Scottish Sensory Centre

Vision for Doing

Assessing Functional Vision of Learners who are Multiply Disabled

Stuart Aitken & Marianna Buultjens

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Acknowledgements

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Preface

The field of multiple disability has come a long way in the past two decades. Happily we have moved on from the time when children and young people were isolated in hospital wards because of their severe disabilities. Now people with similar problems are beginning to be valued in the community. Naturally, as more has been learned, increasing specialism has been necessary amongst the professionals involved in understanding better the world of the learner who is multiply disabled. One natural move in this specialisation has been towards increased recognition of the nature and effects of visual impairment in the presence of additional disabilities.

When we began the research activity on which this book is based, there was little available to offer direction. Fortunately, that position has since changed. Now there are several books and papers which explore some of the issues which can contribute to an improved understanding of the person who is multiply disabled. This book, along with several books and papers written by others, concentrates on understanding better the effects of visual impairment in the presence of multiple disability.

The uniqueness of the present book lies in combining three distinct objectives. First, our principal aim was to help staff who are not specialists in visual impairment in the demanding task of assessing visual functioning. Second, we wanted to make explicit links between assessment findings and suggestions as to what might be carried out with the learner on the basis of these findings. The third characteristic of this book lies in the framework proposed, around which new opportunities in the 'curriculum' may be built.

We believe there is a need for a framework because, coupled with increasing specialisation, has come the emergence of many competing 'therapies' and techniques. The 'Tower of Babel' looms. While recognising the need for assessment materials, we therefore wanted to offer a framework within which to interpret assessment findings. While the reader might want to rush straight into the actual assessment, we would therefore urge caution. We believe it is essential first of all to have some agreement as to general approaches.

You may be thinking that we have omitted to mention parents and families. Our reason for doing so is simple. If parents want to make use of parts of this book then that is fine. We just think parents and families already offer to the child or young person who is multiply disabled a great deal more than is contained in this or any other book.

Stuart Aitken and Marianna Buultjens.

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Use of Terminology

Throughout this book we have used the terms *Impairment*, *Disability* and *Handicap* in a certain way. Our use is in line with that suggested by the World Health Organisationa. Here we set out that use of terminology.

An *impairment* occurs when a condition (such as cerebral palsy) results in some bodily function being affected. Examples of such limitations (not drawn from cerebral palsy!) might include having no teeth, chronic bronchitis or difficulty with seeing. Some of these impairments may, and some may not, result in *disability*, that is, a person's functioning may, as a consequence of the impairment(s), become limited. In the examples we have given above, chronic bronchitis may result in great difficulty walking upstairs; impairment to sight may make it difficult to walk around; impairment to sight and, in the same person, to cognitive functioning, may make it difficult to read letters and words. In common with others, we feel it is important to draw a distinction between these disabilities and the term *handicap*.

A handicap is the result of the person's environment being unable to accommodate his or her disability or disabilities. As a result ther person's social functioning may then be severely limited. It is often easier to change the physical environment - such as installing wheelchair access to buildings - that it is to alter the social environment, involving changing radically society's attitude to disability.

In using the terms *he* and *she* we have aimed to strike a balance, while retaining grammatical and semantic sense. We favour the term *learner* for two reasons. It conveys a reference to people of a wide age range and it suggests ability rather than disability. Where appropriate, we make occasional specific reference to *child(ren)*, *young people* or *adults*.

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foreword

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Foreword

Recently I was visiting a school for children with severe learning difficulties, to meet a child who was described to me as "blind". Jamie was sitting in a wheelchair, facing the window, eyes screwed up against the bright sunlight. He could not move his head out of the sun's rays. Gradually it became clear that he could, in fact, see quite a lot. Through lack of understanding, his teachers and carers had been ignoring his most effective means of learning about the world. The word "blindness" had cast its spell.

Throughout the country there are children and young people whose vision loss is being overlooked or not fully understood, in the face of the other disabilities that are present. There is a great need for clear guidance to their professional staff and carers, to help answer the big quesions: how much can this person see? What can I do to help them make best use of what they have?

Vision for Doing goes a long way towards addressing the needs. It seeks to demystify assessment - to take it out of the hands of 'experts' and place it within the reach of all staff and carers. Use of the simple assessment process outlined here can help all of us arrive at a greater understanding of the young person with whom we are all concerned. It also provides some practical ideas for action. Assessment on its own helps no-one - it must be linked to the process of looking ahead. For Stuart Aitken and Marianna Buultjens, a key part of the process of assessment is the drawing up of 'learning objectives'. No more sterile assessment reports, destined only for feeding cabinets. Throughout Vision for doing there are nuggets of ideas and approaches, hewn from the rich mine of experience of the authors. They have observed examples of good practice around the country, distilled the essence of what can be learned from them, and presented them to us for use within the structure of a sound theory of learning.

The reliance on sound theory is important. In a field where the needs are so great ant the attention has been so little, we are prey to the latest fad. Young people with multiple disabilities can find themselves subjected to a bewildering array of stimuli and experiences, in the cause of innovative teaching, based around apparent success with one child. And most of the ideas involve buying another new device. Without a theoretical understanding and without a way of assessing progress and development in young people, how can we distinguish between the prophet and the charlatan?

Over the years Stuart Aitken and Marianna Buultjens have contributed enormously to the education of countless young people with multiple disabilities. In producing Vision for Doing they have taken this contribution further one great leap. They have provided an accessible and welcoming book which will, I hope, generate a new understanding of the visual needs of many learners. If it also generates other writings, by encouraging the many other excellent practitioners out there to put their ideas on paper, then we will owe them a further debt.

Paul Ennals, Director Education and Leisure, Royal National Institute for the Blind, London, November 1991.

Introduction

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Vision for Doing

Introduction

Who this book is for

This book has been written for all who live or work with children and young people who have a visual disability in the presence of one or more additional disabilities. It offers assistance in assessing and interpreting the effects of visual impairment, where it occurs in the presence of multiple disability. The contents are not medically or clinically based, but rely for the most part on using strategies and materials easily accessible to all. The only essential qualification is a strong motivation to make the living and learning conditions for people with multiple disability more appropriate to their needs.

The presence of dual of multiple disability makes assessment of vision by the usual means more difficult, or - some would argue - impossible. Widely available tests of visual functioning usually expect a certain level of cognitive ability, understanding and use of language. As vision, along with hearing, is one of our main distance senses (and the channel by which, some have estimated, we do about 80% of our learning), it can be a problem for care givers and educators if they are unaware of how well and in what ways a person sees.

Visual disorders may appear in combination with many different types of multiple disability. For instance, a high frequency of eye disorders is present in children and adults who have "mental handicap". (This frequency is so great because there is a close association between development of the eye and the brain. Where damage occurs to the brain during foetal development, vision may also be affected.) As many as 25% of children with hearing impairment may have some form of visual impairment. Evidence exists of visual impairment in 50% of children with cerebral palsy. Unfortunately the effects of these visual disorders often go unrecognised by care givers, medical staff and teachers.

The contents of this book come from both first hand experience and research as well as the experiences that teachers, medical practitioners, instructors, parents, psychologists, therapists and others have shared with us.

The procedures used grew out of many discussions, requests for help and suggestions offered by staff working with children and adults who have multiple disabilities. Conversations varied but they centred around two questions: how much vision did these people have, and what would this sight allow them to do?

Answers to these questions enable the design of appropriate materials and curriculum. We hope to assist those who are not specialists in visual impairment. Moreover we assume no access to specialised equipment. One some occasions, it will be helpful to have assistance from another person. Anyone using this book should be prepared to look carefully at the child or adult and then try to interpret her/his behaviour. Ask questions of your own observations to help build up a sense of the complete picture or that person - the whole person, not just a little part. Working in this way will place you in the role of a problem solver, deciding which methods to try on subsequent occasions.

What lies ahead

Our aim was to provide a procedure which:

- takes into account the continuum of visual impairment from total blindness to presence of visual acuity;
- takes into account the effect or additional physical, sensory or cognitive impairments;
- follows simple strategies of structured and participative observation;
- involves the use of low-cost and easily obtainable materials;
- provides a framework for recording observations over a period of time;
- gives some basic information on how the eyes and vision work;
- offers guidance on applying the findings to planning the learners' curriculum, how it is to be offered and the teaching materials to be used.

As we have said, none of this requires access to specialised equipment. We do recognise, though, that it is useful to know just what the use of specialised equipment might have to offer. We have, therefore, provided additional information which illustrates approaches to assessment and curriculum planning using technology.

Of course, the great cop-out for those who write a set of guidelines is that the authors can then pass over

responsibility to those using that guide (ie you the readers) and ask them to take the initiative. We intend to follow the same line! There will be many occasions - usually where you least expect it - when the child or young person ventures to do something which demonstrates visual potential - when out in the bus, at the swimming pool, being pushed in a wheelchair between rooms or when receiving physiotherapy. Use that information and incorporate in into your assessment. All of these combine together to make up what vision allows us to do. For it is what vision enables us to do that constitutes functional vision - *Vision for Doing*.

Origins of Vision for Doing[1,2,3]

A problem arises

Our research began as the result of following a hunch. We had been involved in a project during 1984/85 which set out to try and discover information in respect of all children with visual impairment living in Scotland. Encompassing children from birth to 19 years of age, throughout the whole of Scotland, the study was interesting not only for what it found but also for what it did not find (Thomson et al 1985).

Responses were given on behalf of 805 children who had visual impairment according to the following definition:

"those children. . . who present problems of educational management as a consequence of visual impairment or handicap and who require special consideration because of this , whatever other difficulties they might have in addition" (Thomson et al, 1985)

Among a few of the many findings of that study, much-needed information emerged on types of schooling, whether there were other members of the family who had visual impairment and causes of visual impairment. There were, nonetheless, some anomalies.

The most important anomaly was the knowledge that there were many children with visual impairment who had not been reported on in the results of that study. Over the combined years of our professionals contact with families, we had known many children who for some reason had not come to the attention of the Edinburgh University study. They had one thing in common: they were not only visually disabled, they had multiple disability. was it our imagination? were these children not after all visually impaired? We decided to find out. This book is the culmination of that search.

Where were the missing children?

We began our search by scrutinising those responses which had been returned in the Edinburgh University study. A pattern began to emerge. Many of the children reported as being multiply disabled had in fact fairly minimal additional impairment. (Later on we will go into a little more detail about what we mean by 'multiply disabled'.) The implication of this finding was even more striking. It meant that children who had complex, profound, severe additional learning difficulties might not be recognised as having visual disability. Or, where visual disability was noticed, little was being done about it (in terms of educational management).

There may well have been apparently simple reasons for children not having been reported. One suggestion made to us frequently went something like this: given the severity of the child's other disabilities, parents might not have felt that the visual impairment was of sufficient note. This, however, begged the question of why they thought this in the first place. Was it to do with the way in which their child's needs were assessed, explained to them, or educational provision prioritised? A more recent analysis has indicated a complex interaction of these factors[4]. Their results demonstrated that explanations offered by the medical profession concerning specific effects of a child's visual impairment are indeed not always satisfactory.

Our research began to take off in several directions. Professionals were invited to respond to a questionnaire, we visited schools offering to make our own assessments of individual children and we looked around for other evidence of this problem.

Questionnaire research

We identified a random sample of 50 children from the Thomson et al study, all of whom had multiple disability. We then contacted each child's ophthalmologist and invited her or him to reply to a short questionnaire. We did the same with the child's psychologist, sending a different questionnaire. We were interested in finding out the processes of assessment and transfer of information between those concerned directly with the identification and assessment of the vision of children who have additional impairments. (We did of course recognise that many others may be involved in this decision making but this fact does not affect our findings.)

The results of the analysis of these questionnaires are presented in detail elsewhere (a reference list is included at the end of the book should you wish to follow this up). In brief, ophthalmologists were found to use measures which were unlikely to provide information specific enough to help in classroom (or home) management. There seemed to be little understanding of the type of information which would be useful to education personnel. There was heavy reliance upon the opinions of others from within the medical profession, most of whom would have had very little, if any, training specific to visual impairment.

Responses from psychologists showed that this group depended upon those same medical sources described above,

with very few having carried out their own assessment of visual functioning. Where such assessments were conducted, these were usually observational. Where formal developmental measures were used, these scales were not designed for use with children who have a visual impairment.

Taken together, the results of these two studies indicated some of the factors likely to lead to an under-reporting of visual disability in these children. Some means were therefore required which would allow identification of the effects of visual impairment for such children.

School visit research

Simultaneously we went to see the 50 children identified through the questionnaires. We carried out our own assessment of the individual child's visual impairment. We talked and listened to school staff in an attempt to discover the nature of the support they received, or would like to have received, from specialists in visual impairment. We noted that we were sometimes the first people to have come to the school with experience in visual impairment.

We looked at school records in an effort to find out what kind of information on the child's visual impairment had been supplied. Where medical information was available, it was usually of a sort that would been of little use to a teacher developing a curriculum to take account of the effects of the visual impairment. We were struck by the extent of the problem. Almost every school we went to asked us to "take a look at these other children while you are here."

None of the parents of children who were 'discovered' in this way had received a questionnaire during the Thomson et al study. This finding did not therefore support the suggestion made to us that complexity of disabilities was the reason parents had not returned the questionnaires: in fact a questionnaire had never been sent to these parents. Nor was it the case that it was lack of awareness of the part of Thomson and his research group. For they had relied on each local authority to distribute parental questionnaires. The conclusion was that the child's visual impairment was either unrecognised or had been downgraded on the priority list of disabilities.

The need for and shape of this book came from those in-service days carried out in schools where we listened and responded to what practitioners really wanted to know. Often this was very different from what we thought they wanted to know. During these sessions we introduced members of staff to thinking about the different roles and functions of vision in daily living and learning and of the implication of visual impairment, especially for a learner whole other senses or faculties are impaired. We also carried out work in a variety of settings dealing with adults, which has led us to modify and develop our thinking.

The many requests from teachers who were not specialists in the field of visual impairment drove us to develop assessment tools for their use which met the following criteria:

- materials used should not depend on specialist equipment, but be easily obtainable;
- these materials should be able to be used by staff who are not specialists in visual impairment;
- results obtained should feed directly into designing the curriculum;
- techniques should revolve around the teacher or care giver trying to understand the learner's world rather than demanding that the learner understand abstract concepts;
- the use of materials should be structured around trying to understand the effects of visual impairments in conjunction with other impairments.

Findings of other researchers

The aforementioned Thomson et al (1985) survey found that 32% of returns were in respect of children with additional impairments. Figures for the year 1985 from Sweden showed that 55% of visually impaired or blind children, aged from birth to 7 years, were identified as having additional impairments (TRC 1985). A significant different was therefore demonstrated between Sweden and Scotland.

Results of other studies by such as Warburg et al (1979)[5] and Ellis[6] would lead one to expect a high prevalence of visual impairment, given greater frequency and severity of other impairments.

The study by Thomson and his co-workers found that children with more severe additional or multiple impairments were located in schools for the blind. Their data, for those children who were placed outwith schools for the blind, presented a picture of children with minor or moderate additional physical disabilities. We were forced to the conclusion that a number of children, located in schools for the more severely disabled, had visual disability - the effects of which were going unrecognised.

Finding the missing children

It was a relatively simple matter to find these children. One means at our disposal was to look at those schools in which the expected frequency of children with visual impairment was greater than the reported frequency. A sample of 3 schools was then selected, for which the reported figure of children with a visual impairment was lower than this expected figure. Tow out of these 3 schools were receiving no support from a visiting teacher specialising in visual impairment. The third school received a visit once per term.

An indication of the extent of the problem was that at one of these schools, with a role of 90 pupils aged up to 18

years, over 30 of the pupils had visual impairment.

Of course, it is only worthwhile to identify a learner's visual impairment when there is something positive which might be expected to emerge out of that identification. There have to be implications for educational management. If, after assessment, no implications arise for those working with the learner, the process of identification would simply be a waste of resources and could rightly be criticised as unethical. For most of the children we identified, our results and suggestions were indeed directly applicable to consideration of the curriculum being offered. For some the results led to questioning the whole structure of approach to learning. Our approach demonstrated that for these learners the result of assessment could lead to specific changes in the curriculum offered.

Layout of the book

Vision for Doing is essentially laid out in 3 large sections. Figure 1 presents in diagram form the ways in which you might like to make use of the book. It acts as a kind of conceptual map.

Using the Book

The text comes in two main forms. The main text is what you are reading right now. Peppered liberally throughout the book there are notes in a smaller size of type. These come in the third column of a page and give you a chance to follow up information in more detail. here you will find items for further reading, detailed descriptions of areas of specific interest and technical points. It is up to you to decide whether you want to read these, omit them entirely or come back to them another time.

Part One

"Laying the Foundations"

Part One does not launch straight into a description of what to do in your assessment. We believe this would be premature and that some groundwork is first needed. We hold certain beliefs as to the meaning of assessment, as to what should frame the general approach to working with those who are multiply disabled and as to how to make an assessment procedure manageable. We would like to share these with you. Without such an appreciation we feel that any specific approach to the assessment of vision would be impoverished. (For some readers the story will be familiar but will, we hope, serve to orient that readership.)

Chapter 1

Assessment and functional vision

Here we offer what we understand by the terms Assessment and Functional vision.

Chapter 2

Thinking about the learner (cycle of assessment)

Here we discuss in more detail those features of the individual learner and her or his environment which have to be taken into account in the process of assessment.

Chapter 3

Making sense of multiple disability - a strategy

In this chapter we outline a way of integrating the results of assessment. This helps in the design of a curriculum appropriate to the learner.

Chapter 4

Working principles (ten commandments)

Chapter 4 offers the reader certain principles we called "commandments" - which we believe should be considered in all work with young people who have multiple disability. These are principles which we seek to promote throughout the remainder of the book. We believe the principles proposed should concern not just those who want to assess the sight of learners with multiple disability. We see them as being of central concern to all those who are motivated to engage in working with people with multiple disabilities.

Part Two

"Carrying out the Assessment"

Having set out building blocks in Part One, we turn to the second major component of the book. In Part 2 there are 3 chapters each with a number of sections. These are concerned with suggesting ways of assessing the learner's

vision, helping to make sense of the results and in offering techniques for curriculum development (note that we are using the work "curriculum" in its widest sense - to refer to all opportunities for learning that may be offered). Part 2 is intended as an interactive aid through which findings in one section might be linked with observations from another in order to formulate new methods or refine existing practices.

Chapter 5

Starting the assessment

Three sections deal with:

- biographical description of The Learner;
- collation of Background Information obtainable from a variety of sources as well as giving space to include details such as visual acuity (don't worry if you have not met this term before, or if no details are available);
- Observing the Learner - to obtain a few general observations.

Chapter 6
The Other Senses

Perhaps unexpectedly we move on to invite you to observe how the learner responds to events experienced other than through sight. This is dealt with in four sections

Chapter 7
Assessing Vision for Doing

The sections of this chapter form the bulk of the book. Together these provide a guide to the situations and activities during which observations can be made of whether, and how, a person is functioning visually. Most of the materials used are to be found in any school, centre or indeed in the kitchen at home! We progress from situations and activities which indicate whether a learner has light perception through to the stage where a more formal assessment of visual acuity might be undertaken. At this stage we refer you to other sources. Explanations are given on what to observe and how to do this, as well as how to use the materials suggested.

Part Three

"Topics Revisited"

We conclude with a series of short essays expanding on topics which are mentioned briefly in the main text.

Figure 1 conceptual map of vision for doing

Part One Laying the foundations

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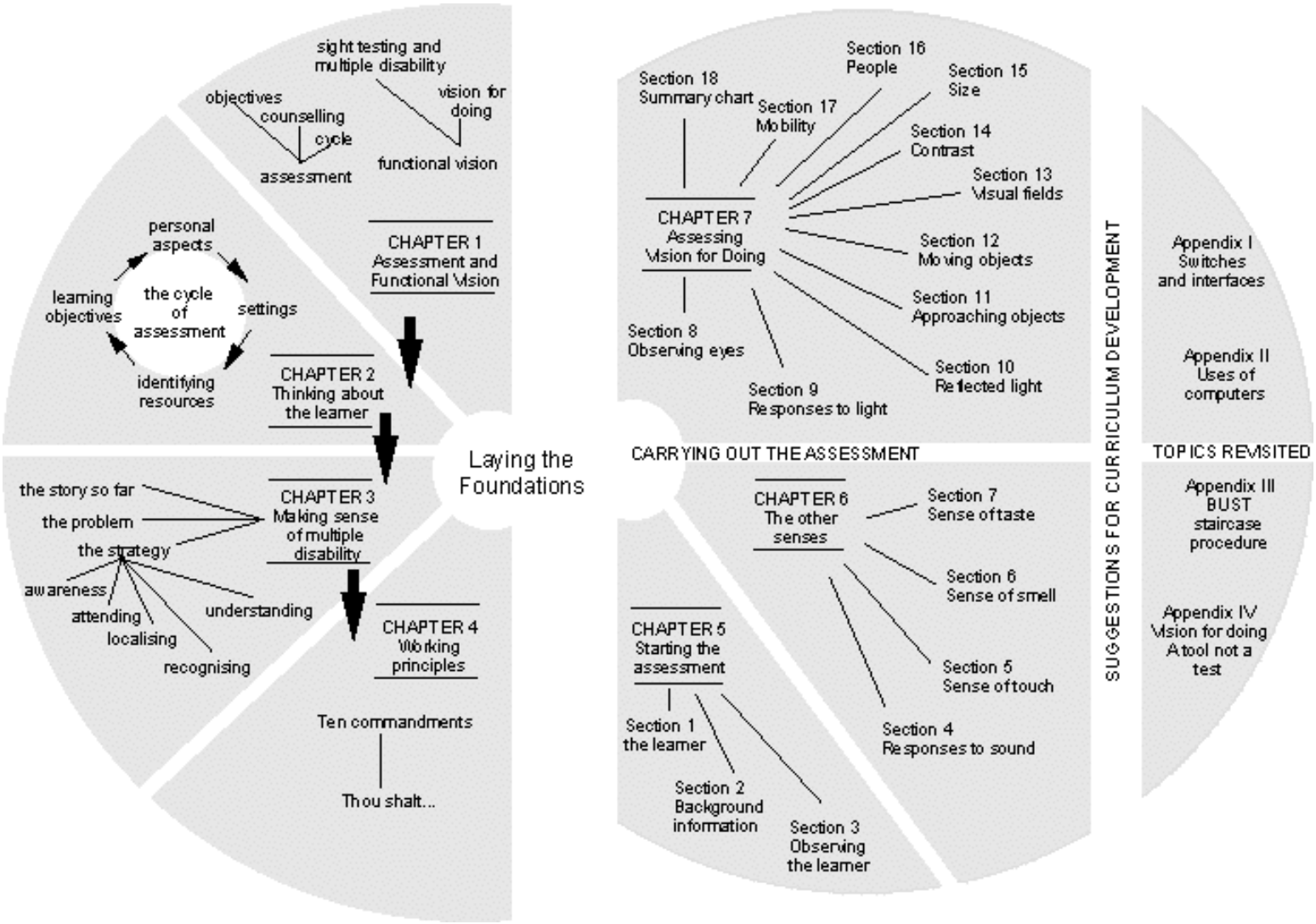
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Vision for Doing

PART ONE: LAYING THE FOUNDATIONS

CHAPTER 1: ASSESSMENT AND FUNCTIONAL VISION

In this chapter we cover two areas. In the first section, we present our use of the term Assessment. In the process we outline what we believe to be a different and widely acceptable basis on which to carry out assessment.

