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## Follow-up to strabismic training

### Abstract

Follow-up to strabismic training

### Degree Type

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Master of Science in Vision Science

### Committee Chair

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**FOLLOW-UP TO STRABISMIC TRAINING**

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**A Thesis  
Presented to  
The Faculty of the College of Optometry  
Pacific University**

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**In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Optometry**

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**by  
Albert R. Reinko  
June 1952**

## FOLLOW-UP TO STRABISMIC TRAINING

### CASE HISTORY:

**Patient:** Male, 15 years old, Hillsboro, Oregon.

**Complaint:** "When reading the lines blur and run together. Makes an awful strain on my eyes. This starts after about one-half hour of reading. The glasses make my eyes tired even when I am not reading. Across the room I can see better without my glasses."

**Ocular History:** When the patient was three years old he had a severe fall and his eyes crossed. He was taken to a doctor for treatment and his eyes were straightened. A week later he was injured again and his eyes again crossed. Once again his eyes were straightened by the doctor. The treatment used is unknown. In 1948 he was having headaches and went to an optometrist. At that time he was given the following Rx: OD  $\nearrow .50 \text{ } -.25 \times 180$  ; OS  $\nearrow .25 \text{ } -.25 \times 180$ . He had no further trouble until the spring of 1950 when he came to the clinic. At this time he had the following complaint: "After reading for about ten minutes the letters blur and then double.". After examination he was classified as an intermittent strabismic and visual training was started. The patient was given seven sessions of training before the

end of the school year. A month after the training was halted, he was again examined in the clinic and the following Rx was prescribed: OD  $\nearrow$ .50  $-$ .25 x 180 ; OS  $\nearrow$ .50  $-$ .75 x 180 ; OU add  $\nearrow$ 1.00. The visual training was resumed in the fall of the year and he received eighteen more sessions of training. At the completion of the training he was given an Rx as follows: OD  $\nearrow$ .75  $-$ .25 x 180 ; OS  $\nearrow$ .75  $-$ .75 x 175 ; OU add  $\nearrow$ 1.50. At this time the patient reported that he no longer had any trouble with blurring or doubling when reading. The patient returned to the clinic in the spring of 1952 with the complaint as outlined at the start of the case history.

**Educational History:** The patient is an eighth grade student in a public school. He reads on about a third or fourth grade level and has in the past been a student in a special remedial reading clinic. He has some difficulty vocalizing certain sounds and his pronunciation is somewhat immature, but he can converse adequately.

The reader is referred to the case thesis presented by Eldred C. Plumley for a very complete discussion of the strabismic training and the educational problem that was involved in this case.<sup>1</sup>

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<sup>1</sup>Eldred C. Plumley, Pedagogical Training Conflicts with Visual Training in a Case of Intermittent Strabismus, Pacific University College of Optometry Case Thesis File, January 1952.

## PRELIMINARY FINDINGS:

## External Examination:

Position	Eyes straight
Cilia and Palpebrae	Healthy
Lid Margins and Caruncle	Healthy
Conjunctiva and Puncta	Healthy
Sclera	Healthy
Cornea	Clear
Anterior Chamber	Clear with normal depth
Iris	Healthy
Crystalline Lens	Clear
Lacrimal Drainage	Good drainage
Tension	Normal

## Pupillary Reactions:

Direct	Present
Consensual	Present
Near Point	Present
Speed	Fast
Size	4 mm.
Stay Contracted?	No

## OPHTHALMOSCOPIC EXAMINATION:

Cornea	Clear
Anterior Chamber	Clear
Iris	Healthy
Crystalline Lens	Clear
Vitreous	Clear
Fundus Coloration	Reddish orange
Disc Margin	Distinct
Physiological Cupping	3 diopters
Vessel Ratio	3/2

OPTOMETRIC FINDINGS: See Tables I and II.

VISUAL SKILLS: See Table III.

ADDITIONAL TESTING: See Table IV.

**ANALYSIS AND DIAGNOSIS: (First Examination 2-26-52)**

The analytical findings show none of the previously found strabismic performance. The phorias both far and near are all still in esophoria, but the ductions are coming up quite well. There is very little phoric shift through the various lens powers. The most outstanding feature is the very low #19, #20, and #21. The patient shows very little adaptability to minus lens at the near point. He is unable to read the 20/20 letters at near through his far lenses. His skills also show this lack of adaptability in that he fails both phases of accommodative rock.

The strabismic behavior is no longer present, but now the patient is very rigid in his performance. If left in this condition it is quite possible that, if he meets a situation that is at all difficult visually, he will again revert to his previous strabismic behavior.

