reading development. The establishment of complete one-sidedness of the hand, foot, and eye is prerequisite to complete mastery of language and reading function. This is true for children who have reading disabilities and also for those who fall within the normal range as readers.

It has been found that in a binocular visual situation, such as reading, one eye controls the visual pattern. It is the lead eye, or predominate eye. It has also been found, that the predominate eye should be on the side of handedness and footedness. Good readers tend to be all one-sided in terms of handedness, footedness, and the predominate eye. Poor readers tend to have some mixture of sidedness in either the hand, foot, or eye. The phenomenon of sidedness (unilaterality) is the result of neurological organization and exists in varying degrees. Hence, a total lack of unilaterality results in a severe language and reading disability. A mild lack of complete unilaterality results in mildly inhibiting the reading development of an average reader. For both these extremes and for those who fall between these extremes, the establishment of unilateral hand, eye, and foot is prerequisite to achieving the highest potential in language and reading development.<sup>2</sup>

We have been able to neurologically organize children so that they become unilateral in handedness and footedness; but we have been in great need of a technique to establish a predominate eye in poor readers and to reinforce it in normal readers. We have attempted to establish a predominate eye through occluding the eye that we wanted to make subdominant. The basic weakness of this procedure is that we are establishing a predominate eye at the expense of the subdominant eye. The occluded eye tends to decrease in reading performance and, indeed, if occlusion is carried on extensively, the vision of the occluding eye is adversely affected. As a result of these inherent dangers, only severe reading problems have been treated in terms of proper binocular visual control.

#### **The various techniques used are:**

1. Direct occlusion of the eye.
2. Optical occlusion of the eye.
3. Color-filtration occlusion of the visual image.
4. Polaroid(r) filtration of the visual image.

**1.** Direct occlusion of the eye through applying a contact path has several disadvantages. Under direct occlusion the eye receive no light and is unfunctional. Through lack of uses its reading ability tends to decrease and its visual function may decrease. Direct occlusion reduces visual perception and reduces reading to a monocular level. It is a somewhat traumatic experience to the child and because of its physiological implications cannot be used by other than qualified professional personnel.

**2.** Optical occlusion is usually achieved through the use of a mottled lens or thorough making opaque (covering) one lens on a nonprescription pair of glasses. Here, again, only qualified professional personnel can utilize the technique and, although the occluded eye is receiving light, it is not seeing functionally.

Another basic perceptual weakness in both techniques is that the actual point of occlusion takes place right at the eye, while the non-occluded eye operates at varying points of accommodation. This tends to weaken the reading function of the occluded eye and tends to make reading monocular, which is not the normal reading situation.

**3 & 4.** The color filtration (using a red lens on one eye and covering the reading material with green plastic or cellophane) causes the pictures seen by the covered eye to be black and, as a result, filters out the writing for that eye while the other eye sees the writing; and Polaroid(r) filtration (which works on the same principal) overcomes the last-mentioned disadvantage in that the actual point of occlusion is at the filter which covers the reading material and not at the eye. The reading material is filtered out for the subdominant eye at the same point of accommodation at which the predominant eye is reading. Although these procedures remove one obstacle, that of point of occlusion, they retain the basic weakness of providing an unnatural monocular reading situation; hence they, also, are training monocularly for a binocular task.

In addition they provide a very confused figure-ground relationship, in that two very different backgrounds have to be fused before the image can be perceptually superimposed upon it. Children who have reading problems tend to exhibit poor figure-ground discrimination, and, as a result, they have poor visual discrimination and visual memory, both of which are basic to reading success.

Finally, most important of all, is the fact they all represent contrived and unnatural neural organizations and as such do not properly represent or train for completely normal nuero-visual function within the reading process.

**What is needed is an instrument and a procedure that will train a predominate eye:**

1. While both eyes actually see the same background, a structured background that will strengthen weak figure-ground perception.
2. While one eye sees the figure, the other eye perceives it by projection as in chiroscopic drawing.