Having adopted this broad view of assessment, the second part of the chapter discusses what this assessment might be directed to: that is Functional Vision; the main theme of Vision for Doing

What is assessment?

In the 1970's Edward de Bono, among others, became famous by asking people to think of as many uses as they possibly could for objects such as a brick, or a shoelace. The more uses a person could think up, the more able that person was to think laterally, or divergently. Those who were only able to think of very few uses for a brick were deemed convergent thinkers. Readers of the many books on this subject were then able to decide for themselves whether they were lateral or divergent thinkers.

Perhaps you would like to indulge in a spot of lateral thinking? We will not ask you to imagine uses for a brick. Try instead to think of as many different uses of the term 'Assessment' before consulting table 1.1.

Uses of 'Assessment'	Examples
Macro-level Political	• Soviet prisoners • IQ testing at Ellis Island
Stigmatising	• Genetic basis of IQ in Negroid populations
Aid to planning	• General household survey • Surveying and screening • Self-assessment
Describe changes in population	• Census
Micro-level End in itself	• Crutch to professionals or parents
Means to and end	• Indirect assessment of school staff by assessment of pupils • Ascertaining school placement • Offering practical guidelines for introducing change • Determining whether to try to restore function or compensate for loss of function

Table 1.1 Different Interpretations of the term 'Assessment'

Table 1.1 presents information on the bases of whether the form of Assessment occurs at a society or population level (macro-level) versus at the level of the individual (the micro-level). Of course in reality there is no such hard distinction. There is much overlap. However, it shows indicate that there are good reasons for regarding assessment as being of potential benefit as well as a possible instrument of social control; witness the terrible events of the Soviet Gulags[1] and, in the West, the debacle of immigration at Ellis Island, New York in the 1920's[2].

One can see why it is that in some realms, it has become fashionable to knock the whole idea of assessment. Nor is it difficult to see why some people have come to reject the possibility of assessment as being a 'good thing'.

Objectives of assessment

Assessment does not for us construe an evaluation of the learner; it also does not happen at any one time; and it should not leave out a contribution to understanding which areas of the learner's curriculum could be usefully explored; and how. For our purposes and as a working definition we will be interested in the use of assessment to offer practical information in order to help bring about beneficial change.

'Assessment' is a word familiar to the parents of children with special educational needs. It may well conjure up memories of long hours spent telling the familiar story of the birth and early years of life of their child and answering innumerable questions about what he or she can or cannot do. Most people cooperate willingly as it is hoped that from this process will come some means to help their child progress or to find the right school for her/his needs.

In other words, as shown in Table 1.1 at the beginning of this chapter, assessment can be a means to an end, not an end in itself. However, this may not always be clear especially when assessment procedures do not result in much practical information or help for parents or teachers. This may often seem to be the case when vision is being assessed, if the child or young person is unable to cooperate or respond verbally in the assessment situation.

If for instance glasses or magnifiers were provided as the result of an eye test, at least that would be a concrete outcome of the process. However, the outcome of even a long series of tests can be inconclusive and often difficult to understand. If the implications of the findings cannot be translated into practical guidance for day to day living, then everyone can be left with a feeling of dissatisfaction. Some of the reasons for this disappointing state of affairs include the following; you could probably add some to the list yourself:

- the person being assessed was frightened by strange surroundings or unfamiliar people;
- the person's other disabilities were not taken into account and the methods used might therefore have been inappropriate;
- people carrying out the assessment were not familiar with the child's home environment or school curriculum.

What can we learn from this? At least three things:

- a learner will respond best in familiar surroundings and with known, trusted people;
- some days the response will be better than others and there may be changes over time due to maturation, so it is important to see assessment as an ongoing process;
- it is important to use all the other information that is already available so all those who know the child should contribute, parents and professionals.

Table 1.2 presents some of the reasons for assessment going wrong. As you look at the table, think of any situations in which you have experienced such obstacles to assessment.

Unfamiliar surroundings
Unfamiliar people
Focus on one impairment or disability
Focus on one skill or learning objective
Focus on one environment or setting
Lack of communication between professionals
Lack of communicaion with parents/carers
Fixed dates for assessment
Inflexible fixation on standardised materials
Unwillingness to use standardised materials
Lack of confidence - of assessor or learner
Too busy doing other things - not making time

Table 1.2 Possible obstacles to assessment

Assessment as counselling?

As the result of a series of national disasters, such as Piper Alpha and the Lockerbie air crash, as well as media attention in cases of child abuse, public awareness of the term 'counselling' has grown. We would like to propose that you begin to regard assessment as having many similarities to the ways in which a skilled counsellor might work. We offer the following analogy to help understand our view of good assessment.

In the realm of counselling this analogy is itself sometimes employed to give the flavour of what the counselling process is about. Imagine therefore a person looking out of a window. Your job is to help the person to see what is outside the window. **How might you do this?**

Figure 1.1 identifies three ways of helping the person to see what is outside the window

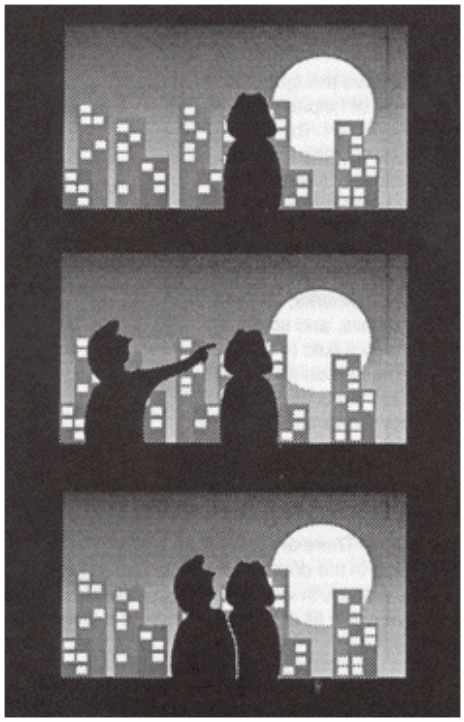


Figure 1.1a Leaving the person alone
Figure 1.1b Directing the person
Figure 1.1c Sharing perspectives

In Figure 1.1(a) we have the first type of help that could be offered to the person looking out of the window. This would simply be to leave them alone, otherwise you might well be interfering. But what if the person has come to you for help? They want to be helped to see more clearly out of that window.

In the process of assessment, this way of helping is represented by not conducting any form of assessment. This is an approach much favoured within the field of multiple disability; so far as vision is concerned. This was one of the reasons we carried out the work which led to this book.

You might have thought of a second type of help to offer, as seen in Figure 1.1(b). This would be to help the person by describing or relating what is out there, beyond the window. You might do this by turning the person's body in a specific direction, perhaps pointing out disctinctive landmarks, filling all of the details, and so on. In doing so, you would in effect by directing the person as to what to see. This too is not counselling. It represents one form of helping, but it is not counselling.

Nor is it like what we call assessment. There are plenty of examples in the domain of multiple disability, in which being directive is all and giving opportunity is forgotten. In fact we see this whole area as being of such importance that we devote one of our central working principles to this subject (see Chapter 4).

We hope that you would then try out an altogether different way of helping that person to see out of the window (as shown in Figure 1.1(c). You could try to share that person's frame of reference, to see out of that window but not just what they see, but how they see it. In doing so, you would be trying to understand that person's world from his or her own perspective. The previous two frames of reference are quite unlike the share perspective of this third view.

Counsellors strive very hard to take the frame of reference of the client. As far as possible, they will perceive the situations, people and events as perceived by that client. In this way, they probe for paths of change that will be meaningful to the client. In remaining the problem of the client, any change that happens stems rom within the clients. He or she **discovers** the right path or paths in his or her world of people and events. Those being counselled are neither left to fed for themselves, nor are they instructed as to how to solve their problems.

It is this shared perspective we are aiming for when we attempt an answer to the question of how in our own work good practice will bear fruit.

While we coud develop these issues in much greater depth, we wish in this book merely to get across that there are salient differences in the style with which we think assessment should be carried out and why it is a good thing to do. In fact we view it as an activity that is indispensable. Assessment is not therefore one activity to be done at one time of the day. Instead it should be present in everything we do. For it is simply the means of trying to comprehend better how a learner with multiple disability comes to understand his or her own world. Through that improved understanding we come to develop methods for offering to the child other aspects of her world.

Often those who work with learners who have multiple impairment believe that assessment materials offer no gain to them. They feel that what is important is to be able to 'get to know the person'. In many ways this is true. However, if we were to agree that this is all there is to assessment, then there would be little point to producing this book. It is no bad thing to retain in a scheme of assessment the richness that is contributed by 'getting to know the child (or young person)'. At the same time, a book like this can help to frame questions, to suggest a few activities. After reading the book, it will still be you who will know the learner's ways best of all. The longer you spend trying to understand the

learner's frame of reference on the world, and the more questions you pose, the more aware you will become of that specific learner's motivation, interests, and awareness of people, places, objects and events in the world.

The analogy of counselling takes us some of the way, identifying the general nature of the process involved. Nevertheless we need to be more specific as to just what is expected of the process of assessment. Counselling would have a pretty flimsy basis if it depended solely on our imaginary window on the world. So too would assessment.

The cycle of assessment

Assessment does not occur just at one level. Instead there are many different levels at which assesment could be carried out. Also rather than occurring at distinctly different levels, these levels tend to interact. So a visit to the doctor or a biochemical investigation has an effect on the child, parents and thereby possibly on a teacher.

Structuring out approach enables us to go beyond guesswork. By observice a learner's responses we establish a base-line or starting point. From this starting point we can plan the learning experiences and strategies accordingly. We can also review, or re-assess and record any subsequent changes in functioning.

We would like to propose that the process of assessment be considered in terms of a cyclical process. Within each step, you attempt to understand the world from the point of the learner. The cycle of assessment can then be thought of in terms of four broad steps or stages. Figure 1.2 depicts each of the four stages.

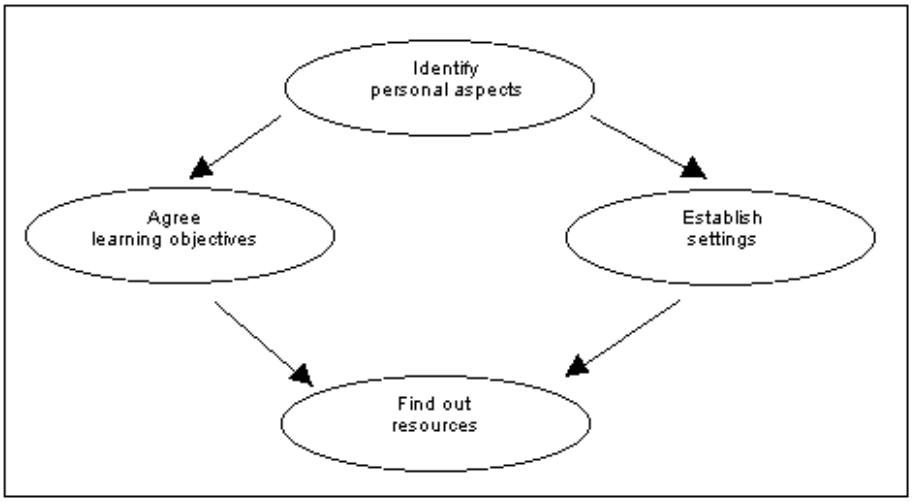


Figure 1.2 Cycle of assessment

Usually you would begin by identiyfing the Personal Aspects of a learner. Having done so, it should be useful to formulate these in terms of the different Settings or contexts experienced by the learner. Without some knowledge of the Resources at your disposal, it could be difficult to set specific Learning Objectives, or new activities. In the next Chapter we will be returning to the **Cycle of Assessment**, and considering each of these steps in greater detail. First we reflect on *Vision for Doing*, our topic in the second half of this chapter.

What is *Vision for Doing*?

Background

By Vision for Doing we mean any remaining sight, no matter how little, by means of which the learner can add to his experience, enjoyment and learning about the world. This includes sight which is so poor as to enable the person to tell only light from darkness.

Many parents, educators and carers have been misled by the description "This child is blind". They have taken it to mean that the child lives in a world of darkness. There is then no point in trying to make the learning environment visually interesting, for it will not be seen. This belief is somewhat misleading. Very few people who are described medically as blind are totally without vision.

Table 1.3 lists a few types of blindness. Some are associated with poverty and lack of public health measures; others are associated with industrialised countries. If you are interested in finding out more about these conditions, refer to the Glossary section at the end of the book.

Definition
Cataract
Retinitis pigmentosa
Optic nerve hypoplasia
Diabetes
Retinopathy of prematurity (RLF)
Xerophthalmia (Vitamin A deficiency)
Trachoma
Cortical visual impairment
Leber's amaurosis
Macular degeneration

Table 1.3 Causes of blindness

It is true to say that it is the legal definition of 'blindness' which determines a person's status; rights to certain benefits; the possibility of being labelled; and rights to specialised equipment at discounted rates. The legal definition of blindness varies from country to country. In fact in 1966 the World Health Organisation documented the then known definitions. There were 65 different definitions! In the USA alone there were 16 different definitions for blindness (Goldstein, 1980).

Only about 5% of the total population of people who are considered blind or visually impaired are in fact totally blind. Any children or young people stated as being blind or visually impaired whom you meet are therefore likely to have some vision available. It is for this reason that it is so useful to try to determine how much a learner can see, the best position in which they see and the optimum location for presenting materials and activities. For instance, for registration purposes a definition of blindness may be that the person does not have enough vision to do a job for which sight is essential. This in no way rules out the presence of useful sight.

Vision for doing

What we mean by *Vision for Doing* is just this sort of functional description. Its investigation is concerned with the objects, events and places in the world. In this book we do not devote much space to dealing with the effects of total blindness. The book is after all a schedule for working with learners who may have some residual vision - useful remaining sight. The implications drawn are for the most part directed to those areas of curricular development for learners who have some, albeit very limited, vision.

Our visual world

The first task of vision is to make us aware of our environment. Sight allows babies to develop precise reaching and to recognise and interact with important care givers. It helps us in walking and running both indoors and out. Through this sense we become increasingly aware of our surroundings. Objects can begin to take on new meanings.

It tells us how objects are related to each other in space - whether in front or behind; moving or stationary; near or far; above or below. Vision also provides us with information usually associated in our minds with other senses. Not only touch tells us whether an object is rough or smooth: vision also detects textural changes. Vision is important for mobility giving us guidance indoors and outdoors, and informing us whether we are moving in relation to our environment, or the environment in relation to ourselves.

Vision for detail

We use our sight for **detailed** information. This kind of vision lets us see the finer grain of objects, pictures, people, letters and symbols. As we need to identify symbols in order to be able to read and write normally, it follows that any impairment of this 'sight for detail' will affect abilities in reading and writing. You will already be familiar with testing or assessment of this detailed vision. This testing gives a measure of **visual acuity**.

We learn to interpret pictures, do jigsaw puzzles, look at television and to read. Our visual world is complex, varying along several dimensions, eg; figures/ground; surface/edge; movement of self/movement of objects in the world; hard/soft; near/far; big/small; changes in perspective; changes in colour.

Some specific functions

In order to detect this complexity in our visual world, our visual system provides information on a large part of one's surroundings (**field of vision**); distinguishes details (**visual acuity**); detects the difference between relative brightness of different surfaces (**contrast sensitivity**); contributes to judging distance (**binocular co-ordination**); allows us to see in poor light (**darkness adaptation**); and to (quickly) accustomise to strong light (**light adaptation**); helps us distinguish between different shades of colour (**colour vision**); *(reprinted with author's permission from 'How Well Does a Child See? Eva Lindstedt*).

Visual impairment

Unfortunately impairment may occur to any one or more of these visual abilities. These impairments may for the otherwise able-bodied child not only produce a distorted sense of visual surroundings, but can also switch off any interest in these surroundings. For those with multiple impairment, the job of seeing becomes even harder. The fun can be completely removed from the activity of seeing. The child with learning difficulties will be uninterested in shape sorting or matching tasks if, because of poor sight, all shapes beyond a certain distance appear as circles. The child with a hearing impairment will have less to communicate if she cannot take note of important visual cues in communication - missing as she does the pointing, facial expressions or eye movements of potential partners in communication. For the learner with multiple disability those additional disabilities can make the impairment of sight present disproportionately greater difficulties.

Sight testing and multiple disability

As we mentioned in the Introduction to this book, the authors investigated established practice in the visual assessment of learners who were multiply disabled. Our findings included the discovery of a range of assessment techniques used, along with the frequency of their usage. These are presented in Table 1.4.

For most of the children who were involved in our study, these techniques would furnish little information that would be of relevance to curricular planning. In fact many of them could, if used, lead to highly ambiguous results. To understand why this is so for each and every technique would be beyond the scope of this book. However, to illustrate we will use two examples drawn from Table 1.4. The first example deals with **Electrical Testing**. The second example is concerned with a relatively new clinical procedure, **Fixation Preference**.

Electrical testing

How it works

You may have come across the use of electrical testing. If so you may know it as VER or VEP (Visually Evoked Response or Potential); ERG (Electroretinogram); or EOG (Electro Oculo Graph). Each is used for a different purpose. Ophthalomologists have made frequent use of this form of testing (as there is more than one form of electrical testing for vision, it is more accurate to say these forms, however as we are only touching on this subject, we will use the simplified singular term for convenience). To carry out the test, electrodes are placed in one of a variety of combinations of sites around the child's head and eyes. The procedure is not painful. Various stimuli are then presented usually on a TV monitor and, so the theory goes, if the eyes and/or brain are working, an electrical potential should be recorded.

Electrical testing can be an extremely useful procedure, resulting in early diagnosis of **Retinitis Pigmentosa** or **Cortical Blindness** (see Glossary section at the end for further explanation of these terms), among other benefits. It can also be misleading. There have been many cases of learners with useful vision being recorded as totally blind. Vice-versa, there have been cases of electrical potentials being recorded, but the child being functionally blind. Both the authors have seen many cases of the former, and a couple of the latter. Why should this be so? Surely such a measure - using sophisticated technology - should be more objective? Unfortunately - and not for the first time in modern bio-medicine - one cannot draw a clear comparison between the technological sophistication of a test and its validity or accuracy.

What goes wrong?

In using recorded potentials, comparison is made with an average. This is then used to provide an arbitrary cut-off point, below which blindness is designated. This should sound familiar to the reader. In essence this is the same situation as with the definition of blindness. We indicated that a relatively arbitrary cut-off point was used to define legal blindness. The same is true for electrical testing.

Many other medical tests demonstrate similar problems. You may well be familiar with these from the field of medicine. For instance, the diagnosis of diabetes is based on an **average** blood sugar level. But there can be variation from this average, without the person showing any clinical sign or symptom of diabetes. Definitions of normal versus abnormal are long way from being as clear-cut as many would like to have us believe. This is one of the central problems in the area of medical screening (or more accurately called surveillance).

You may of course argue that it surely does not matter if a test happens to return false negatives or false positives. Provided the child is seen to have visual functioning, then surely everything should proceed as appropriate. But there at least two reasons for needing more accurate information on visual functioning.

One of the findings in the study which led to this book being written was that electrical testing was frequently used as a test of second resort (see Table 1.4. below). Where the most frequently used test was found not to be helpful, then electrical testing tended to be the next technique to be tried. Apparently, it was felt that electrical testing was regarded as more accurate than anything else. The only reason for it not to have been used in every case was one of cost. In other words, the inherent problems of electrical testing were not being recognised.

Measure	Frequency	Measure	Frequency
Electrical			
• VER	9	Visual fields	2
• ERG	8	Cover test	2
Sheridan-Gardiner	16	Functional measures	3
Catford Drum	11	• observation	3
Stycar balls	9	• tracking	2
Snellen	7	• reaching	1
Beale-Collins	7	• 3D	1
Refraction	6		
Ffooke's	5	Ask parents	1
Optokinetic nyst.	5	Sonksen pictures	1
'E' test	3	City	1
Preferential fixation	2	Guy's	1
100s/1000s	2	Ishihara	1
Landholdt	1	Contrast sensitivity	1
Guy's 7-letter	1	Others	2

Table 1.4 Methods reported in testing vision of children with additional disabilities

The second problem with electrical testing lies in the fact that it is often seen as being most useful when applied to babies and to older children who have multiple disability. When told that their baby is blind, parents often feel that there is little point in trying to encourage the use of vision. After all, what is the point in stimulating something that is not there? When applied to the learner who is multiply disabled, this problem is accentuated. As will be seen in later chapters, this is not always a valid assumption to make. Where even very limited vision is found to exist, there are many techniques to harness use of that vision to increase the availability of the learner's potential world.

Fixation preference

This is our second example of a tool used to assess the vision of individuals who are multiply disabled (see Table 1.4 above). Use of the technique of Fixation Preference (or FP as we shall call it) has burgeoned over the past 10 to 15 years, providing a fertile source of research for those interested in the development of vision in babies. What began as a research tool, for psychologists studying the events in which young babies were interested, has moved on to take its place in the clinics of many ophthalmologists who routinely test the vision of children. Its use with those who are multiply disabled is also increasing.

How it works

FP is a measure of the ability of the eyes to resolve detail. It does not require language abilities, nor ability to point, nor that the testee be able to follow instructions - hence its value to those wishing to test the sight of infants and people with multiple disability.

Figure 1.3. shows a rough approximation to the stimuli presented to the person being tested. There is a striped target stimulus like a set of gratings, and a second blank stimulus. Usually, the target is presented as a series of vertical black stripes, the narrower and closer together the stripes, the greater the acuity required to resolve them apart. Equidistant from the midline at the same height, same size and shape as the target stimulus, a second target is presented. This target is blank. (Actually it is not quite blank. It has an overall grey value that is identical to the average greyness of the black/white striped gratings of the first target.) This comparison is needed so as to be more certain that, if the child looks at (*fixates*) the first target, it is due to ability to resolve detail and not to detecting brightness differences. By averaging the black/white of Target 1, with the same average grey value of Target 2, the tester can be more certain she is checking acuity. The pattern of the target stimulus is *preferred* to that of the 'blank' stimulus.

As the width of the gratings gets narrower, the two stimuli become indistinguishable. Those with poorer vision will find it less easy to distinguish the gratings than those with good sight. By grading the width of the stripes or gratings, this can be used as a tool in place of the eye chart which will be familiar to most readers. These gradings are then represented on individual large cards (often known as Teller cards)[3].

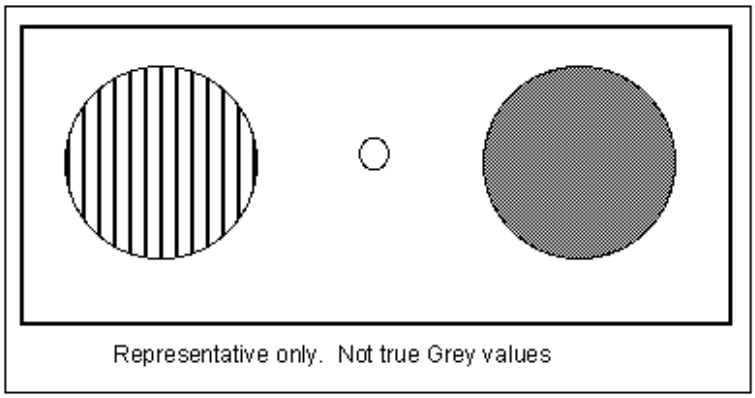


Figure 1.3 Preferential fixation - Teller cards

As it is difficult for manufacturers to achieve just the right average values of luminance, these are fairly expensive as tools for assessment. Nonetheless they have become widely used instruments in infancy research - so much so that more than one respected researcher has questioned whether 'infant vision is disappearing down the gratings'.

