

## MANUAL

## VISUAL TRAINING SEQUENCE IN SCHOOL ACHIEVEMENT CASES

Prepared for use in the study, "The Influence of Vision Training Upon the Subsequent Reading Achievement of Fourth Grade Children," by Dr. Henry Quick with the assistance of the participating optometrists.

This broad general outline of training procedures for school achievement problems is presented for the expressed purpose of generating some degree of uniformity for the study. It is not intended that all the procedures or even a majority of them are to be used in any given situation. It is also recognized that techniques vary according to the visual problem presented and to individuality of the patient and of the optometrist. This is essentially a guideline for the organization and the reporting of visual training procedures.

In view of the importance of this study to optometry, there are certain basic controls which should be recognized and adhered to. All training starts at the patient's achievement level and progresses horizontally and vertically toward higher levels of performance according to individual needs and conforming to the commonly accepted principles of learning.<sup>1</sup> Transfer of newly acquired skills to the everyday life of the child is essential and should be the primary consideration in any home training and other guidance that is necessary. Regular, prompt, and well organized training periods, with gentle, yet firm control or discipline are a must. Motivation may be difficult to secure; or it cannot be adequately developed. If not present, this condition should be reported to the committee for permission to withdraw the candidate from the study. In all instances the program of training should incorporate the use of procedures which are within the purview of optometry - for example the use of lenses, prisms, occlusion, and/or visual control or direction, which is part of an optometrists training and understanding of the functional process of vision in general movement patterning. It is the consensus of the committee that procedures which fall in the normal activities of the remedial reading teacher not be added to the routine for this study. Words, reading material, etc. may be used wherever necessary. Specific areas to be avoided are phonetic training, vocabulary lists, reading pacers, and reading textbooks, etc.

Detailed records of each training session are required. These should include the techniques, lenses, patient response and time. Home training assignments should also be noted.

Records of the home training work as recorded by the patient or parent after the procedure followed in your office are to be part of the patient's file.

It is obvious that it would be impossible to enumerate and outline in detail the various training procedures and techniques in common use. Those that are cited as examples are to be found in the OEP papers, in the works of Getman<sup>2</sup>, Slade<sup>3</sup>, and in the training workshops and Congresses, and implicit in Harmon<sup>4</sup>. The cataloging of the procedures into sections recognizes that there is a continuous interweaving throughout, and that one technique may be used in more than one way simply by changing the controls. For example, a tactual—visual technique may be changed to a visual-tactual one by changing the principle control of movement from one that is kinesthetic dominant to a visually dominant one.

It is assumed that training lenses will be used at home and in the office in nearly every instance. All training should start monocularly, using the maximum amount of plus through which the child can achieve. There are two exceptions:

- the embedded eso is trained monocularly through base in;
- the embedded exo is trained binocularly through plus.

It is also assumed that good control of posture will be maintained at all times. As the child progresses through the training sequences the adequacy of any performance is expected to be maintained under the increasing demands placed upon it by the speech—auditory, body balance, Identification or Centering components, or by any combination of these four components.

Throughout the entire training program, the patient must be exposed to the concept that he does not see to see but sees to act. He must learn to see with an 'eye full,' to utilize the peripheral as well as central vision, the concept of figure-ground structuring, the 'trees to forest ratio,' and the totality of space and its components. The ultimate objective is smooth, effortless, visual performance utilized without fatigue or excessive attention enabling the individual to use vision so efficiently that maximum effort is directed toward the purpose of vision and minimum effort toward the act of vision.

## General Movement Patterns

### 1. Gross Motor Activity

Object: To generate smooth, purposeful movements by establishing the control of all gravity responses and the coordination of head, torso, and limbs, particularly in visually directed activities.

Office Training: Indoctrination, instruction, practice and evaluation of any home training procedures which the optometrists selects on the basis of the patient's needs. Plus lenses.

Examples: Crawling, hopping, jumping, Krause Weber or Prudin, jump board, walking beam, chalkboard, skipping, crab walking, Chinese soccer, stilts, barrel walking, ladder, weighted helmet.