**PRESCRIBED TREATMENT:**

A visual training program was started. The outline of the techniques used is given in Table V. The purpose of the training program was first, to adapt the patient to his present lenses, and second, to increase his adaptability to both plus and minus lenses and to base-in and base-out prism. In this way it was felt that he would develop enough flexibility in his performance to take care of any visually difficult situation without reverting to the strabismic behavior.



## PROGRESS REPORT NO. 1: (3-27-52)

There is some increase in the phorias especially at near, and now there is more flexibility shown in the phoric shift through the various lens powers. The lens findings both far and near are about the same as before. The duction recoveries at both far and near show a marked upward trend which is indicative of organization taking place within the pattern. The adaptability to plus lens is markedly increased, but the adaptation to minus lens as shown by both the #19 and the #20 has dropped below that shown before. The upward movement in the skills phorias is quite marked. It seems to be quite common to see these changes in the skills before they are shown in the analytical findings. At this time the patient passed all of the skills with the exception of the accommodative rock.

The only change in therapy at this time was a greater concentration in the training on procedures aimed toward developing minus lens adaptability.

## PROGRESS REPORT NO. 2: (4-8-52)

This examination was taken only a few weeks after the first progress report, however, there are some changes being shown, especially in the skills. The lens findings and the phoric and duction pictures are substantially the same. The minus lens findings are beginning to show an increase which is encouraging. The skills phorias have again shown an

increase in exophoria and for the first time the stimulatory or minus phase of accommodative rock is passed with ease. Several additional monocular findings were made at this time. His adaptation to minus lens is much higher monocularly than binocularly, but just the opposite is true of his adaptation to plus. At this time he was able to read 20/100 letters at near through his far lenses where previously the best he could do was 20/200. This increased acuity through the far Rx is even more marked in the visual skills dot discrimination test.

PROGRESS REPORT NO. 3: (5-8-52)

The minus flash training has now begun to show in the analytical findings but not in the most desirable form. The base-in duction at far and the base-out duction at near are showing the effects of the training in the form of a drop in both the breaks and recoveries with the recoveries dropping the most. On the other hand, the phorias have shown a further shift in the exo direction which is desirable. All of the minus training has not affected the minus to blur-out finding at all. The least plus for 20/20 acuity at near has stayed the same since the last examination.

The visual skills tests are all passed with the exception of the inhibitory phase of accommodative rock. Quantitatively the skills show little or no change since the last examination. However, qualitatively there is a great deal

of improvement as demonstrated in the rapidity and sureness of his responses.

It would appear from this examination that the training program of forcing the patient to work through minus at near has not produced the desired results. However, with the vast improvement shown in the visual skills and also the increase in the near acuity through the far lenses, from 20/200 previously to 20/80 now, it was felt that the training had accomplished a great deal.

The patient has become very passive toward the training since he feels that his complaint has been eliminated and there is no further need of training. Any further gains that might be made through training are probably quite small with the patient feeling as he does.

COMMENT:

Only too often there is a tendency on the part of both the strabismic patient and the clinician to stop training when the strabismic behavior is eliminated. As was pointed out in this case, as soon as the patient found that his visual performance was not adequate he at once returned for further help. However, here again, as soon as the complaint was relieved the patient became passive to the training. Visual training is nine-tenth's patient cooperation and one-tenth direction by the clinician. Without the wholehearted cooperation of the patient the best visual training program is doomed to failure. How to elicit this cooperation from the patient is one of the greatest problems facing the



visual training therapist.

This case points out the fact that even though there was no strabismic behavior shown when the patient came back to the clinic he was still not able to function adequately and there would always be a chance that he would revert to his previous strabismic behavior. Strabismic training is of very limited value to the patient unless it is followed with a general enhancement program in order to give him the best possible visual performance under all conditions. It is felt that the training program herein reported has met this last requirement. This patient should experience no visual difficulty under any condition with his present visual performance and his lenses.

The reading problem still exists for this patient. It is quite possible that some reading enhancement training along with a good educational program would be of great aid to this patient. It is felt that the enhancement work without the pedagogical training would be to no avail.

#### SUMMARY:

Herein is presented a case that points up the need for a general enhancement program following the elimination of the strabismic behavior. Without this follow-up the patient will be unable to adapt visually under all conditions and he may revert to the strabismic behavior. In this case the changes tend to present themselves in the visual skills findings before they are manifest in the analytical findings.