Nowadays, FP mostly makes use of Teller cards. These are very portable, can be positioned near to the child and at any angle, thereby coping with the unusual positions often taken up by children who are multiply disabled.

What goes wrong?

It is only in more recent times that fixation preference as a technique has come into greater use within clinical practice. Nevertheless, consideration needs to be given to some of the issues raised by its use. First, in common with other measures of visual acuity, it shares a problem of interpretation. One of the principal reasons behind us being driven to offer assessment of functional vision was, as we have said, a lack of information on implications to be drawn from standard measures of acuity. FP suffers from the same problem. If we find that a learner who is multiply disabled looks at gratings which are equivalent to a visual acuity of 3/60, then we still have to work out what to do with that child. If we also have direct behavioural measures we are a step forward in setting learning objectives[4].

A story may illustrate a second type of problem. One of the authors was visiting a centre of excellence in Scandinavia, where they made use of FP. A girl of 14 years who was severely multiply disabled was being tested, accompanied by the specialist teacher for visually impaired and the girl's mother. Two very experienced FP testers were in attendance (a reliability check on the test can then be made on the spot). After repeated Teller card presentations, the testers gave up, saying that they thought the girl might be able to see light, but no more.

Meanwhile the girl's teacher and the author, both of whom were out of sight of the girl, exchanged glances. We had both realised immediately that the girl was attempting to communicate through eye pointing. To do so, she had to avoid both grating and grey square. It transpired that the girl had a fairly complex eye coding system established. The moral of this story is that there is no point in testing the sight of multiply disabled people by itself. What is interesting is to test *Vision for Doing*.

Aside from these difficulties in use of FP, there are one or two practical problems. If there is muscle imbalance or squint present, it may be hard to decide to which side a child is fixating. Nevertheless, FP may often be a very useful technique, one of the easiest to carry out, though, as we have seen, not without difficulties in interpretation.

Summary

In this chapter we covered issues which deal with assessment, allowing us to move on to an analysis of how this relates to functional vision or Vision for Doing'. We discovered that there are grounds for those who are suspicious of the term 'assessment', it having had a rather chequered history.

An understanding which began by taking as a metaphor the process of counselling helped to demonstrate that there was a real contribution to be made by 'assessment'. We elaborated on this by introducing the notion of this process of assessment as being in the nature of a cyclical set of stages or steps. Not surprisingly this is a topic to which we will return, as the subject matter of the next chapter.

In the second half of this chapter, we began to look at the question "What are we to assess?". We found that vision allows us to perform many functions in the world. For the learner who is multiply disabled, visual impairment can accentuate greatly the difficulties of finding out about that world. When examined, the nature of standard test instruments were found wanting when applied to the learner with multiple disabilities.

In the next chapter, we take up our metaphor drawn from counselling. This time the frame of reference we try to take happens to be your own. We offer what we think will be ways by which you probably already try to understand your learner with multiple disability.

Chapter 2

front page

Vision for Doing

Chapter 2

THINKING ABOUT THE LEARNER

Before going on to discuss how we think it is best to approach your work with learners who have multiple disability, it might be profitable to spend some time thinking about how you may already bring together your information about a learner. What would you want to know? What would form your assessment questions?

In setting out our ideas, we admit to having had to examine closely our own partiality, if not bias. We then tried to adopt what might be a terminology that we hoped would be, if not common to the reader, at least familiar. We were anxious to avoid the possibility of misunderstanding. In fact we try to enter your own world, to share your frame of reference, a theme we discussed in the previous chapter.

Setting the scene

Think for a moment about a young person you know who is multiply disabled. Now try to answer this question.

In what ways did you think of that young person ?

You might have answered in one of the following ways:-

- by thinking of his or her name;
- by whether or not you warm to this person;
- by how he or she communicates;
- by details of the person's particular set of impairments

Sooner or later, if pressed hard enough, you would no doubt have begun to describe your chosen person along the lines of certain characteristics or *personal aspects* of that young person, eg; how she perceives the world, what she understands about her world, how she acts in the world, how she communicates with people and other animate things in the world (and they with her). In the same vein, you might have been interested in looking at what holds her interest; as well as how all of these different characteristics unfolded in her own personal lifetime.

In addition to these *personal aspects* you may well have given some consideration to those different *settings* in which your chosen learner can be found whether at home, school, hostel, day centre and so on. You could no doubt think of ways in which the learner seemed to differ across these *settings*.

Each of these different *settings* would be likely to be associated with different opportunities. Making best use of these requires also an analysis of the *resources* at your disposal. These could cover human support resources, equipment resources and perhaps written reports.

Suppose then you had come this far. Now you want to try out some new activity with the young person who has multiple disability. Having taken into consideration all of the above *personal aspects*, *settings*, and *resources*, you would be in a strong position to give some thought to what you wanted to try to do and how you wanted to bring this about. We could reasonably call this a stage of working out *learning objectives*.

The *personal aspects, settings, resources* and *learning objectives* available will all interrelate. Each represents a characteristic to do with that learner. Each is potentially a part of the process of assessment. It is therefore helpful if we look in a little more detail at what we mean by *personal aspects, environments* or *settings*, what constitutes *resources*, and *learning objectives*.

We begin by taking a look at the characteristics which comprise *personal aspects* of the learner.

Personal aspects

A few years ago people began to reject what was termed a "medical model" of assessing children's needs. It was felt that children were being labelled, categorised as being 'physically handicapped' or whatever. Although this rejection was in many ways justified, its outcome has been for the 'baby to have been thrown out with the bath water'. Now, it is not uncommon to hear of professionals refuting any need for understanding of the particular nature and effects of a young person's disability.

By including other factors such as *settings* and *resources* within the assessment, we hope to focus on factors other than these 'within the learner" aspects. We would like this process to be thought of as one of "*diagnostic teaching*". In this view there is an essential place for improving our understanding of personal aspects. What then are these personal aspects? As this book is about vision, a good starting point would be to consider those personal aspects which are involved in receiving information through the senses.

Information through the senses

When thinking of which characteristics of the learner you would want to know more about, at some point you would probably consider how well she detects information on the events, objects and places in her world. She does this by the information picked up through light, sound, pressure, and chemical information. We normally refer to this as using the senses: of sight, hearing, touch, smell and taste. (Some would want to include proprioception[1] here, but its exclusion does not affect our discussion). Figure 2.1. shows the relationship between the information and the sensory channel which is 'tuned into' that information. The different lengths of the boxes indicate how much more 'information' is conveyed through vision when compared with other senses. The learner therefore detects information about events, objects and places in the world through these channels. Through each of the channels or sensory modalities the learner comes, to a greater or lesser degree, to understand the world.

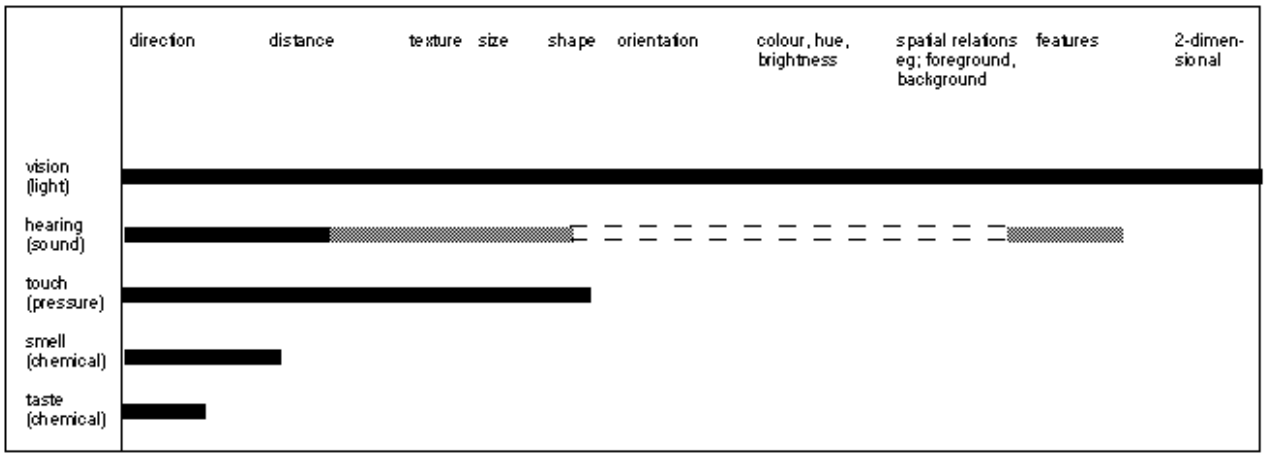


Figure 2.1 The amount of information carried by each sense

Appropriately, we begin with a list of the kind of things vision allows us to do - its functions. This would be expected to include giving information:-

- where an event occurs;
- how far away;
- foreground v background;
- size of object(s);
- whether moving or stationary;
- features that distinguish one object from others.

We are deliberately restricting the potential list of functions of vision. (In the previous chapter, we fleshed out in more detail these functions of vision). We have set out the above selection merely to emphasise that impairment to sight alone could affect one or more of these functions. But what about impairment to hearing, to touch, to taste and to the sense of smell?

For each of these other potential channels of information about the world, a creditable list could readily be determined. Each list would represent ways for us to gain better under standing of that learner's capacity to hear, to touch, to smell and to taste. In doing so we would soon come across two major problems.

One problem would lie in the sheer size of the emergent tome. You, the reader, would baulk at being asked to wade through such a task.

The second problem would be one of interpretation. Was failure on Item X due to difficulties with sight or with hearing, or what?

We therefore need to have some shorthand method for describing a learner's ability to detect information through each sensory channel. From this description, we will improve our understanding of how sight is used by the learner.

Learning, knowing and remembering about the world

In order for a learner to make links between information about the world (through the senses) and his or her own movements (acting on the world), there also needs to be some way for a learner to make these associations - that is he or she needs to be able to learn. You may already think about these as the cognitive abilities of the child. These could include:-

- how well a person learns
- whether and how she attends to what goes on around her
- how good her memory is.

Each of these could be broken down still further, in the same way as we indicated in the previous section. You might therefore want to follow up with questions that:-

- investigate a child's *memory* for events, or facts, or faces, for layouts of buildings, for abstract versus concrete nouns and many other areas;
- explore how well a child represents sights or sounds in his world - that is whether and how well these are stored in memory;
- look to see how well an adult integrates information through sound and sight, through sound and touch, or through sight and touch;
- consider how much a child can understand about events, objects and places in the world.

As with *Information through the Senses* of course, impairment to any of these and other functions associated with *Learning, Knowing* and *Remembering* may well result in disability.

A familiar pattern is beginning to emerge. For any reasonable description to be given of an individual learner's abilities, a vast number of questions would have to be asked. And impairment to the ability to learn, think and remember will clearly have a significant effect on how a person interprets information coming through the senses.

We must avoid confusing a possible sensory cause for some lack of response with a cause based on impairment to learning, thinking or remembering. We also need some means of integrating our methods of assessment, and thereby of reporting what we have found.

Acting in or on the world

Detecting information about the world is not enough. The young person will also, to a greater or lesser extent, have to be able to act on or in his world.

At this point, you may well question this assumption. If so, consider this real world example. Suppose as a result of a road accident, a person is in a coma. How would you know whether that person is able to detect information about his or her surroundings? That person would have to have some - albeit very minimal - means of movement[2]. Without some minimal movement, you would be unable to tell if a person could register information about his surroundings. There would not have to be much movement, only a very little.

Some of the actions (or movements) you would consider would be:-

- reaching;
- kicking;
- head movements;
- tongue protrusion;
- eyebrow raising;
- walking towards an object;

Seems a relatively short but comprehensive list? Or does it? Each one of these items could justifiably be sub-divided. Does 'reaching' include 'grasping'? Is reaching visually initiated or is it visually control led? And so on. The same argument applies to the other items. Indeed many more items, ones which you may well have thought of, could augment this list.

If we do not somehow include in our assessment some notion of actions - physical movements - we meet a familiar problem. Suppose a person with multiple disability does not reach (however it is defined) for an object. Is the lack of response due to problems with sight? Or with physical abilities? Or some other?

Again these issues indicate that we need to develop a system of shorthand in our assessment to encompass this problem. It should still meet our criterion of giving more information about the sight of the learner.

Communicating with and about the world

A special way of acting in the world can be seen in communication. Usually we think about this in a social way, the child or adult communicating with people or animals. There are two general personal aspects of communication. The first lies in the child's reception or comprehension of another person; the second is in how the learner herself expresses needs, requests, intentions, statements - eg; through some form of language such as sign or speech, or through drawing and writing.

We could spend some time describing in detail specific aspects of communication ability which could in some way be impaired. It will come as no surprise that this exercise would also result in us having to add many items to our list. Indeed several excellent assessment tools are available for those who wish to pursue this further. Our problem lies in giving sufficient attention to various aspects of communication, but not so much as to obstruct our true task -

acquiring a better understanding of the effects of visual impairment.

As a parallel outcome of our assessment, we would certainly expect to improve our awareness of the effects of that visual impairment on the learner's strategies for communication.

Personality[3]

Differences in the learner's confidence in a task, and in her confidence in people will have an effect on the manner in which she approaches new events, people and places. Her mood will affect the likelihood of completing an activity. She will be motivated through likes and dislikes. This area is often the hardest to try to understand, and yet it is often the most important determinant of whether a learner will engage in an activity.

We can go a long way to making the most of learning through fun opportunities. We could begin by allowing the learner to dictate the pace, by following the learner's lead. By capitalising on a learner's initiations, we enrich our own understanding of that individual's personality

We will return to this issue in more detail in Chapter 4, where we set out our principles of practice.

Personal aspects: narrowing the options

Above we tried to set out those characteristics that are probably in your mind when you think about an individual child or adult. Most of these terms will we hope be familiar to you, and may indeed already be the concepts you yourself use when thinking about how you plan your activities and timetables.

No doubt you are becoming impatient, saying "So what? There is nothing new here." In some sense you would be right. But we have taken this approach for an important reason. Above we set out isolated areas to cover *personal aspects - information through the senses, action, learning, knowing* and *remembering*, and *personality*. We wanted these to be familiar to you, to try to use the same language to describe characteristics of a learner that you yourself might use. What then is the problem? There are in fact two problems.

The first problem is that you will come to an appreciation of a child's abilities *not* just through isolating each of these characteristics from one other, but through familiarising yourself with how they interact with each other. This results in appreciation of a unique combination or set of characteristics. For instance, a memory disorder will apparently affect certain aspects of seeing - to take a simple example, without a memory for words or letters, a person would be hard pressed to read back the letters of an eye chart.

The problem for the assessor lies in trying to understand whether the learner cannot **see** the letter on the chart (an impairment to sight), or cannot **identify** the letter (a problem of memory, perhaps). Take another example. If a young child does not begin walking, is this because of physical disability or is it due to visual impairment? By presenting distinct categories as we have done, we would not allow for interaction among these. We need a way of getting round this problem.

Our second problem is one we have also mentioned else where. We have to come to grips with an assessment schedule that is manageable, while at the same time being comprehensive enough for the purposes for which it is de signed - assessing functional vision. For each of the areas we have outlined above, we could readily (with some help!) have developed a detailed assessment procedure for profiling a learner. What would have been the result? You would have a useful compendium for supporting a table which has a broken leg but, as a tool for assessment, it would not be very helpful. By the time you had found the section that might be relevant, the learner would long since have gone, to sleep How do we reach a compromise?

Faced with assessing the needs of a learner, you would not determine all of the possibilities which **might** pertain: rather you will use broad initial indicators to constrain the form and content of future finer grained investigations. Moreover, in thinking through the combined implications of any tests performed, you would rely on previous experience from other cases with those or related features; again, constraining and sorting this material is a complex task.

An example may help to illustrate our intended approach. Suppose that in a cursory assessment of hearing, a child is found to understand a wide vocabulary of spoken words. What does this tell us? For one thing, it tells us that hearing is (depending on the child's age, it might also tell us that it has always been) relatively intact. But this finding tells us much more. What else might it tell us?

There are many other incidental findings:-

- there is useful memory;
- there is ability to discriminate among settings;
- there is ability to respond selectively across a variety of settings.

Thus an item purportedly assessing hearing is actually indicating various aspects of cognitive functioning as well as hearing. So long as this technique is well controlled and purposeful, rather than happening by accident, it can be a powerful mechanism for narrowing our search. It is of most use when investigating a specific aspect of functioning - in our case we will be using it to assess vision where several impairments are present in varying degrees.

What will be contained in our schedule? Because this is an assessment of vision, we will clearly want to retain many

options for understanding how the child sees the objects, events and places of her world. At the same time, we need to determine whether there are other possible explanations for this or that apparent level of sight. We need there fore to embed some means for **inferring** those cognitive, memory, physical and other abilities among assessment areas which are not to do with sight. And this needs to be constrained.

Then where we find good cognitive functioning while ostensibly assessing hearing, at the same time finding only an ability to see the difference between day and night, we will be more confident that it is a problem of sight rather than a problem in more global functioning. Had more global problems in functioning existed', then we would have expected to have found a similar level of functioning in hearing as well as in touch, taste, smell: difficulties would not have been restricted to sight.

Conclusion of personal aspects

There are many Personal Aspects for which the learner with multiple disability could be assessed. To cover them all would create a mammoth assessment tool, which would be too unwieldy to use in practice. We need to get round this difficulty. One means at our disposal is to embed some assessment issues within non-visual items for assessment.

Settings

Our understanding of a learner will be enhanced greatly if we try to further our examination of those personal aspects outlined above. However, we also need to look closely at the various settings, surroundings or environments in which a learner happens to be found. Broadly, these fall into home, school, further education, vocational rehabilitation, work (possibly some form of sheltered workshop) and leisure.

One individual, whose *Personal Aspects* are apparently identical with those of a second individual in one setting, may be found to function quite differently in another setting. For one child, a swimming pool may offer a secure, relaxing, warm and comforting set of surroundings in which to learn. For another child, it may instill fear and alarm. A frightened child does not learn easily.

Where a learner 'prefers' one setting rather than others, there are at least two things you should begin to consider. First try to determine which specific cues, prompts or features are salient to the learner. Are they unique only to that setting? Or can some of these be extracted and transferred to other settings?

Second, ask yourself whether it is possible to set learning objectives within the preferred setting. However, there is one *caveat* when determining whether to proceed in setting learning objectives in the 'fun' setting. Should the fun go out of it by implementing these new tasks, you might well remove the attraction of that setting. To avoid this, the trick is to make learning fun. In Chapter 4, we outline what we see as being principles to be adhered to, and which, if followed, will more easily ensure that the fun remains. By the time you have looked at *personal aspects* together with *settings*, you could probably come up with your own rules of thumb to guide your assessment. This will give a better understanding of the whole child.

There is another method of exploiting variation which is found to occur across settings. Some variation in response to *Settings* could be due to differences in the physical characteristics of the settings. Analysis of these factors should always feature in our analysis of the setting or environment. Such physical features include the areas of *lighting* and *contrast*.

Lighting

Adjustments can be made to give adequate lighting which will be evenly distributed and free from glare and shadow. Advantage should be taken of natural light using shades, blinds or curtains. Most obviously the learner should not face the light. If on the light side of the room try to avoid her sitting in her own shadow. A dull surface finish is preferable when choosing a table top or other area to work. Lighting is important not only for near vision tasks, but also is important in mobility activities. Moving around may become less dangerous by paying attention to details of lighting. Optimising lighting does not necessarily mean making the light as bright as possible. For several conditions such as **cataracts**, bright light can become (in many cases) a hazard.

A story might help to illuminate this problem. One of the authors was visiting a child in mainstream secondary school. She had a degenerative central vision problem. At the time of the author's visit, the buzz going round the school was that this girl's vision had unexpectedly and quite suddenly improved overnight. From the same seat she was now reading directly from the blackboard whereas the previous day she had trouble seeing that there was a blackboard present. A remarkable change, if it was true.

Unfortunately the 'improvement' was not real. Close questioning revealed that for the first time, the janitor had cleaned the board thoroughly! Prior to this, the glare reflected from the board because of the remains of unwashed chalk dust had made it impossible for the girl to see any detail. The brighter the light, the worse the glare. On the 'new' board, she was able to see letters and drawings of a similar size to those that she had previously not seen. The able sighted adjust to quite massive changes in lighting and contrast levels. This is done unconsciously.

The most useful lighting positions are from above or behind the child. To reduce the level of lighting, either blinds or curtains offer an effective means of control. As we saw in the above example, substantially different abilities may be

revealed if close attention is given to experimenting with lighting, varying positions and reduction of glare from reflecting surfaces.

Contrast

Just as improvements in lighting can pay dividends, so too will attention to contrast. The subject of offering improved contrast is at first glance a simple one. Surely simple use of a white background with black foreground will in all cases be optimum? For some individuals the reverse is more helpful, having a black background with white foreground with white reduce the effect of glare.

In the everyday surroundings of the learner, contrast variations may indeed become a great source of difficulty. Consider the example of a child being provided with a light blue background on a table with a yellow object on top. Simple? But the blue background will itself be a foreground to other backgrounds of the floor covering, the walls, perhaps the teacher's clothes. There are, though, some rules of thumb to which may be added some experimentation with the learner:-

a plain background makes it easier to distinguish objects in the foreground. A patterned surface for a back ground offers less contrast between object and back ground. The more busy a pattern, the more difficult it is to distinguish the object(s). (See Figure 2.2.)

- movement of the object relative to its background often helps the object to stand out.
- similar colours merge together. For instance, the clothes one wears may make it very difficult for a child to locate one's presence. It is often useful to have available a jacket, apron or overalls easily distinguished by the child.
- try to avoid too many shadows.
- depth changes may be accentuated by improving the contrast between two surfaces.

Unlike our discussion of *Personal Aspects*, there is no shorthand way of presenting findings obtained over different settings. You have to try out these settings, to aid your understanding of the learner.

Having carried out this our second stage in the cycle of assessment, it is possible to move on to identify the resources that are available for use within each environment. This is our third stage in the cycle.

Identifying resources

For each learner and within each setting, variation will exist in the resources that can be made available. Resources can be of many types, of which the most easily recognised will be human, equipment and written reports. In these times, where emphasis is too often placed upon physical buildings, it is useful to remember that most important resource of all: people.

Human resources

Do not be constrained in your thinking as to the kind of help which may be offered or what you might seek. Broadly, this kind of help falls into categories of:-

- practical help, eg; class assistant or volunteers;
- advocacy, useful in the implementation of Records (Statements) of Needs;
- specialised skills, such as speech, physio- and occupational therapies;
- training;
- counselling.

Equipment resources

The list here is endless and constrained only by one's imagination. People like Lilli Nielsen have drawn attention to a wealth of materials easily obtainable around the home or classroom. Seating and microtechnology will also be areas worth investigating. Assessment of seating and positioning, rather than an option, is for many learners with multiple disability, a necessity and should certainly be investigated at this stage. Occupational therapy may be essential.

Written statement resources

We have already mentioned the use of advocacy in the form of help from other people. In that context we pointed to the use of Records or Statements of Needs. If you are unfamiliar with the contents of this document on behalf of your learner, now is the time to investigate these as resources. Other sources of written statements exist. You might consult written reports - often there is a wealth of information on what the learner *could do* as a young child which, as she grew older, was turned into what she *could not do*.

