

Case Report

Visual Dysfunctions Which May Affect Literacy.

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Introduction

History

Lindisfarne is a small Anglican primary school, established in 1984. Since 1986 the school has been integrating children with special needs and providing remedial programs. The Learning Assistance Program was established formally in 1989. To enable it to be effective there is close cooperation between staff and parents. On-going dialogue about, and work with, individual children as they have progressed through the school has led the search to find answers for that group of children labelled as having learning difficulties. One result has been a research project involving behavioural optometry.

During 1991 and 1992 two learning disabled students attending our school had vision care provided by a behavioural optometrist. Then a third student, diagnosed as dyslexic, was also provided with behavioural optometric care. In 1992 the teacher in charge of special education attended a lecture presented by a behavioural optometrist at an Independent Schools' Board Special Education Meeting. She was impressed by the speaker's concepts, but was unsure of the relevance to educators. In March 1993 behavioural optometrist Jim Kenefick attended the school for a child review meeting, and as a result of that discussion we began coordinated care of certain individual students with learning difficulties.

Background

The concept that vision affects learning is not new. Vision has been accepted by educators as an essential tool for learning, yet with very little understanding of the many and varied visual skills required for literacy. This perception of vision has no doubt been heavily influenced by the medical model of vision, which essentially assumes healthy eyes can func-

tion effectively; "normal" eyes are perceived as eyes that see well and are free of disease. The medical profession, in our experience, generally refuses to consider more critically the concept and practice of visual function in relation to the visual demands of reading and writing. There needs to be recognition that seeing is as much a learned skill as walking or talking. Seeing, however, obtains no help from imitation (Orem, 1971, p.56). There also appears to be a need for more widespread understanding that a child learns to see haphazardly, and with the impact of modern living and culture, an individual child's visual development may not merely "get off the track" of normal visual development, but actually may become "derailed", so that visual development of skills such as tracking, eye-hand ability, and visual discrimination can fail to proceed or occurs at a much slower rate than normal. (Orem 1971, p.56).

At the beginning of this century optometrists were seen as technicians who made spectacles for people who could not see. In the 1920's a Dr. Skeffington investigated the many aspects and functions of eyesight and pioneered and developed successful ways of guiding, rehabilitating, and correcting the visual dysfunctions of the human race, and more especially children. (Orem, 1971, p.56). Even today, in our experience, ophthalmologists will often advise parents that their child will out-grow visual difficulties, or that visual dysfunctions do not influence learning, and this can leave child, parents and teachers struggling with the facts of significant underachievement at school, with no specific cause evident. The Skeffington philosophy did not accept this point of view and offered help for children with visual dysfunctions which possibly interfered with efficient learning.

Although much of Skeffington's work paralleled that of Maria Montessori, there has been minimal effective interface or interdisciplinary research.

Writing of this problem more than twenty years ago, Orem said:

"the interdisciplinary team concept is...more idealised than realised, more diagnostic than treatment oriented, and too little involved with educational decision-making or instructional programming. More often, information comes from many sources (multidisciplinary) rather than being shared between disciplines (interdisciplinary). In addition such information exchange frequently places either an added burden on the teacher (to supply reports to many specialists) or offers her little direct assistance (in classroom programming or management). Tragically, the diagnostic-prescriptive effort has perpetrated the medical model and subordinated (if not obviated) the clinical teacher as a full and equal participant-member of the interdisciplinary team."
(Orem, 1971, p.98)

The need for the clinical teacher to be a full and equal member of any interdisciplinary team which investigates visual function is obvious when reading of the findings of optometrists over a span of nearly seventy years. Optometrists' clinical findings have not been comprehensively validated effectively in the educational setting, and conversely, many of Maria Montessori's findings about early childhood education have not been validated from the perspective of teaching the child to see.

We learn to see in the same way that we learn to walk and talk, or in the same way that we learn to play a musical instrument. The level of development of visual skills will influence achievement potential in all areas of activity, whether at school, at work, playing sport or driving a car. Getman describes vision as the catalyst between activity and comprehension. (Orem, 1971, p.2-3) All of this points to the need for interdisciplinary discussions about, and research into, the visual skills which may make the difference between academic success and academic failure.

Literature Summary

There is minimal literature about visual dysfunction directly related to our project. Much of that written by optometrists is not easy for an educator to understand, and even when it is understood it has no immediate application to teaching and learning. Orem, in his book *'Learning to See Seeing to Learn'* attempts to bridge the gap between optometry and education, but really only explains the problem and points out the direction that needs to be taken. Getman in *'Smart in Everything Except School'* adds to the general understanding of visual development and links it with learning disabilities. Various pamphlets written by behavioural optometrists provide simple but limited information.