Home Training: Regular practice periods of the procedures demonstrated in the office are assigned. Records are to be made and returned.

## 2. Reciprocity of Organismic Halves

Object: The development of smooth synergistic and antagonistic movement patterns as visually directed activities.

Office Training: Same as #1.

Examples: Chalkboard-circles both hands, connect dots; Harmon sequence; balance board; gross fusion; coordination of hands on forms or blocks.

Home Training: Same as #1.

Examples: Ball rolling, bouncing, tossing, catching; jumping rope; right and left directions; spinning button on string; simple juggling; pick—up sticks; pie and pan and small sphere; paper folding; trampoline; hula-hoops.

## 3. Hand-eye Relationships

Object: To establish tactual—visual coordination

Office Training: Same as #1.

Examples: Any home training procedure; chalkboard-vertical or horizontal lines, star, push-pulls, running ovals; manual monocular rotations and fixations; tactual reproduction of forms, templates, tracing boards; acoustic tile and pegs; stacking boxes; playing inside boxes.

Home Training: Same as #1.

Examples: Rotations eyes closed; eyes fixed head rotating; Fixations eyes closed, eyes open head moving; Following wand in pursuit in all cardinal directions and around; HAS card (Van Orden: black card with white dots).

## Ocular Motor:

### 1. Monocular Rotations and Fixations

Object: To restore the input-integrative-output feedback response, starting well below any level of mobilizing experience.

a. Monocular rotations through plus

Office Training: Use squint corrector or some rotating device, simple target. Goal is to have the eyes moving smoothly without fatigue, with body relaxed, posture good and the awareness that it feels right. With improving response more peripheral awareness is sought as well as the relationship to the total surroundings. Patient will progress from sitting to standing to walking beam to balance board. Float of spiral and more detailed targets like the TR groups under the control of the patient. Progressive utilization of speech—auditory, kinesthesia, and identification may be introduced.

Home Training: Monocular rotations with parent and then the child performing manually. Different controls may be introduced as needed and in accord with office achievement. Marsden Ball.

b. Monocular Fixations through plus

Office Training: Use TelEYE-trainer, #3 rotor, plus lenses to slight blur, increase plus as target clears. Calisthenic cards, small numbers at arrow points. Eye movements to be slow and easy. Change to #2, then #1. Patient is advanced to AN1, PG25, V03. Numbers are called in order with rhythm, forwards and backwards. Smooth relaxed performance is required. At least ten cycles should be accomplished without fatigue or breakdown of rhythm. Then use a room star patterned after the above slides with patient standing, walking beam, or balance board; helps in transfer.

Home Training: Rhythmic fixations on objects in familiar surroundings, then progressing to enforced fixations (near to far, indoors and outdoors). Naming words from book (1st - last per line) or (1st word then object in room).

2. Dissociated rotations Object: To maintain both observed targets in unchanged spatial localization.

Office Training: Some instrumentation as in the beginning monocular rotations. Prism base up or base down is used in random position before either right or left eye, usually 10 diopters to start. These must be smooth, easy movements in all four positions with the two observed targets holding steady one above the other. There must be no vertical, lateral, or axis shift. With progress the prism power is reduced. Control of speech, balance and identification are increased. Fused rotations with vertical prisms may also be used.

Home Training: Physiological Diplopia

Parallax routine - when fixing a pencil held in the hand two images of a distant object are seen and vice versa. Patient attempts to alternate fixations from far to near without suppressing, rhythmically about sixty times a minute, without winking. Time not to exceed one minute four times daily.

3. Binocular rotations and fixations with plus

Object: Same as monocular

Office Training: Essentially the same technique along with increasingly difficult controls are employed. In some instances, better transfer is obtained by using projected rotary movements, or the room star with or without pointers.

Home Training: Most monocular procedures, Brock String technique using rotations and pursuits in all cardinal directions, varying the distance. Room fixations with rhythm, tapping feet or upon direction.

4. Accommodative Rock

Object: To establish the ability to easily, quickly and accurately change the focus from one distance to another. To restore the integrity of size constancy on a time space basis (SILO effect).