TABLE I

## OPTOMETRIC FINDINGS\*

	2-26-52	3-27-52
2 Ophthalmometer O.D.	: -.75 x 180	: -.75 x 180
O.S.	: -1.25 x 170	: -1.25 x 170
3 Habitual Phoria Far	: 5 eso	: 2 eso
13A Habitual Phoria 16"	: 2 eso	: 4 exo
4 Static Retinoscopy O.D.	: +.25-.50x180	: +.25-.25x150
O.S.	: +.50-.75x180	: +.50-1.00x180
5 Dynamic Retinoscopy at 20" O.D.	: +1.75-.50x180	: +2.25-.25x150
O.S.	: +2.00-.75x180	: +2.25-1.00x180
6 Dynamic Retinoscopy at 40" O.D.	: +1.25-.50x180	: +1.50-.25x150
O.S.	: +1.50-.75x180	: +1.50-1.00x180
7 Subjective to 20/20 O.D.	: +1.00-.25x165	: +1.00-.25x170
O.S.	: +1.00-.75x180	: +1.00-.75x180
7A Subjective to best visual acuity O.D.	: +.75-.25x165	: +.75-.25x170
O.S.	: +.75-.75x180	: +.75-.75x180
8 Lateral Phoria thru #7	: 2 eso	: 2 eso
9 BO to blur thru #7	: 12	: 15
10 BO brk & rec thru #7	: 26/8	: 29/23
11 BI brk & rec thru #7	: 6/4	: 6/4
12 Vertical Phoria thru #7	: ortho	: ortho
12 Vertical Ductions thru #7	: 2/1 2/1	: 2/1 2/1
13B Induced Phoria 16" (+1.00)	: 6 eso(20/200)	: 6 eso(20/200)
14A Dissociated Cross O.D.	: +2.75-.25x165	: +2.50-.25x170
Cylinder at 16" O.S.	: +2.50-.75x180	: +2.50-.75x180
15A Lateral Phoria thru #14A	: 2 eso	: 4 eso
14B Binocular Cross O.D.	: +3.00-.25x165	: +2.75-.25x170
Cylinder at 16" O.S.	: +2.75-.75x180	: +2.75-.75x180
15B Lateral Phoria thru #14B	: 2 eso	: 1 exo-5 exo
16A BO to blur-out thru #14B	: x	: x
16B BO brk & rec thru #14B	: 20/2	: 23/16
17A BI to blur-out thru #14B	: x	: x
17B BI brk & rec thru #14B	: 22/12	: 22/14
18 Vertical Phoria thru #14B	: 3/1 2/1	: 3/2 2/1
18 Vert. Ductions thru #14B	: ortho	: ortho
19 Minus to blur at 13" O.D.	: 5.75	: 4.75
O.S.	: 7.25	: 5.25
O.U.	: 1.50	: 1.00
20 Minus to blur-out at 16"	: -1.25	: -.75
20 Lateral Phoria at 16"	: 3 eso(-.75)	: 4 1/2 eso(-.25)
21 Plus to blur-out at 16"	: +1.25	: +2.25
21 Lateral Phoria at 16"	: ortho(+.75)	: 4 exo(+2.00)

\* The numbers shown are the numerical designations for the indicated tests as adopted by the Optometric Extension Program.