Learning objectives

The final stage in our cycle of assessment (of course, being a cycle, it only returns us to the beginning) is to set *Learning Objectives*. We chose deliberately to keep this section brief. It is an area with which we will be involved in greater depth in the second half of the book. In any case, discussion of learning objectives must, in our view, include

principles upon which the learning objectives are based. Without this knowledge, learning objectives would indeed be insufficient. Discussion of these principles is the theme of Chapter 4.

Summary

We have come a long way in approaching a common language of terms used to refer to the learner with multiple disability. It has been seen that to focus on *Personal Aspects* of the learner alone would not be sufficient. Instead assessment can be seen to be a cyclical process, and we have tried to flesh out some of the details of how that process might reason ably be achieved.

In presenting details we have nevertheless discovered that coverage of **all** of the characteristics of each and every impairment that might pertain, would have created a mammoth volume. Some strategy needs to be adopted to cut down this task. Such a strategy needs to retain flexibility to discover and inform our understanding of the effects of visual disability amongst a constellation of disabilities.

How to accomplish this is our priority in the next chapter.

 Chapter 3

 front page

Vision for Doing

Chapter 3

MAKING SENSE OF MULTIPLE DISABILITY

In this chapter we return to consolidate the themes first met in Chapters 1 and 2. We then outline and expand a strategy to be used in PART TWO. This will reduce to a manageable size the vast array of abilities enveloped by the term 'multiple disability'.

As we are fully aware of potential pitfalls in our strategy, we also include some "notes for those who are interested in technical details". Readers are of course welcome to skip these more technical points and move right along with the discussion.

The story so far

In our Introduction to this book we reported that, of the children identified in Thomson et al's study (1985) as multiply disabled, most had minimal additional impairment. This finding had run counter to our own experience. For during the course of our daily practice, we had met many learners with much more severe additional disabilities. It seemed they had slipped through the net of visual impairment services. We then asked ourselves whether this was a real phenomenon or, was it akin to that occasion when, after buying a car, one subsequently seems to see that same model of car on every street corner? Perhaps we had simply imagined there to be large numbers of children with visual impairment amongst the ones we knew to be multiply disabled? As we showed briefly in the Introduction, our imagination was not in fact on overdrive. Our research did indeed turn up a number of children with multiple disability, for whom opportunities to learn about the world were severely restricted.

The problem

In one sense, however, our results generated a problem of their own. Or more precisely, they exacerbated a problem that already existed. With such a potentially wide range of impairment and disability, how could one be sure of representing that full spectrum of multiple disability? This brought us to the issue of assessment. In Chapter 1 we outlined a general way of 'opening one's eyes' to look at a learner. This was done by sharing the learner's perspective on her world. We then refined this view, indicating that assessment could usefully be thought of as a cyclical process.

Chapter 2 took up this theme. Beginning with the term '*Personal Aspects*', we indicated that in order to comprehensively cover multiple disability, a large number of items would have to be included. This is because of the fact that the term 'multiple disability' is a catch-all, comprising a panorama of abilities.

Let us review briefly the criteria we set out for our assessment instrument. For these criteria relate directly to how we might conceive of multiple disability.

- assessment, rather than being an end in itself, should be a means to an end;
- assessment results, and implications to be drawn from these results, should be illustrative for a wide range of multiple disability - from no apparent response to (but not necessarily including) measurement of visual acuity;
- instruments should not contain so vast a number of items as to be unwieldy in use;
- our greatest emphasis should be placed on discovering the effects of visual impairment amongst the constellation of disabilities (hence the title of the book!);
- a convergence of results in one assessment domain should inform results in another area: we wish to unravel the effects of multiple disability.

How are we to achieve these? For by **omitting** items we would run the risk of not providing for real children and young people with multiple disability. However, if we are exhaustive and make the list of items too specific by including all possibilities, then you the reader would be exhausted. You would be unlikely to make use of the instrument, other than as a possible cure for insomnia.

Some way of classifying *multiple disability* would help meet those criteria outlined earlier. By doing so, results of assessment would contribute to an understanding of what to do next. The range of multiple disability would be covered. We would reduce the sheer number of items. And the complexity of multiple disability would still be

analysable in terms of the effects of visual impairment.

How then might we classify 'multiple disability'?

Before reading on you might like to consider what options are available to allow such classification.

Options open

Option 1: classify by medical condition

One obvious strategy is to adopt the medical terminology so familiar to the field of multiple disability. There is available a standardised set of terminology for doing so, known as the *International Classification of Diseases* (ICD). In ICD an unique number is ascribed to each condition listed therein. ICD classification has the advantage of having been thoroughly worked out, it is apparently simple, and is international so there should be (in theory!) less risk of cross- cultural misunderstanding.

Nevertheless it suffers from distinct disadvantages. Clearly ICD is not a *functional* classification for multiple disability. The essence of the requests which led to us writing this book was a need for functional understanding. It is of little help to know that a learner suffers

from Down syndrome, for such knowledge does not contribute much to awareness of the specific effects of this condition. An ICD index is no aid to curricular planning[1].

Option 2: classify by educational category

A second option you might have thought of is to divide multiple impairment into specific educational categories - *profoundly handicapped*, *severe learning difficulties*, *deafblind* and so on. To some this may be more pleasing, partly because in one form or another it is already in common use (with a nod in the direction of continuous updating of terms used). There is a certain face validity. This approach has 'helped' to differentiate schools, and then to work out placements of children at these schools based upon such categorisation.

However this was the very system that was attacked by the Warnock Report (1978). Lady Warnock and her committee rightly showed it to be inadequate. Arbitrary divisions can represent just another form medical labelling. As we saw with ICD, we have to reject such a system. We reject this type of classification of multiple disability, pointing out that it is quite likely that this system was responsible for many children who have multiple disability missing out on visual impairment services: they went to the 'wrong school'.

Option 3: strategy to be adopted

Introduction

Instead of either of these two options, we propose to adopt a fairly simple but radically different distinction for defining multiple disability. The reader will not be surprised to learn that it is based upon a learner's ability to do things, rather than upon inabilities. Now this does not mean that an **ability** to run and jump through hoops is a prerequisite, it may be that the only ability to do things is through minimal eye movements. But these eye movements could be enough for some children to learn a whole system of eye coding, communicating through this means anything from what they want for their dinner to the 'proof' of Heisenberg's Uncertainty Principle. And of course any scheme would have to be able to cope with the learner who is more severely multiply disabled.

Happily for us, a few workers in this field we contacted also used some form of structured process in their own intervention. For most, this was not an explicit procedure. A few had made explicit some structured process. The one which was logically the most internally consistent was one used by Laura Pease at Whitefield School, London. It in turn bore similarities to that of others such as that suggested by Virginia Bishop. In essence it uses a few broad themes viz: **Becoming Aware, Beginning to Attend, Localising, Recognising and Understanding**. Let us look at these themes in a little more detail.

Awareness

A learner may only have a capacity to be **aware** of visual information - perhaps limited by an impairment resulting in severe mental handicap. It would simply be the case that the child or young person differed from a 'person in a coma' by appearing to show awareness that something had happened. There would be nothing beyond this. Informational content about where, when or why it happened would be absent. It might only be an awareness of the difference between light and dark. It might only be a movement away from a noxious odour. The presence of other disabilities would always (unless you wanted to try this scheme out with a newborn, or someone asleep - neither of which we recommend!) be associated with this relatively poor ability. The greater the number of additional impairments, and the greater the severity of these impairments, the less likely it will be that the learner has good visual functioning. Therefore children and young people with severe and complex additional disabilities will be more likely to show only an awareness of a visual stimulus.

Attending

Our handling of this single theme would probably provoke the loudest outcry from research psychologists. And rightly so. For they have invested a tremendous amount of time and effort into investigating the concept of 'attention'. And we intend to reduce that to a few paragraphs! For this reason we have chosen to call the next stage up from **awareness** that of **attending** (rather than attention) (But psychologists and other interested parties should see the caption).

Attending is a little more specialised in response, showing the ability to attend to a visual, or any other, event object or place in the child or young person's world. In this the child (say) begins to show some differentiation to something happening in her surroundings. It might only be a fleeting movement, lasting less than a second, and it will often be inconsistent. To attend, albeit for brief periods, is to show the beginning of distinguishing different people, objects, events and places.

Technical point

Localising

Slightly more specialised than *attending* is when the learner is able to locate an event. Her movements will show more consistent differentiation in relation to specific events in the surroundings. For instance, a child may turn consistently to locate stimuli, following moving objects and events through movements of eye, head or other body parts. Notice though that we are **not** saying that the child would **have** to be able to make such coordinated movements. It may be that she can **only** move her eyes and nothing else. As we will see in a later section, such an ability to Iocalise would be a prerequisite for being able to use a system of eye-coding to communicate. (But it would not be sufficient. She would also need to be able to **understand** - see below).

Technical point on Localising

Recognising

To recognise the stimulus object or event, the learner has to isolate particular features and has to have some capacity to construct a mental representation of that event. It may not be the same mental representation that a person more cognitively able would make. Typically, learners who are operating at this level of ability would not be able to generalise from one situation to another. Many of the standard tests of vision carried out with children require this ability to recognise consistently the features of stimuli.

Understanding

At the highest level, a learner would be able to comprehend, to understand the meaning of an event. Here a learner can not only recognise the features of an object, but understand the relevance, significance and use of that object.

As with each of the above themes or "categories", there will be further refinements and sub-dividing within the theme of 'understanding'. Indeed within this theme we would expect there to be a great deal of sub division. However, in this book we propose to devote a relatively little amount of space to discussing this area. You may reasonably ask why this should be so. You may recall that our reasons for writing this book arose from us discerning relatively little that was relevant to the learner who was more severely and multiply disabled. Our focus lies firmly within that area.

In addition we have tried to dovetail into a separate publication which deals very well the child who has good **understanding** as well as useful vision - Look and Think Checklist published by RNIB[2].

Limitations of the strategy

We have already emphasised that within our themes there is ample room for further differentiation. But there are other problems with our scheme, ones which you should be aware of at the outset. The biggest problem with the scheme lies in the fact that it stresses a kind of general intelligence. However, there are many instances in the real world where the notion of a general intelligence just does not fit. For instance there are:-

Stroke victims who have one function profoundly affected, but others remain intact.

So-called *Idiot Savants*, who are severely mentally disabled but able to say what day the 29th October 1922 fell on.

Those - often casualties of war - who suffer from *blindsight*. They can locate an object if told to hazard a guess ("Pin the tail on the donkey"), but they will argue that they cannot do the task because they are blind. AND they will remain unaware that they have succeeded.

Advantages of the strategy

Despite these and other difficulties with our scheme, certain advantages ensue. Other than those we outlined at the beginning of this section, it helps us towards a guide to interpreting how a learner responds to events in his or her surroundings. From this it helps to derive and plan systematic methods of intervention. Notice that in this framework there are no hard and fast rules about which child falls into which category. As we pointed out, the notion of categorising or labelling a child does not square well with trying to make sense of his or her individual needs.

At the same time, information on *Personal Aspects* will convey much that is useful in designing a programme of intervention. Such a framework is also consistent with allowing us to move from the strictly perceptual, and move towards the increasingly cognitive. And it happens irrespective of the presence or absence of other impairments. It may be that a child is quadriplegic, or is aphasic, but use may still be made of *Vision for Doing*. We hope that the reader finds this definition of multiple disability useful for the purposes of the book. To give you some idea of how this might work, see Figure 3.1.

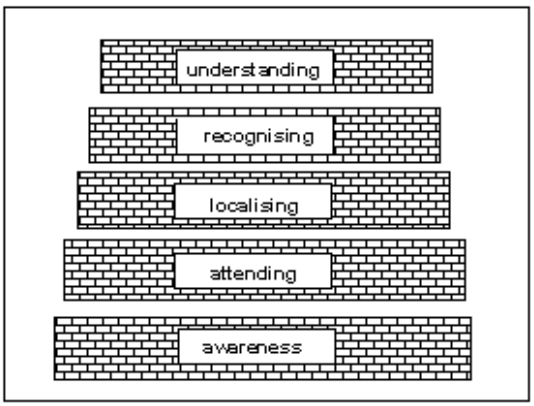


Figure 3.1 Organising themes for assessment and curriculum development

This offers an approximation as to when certain broad areas of intervention might become appropriate. This is the basis on which we will proceed in PART TWO of the book, where we discuss how to assess and make sense of the results of that assessment in planning methods of intervention.

Next step in the strategy

Use of *Awareness*, etc as organising themes helps us in two ways. First, such a scheme allows us to narrow down our areas for assessment. Second, and of equal importance, it allows us to focus the **results** of that assessment. Using this strategy, we can build areas for curriculum development around each of these organising themes.

Conveniently, the broad areas for assessment you will be using are non-visual and visual. Non-visual areas for assessment are of course 'The Other Senses' of hearing, touch, smell and taste. Finding out how well the learner makes use of these non-visual senses and then doing the same with the use of vision will help you to assign the learner into either *Being Aware, Attending, Localising, Recognising* or *Understanding*. (This is what we do in PART TWO of the book).

This process sounds a very complex and roundabout way of approaching the assessment of vision. But what we are suggesting is that you start from what you know and are familiar with - how the learner responds to everyday experiences such as eating, listening to music and moving around (where possible). Having looked at these in some detail, and having made a decision as to the "level" of the learner's response, you can then use these **as a basis for understanding the learner's responses to visual stimuli**.

So, to discover the general 'level' for each learner's curriculum development, you compare the results obtained for these non-visual with visual areas of ability. Where there is a difference among the senses, use the 'higher level' around which to organise areas of curriculum development. If this is too difficult for the learner, all you have to do is to drop back down to the 'level' below.

To make things easier, we have organised several example topics for curriculum development around these very same themes. These are to be found in each section of PART TWO of the book.

An example of how the strategy works is given in the caption. But do not worry if at this stage it is not too clear exactly how the strategy will operate in practice. At the end of PART TWO there is a **Summary Chart**, giving further explanation and guidance.

Summary

In Chapter 2 we set out the difficulties that would be encountered in representing the full range of what could be meant by 'multiple disability', We have in this chapter sought ways of alleviating these problems. The strategy that is suggested as a potential solution is one with which you will become familiar in the second part of this book.

The next chapter is the final one of PART ONE of this book. In it we will set out our own principles for good practice. We believe these principles to be applicable across settings, employable not only by teachers but also by therapists, care staff and others who are involved in the educational management of learners who have multiple disability.

Example of how strategy works: You carry out the items in the non-visual (ie; 'the other senses') sections, followed by the visual assessment sections. You discover the learner is functioning as follows:-

Hearing - Awareness

Touch - Attend

Vision - Localise

You therefore integrate the topics for curriculum development that are organised around localise. These are what you will use in developing curricular opportunities. Should you feel these are too difficult, then drop back a 'level', where appropriate. That is you would return to collate the suggestions which are relevant to Attend.

 Chapter 4

 front page

Vision for Doing

Chapter 4

WORKING PRINCIPLES (TEN COMMANDMENTS)

In this the final chapter of PART ONE we put in place the last of our building blocks. For having taken up a shared perspective having got inside the skin of the learner - what do we do next?

Here we lay out certain principles which we believe should guide our approach with learners who are multiply disabled. We have euphemistically called these a set of commandments. Affirmation of principles is in our view simply the next step on from trying to capture the frame of reference of the learner.

It is our belief that the following principles are relevant to wide range of professionals engaged in work with the learner who is multiply disabled.

Background

Why, you may be asking, should a whole chapter be devoted to consideration of principles underlying methods and techniques of daily practice with learners who are multiply disabled? For in this chapter we intend to investigate not the **what** of practice, rather the **how** of practice. Surely it is time to get on with actual practice? Consider then where we would be if we did **not** dedicate at least some space to discussion of this subject.

Without some notion of what constitutes good versus indifferent practice, we would succumb to the predators hovering round special education. We would be suckers for new therapies. Advertising executives, responsible for new technologies all sorts of bells, whistles, coloured lights and soothing aromas, would drool at the thought of quick and plentiful sales commissions. Potential learners would have one gadget, used in a certain way, thrown at them at 10 o'clock, to be followed immediately by some other gimmick, used in an entirely different way. The world would be without sense to a learner with multiple disability.

Guiding principles offer a 'map-and-compass' to be used in the minefield of current curricular opportunities and, no less important, the means of avoiding future damaging experiences for the learner. With these guiding principles we become less at the mercy of the latest trend. Such principles should be relevant across disciplines (we will soon see the advantages this can bring). They would also be applicable beyond our specific 'client group'. Otherwise we would properly be accused of saying "Up to, but not beyond, a certain point these principles apply. Beyond this point another set of principles will apply."

Some readers will find that the concepts which constitute our principles are familiar. Other readers will find them strange, positively alien, and others still, while believing themselves to follow this approach, will in fact never do so. What then are these principles? As we mentioned we intend to use as a metaphor the Ten Commandments. Not only will you have heard this term used before, but the metaphor too is not that original. In 1989 Diane Twatchman, from Connecticut in the USA, applied this metaphor to the field of augmentative communication. We liked it, thought the idea was sound, and use it here for own purposes. It is no coincidence that there is overlap of the actual 'Commandments' between Diane's and our own.

Ten commandments (to be used when working with people who are multiply disabled)

Table 4.1. gives a synopsis of our working principles, or ten commandments.

1	Thou shalt share the learner's perspective
2	Thou shalt open thine eyes
3	Thou shalt ascertain strengths and abilities
4	Thou shalt follow the learner's lead
5	Thou shalt not compartmentalise
6	Thou shalt adopt a united approach
7	Thou shalt think of tomorrow
8	Thou shalt value the learner
9	Thou shalt give the learner time
10	Thou shalt evaluate thine own work - not the learner

Table 4.1 Ten Commandments for Intervention

1 Thou shalt share the learner's perspective

As we have already spent some time on this particular 'commandment', you will be relieved to know that we do not intend to devote any more space to its discussion. If you want to refresh your memory of this topic, refer to the early part of Chapter 1.

If we are successful in sharing the learner's perspective, it follows that we will have been successful at opening our eyes. We include it to emphasise that it is an indispensable aspect of a quality assessment.

2 Thou shalt open thine eyes

If we are successful in sharing the learner's perspective, it follows that we will have been successful at opening our eyes. We include it to emphasise that it is an indispensable aspect of a quality assessment.

3 Thou shalt ascertain strengths and abilities

This is the other side of the coin from identifying what a learner cannot do. It is not that we are saying weaknesses should be ignored. It is simply to say that a balance has to be restored, in recognising abilities and not only disabilities. All too often we come across Records (or Statements) of Need which describe in detail those areas of weakness of the learner with multiple disability. It can sometimes be difficult to discover in such a report anything other than disabilities.

4 Thou shalt follow the learner's lead

The famous Swiss psychologist (or more precisely epistemologist) Jean Piaget once remarked that "*Everything you teach a child prevents him from discovering it himself*". We would echo this thought. To illustrate what is meant a couple of experiments are presented in the accompanying caption[1,2]. Reading about these experiments may for some be a little disturbing.

Both experiments indicate that active control over the world may be an important factor in development and learning. This active control is often called Contingency, meaning simply that things happen as a result of a person's (or animal's) actions. The second experiment also shows that experiences gained in one setting may carry over to other settings, making the learning of new activities meet with failure. There are lessons for us to learn from these experiments.

Offering contingent control

Wherever possible let the learner lead. Allow her to show what she wants to do and follow and encourage in these activities, giving time for her to explore. Comment incidentally on what is done. Do not continually focus on talking to or at the learner, naming objects, commenting on the learner's movements and one's own movements and activities. For in the latter the content of one's speech becomes like that of a watcher or observer rather than trying to participate in the learner's experience. The result is usually to interfere in that which the learner shows an interest. Rather than having an environment that is directive, instead try to allow the learner to direct his or her environment.

Constant questioning and directing is likely to lead to withdrawal. Give time to respond, be **opportunistic** in taking up cues from the learner when interest is shown in some activity. Be prepared to follow up on the unexpected. This kind of approach ties in very well with our emphasis on the active nature of our attempts at stimulation. For we believe that there is an essential difference between stimulation that is active versus passive.

Stimulation

What does it mean when we say that stimulation should be active rather than passive? Surely all stimulation is active, and can never be passive? To see why we think it is important that this distinction be made let us compare examples of active and passive stimulation. First an example of passive stimulation, one which is typical of many suggestions for stimulating a child's vision. It should be easily recognisable. The suggestion is often made to suspend checkerboards, bullseyes, and other abstract patterns above a child's cot. Or to shine a light towards the child to stimulate vision. Just like the kitten in the carousel, the learner is passive.

We might change this set-up in minor ways. These would have the effect of fostering active stimulation. A simple means would be to stop shining the light at the child, and to introduce it from behind onto real objects. One could bring the visual pattern into range of the child's reaching; or have the child blow at the pattern, thus controlling the movement of the pattern.

The past few years have seen increasing emphasis on using techniques and methods which emphasise learners having control over events, objects and places in their world. Previously, practitioners were often content to present things passively. As we have seen, this kind of approach does not get us very far. Energy must be spent in trying to develop activities so that the learner leads: we follow. In PART TWO, we will meet many examples of how we put this *'commandment'* into practice.

5 Thou shalt not compartmentalise

When working with learners who are multiply disabled there is often a tendency to break up areas of learning and development. There are many advantages to be gained by doing so. Unless activities are presented in meaningful 'chunks' many achievements would not be made. However this can be taken too far. Emphasis may become placed too strictly upon discrete skills enhancement, for instance in shape or colour sorting, language development, mobility, tactile stimulation, feeding, and so on. Timetabled events such as swimming, riding, shopping and music become ends in themselves.

Yet these same events represent marvellous opportunities for developing alternative routes to communication. Often seemingly different areas of learning have more similarities than differences when working with the learner who has severe visual disability[3].

6 Thou shalt adopt a united approach

One of the authors once wrote an extended article on the need for a united approach. In keeping with the weight we have attached to taking the perspective of the learner (*First 'commandmen*t'), the article was in fact written as if the person with multiple disability was doing the writing. Responses to the article were interesting. Speech therapists concentrated on one aspect, physiotherapists on another, teachers on another still. Yet no subject-specific material was contained in the article. It was difficult to avoid the conclusion that each discipline brought to their work an entirely different world view.

Not exactly a unique conclusion, we admit. But where so much stress is placed upon multi-disciplinary approaches, what does this anecdote lead us to conclude? It suggests that work carried out with young people who are multiply disabled may not have a coherent focus. Different professions may pull in different directions. The outcome of many multi-disciplinary case meetings is often one where people leave with the same entrenched views with which they entered the meeting.

As can be seen from the list below, one reason for not embracing coherent frameworks may be that a common ground is not all that obvious.

Where specialised therapies are in use, it may be difficult to see beyond the therapy. Even though only a few simple changes may be required to working practices, in order for that therapy to be integrated into a wider sphere of objectives.

To attain a united approach requires communication among professionals. As we have seen this goal is often more obvious in its breach than its observance. There are many reasons why it remains difficult for inter-professional communication to take place. It may arise from:-

- lack of common terminology;
- possible common goals not being recognised as such;
- lack of time to share thoughts;
- the conflicting demands of both listening actively and getting across one's point;
- lack of openness and trust;
- professional rivalry;
- one person or group dominating meetings;
- insensitivity to feelings of others;
- 'difficult' people (What makes them difficult? Anxiety?).