Educators approach the subject from a different perspective. They recognise the problems but may see them as malfunctions of the brain function that requires training.

An example of this would be Furth and Wachs in their book *'Thinking Goes To School'*. Richards sees a part of the problem and part of the solution in her article *Wasting Teacher Time*. (Teachers working on VAS (Visual Attention Span) also work in training. We quote and use only those sources that are relevant in relation to this project).

Explaining Visual Dysfunction

There are many visual skills that can affect learning. As far back as 1965 the following list of 19 different visual skills had been identified:

1. Fixation Ability
2. Pursuit Ability
3. Saccadic Ability
4. Accommodative Level
5. Accommodative Facility
6. Binocularity of Fusion
7. Convergence Ability
8. Stereopsis
9. Perception of Form
10. Retention of Form
11. Recall of Form
12. Visual Span Extent
13. Visual Field Extent
14. Visual Monitoring of Movement
15. Visual Monitoring of Manipulation
16. Visualisation of Movement
17. Visualisation of Manipulation
18. Conceptualisation - Visual Organisation
19. Insightful Solutions to Problem-Prediction
(Orem, 1971, p.21.)

Problems in these areas were said to make up The Visual Disability Syndrome and children could demonstrate weakness in one or more areas of this syndrome. Problems in some areas could result in a child having difficulties effectively and efficiently using vision, and this was termed dyschriesopia (the term is not used currently). Orem likens this condition to a car that is running badly and needs a tune up. Just as such a car uses more petrol, runs roughly, travels slower and performs inefficiently, so children with dyschriesopia were said to observe less, see less, remember less, learn less, and be generally less efficient (Orem, 1971, p.20-21).

Through our work we have endeavoured to understand the implications of this for teachers. The skills that we began to work with for students in our school were:

- convergence
- pursuit eye movement skills
- saccadic eye movement skills
- flexibility of focus (accommodation)
- sustaining of focus

When a child's eyes are unable to easily perform one or more of these skills, then there is a resulting level of eye-strain and excessive effort which in our experience can affect school performance. The extent to which school performance is affected depends on the number and the severity of the dysfunctions. We identified a total of six different visual dysfunctions that can affect a child's ability to achieve literacy.

Defining The Most Common Visual Dysfunctions

1. Over-Convergence

Over-convergence commonly occurs with children who are long-sighted, and young children are typically mildly long-sighted. Over-convergence only becomes a problem when a child must maintain focus for near visual objects, and in particular to focus clearly on fine visual discrimination tasks such as those associated with literacy. Where over-convergence occurs associated with the sustained demand of close visual tasks the images from the two eyes do not perfectly coincide, and the brain does not receive a stable image to recognise or remember.

2. Under-Convergence

Under-convergence also occurs in young children, although it is not as common as over-convergence. As with over-convergence, with near visual tasks the images from the two eyes do not perfectly coincide and the brain does not receive a stable image to recognise or remember, although the images received through under-convergence would be different from the images received through over-convergence.

3. Pursuit Skills

In reading and writing the eyes need to be able to coordinate to scan smoothly from left to right. Most children have the normal eye muscle tone and movements, but they may be unable to coordinate both eyes to work smoothly together. This can cause them to lose their place when reading, jumble letters when spelling aloud, or write up or down hill.

4. Saccadic Eye Movement Skill

Saccadic skill allows the eyes to "jump" a visual distance in a short time without taking in any information on the way. For example, the eyes perform a saccade in moving from the end of one line of

print to the beginning of the next line of print. If the child is unable to perform effective saccades they must use pursuit skills and this is not only very slow, but causes visual overload or burn-out. This will affect reading concentration and comprehension.

5. Flexibility in Focus (Accommodation)

When looking from something close to something further away, or vice versa, there is a need to change the focus of the eyes in order to see things clearly. Children who are unable to change focus quickly are disadvantaged in the classroom and may develop eye fatigue. Efficient focussing allows more time for interpretation or memorisation of visual information.

6. Sustaining of Focus

When called on to exercise accommodation skills for longer periods, the child whose eyes cannot perform easily may experience eye fatigue which leads to blurring of the images seen, eye strain, headaches and avoidance of close work.