Office Training: Use TelEYE trainer, rotor, Pine fusion card C3 or any similar line drawing, instrument set 2.50-16, R eye +2.25, L eye +2.75. Lenses are reversed at three-minute intervals. Whenever plus side seems larger and farther away (no change during illumination period, no movement or clearing) effective lenses - 0.50, + 0.50 are used up to -2.00, +2.00.

Home Training: Any combination of plus or minus, plano-minus, in hook-overs with half blocks, loose lenses are mounted in holder to be shifted in a manner to obtain desired responses.

5. Modified Updegrave

Object: To establish adequate degrees of freedom in the Identification process.

Office Training: In darkened room, plane of face and plane of material parallel, light flashing device with alternate cycles equal light-dark, material well below reading achievement level, large print, distance 13 inches plus sufficient to blur slightly. Patient strives to clear and DOES NOT read for meaning. Print should clear while light is on. When clear at start of flash, patient moves away to point where it is again blurred but readable. When about 26" away move in to 13" increasing the plus to original blur and repeat. (We find it important during this procedure to have subject learn to perceive the letters (black) as though they were floating off the page. If light on dark

background, then the letters are to be perceived as though the light were coming from behind like light through slits.)

Home Training: Duplication of the office procedure with appropriate lenses. The patient manually flashing the light in rhythm.

#### 6. Binocular Routines

Object: To Improve quality of binocular integration, extend ranges of binocular function (extend degrees of freedom), and to develop ability simultaneously to process input for determination of spatial localization.

a. Gross stereopsis — Polaroid rings, anaglyph rings, with and without central control, at distance or on screen 5 - 6 feet away. Varying degrees of difficulty are introduced; near, far, intermediate.

b. Suppressions: Brock luster series, Figural alternation (Retinal Rivalry).

#### 7. Form field extension: A Perimeter, MacDonald Form Field card or any method to expand the operational form fields.

### Visual Patterns

#### 1. Cheirosopic Drawing

Object: To validate projection and output.

Office Training: Standard instrumentation. Simple line drawings. Urge relaxation — patient not to force the situation. Do not allow patient to become frustrated. Tracing should be easy and efficient. There should be no lateral shifts, size should be good.

Home Training: Practice in the making of size and distance judgments on familiar and unfamiliar objects at home and outdoors with verification and correction.

#### 2. Eye-hand coordination

Object: To bring in ground with kinesthesia

Office Training: Telebinocular, correct eye scope, or stereoscope; cards PG25, AN1, V03; Patient holds different colored pointers in each hand. Relaxation is stressed, with patient looking through hole in star. He is asked to see how many numbers can be called without turning his eyes. The numbers must be let in. Plus lenses to slight blur are used. He is then asked to locate a certain number without turning his eyes; then he is directed to point both eyes to the tip of the star at that number. doing so he places the pointers against the hood of the instrument and instructed to line up each pointer so that the tip is directly between the eye and the star point. They should appear to touch each other. He floats them down, smooth, easy and relaxed until they touch the card at the star point.

Pointers should not disappear, lead the other, or be displaced. Always stress the importance of seeing as many numbers and star points as possible indirectly. Repeat ten times forward and backward without fatigue or deterioration in performance. Proceed to AN3, VO4 and repeat. Location of numbers and star points on the "Z" axis should be in evidence.

Home Training: Specific tasks or application of the principles being taught into things the patient is Interested in on a conscious level.

### 3. Van Orden Star

Object: To build ground with range.

Office Training: Correct eye scope or transilluminated box with stereoscope. Circles in the orthophoric position may be added if necessary. Patient is directed to look in the center of the circle or in the center of the undifferentiated space as though it were way off in the distance. He is to try to place the pencil in his right hand on the upper right-hand dot and the pencil in his left hand on the lower left-hand dot without turning his eyes, if not, he may turn his eyes. Then he is to return to the center, relax and try to see the pencils. He then starts them toward one another until they appear to meet in the center. He should endeavor to keep the pencils clear at all times without looking directly at them. The successive dots are repeated in turn. Ten runs are made on the same paper. Progress is measured by the clarity of the pencils, lack of suppression and the loci of the apices within a 2 mm area around the orthophoric position of the instrument used.