Credits should be given at this point to Dr. Ullin W. Leavell, Editor of the Leavell Language-Development Service, who blazed this trail in attacking this problem. His method is to have the student trace drawings seen through a stereoscopic instrument only by the predominant eye and, finally, copy words and phrases a great many times.

This hand-eye co-ordination represents a lower neurological level than does the visual-motor movement without the help of the hand. This can be demonstrated ontogenetically with younger children who have suffered brain damage by asking them to follow visually an object or light stimulus. Many who cannot do so can follow the object or light if it is placed in their own hand. This account for much of the pointing at words that we can see in the early reading process, the Leavell Language-Development Service is aimed at establishing this neural level. The Stereo-Reader is aimed at the next higher neural level, which is the establishment of proper visual-motor function without intra-personal cues. This higher level requires visual-motor function based primarily upon perception and visual-neural feedback and is prerequisite to the establishment of a predominate eye.<sup>3</sup>

You will note that the stereoscope eyepiece is flat. This special design maintains as normal a visual situation as possible through the stimulation of peripheral vision as part of the training. Do not allow the student to hold his hands at the side of the stereoscope, for this decreases such stimulation.

## **The Delacato Stereo-Reader Service**

The Stereo-Reader Service carries a student through actual reading experiences similar to those found in the regular school readers. Both eyes see the same visual field (a yellow area, traversed by the gray reading guide as the background), while only one eye actually sees the material to be read. If the eye that is being trained is closed, the reading material disappears, as does the perception of that half of the reading guide; if the other eye is closed, the corresponding half of the reading guide disappears; hence, both eyes must be functioning to make the background visual field complete.

Most important of all is the fact that, although only one eye sees the exercises, both eyes perceive them cortically as in chiroscopic drawing.

To demonstrate this, move the reading guide to the bottom of the easel, and then place a card in the Stereo-Reader so that the figures can be seen with the right eye only. While you are looking at the figures through the Stereo-Reader, point to them with a pencil held in your left hand.

When you look at the card, you will note that you did not point to figures that you could see; but, instead, you pointed to figures much to the left, in the portion of the visual field where you could not possibly have seen the figures.

This binocular phenomenon is probably the result of cortical feedback. Although only the right eye could possibly see the figures, the actual perceptions of those figures were completed only when the left eye perceived them through cortical feedback. The visual image goes through the primary cortical visual areas and then the secondary cortical visual areas. The process of integration at this point results in cortical enervation for the visual area of both eyes, although only one eye received the stimulus. Although the retina of the left eye received no visual stimulus, the secondary cortical area representing the left eye received the stimulus through the stimulation of the right eye only. Hence, although only one eye sees the exercises with the Stereo-Reader, the other eye is being trained perceptually through cortical feedback.

### **The Stereo-Reader has the following advantages:**

1. Classroom teachers and clinicians can prescribe its use.
2. The teacher in the classroom can use it.
3. It establishes the predominant eye without occlusion; hence without sacrificing the efficiency of the non-training eye.
4. It trains binocularly for reading, which is a binocular function.
5. While training one eye in reading skills, the other eye receives training and stimulation in both accommodation and convergence and perceives constantly by projection as in chiroscopic drawing.



6. It has great elasticity in reading materials; hence it can be used at any grade level.
7. Because of this elasticity, the materials used need not be remedial materials; they can be classroom materials. This allows the student using the trainer to be reading the same materials being used by his/her classmate.
8. It is designed to be use as part of a developmental-reading program in addition to its use in a corrective, or remedial, program.
9. Its inexpensiveness and size make its use for an entire class group very feasible and practical.
10. It is helpful in developing speed-reading skills.

For this reasons the Stereo-Reader can be used, not only for remedial-reading, or corrective reading, activity, but also can be used to augment the developmental-reading program at either the elementary school or the secondary-school level. Its use can be very easily incorporated into the typical developmental-reading program and its use can be extended into the home.