Identifying Visual Dysfunction

Commencing in March 1993 we worked to try and identify children with visual difficulties before there was an effect on the child's learning, and a possible effect on the child's concept of him or her self as a learner. We found that there was no cut-off point for the emergence of visual dysfunctions, as the problems were only seen when the visual demands exceed the visual abilities of any individual child. There are, however, some points in the educational program when a new or extra stress load is placed on children, and at these points in the educational program a new group of children will demonstrate signs of visual stress. Clearly, the earlier the signs are recognised and the dysfunctions corrected the better it will be for the child.

We decided that we would attempt to discover if we, as class teachers, could recognise children with visual problems through observation alone. This required us to think about, discuss and research indicators that we could observe. Orem says that one of the real tragedies of life is the child who exhibits great potential early in life but fails to achieve it. (Orem 1971, p.18). Dr. Getman is known for his description of children who are 'smart in everything but school'. Since we are a small school of four teachers it has been possible for all of us to be involved in the discussions and the identification process. We found several different symptom and sign check lists that could be used, but in our opinion they were difficult to use in the classroom. We therefore worked to identify what triggered our concern for any particular student, and whether any discern-

ible patterns emerged. We have not done any general screenings so far; all of the children who have been identified have shown up through our observational checklists.

We have found that it is possible to recognise visual dysfunction within two or three weeks of a child starting school. These initial failures are children with more obvious problems. As children begin the reading process we begin to identify children who are slow to develop reading skills. These children are observed carefully.

As children move into written language skills, another group of children is identified with spelling and writing difficulties, and we have been identifying them in year 1-2.

The next group with problems seems to emerge as the visual demands are increased and children are required to do more reading and to read smaller print. These children have been emerging in years 3-5, the middle primary years.

Although lists have been developed to aid in the recognition of problems that may affect school performance not only in the areas of reading and spelling but also in spatial awareness in mathematics, these lists have not been written from an educational point of view. We have developed the following lists after observing children carefully, sending children for assessment when we felt they may have visual dysfunction, and then discussing the signs which alerted us as educators that something was wrong. We also checked our lists against lists established by behavioural optometrists but have limited our lists to those signs which we have actually observed and used for assessment. Our list is contained in Appendix 1.

Incidence of Visual Dysfunction

We have been amazed to discover an incidence of visual dysfunction that parallels the findings of a study done on 150,000 Texas elementary school children as far back as 1951. That study found 20% of the first grade children had visual problems, and five years later the percentage with visual problems had increased to 53% (Orem, 1971, p. 19). See Fig. 1 and Fig. 2. It is important to note that our students have been identified by the teachers observing performance, and not by an optometric screening process.

Results of Optometric Intervention

The changes exhibited by a child following specific optometric intervention follow a clear pattern. The first thing noticed is a change in their attitude to

work and an improvement in their self-concept. These changes are observed by both teachers and parents, but are not easy to substantiate. The second change is an improvement in handwriting and bookwork, and this change can be clearly documented through work samples. This is followed by an increase in the enjoyment of reading and the amount that is read. This is reflected in their routine standardised reading tests. Usually the last aspect of literacy to improve is that of spelling.

From 1988, when we first had a middle primary class of years 3-5, we have been providing the children with standardised tests for reading and spelling to monitor their progress. These are performed at the end of each year for children in years 3-7, while students in year 2 have only the reading test. Teachers may choose to give the students more than the one test usually during second term, although they may be administered at any time a teacher needs the information for planning student programs.

When we began to identify students with visual dysfunctions we did no extra testing. Many of the children identified have been too young to be a part of the testing program. Those that were on the testing program began to show significant development following intervention, and although this project is very new we already have seen some interesting and significant results. Because the tests are done at a specific time in the year the students will all be at different ages and the tests are not done in relation to the intervention. Sometimes the students have had an extra test, and sometimes they have been absent at the time of the test and so may have missed a test completely. Some spelling test results were lost with a computer malfunction. Below are some examples from our ordinary school records that demonstrate different patterns, but all support the benefits of optometric intervention.

In all of the graphs:

CA is chronological age

RA is reading age

SA is spelling age for each test point.