### 4. Jump Ductions

Object: To extend latitudes in centering

Office Training: Use plus lenses to slight blur. Telebinocular, correct eye scope or stereoscope, cards EC5 - 8 and EC105-108, V05-10 and VO11-14 or AN equivalent. Patient is directed to let the light come in - not to reach for it. As in all training techniques the objective is towards easy, effortless, subcortical performance. Explain that the frame of reference should be thought of as the frame of a window, although not always parallel to him. Start where he can obtain fusion of both the top and lower scene. He should rock easily, maintain good crosses, and without suppression, slipping or displacement of one line nearer than the other; locate objects correctly in space in terms of the frame of reference and recognize and feel that one frame is nearer or farther away. Slides or cards are presented first base out or base in then base in and base out, alternately. If the progress of training up to this point is adequate the patient

should be able to let himself perform, relax, and let the scene come in all of the time with full appreciation of all the space. All scenes are to be clear.

Home Training: Vodnoy, orthofusor, Keystone series.

#### 5. Accommodative Rock

Object: To extend latitudes in identification

Office Training: Standard procedures - Van Orden high rock, Robbins Rock, Marsden Rock.

Home Training: Alternate use of binocular plus and minus, near and far material - letter charts, clocks, calendars, pictures, or printed material such as books, magazines or things of interest.

#### 6. Form Perception

Object: To organize and reinforce the skills of copying, matching, size, organization, recall and eye—motor performance.

Office Training: Chalkboard and/or desk. Winter Haven<sup>5</sup> templates, Childcare Templates or Getman Templates. Basically, the procedure used is set forth in the Procedure Manual, Winter Haven Lions Club, pages 43-45. This is reinforced with the use of parquetry blocks and Cuisenaire rods.<sup>7</sup>

Home Training: Any of the office procedures, jig saw puzzles, identification of known and unknown objects in terms of matching, size, and localization with adequate confirmatory feedback.

### Visualization

#### 1. Basic Forms

Object: To aid in learning how one form can be made into other forms, pictures and objects by adding or subtracting lines, blocks, or rods.

Office Training: Same materials as section 6 (Form Perception) above. Child is asked to make some animal, object, or picture from the basic forms. The child is asked to build, change, take away, or add to patterns available in parquetry blocks. The Cuisenaire rods are particularly useful at this stage especially where space and mathematics need reinforcement.

Home Training: Any office procedure. Simple puzzles (broken T), word building, verbal and/or visual predicting of results.

#### 2. Tachistoscope

Object: To develop the ability to recognize and recall any viewed symbol by maximum visual appraisal with minimum auditory utilization.

#### A. Lyons and Getman Series<sup>9</sup>

Office Training: The manuals of these basic series are followed in detail. There is one exception. Only rarely is an exposure longer than 1/100<sup>th</sup> of a second.

#### B. Localization, organization and Identification

Office Training: Usually Far Tachistoscope. Slides of three to ten pennies, buttons, flowers, children, etc., in random position @ 1/100<sup>th</sup> of a second. Patient is to report the number he sees, how many heads or tails, holes or none, types of flowers, boys and girls, and where they were. The slides are then mixed and exposed without any pre-exposure set.

#### C. Geometric Forms

Office Training: Far Tachistoscope. One, two, or three forms are used. Usually advisable to use unfamiliar forms in order that subvocalization is held to a minimum.

#### D. Digits, Words and Phrases.

Office Training: Far Tachistoscope until approaching adequate performance — then an intermixture of far and near instrumentation. Minimum performance six digits at 1/100<sup>th</sup> of a second, seven digits desired.

Note: In recent years, in working with reading or other achievement problems, it has become our practice to have the patient repeat the alphabet or in some manner to utilize the speech mechanism as soon as some level of skilled visual performance has been achieved. We have found this very effective in eliminating vocalization or subvocalization from the reading act. With the tachistoscope, the alphabet is used with digits and the counting with letters, words, or phrases. If the initial work in preparation for this procedure at the Visualization level has been introduced and integrated in the lower levels of the training procedures, little difficulty is encountered.

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