### **The Need for the Stereo-Reader**

#### **A. Developmental-Reading Program**

The developmental-reading program is applicable for children who fall into the normal range of reading performance as evidenced by test scores utilizing vocabulary, comprehension, and speed. Proceed as follows, checking the appropriate blank under "RIGHT", "LEFT", "OR MIXED" on the summary sheet (see page 11):

1. Ascertain handedness through observing the student writing, throwing, crayoning, using scissors, brushing teeth, eating, or picking up small objects.

The child in the developmental program should be completely right or left-handed in these activities.

2. Ascertain the child's footedness through observing him/her step forward, step backward, step onto a chair, step onto a step, step off a step, and kicking a ball.

The student in the developmental program should be almost completely right or left-sided. There is some variability in footedness with some children because they reflect having been taught some footedness skills that are at times opposite to their handedness with little or no negative effect.

Both 1 and 2 above should fall on the same side. If 1 and 2 are on the right side, the Stereo-Reader should be used to train the right eye (the eye on the side of both handedness and footedness) and if the hand and foot choice is on the left side, the Stereo-Reader should be used to train the left eye (the eye on the same side as footedness and handedness).

## B. Remedial-Reading Program

For children whose reading is mentally challenged, proceed as follows:

1. Ascertain handedness as in the developmental program above.
2. Ascertain footedness as in the developmental program above.

If there is a tendency for footedness and handedness to be in conflict or if there is a tendency for the child to vary the hand with which he/she does the tasks, a complete program of neurological organization should be instituted to be carried on concurrent to the use of the Stereo-Reader. This program is aimed at establishing complete one-sidedness for hand and foot.

For a description of the program see:

Delacato, Carl H., *The Treatment and Prevention of Reading Problems*, Charles C. Thomas Co., Springfield, Illinois, 1959.

3. Ascertain the predominant eye.

### Sighting

- a. Have the child point at an object at far point with both eyes open. The sight from the object to the finger and back to the eye. The eye that is in a direct line with the object and finger is the binocular sighting eye at far point.
- b. Give the child a telescope-type tube through which he/she can sight something at a distance. The eye that he/she uses is the monocular sighting eye at far point.
- c. Put an X on a piece of paper approximately sixteen inches away from the eyes. Give the child a tube through which he/she can sight the X. Have the child hold the tube right up to his/her eyes without losing sight of the X. The eye to which the tube comes is the near-point sighting eye.

## Control

a. Administer the Keystone Visual-Survey Tests 41/2, 5, and 6 with the Telebinocular. Test 41/2 is necessary as an instruction test.

If the student makes a better score on Test 5 than on Test 6, he/she is right-eyed for far-point visual efficiency.

If the student makes a better score on Test 6 than on Test 5, he/she is left-eyed for far-point visual efficiency.

b. For near point use Tests 12, 13, and 14. Test 12 is for instructional purposes. If he/she makes a better score on Test 13 than on Test 14, he/she is right-eyed for near-point visual efficiency. If he/she makes a better score on Test 14 than on Test 13, he/she is left-eyed in near-point visual efficiency.

If he/she makes the same score with both eyes at either far point or near point, check "MIXED" on the summary sheet.

## Function

a. Administer the Keystone Tests of Binocular Skill (Keystone Telebinocular). With these tests you can ascertain the binocular reading level and the monocular reading level. The reading performance of each eye can be ascertained both in terms of accuracy and speed. Note the side of the better eye on the summary sheet. Check "MIXED" if they are equal.

b. If the Keystone Tests of Binocular Skill are unavailable, administer an informal reading inventory to one eye at a time and ascertain which eye has the higher level of performance. Check that side of the summary sheet. Check "MIXED" if they are equal.