Individual cases

Student G1 struggled with literacy from the beginning of schooling, and despite intensive and extensive LAP intervention had plateaued by the age of 9 and was falling further and further behind. Optometric intervention occurred just over a year ago, between T5 and T6. Progress has resumed and the gap between the chronological age and the reading and spelling ages is beginning to close. The bookwork is beautiful. (See fig.G1)

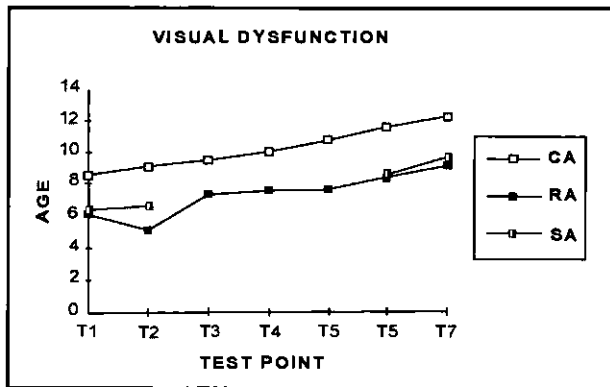


Fig G1

Student G2 is an interesting case, presenting initially as exceptionally bright, but immediately showing signs of learning difficulty with reading and phonics and then spelling. She saw an ophthalmologist between T4 and T5 and was given glasses to correct a slight difference in focal lengths. Some improvement was seen, but the effort from both child and parent was enormous. She stopped wearing the glasses and lost interest in reading again and writing and spelling were still very hard work. She eventually saw a behavioural optometrist. The glasses were only for acuity and did not address the accommodation, convergence and pursuit skills that were functioning poorly. The resulting eye strain was overwhelming. Optometric intervention occurred 15 months ago between T5 and T6. After 12 months the results of her tests showed a reading age 2 years in advance of the chronological age. Her bookwork has improved but her spelling is still behind. The spectacle lenses have required changing since T6, so we await with interest the results of the next test. (See fig. G2)

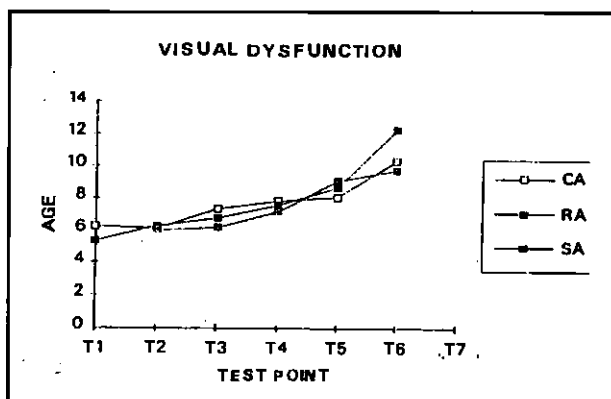


Fig G2

Student G3 came to the school with significant delays in both reading and spelling and despite extra support through LAP was not making any gains. Optometric intervention occurred between T2 and T3 with obvious gains in all areas. At T4 there was a regression in spelling and we advised an optometric reassessment. The lenses have just been changed and we await the results. (See fig. G3)

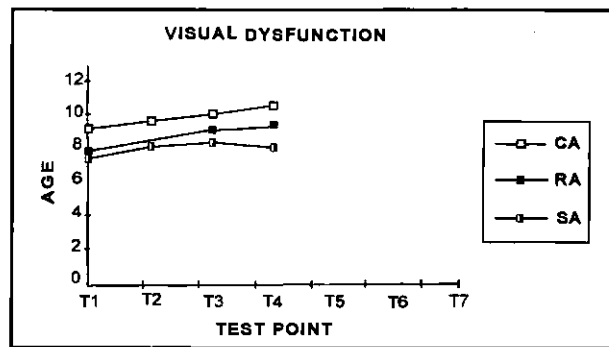


Fig G3

Student G4 wanted desperately to read and write and worked hard from the beginning of schooling, but at T4 the gaps between CA, RA and SA were widening. Intervention - optometric vision training only - occurred between T4 and T5 and the last results show the gap has stopped widening. From teacher observation we would predict catch up by the next test. (See fig. G4)

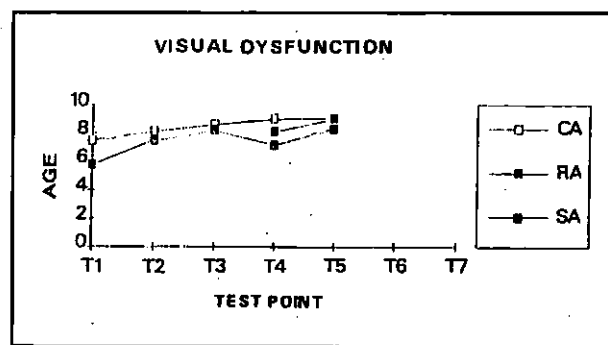


Fig G4

Student G5 also tried hard from the beginning of schooling and the reason for the delay in reading and spelling was not obvious. Intervention occurred between T4 and T5. This student was long-sighted and had no other visual dysfunction. There is a clear improvement in the spelling age that had plateaued, but we are puzzled by the last reading test result as it does not reflect our observations. We decided not to re-test as this student does not respond well to the test situation, especially when others are not being tested. The next test may give more indication of any change. (See fig. G5)