TABLE II  
OPTOMETRIC FINDINGS\*

		4-8-52	5-8-52
2 Ophthalmometer:	O.D.	: -.62 x 170	: -.75 x 165
	O.S.	: -1.00 x 180	: -.75 x 175
3 Habitual Phoria at Far		: 3 eso	: 2 eso
13A Habitual Phoria at 16"		: ortho	: 1 eso
4 Static Retinoscopy	O.D.	: +.75-.50x180	: +1.00-.50x160
	O.S.	: +1.00-.75x180	: +1.00-.75x180
5 Dynamic Retinoscopy	O.D.	: +1.75-.50x180	: +2.00-.50x160
at 20"	O.S.	: +2.00-.75x180	: +2.00-.75x180
6 Dynamic Retinoscopy	O.D.	: +1.00-.50x180	: +1.25-.50x160
at 40"	O.S.	: +1.25-.75x180	: +1.25-.75x180
7 Subjective to 20/20	O.D.	: +1.00-.25x5	: +1.00-.50x180
	O.S.	: +1.25-.75x5	: +1.00-.75x180
7A Subjective to best	O.D.	: +.50-.25x5	: +.75-.50x180
visual acuity	O.S.	: +.75-.75x5	: +.75-.75x180
8 Lateral Phoria thru #7		: 6 eso	: 4 eso
9 BO to blur thru #7		: 11	: 8
10 BO brk & rec thru #7		: 26/16	: 24/14
11 BI brk & rec thru #7		: 5/4	: 8/-4
12 Vertical Phoria thru #7		: ortho	: ortho
12 Vertical Ductions thru #7		: 4/2 4/2	: 4/2 4/2
13B Induced Phoria 16" thru #7		: 3 eso(20/100)	: ortho(20/80)
14A Dissociated Cross	O.D.	: +2.50-.25x5	: +2.25-.50x180
Cylinder at 16"	O.S.	: +2.50-.75x5	: +2.25-.75x180
15A Lateral Phoria thru #14A		: 4 eso	: 4 exo
14B Binocular Cross	O.D.	: +2.75-.25x5	: +2.25-.50x180
Cylinder at 16"	O.S.	: +2.75-.75x5	: +2.25-.75x180
15B Lateral Phoria thru #14B		: 4 exo	: 2 exo
16A BO to blur-out thru #14B		: X	: 8
16B BO brk & rec thru #14B		: 22/17	: 12/-4
17A BI to blur-out thru #14B		: X	: X
17B BI brk & rec thru #14B		: 18/12	: 24/9
18 Vertical Phoria thru #14B		: ortho	: ortho
18 Vertical Ductions thru #14B		: 3/1 4/2	: 4/2 4/2
19 Minus to blur at 13"	O.D.	: 6.50	: 7.00
	O.S.	: 7.75	: 7.00
	O.U.	: 1.50	: 1.75
20 Minus to blur-out at 16"		: -1.25	: -.75
20 Lateral Phoria at 16"		: 7 eso(-.75)	: ortho(-.25)
21 Plus to blur-out at 16"		: +1.25	: +1.25
21 Lateral Phoria at 16"		: ortho(+.75)	: 4 exo(+.75)

\* The numbers shown are the numerical designations for the indicated tests as adopted by the Optometric Extension Program.

TABLE III

## SUMMARY OF VISUAL SKILLS

Techniques or Skills	#1	#2	#3	#4
Accommodative Rock	:	:	:	:
Inhibitory Phase	: F	: F	: F	: F
Stimulatory Phase	: F	: F	: P	: P
Simultaneous Perception	: P	: P	: P	: P
Far-Point Binocularity	: F	: P	: P	: F
Far-Point Stereopsis	: P	: P	: P	: P
Far-Point Pericentral Suppression	: F	: P	: P	: P
Far-Point Central Suppression	: P	: P	: P	: P
Far-Point Visual Discrimination	: P	: P	: P	: P
Hand and Eye Coordination	: P	: P	: P	: P
Color Vision	: P	: P	: P	: P
Far-Point Lateral Phoria	: F(3½)	: P(6)	: P(6½)	: P(6½)
Far-Point Vertical Phoria	: P	: P	: P	: P
Near-Point Vertical Phoria	: P	: P	: P	: P
Near-Point Binocularity	: P	: P	: P	: P
Near-Point Stereopsis	: P	: P	: P	: P
Near-Point Lateral Phoria	: F(2)	: P(3)	: P(5)	: P(5)
Near-Point Pericentral Suppression	: F	: P	: P	: P
Near-Point Central Suppression	: F	: P	: P	: P
Near-Point Visual Discrimination	: F	: P	: P	: P
Rotations and Versions	: P	: P	: P	: P
Saccadic Fixations	: P	: P	: P	: P
Near-Point of Binocularity	: P(4")	: P(4")	: P(3")	: P(3")

P = Pass

F = Fail

## Examination Dates:

#1 - 2-26-52

#2 - 3-27-52

#3 - 4-8-52

#4 - 5-8-52

TABLE IV

## ADDITIONAL TESTING

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 Date: 4-8-52
 

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## Donders' Amplitude:

OD - 6" through plano  
 OS - 6" through plano  
 OU - 12" through  $\pm 2.25$

## Unaided Acuity at Near:

OD - 20/20  
 OS - 20/20  
 OU - 20/200

## Monocular #20:

OD - -2.75  
 OS - -2.25

Near-Point Dot Discrimination  
through the far Rx:

OD - #11 (20/28)  
 OS - #14 (20/20)

## Monocular #21:

OD -  $\pm 7.75$   
 OS -  $\pm 7.75$

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 Date: 5-8-52
 

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## Monocular #20:

OD - -2.25  
 OS - -2.25

## Unaided Acuity at Near:

OD - 20/20  
 OS - 20/20  
 OU - 20/80

## Monocular #21:

OD -  $\pm 1.00$   
 OS -  $\pm 1.00$

Near-Point Dot Discrimination  
through the far Rx:

OD - #11 (20/28)  
 OS - #8 (20/40)

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