DELACATO TEST SUMMARY SHEET

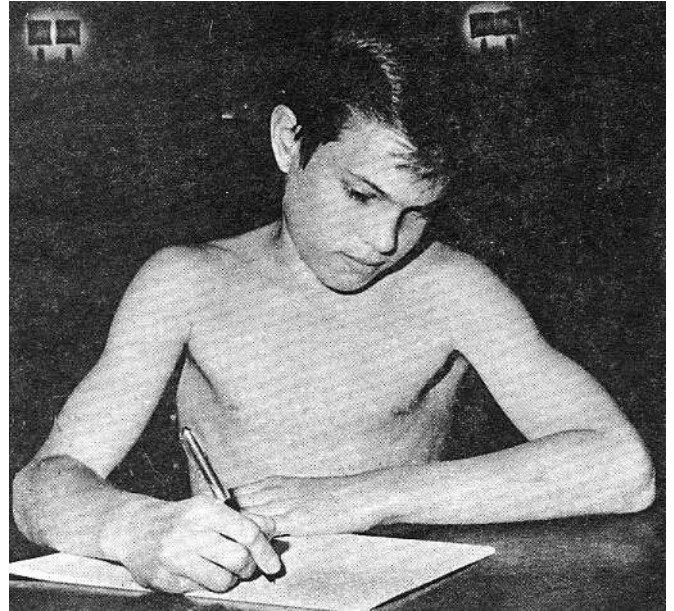
Name: \_\_\_\_\_ Age: \_\_\_\_\_ Date: \_\_\_\_\_

School: \_\_\_\_\_ Grade: \_\_\_\_\_

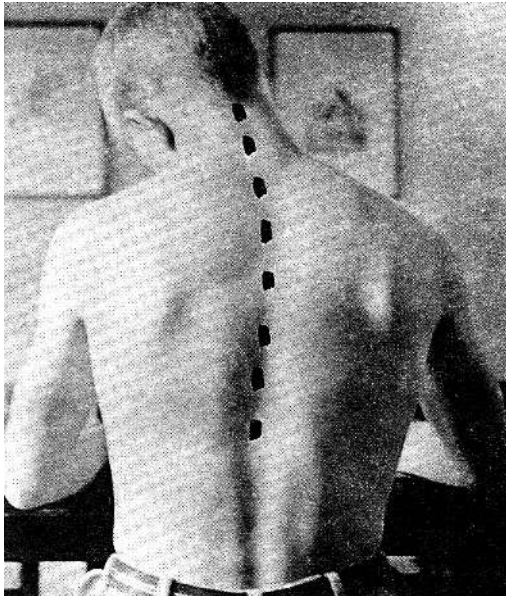
	<u>RIGHT</u>	<u>LEFT</u>	<u>MIXED</u>
<u>Handedness</u>			
Writing or Crayoning	_____	_____	_____
Throwing	_____	_____	_____
Using Scissors	_____	_____	_____
Brushing Teeth	_____	_____	_____
Eating	_____	_____	_____
Picking Up Small Objects	_____	_____	_____
<u>Footedness</u>			
Stepping Forward	_____	_____	_____
Stepping Back	_____	_____	_____
Stepping onto a Chair	_____	_____	_____
Stepping off a Step	_____	_____	_____
Kicking a Ball	_____	_____	_____
<u>Predominant Eye</u>			
<u>Sighting</u>			
Binocular Sighting at Far Point	_____	_____	_____
Monocular Sighting at Far Point	_____	_____	_____
Sighting at Near Point	_____	_____	_____
<u>Control</u>			
Far-Point Visual Efficiency (Telebinocular)	_____	_____	_____
Near-Point Visual Efficiency (Telebinocular)	_____	_____	_____
<u>Function</u>			
Monocular Reading Level (Keystone Tests of Binocular Skill)	_____	_____	_____
Monocular Reading Level (Informal Reading Inventory)	_____	_____	_____
Writing Position	_____	_____	_____

## Writing Position

a. Ask the child to crayon or write. See that the paper used is slanted in the proper position, as pictured below. Observe the child from both front and rear as he/she writes.



The right-sided child will rotate his/her face slightly toward his/her left when observed from the front.