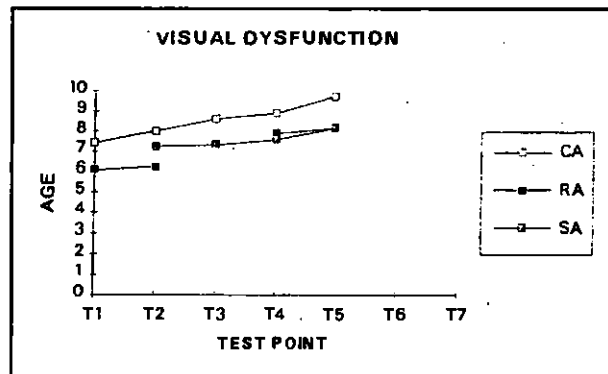


Fig G5

Student G6 came to us with recognised learning difficulties. The early spelling results were lost in the computer malfunction, but were trailing behind her reading. Her LAP time was doubled between T3 and T4 with obvious effect, but she was unable to read music. Optometric intervention occurred between T4 and T5 and LAP focussed on vision training and spelling. In the 6 months between T4 and T5 the music teacher reported that this student whom she had been trying to teach to read music, and who she had decided would never read music, was now sight reading music. We are concerned that this student has been diagnosed so late and that the critical learning years may have been lost. (See fig. G6)

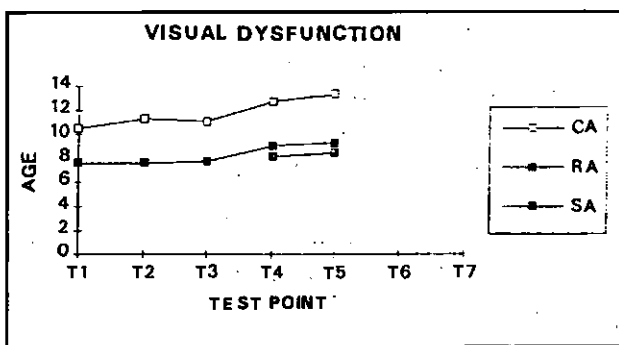


Fig G6

Student G7 was diagnosed as at risk of learning difficulties prior to any testing. There were speech problems diagnosed even before schooling began and some speech therapy was given. Further testing between T1 and T2 has revealed a hearing disability. With speech therapy resumed, vision training continuing and strategies in place to support the hearing disability, the changes that began between T1 and T2 is continuing and we will be watching the progress with great interest. (See fig. G7)

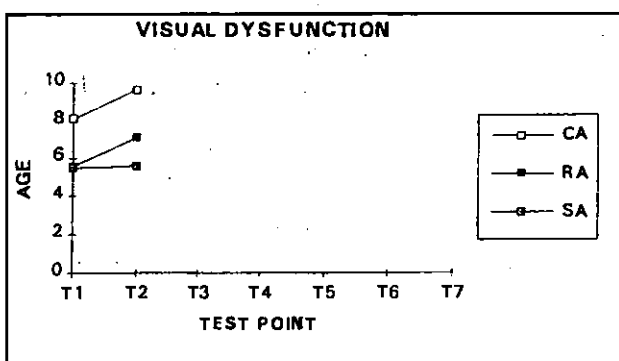


Fig G7

Student B1 presented with learning difficulties from the beginning of schooling and by the time standardised testing was begun was demonstrating considerable delays in reading and spelling ages. Intensive LAP was begun between T3 and T4, to some effect, but the gap only started to close after optometric intervention between T5 and T6. This graph shows clearly the year delay that we are noticing between the intervention and its reflection in the testing. (See fig. B1)

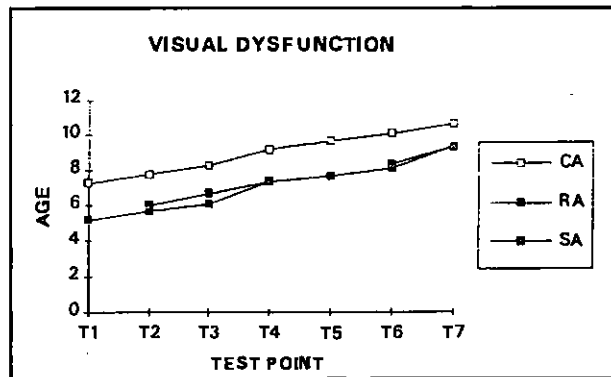


Fig B1

Casual observation indicated that **student B1** should be classified as being clever or bright. The parents were concerned because the child was putting in an enormous effort to achieve poor results. Optometric intervention occurred between T2 and T3 with immediate improvement in the reading scores and in the presentation of work. Spelling performance is improving now but is not as yet reflected in the standardised testing. (See fig. B2)