You may well have recognised that among this list there are items which could be improved by structural change or changes to the system that is in operation. This may require administrative approval, or time to be given over within staff meetings to discuss how these items could be dealt with. Are meetings being run as well as they could?[4]

7 Thou shalt think of tomorrow

A common thread ran through the two previous 'commandments'. Both identified the need for a collective approach as to the purpose and methods to be used. There is, however, an additional coherence that needs to be introduced into our practices. We need to think ahead.

For people who have severe learning difficulties, consistency and continuity of approach is necessary. Whether we are about to embark on - use of a computer, or using less complex technology; adopting a symbol system of communication; giving thought to choice of objects by which we might represent daily activities; or indeed a host of possible strategies for offering the world to a learner - we must think ahead. Blindness is enough of a disability without creating blind alleys ourselves.

A note of caution

Rigid adherence to this 'commandment' could however present us with a serious dilemma, which we do recognise. For if we do not yet know what will be successful, how on earth do we ever begin? Resolution of this dilemma is not usually that difficult. For even in the very experimental phase, when trying out a new method, we can still ponder on what to do if the method succeeds versus how to proceed if it fails.

8 Thou shalt value the learner

We hesitated before deciding to include this as a 'commandment'. Our reluctance is due to the fact that we did not wish to offend anyone. After all by choosing to work in this field, almost by definition you already value the learner. By this of course we mean that your view of the worth of the learner who is multiply disabled is equal to that of any other human being.

We decided to include this as a principle for two reasons. First if anyone happens to read this book and is contemplating working in the field then he or she might give it some thought. Valuing the learner makes it a whole lot easier to invest time in trying to share his or her perspective. Our second reason is that while individual teachers and care staff may well value the learner, others in positions of power may not. These people may arrange timetabling, not give access to activities, or a whole host of other difficulties may be created. Where this occurs try to identify ways of dealing with the issues.

9 Thou shalt give the learner time

Usually we do not give enough time to allow the learner to respond. Because you are caring you will naturally want to do things to fill the gap, but sitting waiting for a response to happen is allowing opportunities for that much needed control to take place. It will take the learner with multiple disability longer to process information, and longer to organise a response. We need to recognise this and build in that extra time.

In fact by developing the practice of waiting to capitalise on opportunities that arise, you are at the same time incorporating this element of giving more time.

10 Thou shalt evaluate thine own work - not the learner

We believe evaluation is an important tool. Evaluation is something that should take place, not of the learner but of one's working practices and methods.

There is nothing mystical about this area of concern. It is simply to say that you should aim to be 'doubting Thomas's' when it comes to the methods employed and the conclusions drawn. It is always nice to rejoice in the outcome that **seems** to have emerged after embarking on some new activity with a learner who is multiply disabled. But was it really true that the new activity was responsible, or was it perhaps something else? If so, what?

Evaluation helps to tease apart whether observed improvement arose from things completely beyond our control. A good example of a time to pose this question is when some technique is used to 'stimulate vision' in an infant. Suppose that by using this technique, improvement occurs over the course of, say, 6 months. The question remains as to whether the improvement was due solely to biological maturation, or the specific technique introduced.

If it was due to the former, then it would make no difference the amount of time spent on stimulating vision: it was going to happen anyway. Now this is **not** to say that it is wrong to stimulate vision. It is to say that it is helpful to investigate whether the technique or something entirely different was responsible for change being brought about. Frequently it is very difficult to tell what was responsible for the change.

Another reason for remaining in doubt is that the reason for improvement may be one of a general effect such as

some one taking an interest or that of counselling involvement. This can be an especially striking effect for those who work with the families of younger children. The story in the caption (Need for evaluation) helps to illustrate this point.

Summary

In this chapter we have outlined certain principles which should work with learners who are multiply disabled. Unlike those of Mount Ararat we do not see them as being set in tablets of stone! They can be regarded as a skeleton or template onto which can be laid our actual practice. The nature of that practice is the subject area in PART TWO of *Vision for Doing*.

Finally, but not quite in the nature of a commandment, be confident in your own abilities!

Part Two

front page

Vision for Doing

PART TWO: CARRYING OUT THE ASSESSMENT

INTRODUCTION TO PART 2

In the second part of the book we present ways of assessing the specific effects of visual impairments in learners who are multiply disabled. The understanding gained can then be used in planning the structure of new materials and curriculum (as in Part I we use the word 'curriculum' in its widest sense). We offer some suggestions which might be incorporated into curriculum design.

In PART 2 we assume the reader is already familiar with the contents of PART 1. PART 2 forms the bulk of this book. It is split into three related chapters. Each of these chapters has several sections. At the beginning of most sections instructions are given on how to transfer the results of that section to a Summary Chart in Section 18. Although these instructions are quite consistent among sections, they are not identical. Having carried out one or two sections, you will soon become familiar with the approach.

Chapter 5 STARTING OFF

Section 1

We begin by inviting the user to describe simple biographical details about the learner.

Section 2

The next section is the place to include additional background information which may or may not be available. If available it will come in the form of written reports, such as medical reports and Records of Needs. Many of the terms used to describe vision may well not be familiar. So in this section we discuss some of those terms you are likely to come across.

Section 3

In the third section we ask you to begin observation of the learner. At this stage you will only be observing and integrating these observations with the ones you have made on the many other occasions you have been in the company of the learner.

Chapter 6

Sections 4 - 7

We now start to glean information about how the learner makes sense of his world through senses other than vision. If you want to refresh your memory as to why emphasis is placed on non-visual areas of assessment, you can refer back to Chapter 3. It contains a detailed explanation of how we arrived at this strategy.

Chapter 7

This is the "how to" part of assessing vision and is the biggest chapter of the book. You might expect this as the title of the book is Vision for Doing. You do not require special materials or six computers to carry out the directions therein. You need only your own 'willing eyes' along with materials that are readily available.

Sections 8 - 18

Chapter 7 is sub-divided into 11 sections, Numbering of sections allows a more manageable foray into visual assessment. These sections are organised in a particular way, and an explanation of this structure is given at the beginning of Chapter 7.

Section 18 Summary Chart

At the end of these three chapters, you have an opportunity to summarise all the information you gathered during the assessment. This comes in the form of a one-page summary of all the sections. This will give you an at-a-glance profile of the learner. Use it to decide the areas of intervention on which to concentrate.

The way to use the Summary Chart is to carry out each of the sections in Chapters 5, 6 and 7. At the beginning of each section you will find guidance on how to convert your results for that section into summary form. As you complete each section you are shown how to transfer the summary to Section 18.

Have a look at the diagram at the beginning of Section 18. You will see that there is a single row corresponding to each of Sections 1 to 17. By the time you have finished your assessment you will have an at- a-glance profile of the learner's abilities. Section 18 itself tells you how to use this profile to guide you in selecting topics for curriculum development.

When working with a learner who is multiply disabled, it is essential - where it exists - to bring together information that may already be available within the school or centre, in school medical records or previous assessments done by other professionals. This process may help you uncover details that will prompt you to ask further questions.

SECTION 1 THE LEARNER

SECTION 2 BACKGROUND INFORMATION

When working with a learner who is multiply disabled, it is essential - where it exists - to bring together information that may already be available within the school or centre, in school medical records or previous assessments done by other provessionals. This process may help you uncover details that will prompt you to ask further questions.

Principal players[1]

Aside from the parents or other carers many professionals will have a role to play in reporting on the learner. A brief description of the roles of these professionals may help you to narrow the search for reports.

Clinical medical officer (also known as school clinical medical officer among other titles)

This person is responsible for the medical welfare of children from birth until leaving school. Unlike the GP, he or she will have a formal link between education and health. This person will often be the source of background information on the learner's disabilities.

Educational psychologist

Usually employed by the Education Authority, this person provides support, guidance and information to parents, teachers and other professionals in respect of pre school and school-aged learners. Often Education Authorities will have an educational psychologist who specialises in the area of visual impairment. This person is charged with the responsibility of drawing up a Record (or Statement) of Needs. This document can be a rich source of information on many aspects of the school-aged learner's functioning.

Educational visitor

An experienced teacher, employed by the Education Authority, who visits the home and works with parents of pre school children who have disabilities.

Occupational therapist

May be essential in assessing the most appropriate seating and positioning for learners of all ages. With the learner who is multiply disabled, an understanding of positioning may put you well on the way to introducing new opportunities for learning.

Ophthalmologist

A medical consultant, mostly based in hospitals, who specialises in the diagnosis, testing and treatment of eye disorders.

If you are able to have the ophthalmologist's medical diagnosis translated into its implications for the learner's functioning and curriculum, you may have little need for this book.

Orthoptist (optometrist in USA)

An additional source of medical information on the learner's (usually a child) visual functioning. Will often be involved in management of a young child's squint. Orthoptists are generally employed by a health authority, and will work

closely with Ophthalmologists.

Paediatrician

Working with people who are multiply disabled you will of course not only be interested in the learner's sight impairment.

A paediatrician (especially a Paediatric Ophthalmologist or Neurologist) can synthesise the many aspects of information on a learner's medical condition.

Social worker for the blind

Much of the in-depth intervention available to the school-aged learner stops on leaving school. A social worker who specialises in visual impairment can represent a valuable link into and right through adulthood.

Specialist teacher for visually impaired

Many Education Authorities now employ at least one teacher who specialises in the education of school-aged learners with visual impairment.

No information available?

Do not despair if you find that none of this background information exists on eye condition, nor a measure of visual acuity, nor information on visual fields, with no mention of whether or not glasses or lenses have been prescribed. It was because of the lack of this kind of information that we found it necessary to set out to produce this book. We would, of course, encourage you to try and build up background information from the headteacher and staff in a school or other centre; from parents or other relatives; as well as from the 'principal players' described above.

However, even without background information you can still use the methods suggested in these guidelines to start finding out yourself whether or not the learner has any useful vision, and if so how much and how well is it used.

We now take a look at the individual items making up the assessment list for Section 2.

What to do next

Refer to the diagram at the beginning of Section 2. This is a list of assessment items. Using the information you already have available (if any), complete the boxes on that page. As a guide to what these mean, the topic headings that follow correspond to the items in the assessment list.

Learner is described as..

In this part we give you the chance to note down whether the learner is described as blind or partially sighted. In the second half of Chapter 1, we discussed the confusion that can result through a learner being described as blind when in fact that person has useful functional vision. You may want to refresh your memory on the details of this discussion.

The other point to note besides the information in Chapter 1 is that a learner may function as blind in one Setting but not in another. In that second setting she may well appear to have useful functional vision. This is especially true when crossing from a familiar into an unfamiliar environment. In Chapter 2 we discussed the need for observing the learner in more than one setting. This is one very good reason for doing so.

General diagnosis..

In this space, you would write the name of the learner's medical condition. Usually, information is available on a learner's condition. For instance, common disabling conditions that could occur might be *cerebral palsy*, *rubella*, *cytomegalovirus*, or a host of other conditions.

Name of eye condition..

It is quite likely that this kind of information will **not** be found in medical or other records. Several writers have pointed out that it is often the case that no firm diagnosis has been made for a learner's visual impairment. Especially for the parents and relatives of a child this may be very traumatic, affecting for example their decision on whether to have other children. The situation may arise because of similarities to other conditions, but it may be the case that the presence of additional impairments has caused medical personnel not to believe that there is anything further to be gained by offering a diagnosis of eye condition. Where this does happen, then it may be useful to consult further with the medical profession, as it may be possible to refer for further diagnosis.

Where the name of the eye condition is known, this may be helpful in understanding some of the effects of the type of impairment from which the learner is suffering. In such circumstances, you are invited to turn to the **Glossary** (towards the end of the book) in which a brief description is given of the effects of a few eye conditions occurring frequently in learners who have multiple disability.

Visual acuity..

In an earlier section we discussed what is meant by *Vision for Doing* or as it is often called *Functional Vision*. We represented **visual acuity** as being a particular measure selected from a range of activities our sight lets us perform. Acuity is simply a measure of the ability to see detail. Many of the learners for whom these guidelines have been designed will not learn to read or write, but some may be involved in activities such as looking at pictures. For these activities you need detailed vision and this is what is known as 'visual acuity' sometimes abbreviated to **VA**.

Visual acuity is a measure of the sharpness of vision in picking out small detail, small shapes, small outlines, and in the case of reading, picking out small letters and symbols. A visit to the optician usually begins with an attempt to obtain a measure of visual acuity'. If this information is available it will be found as a set of numbers. For a rough guide to what these numbers mean, refer to Table 5.2.1.

Most learning activities take place quite close up and even if you think back to your own education, when you were engaged in reading and writing, working with materials on the desk involved what is called **Near Vision**. Notice that we offer boxes for both eyes along with left and right eyes independently. You may find figures describing the child's VA, but do not despair if you are unable to do so.

Refer to Table 5.2.1. in the third column there are figures in brackets. One of these is 6/60. Two figures separated by an oblique mean in this case that the learner can see at 6 feet that which a person with normal vision can see at **60** feet.If, however, a learner notices people coming in through the door, turns to them and appears to be looking at them, this kind of ability to see at a distance would be where a child used '**Distance Vision**'. For certain learning activities - such as looking at blackboards - or other activities in life, it is very useful to be able to see things at a distance. You would probably be able to think of many examples. In between these two is '**middle distance**' and again at school quite a few activities take place at that distance. For example, the learner seeing dinner approaching, or identifying another person seated alongside.

In our chart, we offer two ways of reporting information already known on a learner's near and distance visual acuity. These are **With Correction** and **Without Correction**. These terms simply allow you to record VA with and without glasses or contact lenses.

It is often the case that the reports on learners who have multiple disability show no information as to visual acuity.

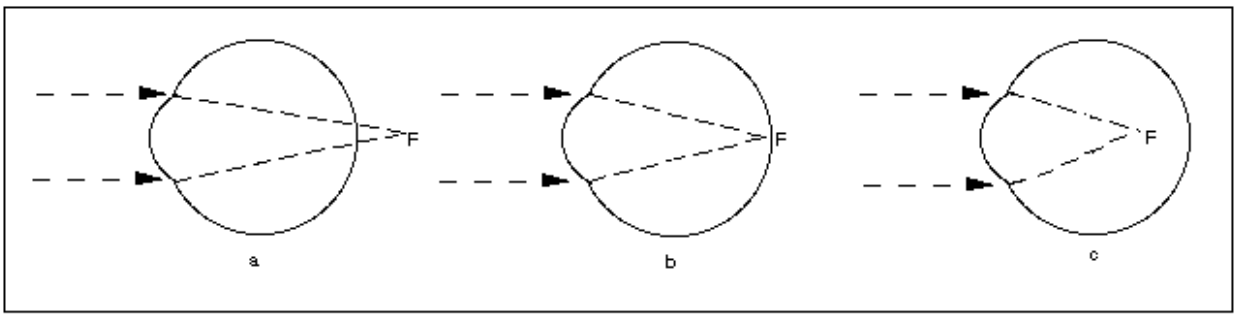
Visual Field

Often known as '**peripheral vision**' this is the area of vision which helps us become aware of our surroundings and is used when we move around. We cannot see detail with our peripheral vision, but it is extremely useful to us in avoiding obstacles. If our attention is attracted by some thing in our peripheral field of vision, we tend to "look" at it with our central vision. In order to understand if there are limitations on peripheral vision, we measure the learner's *Visual field*.

Only occasionally will you find a reference to '**visual field**' within the records contained in the school or other centre. Visual field is the width, height and depth of the area in front and to the side of a learner that can be seen without moving his eyes in any direction. Limitations on the field of vision may be so severe as to result in the person being limited to seeing only the equivalent of the width of just one word at a distance of two feet. Later on we will be offering you ways by which you can get your own idea as to the size of a learner's visual field. At that point we will have more to say about the learner's visual field.

Refractive errors..

What we see of our world is contained in the light that passes through the lens of each eye to the retina at the back of the eye. As the light passes through the eye, it is bent or refracted in a certain way. If the eye is not a 'normal' shape, then the light that is bent will not fall sharply on the retina. Just as in a camera, if the lens is not adjusted properly, the image can be blurred. The greater the degree the eye curves from a normal shape, the more blurring will result. As a result of this abnormal curvature, the learner may be **long sighted, short sighted** or can have **astigmatism**. Figure 5.2.1. shows how these errors of refraction can occur.



a) Hypermetropia (long sighted) - Parallel rays of light enter the eye and focus behind the retina;
b) Emmetropia (normal sight) - Parallel rays of light enter the eye and focus on the retina;
c) Myopia (short sighted) - Parallel rays of light enter the eye and focus in front of the retina

Figure 5.2.1 Refractive errors in the eye

Long sightedness (Fig 5.2.1 a)

A learner who is described as long sighted (or hypermetropic) will see things at a distance more clearly. This is familiar to us all when seen in a relative or friend who is beyond middle age. The person may hold a newspaper at or even beyond arm's length. Closer than this the image appears blurred. Where this is present from an early age, the acquisition of fine motor control or pincer grasping may be affected. (In the older person there is a reduction in the elasticity of the lens and muscles holding the lens. This is called *Presbyopia*).

Normal eye (Fig 5.2.1 b)

Illustrates the normal eye with light entering the eye and focussing on the retina. This may be recorded in medical records as emmetropia.

Short sightedness (Fig. 5.2.1.c)

Of the three it is most common to encounter short sightedness (myopia) in younger people. If so details are seen best when they are up close, to within 2 to 3 feet (and often even closer). It may explain why a learner does not seem to notice facial expressions at the far side of the room, or even at distances which are usually associated with normal communication. As a result he may be deemed surly or uncommunicative, unable to detect non-verbal communication. You will be able to explore this further through the sections of this chapter.

Astigmatism (not illustrated)

This occurs when there are distortions in the light entering the eye. The result can make straight edges (such as lamp- posts) appear distorted.

Combinations (not illustrated)

Astigmatism can occur in conjunction with either short or long sightedness. And of course one eye may have a different refraction from the other.

Glasses prescribed..

If glasses are prescribed but not worn, find out whether there are good reasons for them not being **worn**. Often glasses are not prescribed for those who have multiple disability. Some times, all things being equal, glasses would have been prescribed for that visual impairment had the learner been without additional disability. Why should this be so?

For some it can be an unfortunate case of the stigma associated with having severe disability. In terms of our distinction in terminology cited at the beginning of this book, this would deservedly be called a 'handicapped learner'. There may nevertheless be very good reasons for a learner with multiple disability, who has refractive error, not being given glasses or contact lenses.

It may be that the learner constantly pulls them off his face. In such cases it may be possible to set up, and keep to, a rigid timetable of gradually building up to having them worn. Try starting with a few seconds and, if necessary, offer some sort of reward so that wearing glasses equals "good stuff"!

Another good reason would be where injury could result (perhaps from "head-banging"), but do not be too passive in accepting an explanation. Where the explanation smacks of an excuse, be prepared to press on.

While on the subject of wearing lenses, a couple of hoary old chestnuts need to be dispensed with. It is not true that every visual disability is amenable to wearing glasses. Many of the visual disabilities you encounter will not be alleviated by the wearing of glasses.

The second common misunderstanding that needs to be dispensed with is that by wearing glasses perfect sight will be restored. Wearing them may help but not in every case.

Glasses v contact lenses

You may wonder why it is that some learners wear glasses and others contact lenses. Although there may be many other reasons for one being chosen over the other, a reason that often occurs is that contact lenses may be prescribed for more severe refractive errors. This is because a spectacle lens would be very thick and thereby reduce the field of vision. Contact lenses, being worn closer to the eye, allow a greater field of view.

Low vision aids..

Where refractive errors do occur, glasses may be prescribed. You might even find a **low vision aid** (LVA) useful. Glasses and low vision aids are no more than different kinds of lenses. Often the child with multiple impairments does not have glasses prescribed even though there is a significant refractive error. Where glasses, contact lenses or low vision aids have been prescribed, you might never have seen them since the child has been at school. It is important to find out if they have been used in the past and you may well have to ask the parents or guardians about this. You may find that the reply is "Oh yes, they did have a pair of glasses", and it is the first you have known about it.

Any other information..

Under 'Any Other Information' you would include other impairing conditions; if there is any indication that the child's vision is likely to deteriorate; or other information you yourself find useful.

Transferring results to section 18:

This is the first opportunity for using the results you obtained in the assessment to inform suggestions for curriculum development. To do this you need to summarise your results and carry this summary across to the Summary Chart (Section 18). The Summary Chart. This relates to the model we set out in Chapter 3, in which we described our use of the terms *Awareness, Attending, Localising, Recognising* and *Understanding*.

For the present section, we could in theory determine that the learner functions at the "level" of *Understanding*. You would be able to do this if you have Background information that the learner has measurable visual acuity. You could then transfer this in summary form directly across to the Summary Chart. To do this you would simply go to Section 18, find the row for Section 2, go along and tick *Understand*.

In practice, however, the problem is that you have to be absolutely certain that you are confident in this measure of visual acuity. If you are not confident in the result, or (more likely) you do not have any information on visual acuity, you should not transfer any information across to the Summary Chart. Leave blank the row for Section 2.

Should you be quite happy with any visual acuity measure you have found from Background information, you should still carry out Section 3 in this chapter, as well as the sections in Chapter 6. In your assessment of vision you should concentrate on Sections 12, 13, 14, 16 and 17.

SECTION 3 OBSERVING THE LEARNER

Carrying out Section 3

The items contained on the checklist beginning this section represent the first stage in taking an active role in observation of the learner. Tick the box appropriate to each item or, where appropriate, write in the space provided.

You will notice this is the first use of three categories - *Consistently, Occasionally* and *Never*. You will be using these throughout the assessment.

We wanted to recognise that learners who have multiple disability might not be consistent when they respond. We do this by recording:-

- **Consistently** where the learner is consistent in showing a change in behaviour OR
- **Occasionally** where the learner sometimes shows a change in behaviour OR
- **Never** where there appears to be no change in the learner's behaviour.

You will probably be able to think of many times when you were not sure whether a response occurred by chance. Where there is doubt as to whether to put down **Occasionally** versus Never, then the rule is to give the benefit of the doubt and include the Occasionally. The very nature of this kind of assessment is that you can come back another day and try again.

Notice, too, that we do not ask you to describe the nature of that response. It is not difficult to understand why it would have been pointless for us to indicate specific behaviours to be recorded. Suppose we had specified that you record if the learner 'turns her head to a moving object'. If her head just happens to be held rigid in an orthopaedic chair then you would not obtain that response! The box would go unmarked, even though you might have seen her make some other response. It is not, therefore, helpful to specify responses.

Instead what is looked for is whether a change has occurred. In later sections you will use this same scheme to find out if the learner's behaviour changes in any way whilst carrying out each of the items.

No response present

What happens if you have carried out all of the sections, that is you have completed the whole assessment, and you have found that **the learner does not respond at all**? Or perhaps you know already that it is pointless to carry out the assessment. You think the learner does not respond in any way. What can you do? (*You should only use the technique that is described next if you have found it difficult to obtain any response. Otherwise carry on with* Vision for Doing).

When working with learners who have the most severe multiple learning difficulties, it can be difficult to determine whether **any** response is being made to an object or event. Sometimes a technique may be needed for refining our observation. One variety of tools does assist in this process. They are simply additional methods for structuring your observation. As you may not have come across these methods we thought we would include an example.

Note that this is a technique which does not fit comfortably with many caring and committed people. The reason it seems alien has to do with us wanting to be doing things with the learner, rather than sitting watching. Yet much may be gained by taking time out to observe. In the real example shown in Figure 5.3.1. we see three different observation periods. You may be able to do all three in one session. If not, select a similar situation at the next opportunity. There are after all many other aspects of teaching and physical caring in which you will have to be engaged. So do not despair if you have to break, but carry on where you left off.