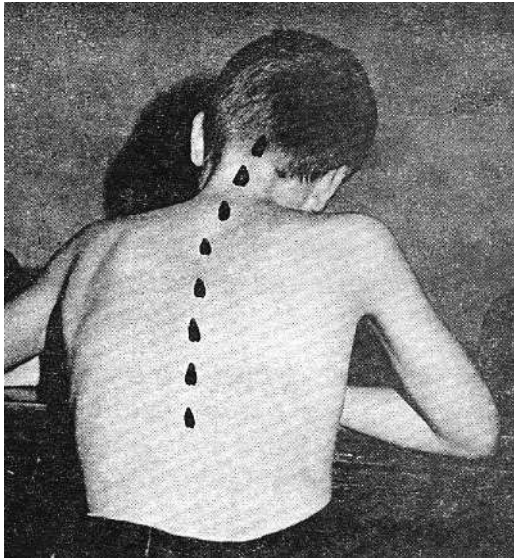
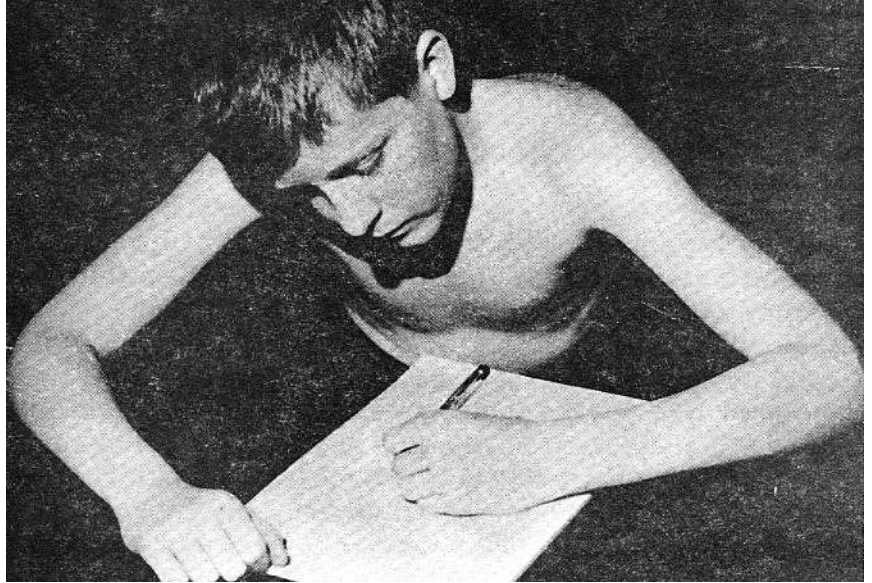


The right-sided child will also tilt the head slightly to the left of the spine when observing from the rear.

If the child assumes these positions and if they are not exaggerated, mark the space under "RIGHT" on the summary sheet.



The left-sided child will rotate his/her face slightly toward his/her right when observed from the front.



The left-sided child will also tilt the head slightly to the right of the spine when observed from the rear.



Check the space under "LEFT" on the summary sheet if the child assumes these positions.

If either position is grossly exaggerated or if the child assumes another position, check the space under "MIXED".

## How to Evaluate the Summary Sheet

If the section under "Handedness" is all right or all left, the Stereo-Reader is used to train the eye on the side of handedness.

If there is variation of right and left, or if mixed, a program of neurological organization to establish complete one-sidedness is indicated. This should be done concurrent to the use of the Stereo-Reader.

Evaluate the section under "Footedness." If there are more than two items that are at variance with the handedness, a program of neurological organization may be indicated. If at least three items fall on the side of handedness, we can assume that footedness is properly established.

Through the use of the Stereo-Reader, all of the tests under the "Predominate Eye" on the summary sheet should be established on the side of handedness. When all the items in this section fall on the same side as the handedness and footedness, the use of the Stereo-Reader is no longer indicated. These tests should be repeated periodically during the course of the training.

**NOTE:** For speed-reading courses proceed as in the developmental program (page 8). This should include special stress on Part I and VI of "Materials." The materials of Part VI are especially designed for speed-reading courses, and they are self-explanatory.