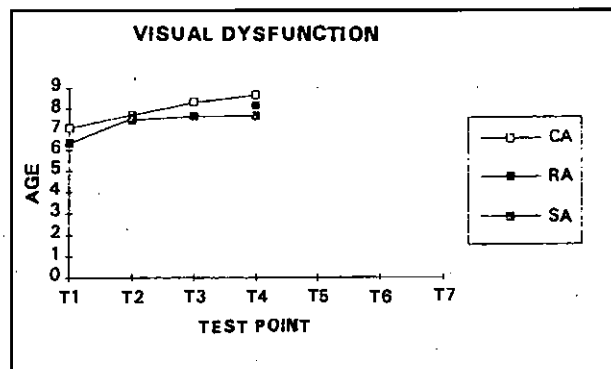


Fig B2

Student B3 was optometrically assessed before standardised testing took place. Glasses were not prescribed for this student, only exercises. The home exercise program was not implemented as the child found the exercises hard and didn't want to do them. The child had been receiving LAP intervention before the visual assessment and continued in that program. The test results show that the school performance is regressing. The vision therapy program has been implemented at school, but as this is only twice a week and not twice a day there is concern that this student will not achieve well. These results support the value of the therapy program. (See fig. B3)

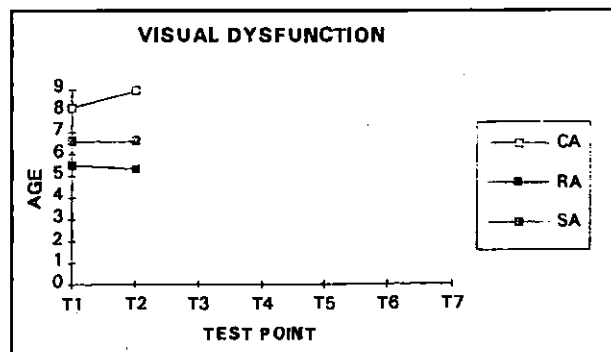


Fig B2

Student B4 was regarded as a very bright, very active child who just wasn't interested in reading yet, but who was performing close to chronological age. Using the assessment guides the class teacher asked for an assessment by the optometrist. The intervention occurred only 3 months before T2 with instant and amazing results. (See fig. B4)

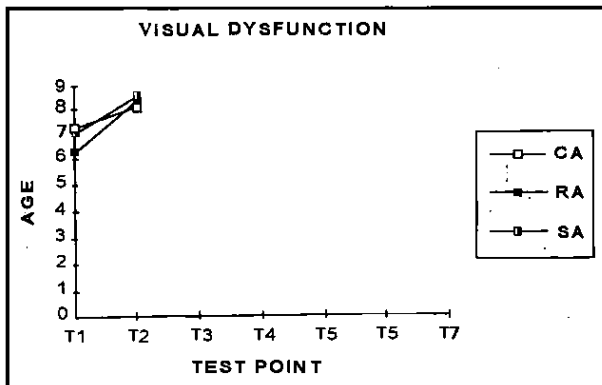


Fig B4

Teaching Strategies - Classroom

We have begun to assess teaching strategies and student activities that will promote development of the visual functions that are necessary for literacy. We have identified the eye movements we believe are necessary, and so have organised activities that help in their development.

From the time that a baby is about six weeks old the eyes are capable of making all of the movements that are used for developing literacy. Some children develop the necessary eye movements from infancy, but just as with any other physical development there is a very wide range of skill found in children of five, six, nine or even fifteen years of age.

It is well accepted in educational circles that children "learn" or develop a skill through practising that skill, and so educators will be quoted as saying that children learn to write by writing, or children learn to read by reading. We also recognise that children learn to catch, throw or kick balls by actually doing those things. Some children seem to have what is seen as a "natural" talent. This is particularly noticeable in areas such as sport or music. This natural talent still requires consistent practice to be developed and maintained at a high level of performance.