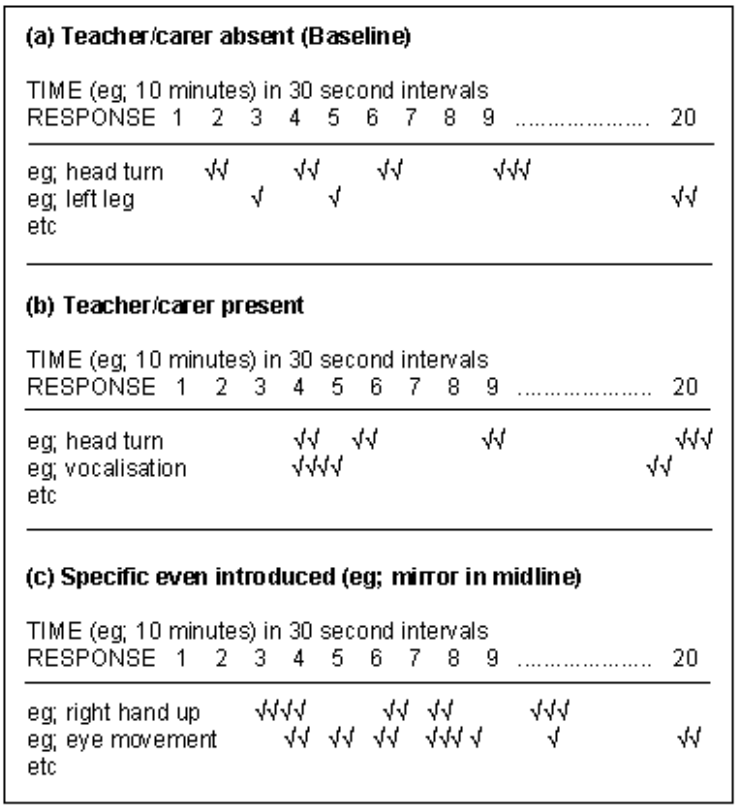


Figure 5.3.1 Observational technique which can be used when doubtful if any responsiveness in learner

Each of the three periods of 10 minutes (you might choose 5 minutes) is spent closely observing the learner. Record any movement (note that in our example one of these is a vocalisation) the learner makes in the appropriate appropriate time slot. This will take practice. Any difference between Parts b) and c) will help you to distinguish the effect of a person's presence on the learner versus that of the specific stimulus you wish to investigate.

Structured observations of this type begin with a measure of **baseline** performance (see 5.3.1.a). In this you record what the learner does when no-one is present. Conceal yourself behind a screen or by other means. Record behaviour over a 10 minute slot, at 30 second intervals.

The next thing to record is thelearner's response when an adult (yourself or a helper) approaches and interacts (Figure 5.3.1.(b)). Note that we need a comparison between a) and b). It would be erroneous to take as a baseline the learner's behaviour only in b). You need to know what hap pens when ostensibly no person is around (Figure 5.3.1. a above). And compare this with what happens when a teacher/carer is present.

In this example our comparison reveals interesting results. Comparing a) with b), it can be seen that the learner does indeed respond differently with an adult present as opposed to being isolated. You might then want to go on to explore a whole range of communication issues.

After these are recorded, that is the time to note whether there is any response to a **specific** event of your choice (as in Figure 5.3.1. (c)).

From 5.3.1 .(c) we surmise that the particular visual stimulus did indeed have an effect. You are then ready to proceed to discover whether this will be the only type of visual or other form of stimulus which will be effective in eliciting a response.

Response present

Having set out what to do **if you are finding it difficult to record any response**, we can now return to the remainder of Section 3 and indeed the other sections of the book.

In Section 3 you will record behaviours that are apparently not related to vision. In the text that follows we show why these items have been included. We use the same headings as the items included in the checklist at the beginning of Section 3. You will be most interested in discussion points under these headings should you have ticked Consistently.

Transferring results to Section 18:

Before you read about the discussion on each of the items, you should transfer a summary of the results of your observations to the Summary Chart in Section 18.

Score attend if: the learner has *Consistent* preferences **and** *Consistent* Challenging behaviour. If so, go to Section 18, find the row for Section 3 and tick *Attend*. Then move on to Section 4.

OR score aware if: the learner *Consistently* shows unusual mannerisms. If so, go to Section 18, find the row for Section 3, and tick *Aware*. Then go to Section 4.

Learner has likes..

In accordance with our Commandment on 'abilities' (see Chapter 4), we begin by recording if the learner has any 'likes'. Later on you will be able to capitalise on these. Examples of likes might be situations, places, certain people, music, particular toys, activities and even foods or drinks. The learner may only give a vague indication of these 'likes'.

You may be in the position of being aware of the learner liking any one of these suggestions (or indeed any others not listed), but you are finding it very difficult to complete the remaining sections of the assessment. If so, ask yourself this question. **How do I know he has likes?**

For to indicate a liking the learner must, in some small way, be moving, making a response or being vaguely consistent - to a smell, a taste, a feature. Try to clarify this for yourself. This should help you to complete some of the later assessment items.

Learner adopts unusual postures..

Positioning

Supported positioning is of significant importance for learners who have sitting or hand control difficulties[1]. If they are using all their energy in maintaining balance, the visual target might be lost involuntarily. When securely supported energy can be put to the activity of seeing.

Positioning and seeing

There is some evidence to show that learners - especially children - who have multiple disability have optimum positions for seeing (and for other activities). If you are not already aware of information on optimum positioning, then consult with a physiotherapist or occupational therapist. Gross physical positioning should be investigated as it may be that in a side-lying, or supine position, or indeed some other position that visual tasks are facilitated.

You should also note that it is not always the case that the best position for seeing coincides with optimum physical positioning. You may have to take a consensus decision. In this way it may be possible to devote short periods of a day to achieving positioning for seeing optimally, at the expense of optimum physical positioning. That is why we emphasise consulting with occupational and/or physiotherapists.

Compensatory head postures

Less obviously, orientation of the head in a certain direction may help a learner to see objects. For some learners with impaired sight, only certain parts of their eye can detect information. It may mean that in order to see more effectively, the learner has to adopt an unusual head posture.

You may be trying very hard to encourage looking in a midline direction, while the learner sees best by turning her head in an apparently unusual manner. Observe whether there is any consistency to unusual positions adopted by

the child. For example, she might strain parts of the face or neck, or adjust her body into certain positions. Does this happen **only** with certain objects; or **only** when things are presented visually?

You can increase your confidence in deciding between an unusual posture being a purely visual response or a more general response. Try comparing your observations to visual information (Chapter 7) with those gained with non-visual information (from Chapter 6).

Learner shows unusual mannerisms..

What are mannerisms?[2]

Blind children often exhibit mannerisms or apparently unusual and repetitive or stereotypic behaviours. Some times known as 'blindisms', these have been known to include eye poking, hand waving, unusual head movements, rocking of the whole body and others. The younger the child and the more additional impairments there are present, the more likely it is that one will observe one or even several mannerisms. Generally these do reduce with age.

What causes mannerisms?

Although several authors have wanted to ascribe the cause of mannerisms to one single thing: maternal deprivation, cross- cultural differences in child rearing practices, sensory deprivation and so on - it would seem that there is in fact no single cause. Eye poking may indicate an irritation of the retina, and further medical advice should be sought.Some other mannerisms may, however, have their origins in attempts at communication which were successful early in life. There may be other reasons.

This last point shows that it can be hard to draw the line between what is and what is not a mannerism. For example a lack of awareness of facial expressions of adults could apparently be manifested by a learner avoiding eye contact. Is this a good thing or a bad thing? It may be that what appears as a pathological sign is in fact the learner attempting to catch sight of a hair line offering good contrast against the background: in other words attempting to interact - the very opposite reason. These unusual patterns of interaction may well represent useful responses for that learner in particular situations. Which takes us to possible remedies.

What to do about them?[3]

Having followed the discussion above you will realise that a single 'treatment' for mannerisms is out of the question. So behaviour modification and other simplistic approaches should be re-considered. In some instances that approach **may** be right, but there is no educational aspirin which applies to all instances of mannerisms.

The first thing to do is to record instances. Is there a pattern that emerges over a couple of weeks? Look at different settings, when different people are present, at different times of the day. Glean information from home. Depending on the results of your observations, you may want to consider some of the following approaches:-

- giving substitute means of initiating interactions with staff;
- engaging the learner in motivating activities;
- try saying no - just because a child is blind does not mean mannerisms follow automatically.

Remember though that there is also a place for the learner with multiple disability to have the same range of normal neurotic responses as the rest of us. Where these do spill over and become the ritualistic mannerisms, or stereotyped behaviours, then one needs to ask the kind of searching questions mentioned above.

Learner has challenging behaviour..

A confusion in terms..

A significant number of those who have multiple disability including visual impairment exhibit challenging behaviour. In fact the term 'Challenging Behaviour' has several different meanings. In the USA it is now often applied to behaviours seen in a range of learners who in this country are seen as having 'severe and profound learning difficulties'. Whereas in the UK it is usually applied to those who exhibit severely antisocial behaviours. These could include a variety of forms of self-mutilation and aggression to others. We use it to refer to learners who exhibit anti-social behaviours.

The term shifts the focus away from thinking that there is something wrong inside the learner's head and towards there being something wrong with what she does, and with the structures we have put in place to deal with it. The broader use of the term places an onus upon those working with the learner. It is the professionals who are challenged, NOT the learner who is challenging.

A definition..

We are happy to use the definition as introduced by Gordon Phillips that it is

"**of such intensity, frequency or duration as to affect the physical safety of the learner or others**"[4]

As with many of the other topics touched on in this book the issue of Challenging Behaviour is deserving of more in-depth treatment than our cursory glance.

Challenging behaviour and severe visual disability

You may wonder why this is common with people who are blind and multiply disabled. A few obvious causes which may spring to mind are that the behaviour could be:-

- merely one aspect of being blind. If this were indeed true then it would be a cause for great pessimism, for it would indicate that very little could be done to alleviate the problem - short of restoring vision;
- blindness could be just one form of damage to the brain. Challenging behaviour would then be just another form of brain damage - just as the learner's other disabilities would be;
- because of the level of sensory deprivation, the learner has to provide his own stimulation. After all, this may be the only one over which he has some control;
- a problem of communication. In this view the blindness causes problems in communicating. The Challenging Behaviour then becomes either a way of communicating or a way of withdrawing from communication;
- one specific example of the above point would be that this offers a consistent way of getting attention;
- a consequence of the structures put in place by various forms of local or central government. There are many examples of how this may happen. For instance, many parents will report anxiety at an impending long summer vacation.

Of these suggestions - to which more could be added - it is clear that the last four would be the most amenable to being changed by adopting changes in curriculum. For these explanations suggest that the maladaptive behaviour(s) have results to do with the learner's Settings. That is it is functional for the learner to engage in challenging behaviour.

Begin by describing

As with most of human behaviour there may be more than one cause and each cause may interact with other causes. That being so, it is important first of all to describe which behaviours occur; the occasions on which these are observed; the people with whom they happen; and what the learner might be getting out of performing these behaviours.

A useful source of help in this is to consult with a psychologist. He or she may draw up a list of behaviour categories for you to record such as ones that are:-

violent, aggressive to others - such as hitting, pushing people;

self-injurious - head banging, eye poking;

disruptive - tantrums, running away.

Styles of non-intervention

There are a host of ways of not dealing with the problems presented by challenging behaviour. Many have *hidden from the problem, or blamed the victim, or passed the buck to someone else or permitted it to happen*. In a thoroughly interesting and entertaining account, Phillips discusses these and others and shows how various administrations of government and local government have striven to build structures around these ways of not dealing with the problem.

Styles of intervention

We would like to describe four broad areas which you may encounter as suggested ways of guiding your intervention with those who exhibit challenging behaviour. These are Drug Treatment, Behaviour modification, Gentle Teaching and Cognitive Therapy.

Drug treatment

We think this is overdone. To give you some idea as to why we think this to be so let us tell you a true story. It concerns a young man of 14 years. He had been exhibiting a great deal of challenging behaviour, including wrecking rooms, breaking windows, assaulting staff and many more.

The school staff pressed for him to be put on a form of tranquilliser which they could administer. Soon after the drug had started reports were that he had calmed down. The drug treatment had worked. Or had it?

Unknown to the staff the boy's mother - who was unhappy at him taking the drug - struck a deal with the local chemist who supplied the drug. He mixed a placebo, coloured the mixture the same as the drug and in the same shape. The school used this happily for over a year, blissfully unaware of the true contents of the 'wonder drug'.

Too often drug treatment is used in place of changing administrative structures. Medication should be a last resort, only used when all else has failed and for as short a time as possible. In fact, many drugs used for this purpose have side-effects on concentration, on vision, and on mood.

Behaviour modification

You will no doubt be aware of this term used to describe the system of rewards and punishments to reduce challenging behaviour (as well as in other realms of the curriculum). Indeed its use is a severe challenge (no pun

intended) itself to the commandment in Chapter 4 on allowing the learner to have control over his world. For challenging behaviour is in this view a sign that the learner already has too much control. The aim is to reduce the control the learner has over the world.

Behaviour modification can be very effective. However it has two main disadvantages. First there is difficulty in generalising. What is learned becomes extremely specific - to one member of staff, to one room, to one activity at one time of day. Transfer becomes difficult. The second difficulty with this method is that training in skills does little good without concurrent change in attitude.

Gentle teaching

This is only one of many forms of practice currently being used with learners who in general do not have visual disability. The technique can be applied to those who have visual disability.

A special form of this kind of approach has recently been discussed by Lilli Neilsen[2].

Cognitive therapy

This technique, recently introduced into the field of Clinical Psychology is, as yet, almost entirely untried in the area of multiple disability with visual impairment. It is an area worthy of further investigation. Further discussion of this subject is beyond the scope of this book[5].

General principles..

Here are some general points to consider when thinking of ways of handling challenging behaviour. However, you are also invited to refer to other sources which deal much more comprehensively with the subject:

- begin with the learner's interests and likes;
- establish security aiming for a key worker;
- identify communication strategies that will indicate what is to come next rather than having the world continually **happening to** the learner;
- allow some control over what happens in the life of the learner;
- all staff must agree on ways of handling behaviour.

As can be seen these issues represent the broader area of how to work with the learner who is multiply disabled. These are discussed in Chapter 4. A final point on our brief discussion of challenging behaviour. It can be very difficult to work with a learner whose behaviour is challenging. In that position it can be very difficult to identify where you are 'going wrong.' As a committed professional you are likely to blame yourself. In that position, it is important to discuss with others. Consider what other kinds of resources are available - in the centre, at home, within the local authority, within the voluntary sector. Can they help and does their approach coincide with your knowledge of the 'Ten Commandments'.

Chapter 6

front page

Vision for Doing

Chapter 6 THE OTHER SENSES

For consistency you will, in this chapter be using a format similar to that introduced in the previous chapter.

Having carried out the items in each of the four sections that make up this chapter, you are invited to integrate your findings with those from Chapter 7 - responses to visual information.

Background

You may be wondering why it should be that in a book about assessing vision, we should. spend time discovering how a learner responds to non-visual events in her world. For in this chapter the intention is to give you the chance to assess the learner's responses to information about the world coming through sound, touch, smell taste.

Our rationale for doing this was set out in great detail in Chapter 3. You will be pleased to know that we do not intend to repeat that rationale here. Instead we give a brief summary as to why it is so important, in the case of the learner who is multiply disabled, to investigate response to non-visual information.

This helps us build up a wider knowledge of the learners and gives us a means of comparing her visual responses with those responses made to information detected through other senses. Also by channelling some of our observational energies into assessing response to non-visual information, we have a better chance of offering to the learner a wider range of suitable activities. However, as we pointed out in Chapter 3, if we were to enter into as great detail for non-visual items as we will do for visual items, you would be reading a set of volumes which would cure your insomnia! We offer a short hand version for observing response to non-visual information.

Sections in chapter 6

In this chapter there are four short sections. These are numbered Sections 4, 5, 6 and 7. They are numbered in this way so that they follow on from the final section of the previous chapter. Thereby if you only wish to use the front page of each section, these will follow in a logical numerical sequence.

Section 4

In this section you have an opportunity to observe the learner's responses to sound information.

Section 5

The items of this section are geared to helping your observations of responses to pressure - for convenience we call it 'touch'.

Section 6

Here you will take a look at response to one form of chemical information - again for convenience we will call it 'smell'.

Section 7

In the final section of the chapter we take a look at another form of chemical information, this time 'taste'.

NB For general Information as to the meaning of Consistently, Occasionally, and Never refer to Chapter 5, Section 3.

What to do with results

Each time you complete one of the Sections 4, 5, 6 or 7, carry forward the result for that section to the Summary Chart at the end of PART TWO. This will give you an at-a-glance profile of your learner.

On the basis of that Summary Chart, you will discover at which 'level' the learner is functioning. With this knowledge you can then proceed to collate all of the suggestions for curriculum development which have as their theme that particular 'level'. (If you are uncertain, you can refer back to Chapter 3. This sets out in great detail the meaning of these functional 'levels', which are used as organising themes for suggestions as to curriculum development).

SECTION 4 LEARNER'S RESPONSES TO SOUND

Aims of section 4

In this section we have five categories o! items. You will be using these to give some idea as to the learner's level of responsiveness to sound.

From this you can be more precise in selecting which of the intervention strategies outlined in Chapter 6 and Chapter 7 are most relevant to your learner.

How to use section 4

Refer to the diagram. For each of the items under the five broad headings to the left you will want to record whether the learner responds in a manner that is *Consistent, Occasional* or *Never*.

While carrying out the items in this section, as far as possible try to use stimuli that only involve sound. Remember also to remove the previous stimulus before going on to the next.

Note that you should not consider this in any way as a substitute for a test of hearing.

Transferring Results to Section 18

Learner is aware..

For this to be the case you may not have found any specific response. Instead, you will observe only a vague and non-specific response to sound.

If your results show that the learner responds *Consistently* to the item, go to the **Summary Chart** (at the end of PART TWO), find the row for Section 4 'Sound' and put a tick in the box for *Awareness*. Then move on to the next topic (**Learner attends to...**).

If instead the learner responds only *Occasionally*, try again on different occasions. If the result is still *Occasionally* use *Awareness* as the level of responsiveness. If so, go to the **Summary Chart** (in Section 18 at the end of PART TWO), find the row for Section 4 'Sound' and put a tick in the box for *Awareness*.

If the learner *Never* responds to any of the items under this heading go on to Section 5 dealing with 'Touch'. Note that you should not have results in which the learner *Attends* or *Localises*, or *Recognises* or *Understands* sound but is still not *Aware* of sounds. A learner has to be *Aware* of sound in order to *Attend to*, *Localise*, *Recognise* or *Understand* a sound.

Learner attends to..

In order for you to observe an ability to *Attend*, you must first have found that the learner is *Aware*. If you are uncertain, read over the previous information on "**Learner is Aware..**"

For the learner to *Attend* you will have observed a more specific response to sounds such as to people's voices.

If your results show that the learner *Consistently* responds to each of the items on the checklist under *Attends*, go to the Summary Chart (at the end of PART TWO), find the row for Section 4 'Sound' and put a tick in the box for *Attending*. Then move on to the next topic (**Learner localises sound..**).

If the learner responds *Occasionally* to one or more of the items, and one of them is *Consistent*, take *Consistent* as the level of response. In this case too, tick *Attend* in the Summary Chart and move on to "**Learner localises sound..**"

If all are *Occasional* try these out on different occasions. If the result is still *Occasional* use *Awareness* as the level of responsiveness. The Summary Chart should already have been ticked.

If the learner *Never* responds to any of the items under this heading go on to Section 5 dealing with 'Touch'. Note that you should **not** have results in which the learner *Localises*, or *Recognises* or *Understands* sound but does not *Attend to* sounds. A learner has to be able to *Attend to* sound in order to *Localise*, *Recognise* or *Understand* what that sound is.

Learner localises sound..

In order for you to observe an ability to *Localise*, you must first have found that the learner can *Attend*. If you are uncertain, read over the previous information on "**Learner Attends to..**"

For the learner to *Localise* you will have observed specific directional responses to sounds indicating the learner knows **where the sound comes from**. This may, but will not always, be seen as a head turn towards the source of the sound. If the learner cannot turn her head then clearly you will be looking for a change in response which is still specific enough to indicate she knows the direction from which the sound came.

If your results show that the learner *Consistently* responds to each of the items on the checklist under "**Learner localises sound..**", go to the Summary Chart, find the row for Section 4 'Sound' and put a Ã in the box for *Localises*. Then move on to the next topic (**Learner recognises sound..**).

If the learner responds *Occasionally* to one or more of the two items, and one of these two results is *Consistent*, take *Consistent* as the level of response. In this case too, tick *Localise* in the Summary Chart and move on to "**Learner recognises sound**".

If all are *Occasional* try these out on different occasions. If the result is still *Occasional* use *Attending* as the level of responsiveness. The Summary Chart should already have been ticked.

If the learner *Never* responds to any of the items under this heading, still try *Recognises*. Note that you should **not** have results in which the learner *Recognises* or *Understands* sound but is not *Aware* or *Attending* to sounds.

If the learner is physically disabled such that she is unable to turn to sound, consider whether there is another means open to you to introduce that sound. If her response indicates localisation of the sound then record this as a consistent response (tick *Consistently*).

Learner recognises sound..

In order for you to observe an ability to *Recognise* sound, you **may** first have found that the learner can *Localise*[1]. If you are uncertain, read over the previous information on "**Learner localises sound..**"

For the learner to *Recognise* you will have observed specific responses to sounds indicating that these are familiar to the learner. In order for you to justifiably say that the learner *Recognises* sounds, it has to be very clear to you that the learner is making a clear distinction across a **range** of familiar and unfamiliar sounds.

If your results show that the learner *Consistently* responds to each of the items on the checklist under "**Learner recognises sound**", to to the Summary Chart, find the row for Section 4 'Sound' and put a tick in the box for *Recognises*. Then move on to the next topic (**Learner understands sound..**).

If the learner responds *Occasionally* to one or more of the items, even if one is *Consistent*, still take *Localise* or *Attends* as the level of response. In this case, tick *Localise* or *Attend* in the Summary Chart. Do not move on to '**Learner understands sound**."

If all are *Occasional* try these out on different occasions. If the result is still *Occasional* use *Localise* or *Attends* as the level of responsiveness. The Summary Chart should already have been ticked in the appropriate box. Do not tick *Recognise*.

If the learner *Never* responds to any of the items under this heading go on to Section 5 dealing with 'Touch'. Note that you should **not** have results in which the learner *Understands* sound but is not first *Aware*, *Attends* and *Recognises* sounds. A learner has to be able to *Recognise* sound in order to *Understand* that sound.

Learner understands..

In order for you to observe an ability to *Understand* sound, you must first have found that the learner can *Recognise*. If you are uncertain, read over the previous information on "**Learner recognises sound..**"

For the learner to *Understand* you will have observed a very clear response to sounds including an understanding of a wide vocabulary. It will be clear that the learner is making sense of this wide vocabulary.

If your results show that the learner *Consistently* responds to each of the items on the checklist under "**Learner understands sound**", go to the Summary Chart, find the row for Section 4 'Sound' and put a tick in the box for *Understands*. Then move on to the next section (Section 5) dealing with Touch.