### Corrected Vision

The student's vision should be screened, and, for those who show visual inadequacies, a professional visual evaluation should be made before the Stereo-Reader is used. Children who wear glasses should wear them while using the Stereo-Reader. All children corrected for distance should wear their glasses at all times.

## Assembling the Stereo-Reader



1. Adjust the easel height to the most comfortable level for the student.
2. Adjust the stereoscope so that the student is satisfied with the clarity of the visual field.
3. Attach the reading guide to the easel.
4. Have the student look through the stereoscope. Have him/her slowly move the guide from top to bottom. This will familiarize him/her with the outlines of his/her visual field and the guide, which is the focal area of his/her visual field.
5. Move the guide as far down as it will go.

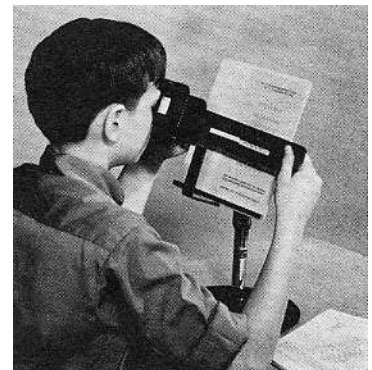
6. Insert a practice card. For training the right eye the card should be placed so that its right edge is at the right edge of the yellow color on the easel; for training the left eye place the card so that its left edge is at the left edge of the yellow color on the easel.
7. Move the guide to the top of the easel by sliding it over the practice sheet. If necessary, have the student readjust the shaft so that he/she achieves optimum clarity.
8. Make sure that the student can see the practice materials with the eye that is being trained only. If there is an overlap, move the training sheet to the right for right-handed students and to the left for left-handed students until the overlap disappears.
9. After the student has begun to master Part I of "Materials," he/she should be placed in complete charge of moving the guide. The student should be taught to move the guide. The speed of the vertical movement of the guide controls the reading speed.
10. If a hand mirror is available (see circular), it may be used to observe and to evaluate eye movements. When held near the top of the easel and directly above the center of the visual field, both eyes can be observed without interfering with the student and without the student's awareness of the observation.

## The Stereo-Reader in Use

The Stereo-Reader should be used for at least four twenty-minute periods per week. It can be used for as much time each day and as often in addition to the above as the teacher or clinician deems practical or necessary.

It should always be placed so that glare or shadows are eliminated from the visual field.

The materials should be presented in the order given herein. At the outset of the program, every child, no matter what reading level he/she has achieved, should go back over the materials of Part I daily. The subsequent materials used can be fitted to the student's reading level.



The slot in the reading guide is used to frame the visual field until the student arrives at The Gold Ring, Materials, and Part IV. From this point most of the materials are single-spaced. Have the student reverse the guide so that the text is completely occluded and use the bottom edge of the reading guide as the marker. As the student reads, the bottom edge of the reading guide covers the preceding line; hence the reading guide is positioned so that its bottom edge is just above the line that is being read.



The instructions for each exercise should be given informally. They should be read prior to giving the exercises. As soon as it seems possible to the teacher, the child should work on reading the materials orally without direct supervision.

For some students who are on a complete program of neurological organization, Parts II, III, IV, and V should be read in whispers.<sup>4</sup>

## **Materials**

### **I. Visual-Motor Exercises (10 pages)**

These exercises are designed to establish greater visual-motor efficiency at reading distance. Although the student sees the exercise with only one eye, both eyes follow the visual patterns made necessary by this section.

These exercises are of such value that they should be used preceding actual reading with the Stereo-Reader during the early weeks of the training, no matter what reading level the student has achieved.

Ask the student to visually trace the line. Have the student trace accurately and slowly. As he/she improves, have him/her try to increase his/her speed.

The teacher should control the line guide at the outset of the program. The student should be given full control of the line guide as he/she becomes more proficient.

Always have the student go through the exercises in this section in the proper numbered order.