If these same beliefs are transferred to the development of the eye movements required for a child to be able to read or write or spell, then it immediately becomes obvious that there are some children who obviously have a "talent" or high level of skill. Others may develop enough skill to allow them to man-

age as long as the visual demands made on them are not too great, and there are some children who are not able to use their eyes appropriately without a lot of teaching and practice. The children who are unable to perform one or more of the required eye movements can show up as children who are slow to read in the early years of schooling. Other children who start to read and write begin to struggle and to fall behind as greater visual demands are placed on them in the middle years of primary schooling. These problems may occur in children of widely ranging intellectual ability and may explain under-achievement in gifted children.

Teaching approaches or learning experiences that can be incorporated into the daily activities for children in the early years of schooling for the practice of those necessary eye movements could benefit all children. For some children it would merely be the polishing of existing skills. For others it could provide important practice and help to prevent problems from emerging in later years, and for some children it would provide a beginning point for the skills that are needed if they are to become literate.

The purpose or the reason for establishing classroom practices that incorporate visual training is to develop and/or enhance the visual skills required for literacy. They are not skills that are required in an agrarian or illiterate society. These skills only become important when a child seeks to learn to read and write and spell ie. to become literate.

1. Correcting Over-convergence

Aim of activities: To encourage tracking of both eyes on an object that is moving in focus from close to distant or from distant to close.

Note: The eyes will be more relaxed and less strained in activities that move away from the body rather than towards the body.

2. Correcting Under-convergence

Aim of activities: To encourage the eyes to maintain focus on an object as it moves towards a close visual mid-point.

3. Pursuit Skills

Aim of activities: To practise visual pursuit of objects, especially in a linear and left-to-right mode.

4. Saccadic Skills

Aim of activities: To practise quick changes of focus for the eyes.

5. Flexibility of Focus

Aim of activities: To practise changing focus in 'jumps' rather than by 'zooming' in and out.

6. Sustaining of Focus

Aim of teaching strategies: To develop accommodation skills, and then to gradually extend the ability to sustain focus in visually demanding activities for longer periods of time.

Teaching Strategies - Learning Assistance Programme

It is frequently stated that vision is involved in more than 80% of tasks in educational programs. Educational research shows that a large percentage of children with reading problems, approximately 80%, have some functional visual problems (Richards, 1985, p.418). Therefore, one might postulate that before conventional remedial educational activities and assessments are embarked upon, visual function should be examined. This process would also identify those students likely to require special consideration.

Children identified for special consideration before they have learned to read are described as having a developmental visual delay, meaning that visually they have not developed the necessary skills for school readiness. Developmental deficits in the acquisition of these skills will affect the learning-to-read process. The visual dysfunctions we see later, once the child has learned to read, are known as functional reading disability. This type of disruption affects the ability of the child to read-to-learn by interfering with concentration and comprehension. These two areas are not mutually exclusive. (Butler, 1990, p.244)

Once children have learned to read they are confronted with a significant reduction of print size and an increased volume of material per page. Visual endurance skills are required to enable the child to sustain a comfortable and efficient focus while reading and handwriting. Without these skills a child may avoid reading and become a reluctant reader, or have difficulty with reading comprehension. These children are often referred for remedial intervention in the later grades with a functional reading disability. (Butler, 1990, p.231)

We have identified five commonly observed areas of visual dysfunction which impact on the student's ability to acquire and process visually presented information. A child who has visual dysfunction in two or more areas is more likely to experience significant difficulties with the educational demands of the classroom. A successful vision training program does not necessarily mean that the learning deficits are automatically solved. The visual training program may make the child more teachable, but a special education program may still be required to overcome specific educational problems (Butler, 1990, p.244).

Over the last ten years, working closely with children requiring remedial support and with their classroom teachers, I have regularly observed the following reading behaviours:

- a) Reading in a halting word by word method
- b) Omissions of words or word endings
- c) Continual loss of place in a passage
- d) Reading with excessive head movements

Conventional remedial activities have not produced any significant improvements in these problems. Once a child has been examined by a behavioural optometrist we look for a report with suggestions for management, often including vision training. This is the aspect that has been missing from our remedial programs. The methods we were using were not remediating an important part of the child's problem - their visual functioning ability.

All of our students previously in LAP have now been assessed and all have been identified as having a visual dysfunction. We are now in the process of developing educational activities that support the exercises outlined in the recommendations made by the behavioural optometrist. We found many appropriate activities and suggestions in Whitehead 1981, Frost 1972, Rosner 1979, McMonnies 1991 and Richards 1988. The children in LAP now have activities for vision training that have an educational bias as well as a program to address their specific educational needs.

