CASE 2   Male , 9.4 years of age, repeating grade 3

The individual presented for a vision examination related to his learning problems. A comprehensive patient history for learning-related vision problems was assembled that included the chief concern or complaint, his visual history, a symptom profile checklist, a medical history, and an academic/educational profile. He was said to enjoy school. He has not been taking any medications and is in good health. There have been no reports or indications of attention-span problems in the classroom. The results of a complete vision examination revealed no deficits in visual acuity, ocular health, refractive status, and binocular vision and no need for lenses. His symptom profile checklist indicated difficulties related to oculomotor dysfunction, e.g., a tendency to skip lines while reading or copying, lose his place while reading or copying, reread words or lines, and use a finger or marker to keep place while reading and writing.

ACHIEVEMENT TESTS   Stanford Achievement Test Showed a Grade Equivalent of the following:

Reading Comprehension 2.5, Vocabulary 4.6, Language 5.4, Math 2.3

DEM test

Test A: 21 seconds
Test B: 22 seconds   total vertical time: 43 Seconds
Test C: 56 seconds (12 errors): (9 omissions, 2 Transpositions)

Adjusted horizontal time

$$\frac{80}{(80-9)} = 1.13 \qquad 1.13 \text{ X } 56 = 63 \text{ Seconds}$$

adjusted horizontal time =   63 Seconds

Ratio $\frac{\text{adjusted horizontal time}}{\text{vertical time}} = \frac{63}{43}$ ratio =1.47

Go to TABLE 4   AGE 9.0 - 9.11
Convert Raw Scores to Percentile Ranks and Standard Scores

Test	Raw Score	Percentile	Standard Score
Vertical	43	47%	99
Corrected Horizontal	63	19%	87
Errors	12	1%	64
Ratio	1.47	9%	79

Result: Only the DEM vertical time score is in the average range. All the others (horizontal, ratio, and errors) are well below the levels expected for a 9-year-old. This is an example of a **type II response type oculomotor dysfunction** characterized by an abnormally increased horizontal time with a good performance on the vertical subtest. The ratio is higher than expected in this case, because number-calling speed is significantly reduced when numbers are arranged horizontally.

This case of oculomotor dysfunction is consistent with the reported symptoms and DEM test scores. Oculomotor dysfunction (OMD) is one of many visual anomalies that can be successfully treated with optometric vision therapy (OVT). When OVT is appropriately administered to improve visual performance, including reading function, significant gains were reported in diverse populations (Performance Task Force. AOA Special report, 1988; Bonilla-Warford; Allison, 2004; Ciuffreda; Ludlam; Kapoor, 2009; Ciuffreda; Rutner; Kapoor; Suchoff, 2008). Optometric vision therapy for oculomotor dysfunction may be found in numerous reference books and instruction manuals for therapy equipment sold by Bernell Corporation in Mishawaka IN. (Scheiman; Wick, 2008; Press, 1997).

A question may well be raised about the need for OVT if scores improve upon retest (test–retest reliability) in the horizontal time score and, consequently, the ratio even when symptoms are present. The children that fall into this category are still appropriate candidates for OVT. It was reported that even in a small percentage of cases with OMD who normalize without OVT, timely treatment with appropriate therapy may shorten the time period of the oculomotor dysfunction (Tassinari, 2007).

CASE 3   Female, 8.6 years of age, Grade 3.7

The individual was referred for a vision examination because of concern regarding her academic performance, overall poor reading skills, and need to hold reading material close to her face. A comprehensive patient history for learning-related vision problems was compiled that listed a chief concern or complaint for her visit, visual history with a symptom profile checklist, medical record, and academic/educational profile.

She had great difficulty in first grade in making associations between sounds and symbols. She continues to have problems in phonics. Her teacher reports that she has difficulty in understanding words and expressions and decoding thoughts. There was a previous visual exam that indicated no need for glasses. She continues to report that her eyes hurt after school and that she has headaches after studying. The current functional vision exam revealed that following a binocular vision analysis, there was a convergence insufficiency. These findings were consistent with the reported symptoms.

ACHIEVEMENT TESTS

Stanford Achievement Test Showed a Grade Equivalent of the following:
Reading Comprehension 2.5, Vocabulary 2.9, Language 3.1, Math 5.4, Number Concepts 4.7
WISC-R Verbal Score   100 Performance Score 120: Total Score 112

DEM test
Test A: 26 seconds
Test B: 29 seconds total vertical time: 55 seconds
Test C: 64 seconds (1 error): (1 substitution error, no omissions)
                    No adjusted time calculation required
Ratio   adjusted horizontal time   64 = 1.16
                      vertical time   55

Go to TABLE 3   AGE 8.0 - 8.11
Convert Raw Scores to Percentile Ranks and Standard Scores

Test	Raw Score	Percentile	Standard Score
Vertical Corrected	55	15	84
Horizontal	64	31	92
Errors	1	70	108
Ratio	1.16	67	107

Since she is reportedly struggling, at the end of 3rd grade, we also may look at her grade performance as well.

Go to TABLE 11 Grade 3

Test	Raw Score	Percentile	Standard Score
Vertical Corrected	55	6	77
Horizontal	64	18	86
Errors	1	62	105
Ratio	1.16	65	106

TABLE 4		AGE 9.0 - 9.11	
Converting Raw Scores to Percentile Ranks and Standard Scores			
N= 84	MEAN	ST. DEV.	SEM
Vertical time	42.33	8.20	0.89
Corrected Horizontal time	51.13	13.30	1.45
Errors	2.17	4.10	0.45
Ratio	1.21	0.19	0.02

Vertical Time   AGE 9.0 - 9.11

Raw Score (seconds)	Percentile	Standard Score
27	97%	128
28	96%	126
29	95%	124
30	93%	123
31	92%	121
32	90%	119
33	87%	117
34	85%	115
35	81%	113
36	78%	112
37	74%	110
38	70%	108
39	66%	106
40	61%	104
41	56%	102
42	52%	101
43	47%	99
44	42%	97
45	37%	95
46	33%	93
47	28%	91
48	24%	90
49	21%	88
50	17%	86
51	15%	84
52	12%	82
53	10%	80
54	8%	79
55	6%	77
56	5%	75
57	4%	73
58	3%	71
59	2%	70
60	2%	68
61	1%	66
62	1%	64
63	<1%	62

Errors   AGE 9.0 - 9.11

Errors Score	Percentile	Standard Score
0	>70%	108
1	61%	104
2	52%	101
3	42%	97
4	33%	93
5	25%	90
6	18%	86
7	12%	82
8	8%	79
9	5%	75
10	3%	71
11	2%	68
12	1%	64