### **II. Word Families (6 Pages)**

Speed of perception is the objective of these exercises. Because these words are grouped in familiar configurations, the student can rapidly improve in speed of perception.

These exercises should be repeated until the teacher is satisfied that the student has achieved optimum speed.

### **III. Visual Discrimination (5 Pages)**

These exercises are designed to improve the ability to perceive differences in word configurations. These exercises contain configurational differences as well as detailed differences to be perceived.

The first two exercises are composed of the most commonly reversed words. These exercises must be read slowly and accurately at first. Following completely accurate perception, the student should practice to gain speed.

The remainder of the exercises in this section is aimed at speed of perception. They should be read as rapidly as possible from the outset.

#### **IV. Phrase Reading (16 Pages)**

The words used in these two stories (The Big Race and The Gold Ring) are words taken from the first-reader level of ten of the most widely used reading series.

The stories are to be read orally by the student.

When reading The Gold Ring, remove the slotted reading guide and turn it over so that the covered end comes down over the copy. Then bring the lower edge of the guide down, line by line, as the copy is read.

#### **V. Reading for Interest (103 Pages)**

The words in this story (Star at Valley Forge) are words taken from the third-grade level of ten of the most widely used reading series. The interest level has been ascertained for normal readers at the fourth-to fifth-grade level. The print size is large at the outset and diminishes as the story progresses. The line spacing becomes more difficult as the story progresses. This is designed to compensate for the often-found fact that many children have difficulty in comfortably maintaining fusion when they first begin to read materials of greater length than is usually found in first-and second-grade reading books. The most apparent symptom of this difficulty seem in the classroom is the tendency of children to move their eyes closer and closer to the material which they are trying to read for a more prolonged period of time. This is in many instances transient or developmental and is eased significantly through increased print size. It is probably eased because the larger type decrease the amount of perception tension required maintaining fusion comfortably. When the student arrives at the single-spaced materials, proceed as instructed under IV, The Gold Ring.

#### **VI. Speed Reading (12 Pages)**

These exercises are designed for use with speed-reading programs. They are aimed at increasing perceptual speed, eliminating sub-vocalization, and preparing the student for reading at highly accelerated speeds.

**For those teachers who wish to type their own materials, blank yellow cards are available from Keystone View.**

## **Glossary**

Accommodation. The ability to focus the eyes at distance, maintaining clear vision.

Binocular. Pertaining to both eyes working together.

Convergence. The ability to turn both eyes in properly from the straight-ahead position.

Far Point. When an eye is looking at distance (clinical infinity, 20 feet) with little accommodation.

Figure-Ground Discrimination. The ability to discriminate visually the figure from the background and to reliably appreciate both.

Functional Vision. The aggregate performance of all abilities of the visual apparatus while seeing.

Fusion. The integration of the two images of an object, seen by the two eyes, into one.

Midbrain Stage of Mobility. Illustrated by serialized cross-pattern creeping on the floor.

Monocular. Seeing with one eye alone. Near Point. When the eye has maximum accommodation, with the point of light focusing on the retina, seeing is at the near point. Objects should be seen clearly at about 16".

Neurological Organization. The orderly ontogenetic neurological maturation that proceeds vertically through the spinal cord, medulla, pons, midbrain, and cortex. Human's unique and final development is lateral and is designated as "cortical hemispheric dominance."

Occlusion. The cutting off of the vision of one eye.

Ontogenetic Development. The developmental progression made by a single human being.

Phylogenetic Development. The developmental progression made by the animal world toward becoming human.

Predominant Eye. The eye that reflects the dominant cortical hemisphere. It is ascertained through the following sub-areas: sighting, control, and function.

Sub-cortical. All areas of the brain lying under the level of cortex.

Telebinocular. The registered trade name for the Keystone vision-testing and vision-training stereoscopic device.

Unilaterality. The uniquely human level of neurological organization of being generally one-sided in both skill and choice relating to vision, handedness, and footedness.

Visual Field. That portion of space in which objects are visible during fixation of gaze in one direction only.

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