We cannot ignore the near vision stresses placed on our visual systems by the demands of living and learning in today's society. It is time for educators to acknowledge that an inefficient visual system may be the cause of a learning difficulty and pursue the appropriate activities to more effectively remediate the problem.

Conclusion

The debate about whether behavioural optometry has anything to offer to the teaching and learning process has been going on for far too long. It is very clear from the observed and measured changes of students at all levels of schooling at Lindisfarne that the ability of a child's eyes to perform complex and specialised movements affects the child's ability to learn, and that behavioural optometric intervention can be very effective. In our experience the statements made by the medical profession look at learning problems from the perspective of children with medically recognised learning disabilities. Behavioural optometrists address the visual problems that relate to that large category of students with learning difficulties. These are students who are not treated by the medical profession, although some

could conceivably manifest as Attention Deficit Disorders. These are the students we are worrying about constantly in our classes.

What has been missing from this debate, and what is now needed, is for educators to enter the arena with their expertise and understanding of the teaching and learning process. Teachers need to give direction, so that this pointless debate will be terminated and we all work together to understand how visual dysfunction can affect literacy, and what each member of the teaching and health professions can do to help. There is enough work for us all.

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15. Richards R. Classroom Visual Activities. Academic Therapy Publications, California USA, 1988.

Further reading

Getman GN, Milkie G. Vision Consultants to Educational Programmes. American Optometric Association, St. Louis MO, 1973.
Getz D, McGraw L. Vision Training for Better Learning. Mafex Associates Inc, Johnstown PA, 1980.

Appendix 1

Visual Checklist

Appearance of the Eyes

- Redness of the eyes
- Redness of the lids
- Watering of the eyes
- One eye turning in or out when tired

Evidence of Discomfort

- Rubbing the eyes
- Avoiding bright lights
- Closing the eyes
- Excessive blinking
- Holding the head at an angle, or turning it from side to side when reading or doing book work
- Poor posture
- Holding the book very close
- Covering one eye or closing one eye while reading
- Squinting when working at the desk
- Slow with work that requires reading

Older children may complain of:

- Sore or tired eyes
- Itchy eyes
- Blurred or double vision
- Headaches (At school or after school)
- Mental fatigue ("My brain is tired", or "I can't think any more")

Educational Indicators

Early Years of Primary Schooling

- Has difficulty with cutting and pasting
- Has trouble colouring in, is unable to keep within the lines
- Has difficulty copying simple shapes and letters
- Unable to develop age-appropriate ball skills
- Tracing skills are poor
- Orients drawings poorly on the page
- Has trouble with left/right orientation
- Has difficulty with directions
- Reversals of letters, words or numbers
- Is not able to judge distances
- Loses the place on work sheets or in books
- Slow to develop sight vocabulary

Educational Indicators:

Middle Years of Primary Schooling

- Fails to recognise the same word in the next sentence
- Repeatedly omits small words when reading
- Rereads or skips words or lines unknowingly
- Uses finger to keep place while reading
- Keeps losing the place while reading (Where am I up to?)
- Comprehension declines as reading continues
- Writing is up or down hill
- Irregular letter or word spacing
- General lack of progress in spelling
- Misaligns digits in columns or lines of numbers
- Has trouble copying from page to page or blackboard to page
- The child's performance in reading and writing (including spelling) does not match the performance in mathematics
- The child initially performs to expectations, but in years 2 and 3 begins to fall behind and to struggle with reading instructions and with spelling

At any stage of schooling

- The child's performance does not match the expectations from either formal or informal assessments of ability
- The child exhibits avoidance or disruptive behaviours (leaving their seat, looking at other children's work rather than their own, talking rather than working, gazing into space or out of the window or becoming distressed over the near - focus activity e.g. colouring, cutting, handwriting)

Appendix 2

Resources

Pamphlets

Australasian College Of Behavioural Optometrists

1. Does Your Child Have a Learning-related Vision Problem? 1985.
2. Parents Guide and Checklist. 1987.
3. Vision Care. Undated.
4. What is Behavioural Optometry? Undated.

Australian Optometrical Association, Carlton, Vic.

1. A teachers guide to vision problems in children. 1979.
2. Convergence Problems. August 1990.
3. Parents Guide to Children's Vision. June 1990.
4. Spectacle Corrections for Children. May 1991.
5. Visual Skills Of Special Importance To Children. March 1990.

Optometric Extension Programme, Santa Ana, California.

1. Educator's Guide To Classroom Vision Problems. 1985.
2. Efficient Vision. Spring 1985.
3. Perspectives On Visual Training. 1987.