If the learner responds *Occasionally* to one or more of the items, use *Recognise* as the level of responsiveness. If this is so, do not tick *Understands*.

If the learner *Never* responds to any of the items under this heading go on to Section 5 dealing with 'Touch'. Note that you should **not** have results in which the learner Understands sound but is not first *Aware*, *Attends* and *Recognises* sounds. A learner has to be able to *Recognise* sound in order to *Understand* that sound.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice.

EITHER you can skip the remainder of this section and proceed directly to carry out Section 5 dealing with Touch. By doing this you will complete more of your assessment on the learner's use of 'The other senses'.

OR postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development. These are to do with the use of sound. You might want to follow this option if you feel you need a break from presenting objects. At some point you should still carry out further assessment using the remaining sections of this chapter.

Note: Much of the text above (on completing the results) seems complex. Be assured that throughout the following sections you will be using a very similar system.

Developing a curriculum

We assume, if you are reading this paragraph, that you will have carried out all of the assessment items for each section in Chapter 6 and 7. We also assume you have completed the Summary Chart showing a profile for your learner. (Or you might be reading this whole section out of interest, for a break, or in order to get a 'feel' for the whole approach.)

You are now ready to proceed with structuring your intervention. The suggestions for curriculum development are presented under each of the five themes of *Awareness*, *Attending*, *Localising*, *Recognising* and *Understanding*.

Improving *awareness* of sound:

The washing line

When out in the back garden hanging out the washing, sounding objects may be attached to the clothes on the line. Any objects which come to hand may be used - such as milk bottle tops, cat bells and cutlery (not knives or forks in case they fall) can be used in this way.

Hearing impairment and severe visual impairment

If you suspect hearing impairment, you should not regard this short assessment as an adequate diagnostic form of hearing assessment. If not already done you should consult or refer on to relevant services such as the School Medical Officer or peripatetic hearing impairment service (where appropriate), or educational audiologist[2].

There is however one thing to bear in mind when anyone carries out an assessment of hearing with a learner who happens also to have a severe visual impairment or is blind.

When screening children's hearing, a common method is to use what is known as Free Field Distraction. In this, the attention of the learner (usually a child) is engaged and a sound is made - perhaps using a rattle to one side of the child. Recording is then made as to whether he or she then turns to that side. When carried out with blind children, however, the result is often a misdiagnosis of hearing impairment[3]. It is easy to see why a blind child would not turn to a sound source.

The difficulty for totally blind children is that they will not see any object if a head turn is made to the sound source. It would in fact be counterproductive for a blind child to turn its head towards a sound source. To do so would not gain additional information as to the location of an event. Moreover, a head movement will create additional sound, through clothes rustling, perhaps bedding being disturbed. It is likely therefore that by a certain age a blind child will have learned **not** to turn its head to a sound source. Those who are late-blinded, as opposed to congenitally blind, do continue to turn to sound sources.

That the behaviour - head turn to sound - is present in a young blind infant is suggested by observations of those born blind. Blindness is often not diagnosed until several months after birth. In many ways the young baby behaves as if sighted, and may well turn appropriately in the direction of sounds presented off to one side - with unseeing eyes. Evidence as to the degree of residual vision necessary for this auditory-visual coordination to continue beyond this early age is also by no means clear. For our purposes, it is important to note that children who are born blind or have a severe visual impairment may be misdiagnosed as also having a profound hearing loss. Consultation with other services, as mentioned above, is important.

One question which arises is whether head turning to sound indicates the presence of **cortical vision**. Surely, you might ask, if a head turn occurs then this must indicate an **expectancy** to see something? This would in turn imply a higher level use of vision. **If this were true, you would not expect to observe this response in a learner who is described as cortically blind**. Or indeed in a learner who is only *Aware*. Unfortunately the jury is out on this one, there is simply not enough evidence to come down on either side.That being the case, you may find a learner who does appear to turn to sound but who is indeed 'cortically blind'[4].

Music with movement

Here we propose to have a short discussion on the use of music, or indeed any sounds which are motivating to the learner. We wish to stress use of the kind of contingency framework presented in Chapter 4 (*Thou shalt follow the learner's lead*).

It may be possible to augment small movements of the foot, hand, finger, or other part of the body. One routine could be to associate the movement with various musical rhythms. This would be similar in many respects to the use of music and movement therapy sessions. The best of these occur when it is the learner who has to make a movement

in order to have the musical rhythm occur. Where there is no active movement to begin with, one can begin by making passive movements with the learner.

A second routine is to place the foot or hand into a container with one of a variety of materials. On the leg being lifted (or some other selected movement), simultaneously switch on a tape recorder, following this by moving the leg or foot in rhythm with the music. As this may involve the limb going into extension you should consult with a physiotherapist before embarking on this activity. Indeed this would be an ideal opportunity to investigate ways of carrying out physiotherapy exercises in conjunction with music. You could:-

invite along a music therapist to help work out suitable music to accompany the exercises. Record the music to be used in future physiotherapy sessions. Watch for **any** sign by the learner that he is anticipating the physiotherapy movements to come. Decide in advance what to do about movements begun *by the learner* that are appropriate to the exercises but out of sequence. Reach agreement with the physiotherapist as to whether it would be acceptable to take up the lead from that movement. (Switch off the music if it is the wrong rhythm and hum or sing along, to the rhythm of the new movement). The exercises might end up out of sequence, but the learner would become in **control**[5].

If carrying out some sort of wheelchair dancing to music look for opportunities for allowing the direction of movements to be brought under the control of the learner in the wheelchair. Allow the learner to go beyond the passivity of wheeled around. This does not mean having to fit a joystick controller to guide the wheelchair (but see Section 17 for a discussion on this issue). Control of movement might be something as simple as **you** responding to a movement by the learner's right hand by turning the wheelchair to the right.

A sound source placed around the wrist or ankle can help encourage hand or foot movements.

Improving *attending*:

Imitation

Give back to the learner any sounds they utter. Mimic any sound the learner will make. After some success, follow this by changing it slightly and see it you can obtain a different sound. Try changing the intonation as well as the word ending/beginning.

Encourage understanding of finger play and action songs. Games with actions such as clapping hands; bouncing on lap; see-sawing are all good additions. Here a few more action songs are given, to which you could add the learner's and your own favourites. Because action songs are carried out one-to-one and are great fun as well as being reassuring, they can offer a rich learning environment. The learner and caregiver are involved in communicating; the closeness of the care-giver facilitates both *attending* and *localising* parts of the learner's own body. Often repeated words and actions are gradually recognised and anticipated. Eventually the learner may come to *understand*. (See list of a few action songs).

Echoes

Refer also to Section 10 which discusses the use of echoes. In Section 10, discussion centres around the use of echoes in conjunction with reflected light. But the sound information produced by echoes can be used in conjunction with other visual and non-visual information.

Improving *localising*:

Babywalker

In Section 9, we discuss the use of light sources to help in localising while using a babywalker. For the visually impaired child, trundle truck types of walkers offer a better chance for establishing independent mobility than the makes of babywalker in which the child is seated. Another idea used successfully has been to use a small rollator at the front of which is attached a sounding toy in which the child is known to be interested.

Emphasise game-playing through which primary aims (of the teacher/therapist) to establish physical movements and positioning become (to the learner) secondary to having fun. For example this can be used in trying to encourage sitting posture. Place the learner's hands to either side in conjunction with music, songs, nursery rhymes. It achieves the same end and is less confrontational, while simultaneously helping anticipate and locate sound in different directions.

Stairs

When moving up or down with the learner, such as going up or downstairs, make your voice similar to the direction of movement. If going up stairs, raise the intonation of your voice; if going downstairs, lower your voice with the downward movement.

Sound map

Use sounds in different rooms as games. This can help to create a sound map of an area. The kind of object to use could be radiators - tapping on them with a fork or wooden spoon; cutlery and plates on a draining board; cupboards

tapped on; walls and floors.

NB See also the comments on auditory-visual coordination (under topic *Improving Awareness*).

Improving *recognising*:

Make a slight incline with a piece of heavy cardboard or thin plywood and a small box. At the bottom of the slope place any toy which makes a sound when contacted such as a bell, squeezed toy. Encourage the child to roll a ball down the slope to make this sound.

Action Songs

Everyday sounds

Let her explore the association between everyday sounds and their meanings. This section topic alone could afford a book[6].

Matching

For learners whose hearing is not severely affected, the concept of matching can be developed by using different musical instruments such as symbols, rhythm sticks, blocks. These can be simple rhythm patterns which the learner to move to or imitate, Often, these same routines can be used even where the learner has a hearing impairment, in which case relying on the detection of vibrations.

Improving *understanding*[6]

At this stage we stop offering suggestions. We are after all dealing with the learner who is more multiply disabled. Nonetheless we offer a few suggestions for further reading in the accompanying footnotes.

Section 5

front page

Scottish Sensory Centre

Vision for Doing

Chapter 6 THE OTHER SENSES

SECTION 5 LEARNER'S RESPONSES TO TOUCH

Aims of Section 5

In this section, as in Section 4 on Sound, we have five categories of items. These correspond to the topic headings *Awareness*, *Attending*, *Localising*, *Recognising* and *Understanding*. In the same way as you did in Section 4, you will be using these headings to give some idea as to the learner's level of responsiveness to tactile information about the world. This knowledge will help when selecting which intervention strategies are most relevant to your learner.

How to use Section 5

Refer to the diagram on the previous page. For each of the items under the five broad headings to the left you will want to record whether the learner responds *Consistently*, *Occasionally* or *Never*.

You may already be able to complete some of the items of this section. For instance if presentation of objects by sound resulted in the learner reaching out to touch the object you will be able to show on the diagram which positions the learner was able to locate.

Transferring results to Section 18

"Learner shows awareness.."

For this to be the case you may not have found any specific response. Instead, you will observe only vague and non-specific tactile responses. If, therefore, your results show that the learner responds *Consistently* to the item, go to the **Summary Chart** in Section 18, find the row for Section 5 'Touch' and put a tick in the box for *Awareness*. Then move on to the next topic (**Learner attends to..**)

If instead the learner responds *Occasionally*, try again on different occasions. If the result is still *Occasional* use *Awareness* as the level of responsiveness. If so go to the Summary Chart, find the row for Section 5 'Touch' and put a tick in the box for *Awareness*.

If the learner *Never* responds to any of the items under this heading go on the Section 6 dealing with 'Smell'. Note that you should **not** have results in which the learner *Attends*, or *Localises* or *Recognises* or *Understands* by touch but is still not *Aware*. A learner has to be *Aware* in order to *Attend* to, *Localise*, *Recognise* or *Understand*.

"Learner attends to touch.."

In order for you to observe an ability to *Attend*, you must first have found that the learner is Aware. If you are uncertain, read over the previous information on "**Learner is aware…**"

For the learner to *Attend* you will have observed more specific tactile responses such as to certain surfaces, toys or food.

If your results show that the learner *Consistently* responds to each of the items on the checklist under *Attends*, go to the Summary Chart, find the row for Section 5 'Touch' and put a tick in the box for *Attending*. Then move on to the next topic (**Learner localises by touch..**).

If the learner responds *Occasionally* to one or both of the items, and one of the results is *Consistent*, take *Consistent* as the level of response. In this case too, tick *Attend* in the Summary Chart and more on to "**Learner localises by touch..**"

If all are *Occasional* try these out on different occasions. If the result is still *Occasional* use *Awareness* as the level of responsiveness. The Summary Chart should already have been ticked.

If the learner *Never* responds to any of the items under this heading go on to Section 6 dealing with 'Smell'. Note that you should **not** have results in which the learner *Localises* or *Recognises* or *Understands* through touch but does not *Attend* through touch. A learner has to be able to *Attend* in order to *Localise*, *Recognise* or *Understand* through touch.

"Learner localises by touch"

In this part of the checklist you are presented with a diagram. Use it to show areas around the learner which can be located. Possibly this will occur through reaching, showing preferred direction(s) for reaching. Of course, you may want to use it to show directed leg movements or to indicate attempts to roll. In order for you to observe an ability to *Localise*, you must first have found that the learner can *Attend*. If you are uncertain, read over the previous information on "**Learner attends to..**"

For the learner to *Localise* you will have observed specific directional responses indicating the learner knows **how to search purposefully for objects by touch**.

If your results show that the learner *Consistently* responds to each of the items on the checklist under "**Learner localises by touch..**", go to the Summary Chart (at the end of PAR TWO), find the row for Section 5 'Touch' and put a tick in the box for *Localises*. Then move on to the next topic (**Learner recognises by touch..**)

If the learner responds *Occasionally* to one or both of the two items, and one of these two results is *Consistent* , take *Consistent* as the level of response. In this case too, tick *Localise* in the Summary Chart and move on to "**Learner recognises by touch**".

If all are *Occasional* try these out on different occasions. If the result is still *Occasionally* use *Attending* as the level of responsiveness. The Summary Chart should already have been ticked.

If the learner *Never* responds to any of the items under this heading, still try recognises. Note that you should **not** have results in which the learner *Recognises* or *Understands* through touch but is not *Aware* of or *Attending*.

"Learner recognises by touch..."

In order for you to observe an ability to Recognise by touch, you **may** first have found that the learner can *Localise*[1]. If you are uncertain, read over the previous information on "**Learner localises by touch;**"

For the learner to *Recognise* you will have observed specific tactile responses indicating that a range of objects is familiar to the learner. In order for you to justifiably say that the learner *Recognises* through touch, it has to be very clear to you that the learner is making a clear distinction between a range of familiar and unfamiliar objects, people and places by touch.

If your results show that the learner *Consistently* responds to each of the items on the checklist under "**Learner recognises by touch..**" , go to the Summary Chart, find the row for Section 5 'Touch' and put a tick in the box for *Recognises*. Then move on to the next topic (**Learner understands..**)

If the learner responds *Occasionally* to one or more of the items, even if one is *Consistent*, still take *Localise* or *Attends* as the level of response. In this case tick *Localise* or *Attend* in the Summary Chart. Do not move on to "**Learner understands..**"

If all are *Occasionally* try these out on different occasions. If the result is still *Occasional* use *Localise* or *Attend* as the level of responsiveness. The Summary Chart should already have been ticked in the appropriate box. **Do not** tick *Recognise*.

If the learner *Never* responds to any of the items under this heading go on to Section 6 dealing with 'Smell'. Note that you should **not** have results in which the learner Understands through touch but is not first *Aware*, *Attends* and *Recognises*. A learner has to be able to *Recognise* in order to *Understand*.

"Learner understands uses.."

In order for you to observe an ability to *Understand* through touch, you must first have found that the learner can *Recognise*. If you are uncertain, read over the previous information on "**Learner recognises by touch..**"

For the learner to *Understand* you will have observed very clear tactile responses including an understanding of a wide range of uses. It has to be clear to you that the learner is making sense of this wide range of objects, people, events and places.

If your results show that the learner *Consistently* responds to each of the items on the checklist under "**Learner understands uses of objects by touch..**", go to the Summary Chart find the row for Section 5 'Touch' and put a tick in the box for *Understands*. Then move on to the next section (Section 6) dealing with Smell.

If the learner responds *Occasionally* to one or more of the items, use *Recognise* as the level of responsiveness. If this is so, **do not** tick *Understands*.

If the learner *Never* responds to any of the items under this heading go to Section 6 dealing with 'Smell'. Note that you should **not** have results in which the learner Understands but is not first *Aware*, *Attends* and *Recognises*

through touch. A learner has to be able to *Recognise* in order to *Understand*.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice.

Either: You can skip the remainder of this section and proceed directly to carry out Section 6 dealing with Smell. By doing this you will complete more of your assessment of the learner's use of 'The other senses'.

Or: Postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development. These are to do with the use of touch. At some point you should still carry out further assessment using the remaining sections of this chapter.

Developing a curriculum

Improving *awareness*:

Massage

A fair amount of information has been written on the use of massage with learners who are multiply disabled. In fact a few 'specialist therapies' have suggested it as a panacea for all ills of people who are multiply disabled. It is important to retain some sort of perspective about the use of massage.

Massage can be very useful in alleviating the difficulties imposed by a learner being 'tactile defensive'; disliking being touched. It can also be useful when introducing new experiences to the learner. If massage is perceived by the learner as relaxing then the new activity or experience can be associated with this relaxing occupation. Another important area for its use is in the early establishment of a relationship with the learner: it can be useful to form trust.

When using massage always be prepared to turn this essentially passive event into one that is brought under control of the learner. If, during massage, you see the learner begin to massage or in some way indicate another part of his or her body, start to massage that area (within reason!). This is one way for a learner to begin to appreciate that people respond to movements she makes. In this way the foundations for signing as a medium of communication can be laid down.

Another method of massage is to use a hand massager which would be turned on **only** consequent upon the child moving her hand in the direction of the device. (Naturally, you would have to begin by switching on the device and introducing it passively for a few seconds. Otherwise the child will not be aware of its presence).

(Relevant to other sections too)

Encourage understanding of finger play and action songs (see the List contained in Section 4) Games with actions such as clapping hands; bouncing on lap; see-sawing are good fun.

Beyond the hands

There are many other approaches in trying to increase the type and extent of movement of a learner who is physically disabled and with a severe mental disability. Lilli Nielsen and others have noted that we too often concentrate upon one set of physical movements, while ignoring other potentially productive targets for our work. For example rather than concentrating upon the hands, a child's feet may be dangled in a metal or plastic basin, into which a different substance may be placed each day. Nielsen suggests the use of syrupy liquid, breakfast cereal, tepid water, you might also use table tennis balls, cat bells. Each substance is used to signal a different day of the week. The following week the same substances reappear in that order. Here one is looking for any type of exploratory foot movement. One may observe one kind of movement with one substance, perhaps different from that with sounding objects or cornflakes or liquid for example. If movements be come consistent and different from one substance to another then introduce some variety, such as a substance which is disliked always presented to one side. Note any signs of anticipation.

If there is any change noticed in using this approach then one would have the opportunity to begin the kind of environmental control that we discuss in more detail in Appendix I (Switches and Interfaces). For example, a foot kick against a switch might operate a tape recorder in the same way as it might activate a Pethna box.

Resonance board

Another practice introduced to this country by Lilli Nielsen is in the use of a resonance board (see Figure 6.5.1). Small movements of the learner will cause sounds to be magnified and the resulting vibrations can be felt by the learner. This may help to improve the understanding of a relationship between movement, sound and touch. This in turn increases awareness of position of the limbs[2].

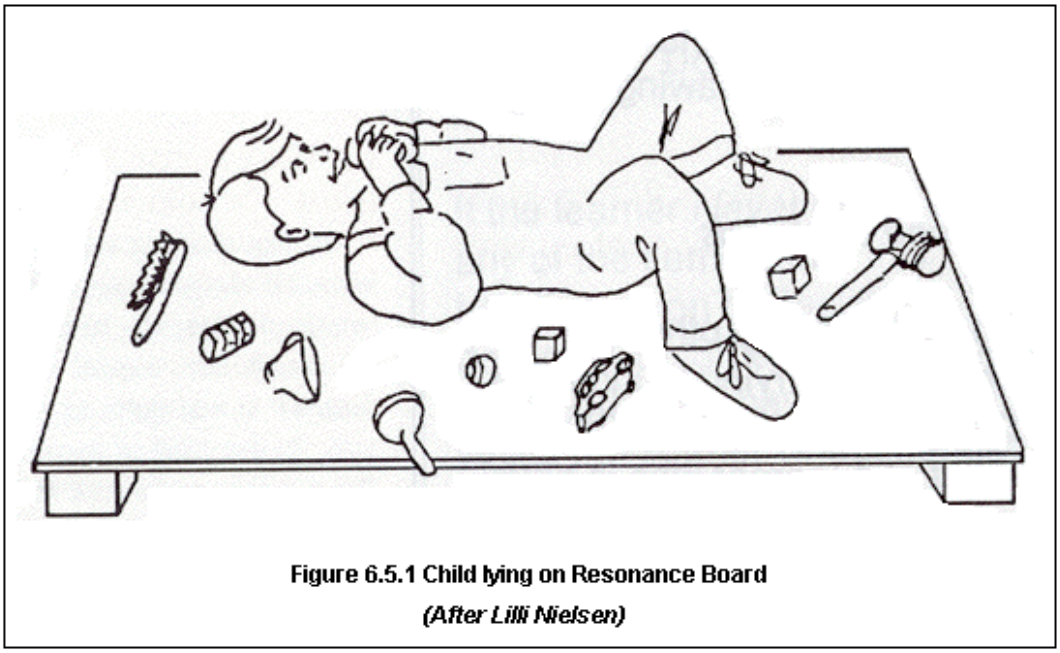


Figure 6.5.1 Child lying on Resonance Board

(After Lilli Nielsen)

There are several variations on the theme of using a resonance board. The board might be placed on wooden supports, providing a slight slope. A coating of varnish is preferable to gloss paint, both in reducing glare and in providing a source of clearer vibration. Omitting a pillow improves sound conduction, though this may not be ideal for every child. (Consult with a physiotherapist). You would want to avoid encouraging excessive rocking of the head from side to side. The resonance board can also be used with the learner lying in different positions, such as facing down the slope, up the slope, side lying as well as on her back.

Using movement

Although deprived of many of the cues we take for granted in face to face interaction, others, may often be recognisable in the child. For instance, subtle movements of the hands or legs of children may be present in a manner that seems consistent with different sorts happenings in the child's surroundings. Ask the parents and other staff about the kind of pleasure-like sounds their child makes, which they know to have emotional significance. Use, as the parents may, vocalisations and laughter to allow their smiles to be detected by the child. This gives non-visual feedback in conjunction with (or as a substitute for) visual feedback. Laughter can be felt through the body while holding the child. A whole field exists for work with learners who are deaf-blind trying to make use of such gross cues for information on emotion[3].

A related area is mirroring of the learner's actions. At one level this movement therapy (as it has been called) can be done by responding in exactly the same way as the learner's movements. An alternative is for the learner's actions and reactions to be responded to by vocalisations and/or movements made with the learner. In this way one promotes the idea that her own actions may influence the environment. It is like trying to become an acoustic or tactile mirror, substituting these for the usual qualities of a mirror for the sighted child.

Improving *attending:*

Tactile cueing (signifiers)

Use an object to indicate the onset of a new activity. At this stage use only one object and one activity. It is best to choose an activity that seems to give pleasure to the learner. The object chosen to represent that activity has to be one that does indeed have some strong association with the activity in the mind of the learner.

Signifiers may also be used as a means of identifying people - members of staff. Again it is best to use an object which already has an association with that person - perhaps an earring. It is important that once the association is established between object and person that you move on to separate the object from the person. At that point the object begins to **represent** rather than **be** that person. This is the kind of single association - done at this stage - that lays down the foundations for use of tactile calendars, activity shelves and activity boxes discussed in later sections. (An example of following the Commandment *Thou shalt think of tomorrow*)[4].

Resonance movement

The use of this technique is yet another instance in which the field of visual impairment in the presence of multiple disability can learn from that of deafblindness (or to be more precise dual sensory impairment). It is not to be confused with the use of a 'resonance board' as outlined earlier. It does however follow on from the discussion above on 'Using Movement'.

Think of a young baby. As the baby initiates a movement the adult may take it up and continue with the infant. Or the

adult may await a slight movement by the child as a signal to begin a movement such as rocking to from side to side.

Resonance activities are just the same. In them the adult maintains physical contact with the learner. They then go through a kind of 'start-stop' process. The adult usually moves first, stops and waits for the learner to signal the start of the movement again. At that point the adult begins moving again. The signal by the learner may be of any kind - a smile, vocalisation, hand movement or other. The adult is in effect making his or her movement contingent on a signal from the learner. The adult is imbuing communicative intent to the signals from the learner.

Through this means not only is contingency being afforded. A relationship is being established and trust is being introduced, where both learner and adult are being allowed the opportunity to respond to each other's movements.

Other variations of this kind of activity have variously gone under the name of "Intensive Interaction", "Intensive Education" and so on[5]. It is not within the scope of this book to discuss similarities and differences of these approaches in any detail.

Co-active movement[6]

As with resonance movements described above, the coining of the term "co-active movement" along with its use as a technique of intervention, was introduced by Jan van Dijk in his work with dual sensory impaired children. Both are fine examples of adhering to one of our Ten Commandments - *Thou shalt follow the learner's lead (contingently).* Co-active activities are the next step after resonance. The major difference is in trying to create more of a physical (and thereby mental) distance between the movements of the adult and those of the learner. Instead of having the close physical contact of Resonance Movements, the movements of adult and learner are gradually separated. The time to introduce co-active movements is after the learner has participated in several resonance activities. It is important to link in another of our Commandments - *Valuing the learner*. In this case stress is laid on trying to recognise and value efforts by the learner to show intention. In a similar 'start-stop' sequence the adult is particularly sensitive to signals from the learner.

Co-active movements may become more complex through involving sequences of movements the learner is able to carry out, eg; walk-turn-walk. Through these the learner is encouraged to conceptualise the world in an increasingly abstract manner.

Improving *localising*[7]:

Swiping

Placing objects beside and within swiping distance gives both positive and negative affects. The positive effect is that reaching is thereby encouraged as well as outward movements of the arms. Mobiles are attractive and useful if placed close enough to be seen, heard or touched. However, their usefulness is limited as all that is necessary is to swipe from side to side. This will eventually result in contact. Similarly objects of different materials are often placed in the child's hand or nearby. The result is that grasping becomes a passive exercise and reaching a swiping exercise.

However, some of this movement may be capitalised upon. For example, one would be to place an object a table top and knock the object off. Attempts can be made to encourage locating the object either by visual scanning or to have the location provided through sound. The object could be attached by cord or string to control the distance it falls, and also make retrieval easier. Once successful in one plane, such as on a table top, then this should be extended more to free space.

Stabiles can be more useful to a blind child if fixed to a cot, on a baby chair or attached to a wedged chair or with the child lying on her back. Toys should require different types of manipulating such as a rolling ball, bell, one requiring a pulling effort. Commercially produced activity centres can be used but remember to change positions to challenge the learner by presenting the objects and activities in different orientations. This too encourages the child to explore.

Tactile playmats

Instead of using only differences in visual contrast when making a playmat (as in Section 14) these may also be made out of different textures. It is useful to have clearly distinguishable sides in order to give added clues to orientation. In this way, visual contrast is combined with tactile contrast. For example, a smooth dark coloured surface may be set against a rougher surface of a lighter colour. Sheets, quilts, or blankets can be decorated with paper, small bean bags, etc.

Involve the child in rolling movements. In this it is helpful provide a consistent textured surface as this encourages concept of place in space. It can also be helped with the addition of sound sources such as washing machine, fridge, running water.

Improving *recognising*:

Imitation

Following Jan van Dijk, we present this term in the same context as that used for Resonance and Co-active movements. That is Imitation is seen as the next step after Co-active Activities. Now increasing emphasis is placed

upon the gradual introduction of a **time-lag** between the activities of the adult and those of the learner. The learner is encouraged to join with the adult's movements. In a gradual fashion more of the movement is shown while the learner watches on. Eventually both are carrying out a series of movements by imitating one another.

In all three instances - resonance, co-active movement and imitation - the essence is that interest in the world follows from opportunities to influence that world[8].

Tactile calendars

In Section 10 we also present the idea of constructing a tactile calendar. This idea has sprung mostly from the literature on deaf-blindness, being associated with Jan van Dijk at Sint Michielsgestel, a school in Holland. More recently it has been used with a wider range of learners who have visual disability in association with other disabilities. (Indeed the technique applies beyond those who have visual impairment). We do not propose to repeat the discussion contained later in Section 10. Here we will focus on some of the issues surrounding use of tactile calendars.

What is a tactile calendar?

A tactile calendar is no ordinary calendar. Rather than containing days and dates which would be too abstract for those who are multiply disabled an activity calendar may be designed using a mixture of real objects. The objects could be perceived both visually and non-visually through touch, smell, sound and taste.

Alongside each of the days, leave plenty of space in the row. These are used to position objects horizontally. Objects or parts of objects are used to indicate different activities. There are many ways to do this and a fuller discussion is given in Chapter 6. One strategy is to begin with the week blank, and as each activity occurs, its signifier (the object referring to it) is added to the calendar. The signifiers can be kept in a special box. By the end of the week, there are 'memory pegs' which can be discussed and explored in other ways.

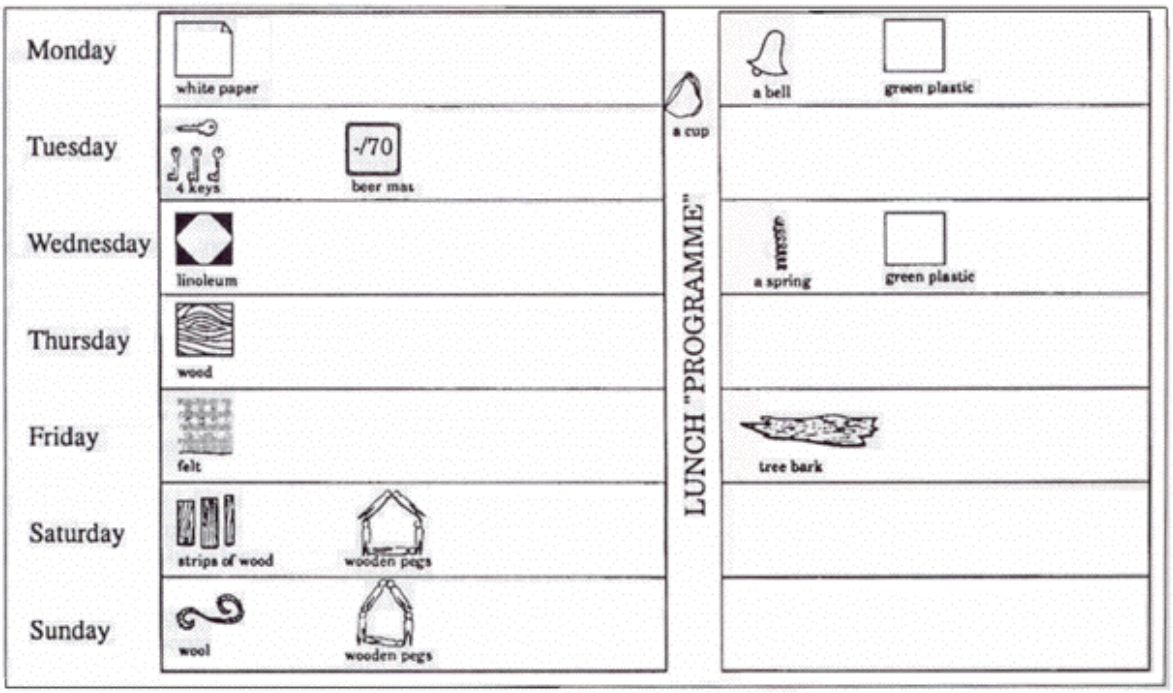


Figure 6.5.2 Tactile Calendar
(Hypothetical calendar with some signifiers being too abstract)

Why use tactile calendars?

Some suggestions for occasions in which a tactile calendar may be useful would include the following:-

- in presence of memory difficulties;
- where problems in representation (perhaps due to global learning problems or 'mental handicap');
- only limited use of gestures;
- and of course visual impairment;

Advantages

- greater emphasis is placed upon perceptual rather than cognitive abilities. This opens up the potential number of learners who could make use of this as a system of communication;
- they are relatively permanent, using recognition memory rather than recall memory;
- although possibly cumbersome the calendar may be moved around, giving a semi-portable system of

communication;

- there are less demands made upon physical abilities, opening up a range of ways for the learner to indicate the object/activity such as pointing, touching, eye pointing;
- figure versus ground relationships are enhanced: some visual perceptual problems (eg; due to 'cortical visual impairment or blindness') result in difficulty for the learner to distinguish a 2-dimensional figure from its background;
- there can be an obvious relationship between the object and its referent (the activity to which the object refers);

Disadvantages

Practical problems with using tactile calendars are that:

- although the calendar is somewhat portable, nobody could say that they are very portable;
- difficulties exist in finding enough objects to represent activities.

In addition to these practical problems there are conceptual problems with tactile calendars.

The calendars do not give a high degree of **specificity**. If a learner should point to an object it could mean any of these: "I want to do that now" (a request); "Wasn't it fun when we did that" (a statement); "When are we going to do that?" (a question) and many more.

A second conceptual difficulty is the converse of specificity - it may be difficult to **generalise** out from the objects on that calendar. How does the learner communicate intentions that are not contained by objects that are on the calendar? The answer here is to plan ahead in order that you aim for generalisation.

Using the calendars

As the learner becomes familiar with one object/activity relationship, introduce change. Such changes may be to the object itself - just as a swimming cap may represent swimming so too could a bar of soap; or use the same object but change its size. Or change the activity slightly so that the same object may stand for a slightly different activity. In this way you are offering the same thing as the multiple meanings which may be afforded by a symbol - the same symbol may represent more than one meaning.

Other practical uses

There are many potential avenues of usefulness for the tactile calendar including:-

- as forms of expressive communication - going beyond the passivity of the learner always having to respond to another person. Instead he or she can initiate communication;
- going beyond the 'here and now';
- avoiding making significant cognitive leaps in understanding;
- where there is difficulty in moving to abstract relationships between conventional sign and the meaning of that sign.

Practical tips

- where one activity takes relatively longer than others, allocate more space to the object on the calendar;
- know ahead of time what you will do if the learner takes the wrong object from the calendar - will you be in control or will the learner be in control?
- practical considerations in your work area will dictate whether you begin on Monday with a blank calendar (though days of the week will still be represented) and gradually fill it up as the activities are carried out; or you start with one whole day filled; or have the objects in place permanently.

How concrete is concrete?

It is important to get right the level of representation for your learner. Too abstract an association between object of reference (or signifier ie the object on the calendar) and its referent (the thing to which it refers) and you may well get success but for the wrong reasons. Here is why.

An abstract shape, say a square, could stand for "I want to go out" or "We're going out now". And one can teach chimpanzees these sorts of relationships. But you would be hard pressed to state **why** this relationship exists. In simplistic behaviour modification this could indeed work. For an association would be built up over a period of time so that

Square = Going out

But there would be no carry over to make learning of the next association any easier. Learning would be slow and pedantic and difficult for the learner. Two of our Ten Commandments - *Thou shalt not compartmentalise* and *Thou shalt think of tomorrow* - would be violated.

You want to encourage "learning to learn" to take place[9]. As an aide-memoire Table 6.5.1. sets out a hierarchy of difficulty of representation between signifier and activity. The top line gives an example of the most concrete

relationship. The bottom line presents the most abstract relationship.

Level of Representation	Referent	Signifier
Identical object	Raisins	Raisins glued to card
Partial or associated object	Shoe Bicycle	Shoelace Handlebar grip
One or two shared features	Vinyl therapy	Wooden block covered with coloured vinyl
Artificial association	Cafeteria	Wooden apple shape attached to door
Photographs	watch for generalisation	
Line drawings	watch for generalisation	

Table 6.5.1 Hierarchy of levels of difficulty in using different materials in tactile calendars

adapted from Mirenda & Mathy-Laikko P (1989)

Activity shelf

The tactile calendar may be augmented using an activity shelf. For this an area is set aside that is easily accessible but until then not often used with that learner. In that area, set aside a space, perhaps a single shelf or a table in a cubby hole. Start with one activity and use a single object that is linked with that single activity. For instance, for a child it might be going swimming or playing in a mobile car. Suppose it is the latter, a big, bright, orange, yellow, and blue car. You then need something that signifies this activity. It may be that, when in the car, the learner loves to press a big bright red horn. That horn becomes the object on the shelf.

All the learner has to do is grab it from the shelf, or point to it (if she has enough vision), or reach for it. Arrange things so that the car is near enough to get quickly from the signifier (the horn) to the activity. Attach the horn and let her play a while. Suppose she has a go in the car and, an hour or so later, goes to the shelf and takes the horn. That's fine in the early stages, in fact that's what we are hoping for. If this happens often enough that she seems to have got the idea, then it's time to change. But what if she doesn't make the association? Do we just sit and wait? Before the activity, one person goes with the learner to shelf, picks up the horn, goes to the car and gets on with the fun. At the end of the activity, return with the learner to the shelf and replace the horn.

How would we let the learner know the start and end of the ride? If there is space on the shelf, you could put a 'finished box' there. The learner will probably not understand its purpose at first. Over a period of time, she may come to realise that, once the horn is in the box, that is that particular activity finished. Suddenly, a whole new set of possibilities is opened up. By this means, we could help the learner understand the different things that could be happening on any one day. You might have spotted a problem. Suppose someone goes to the shelf with the learner and begins to talk about the horn itself. You know the sort of thing. "Isn't it nice, what a lovely red colour, let's take it over there, and so on." This should be avoided, as it is then the **horn** that becomes the centre of attention to the learner. Instead, we need to focus upon the activity ie the **car ride**, not the horn. The horn only happens to be on the shelf because of its link to the car ride. The purpose of the objects on the shelf is in order to allow them to stand for the specific activity.

This activity can be used with many different levels of visual impairment, including total blindness. Use objects appropriate to the degree of the learner's visual disability - as assessed through these guidelines. For a learner who can see medium sized objects, as it is the start of a new activity, use highly contrasted materials against a plain background. For the learner without sight, use distinctive smells - those associated with the swimming pool for going swimming, for example. Or relevant tactile materials, or both. So long as the signifier is associated with the activity.

Pick up on this but not too many times. Car rides all day might be all right for a while, but there is a time for moving on.

The link should not be broken, nor the response of the staff stopped. Instead now is the time to add another object to stand for another activity in which the learner shows interest. Each individual link is a micro-teaching opportunity to discover. The bigger picture - the macro-teaching - is that other objects on the shelf have a similar overall usefulness. The list of objects that can perform the function of signifier is as endless as the list of activities in which the learner's interest is known to be engaged. This is not to say that a clutter of objects should be on the shelf at one time. However, it is a fine idea to place more than one signifier on the shelf. This enables the learner to demonstrate a choice between or among different activities.

Tactile books

Although discussed in detail in the next topic (**Learner understands...**) signifiers of activities in which the learner had been engaged can be glued into a loose-leaf book. This gives a personalised history of places and events that were of interest to the learner.

Communicating by sign[10]

To do justice to the topic of sign communication would require at least one book and at least the length of this book. We would nonetheless like to mention a few things about sign in communication.

We have included sign communication at this point simply because it is the most likely place a reader may look for discussion of the topic. However we do not believe - as we hope you, too, do not believe - that the full range from simple movement right through to sign language can be presented under one topic heading. There are many curricular suggestions which we have given throughout this book that would help to lay down the foundations for introducing sign in a more formal way. We chose not to describe these as signing because to have done so may have confused readers. This is the right place to have some limited discussion of the topic. Here are some thoughts to hold:-

- just because a learner is blind and multiply disabled does not mean that signing is 'not for them'. Signing is not the exclusive province of the hearing impaired;
- 'signing' does not have to mean the adoption of some formal system of sign;
- adapting conventional signs can be very helpful where there is visual disability;
- remember always that signing is two-way. Don't expect the learner to be a passive recipient of signs. If you do then there will be little chance of her using sign to initiate.

It is not only those who have the dual sensory impairment of deaf-blindness who might benefit from this form of augmentative communication. Often the learner who has low vision (or even total blindness), coupled with difficulties in expressive communication, may be able to use modified signing to achieving. Yet it may not be tried. There are clear reasons why this approach is often not tried. First, standard forms of assessment of communicative competence rarely fully incorporate the needs of the learner with severe visual impairment[11]. The effects of visual impairment are not taken into account in the assessment at the subsequent interpretation of results. The result is that the importance of non-verbal cues for understanding of language - taken for granted when dealing with the sighted learner- is often missed with the learner with both visual impairment and difficulties in expressive communication.

Use of computers

Some additional general information on the use of computers with learners who are multiply disabled is provided in Appendix 2. There are two areas of new information technology which are most appropriate within the context of using **tactile** information. One is to use computers which can make use of software operated through a Concept Keyboard. The second is in the provision of augmentative communication aids which have tactile overlays.

Concept keyboard[12]

Instead of overlays containing 2-dimensional symbols, pictures, numbers or letters the overlay can have these presented in tactile form in 3 dimensions. You could use real objects in a similar way to the calendar mentioned earlier. The range of these signifiers (or objects of reference) can be as large as one's imagination. For non-speaking learners, or those with severe articulatory speech problems, a speech synthesiser attached to the computer can give spoken output.

Communication aids

There are available a host of dedicated communication devices. Their advantages over 'computer + concept keyboard arrangements' is that they are portable and they are designed specifically for the task of enhancing communication. Recently more work has been done in the use of tactile overlays for these devices, thus opening up their potential for those who are multiply disabled with visual disability.

If you are considering pursuing this as an option then it is important to obtain specialised assessment and training in the use of such devices. A number of centres in the UK (and in many other countries including USA, Sweden, Denmark, Holland, Australia and many others) offer these assessment and training services. Appendix 2 lists some of these centres. A final point is that although there are a few studies which discuss using tactile surfaces for these devices much more work needs to be carried out. Who knows perhaps it will be you who produces the next report!

From 3D to 2D

With the results obtained to items in the various sections of Chapter 7, you will be able to establish whether the learner has some visual ability to distinguish 2-dimensional shapes. If so you have the beginnings of communication through symbols (for those who are speech and/or language impaired). However to introduce symbols immediately would be too great a cognitive leap. Better to move gradually from tactile (concrete and real) through to symbol (abstract and less real). How to do this?

There are two main factors to bear in mind. One is the materials you use. Second is the teaching style adopted to

introduce the more abstract symbols.

Materials

The essential idea is to devise ways which allow a gradual shift from the concrete to the abstract. Table 6.5.2 gave a way of thinking about signifiers on calendars. That table showed a move from concrete to abstract, with pictures and symbols coming **at the foot of the list**. There are a variety of ways in which to shift gradually from concrete to abstract. We could reduce the size of the real object by using a part of the whole object. A 2-dimensional raised diagram can eventually be used for a 'blind' learner, and a well-contrasted symbol for a learner with residual vision.

In conjunction with this a faint line can be marked around the signifier. Each week the line becomes heavier. Eventually it is the outline that is being responded to rather than the concrete object.

Another possibility is to **embellish** the signifier (or the symbol). This involves adding some other feature to the signifier so that the signifier takes on an extra meaning. With one signifier (or symbol) able to have more than one meaning this cuts down on the number of signifiers needed. It also gives rise to the possibility of symbols having multiple meanings.

Teaching techniques[13]

Any combination of ways of using these materials in moving from the most concrete to the most abstract can be enhanced by the use of a variety of teaching techniques. The main feature of these techniques is that some are **very directive** - the teacher/therapist/carer is in control - while at the other extreme there are techniques which are **non-directive**.

Examples which are **most directive** include *Errorless Learning*; *Massed or Multiple Trial Instruction*.

Those which come in between include *Mand modelling; Time delay; Facilitative Communication*.

And **least directive** include Prompt-free teaching, *Incidental Teaching; Exploratory play*.

A useful tip is to begin a new activity with **most directive** and as quickly as possible move on to least directive teaching methods. This is not meant to be prescriptive. You may well find that the learner responds best with non-directive methods even when beginning new activities.

Improving *understanding*:

Here it is time to move firmly into the province of those who are less multiply disabled, and more likely to have the single impairment of vision. We therefore consider only a few small areas and follow this up by suggesting other sources of reference. Of course, there is a wealth of variation in what is covered by the term "Understanding". As we indicated at the outset, the structure used throughout has been that of an organisational rule of thumb: there are no hard and fast rules which must be followed rigidly.

Books and pictures

There are certain activities in living and learning which could fit appropriately into several of the sections of this book. One of these is the use of books, both visual and tactile, for recreation and learning. We have chosen to place it in the section on Understanding through touch although it deals also with visual as well as tactile representations.

Books play a very important part in our culture and education. From about one year of age, when infants are learning to talk, being able to point to or name a picture in a book provides children with a feeling of achievement and further motivation to communicate, as well as thrilling their parents and family! It lets us know that the child is able to think symbolically, recognising that the visual representation in the book is a symbol for the real object, apple, book, brush or whatever, just as saying the name "apple", "brush" shows that the child is beginning to understand and use the symbol in system of language.

It is just as important for people with visual impairment as for people who can see, whether young or old, to have access to books and illustrations. It is also important for the families, teachers and others to make sure that they provide these for people in their care. But how we decide what would be suitable or meaningful? Let us think about it under the following headings: visual illustrations; hand-made books; tactile perception; learning from the learner.

Hand-made books

As we have said before, multi-sensory input, whenever possible, is very important. To help confirm for the child what she is seeing, additional tactile, auditory or olfactory clues can be used. There are a few tactile books, pop-up books and scratch and sniff books produced commercially but you would be lucky to find ones to suit your purpose. For all those whose vision does not allow them to see small objects with poor contrast it is advisable to use information additional to the purely visual. That does not mean that you don't let your student leaf through books or catalogues just for the pleasure of it! We all know that most children love the smell, feel and sound of turning pages and it also lets them imitate adults and feel "grown-up". However, illustrations used as a **teaching aid** will need to be more than purely visual.

Hand-made books share the features of both picture books and toys, combining the features of concrete objects with

abstract features of a picture[14]. They can have detachable and re-attachable parts involving simple skills such as pulling or more complex skills of unfastening. They can contain objects to be found and re-hidden. They can be moving pictures or "movies": a monkey on a zip can be made to climb up and down a tree! (Imamura 1981).

Hand-made books can be used for many teaching and learning purposes. Here are some and you will probably want to add many more:

- to coordinate movements of hands, arms and eyes (if vision is present);
- to develop perception and recognition through vision, touch, hearing and sense of smell (or any combination of these);
- to foster the development of symbolic understanding: from object to tactile symbol of it; from tactile to 2D and/ or sign or spoken language;
- to provide the learner with "concrete" help in developing the concepts necessary to follow a story, eg; the main "character" can be moved from page to page;
- to stimulate memory, anticipation and imagination through the combined use of the senses, eg; items as well as pictures, associated with the learner, family, home or holidays could be used to make a "photo album".

The materials chosen and the purpose for which the book is made is determined by the level of vision and other learning needs of the child. Some types of books, such as the alternative "photo album" mentioned above would be appropriate for all ages though the materials and items used would be chosen to suit the vision, hearing and manual dexterity of the learner.

Perhaps it would be useful to stress again the difference between making and using books as a **teaching tool** (which would take into account the sensory and cognitive development of the individual), and provision of books or illustrations for leisure, pleasure or because they are age-appropriate, eg; photo album for all; pop star scrap book, posters, diary for teenagers or older.

Tactile perception

Visual illustrations and written language have evolved over time and in different cultures to suit the detailed discriminations possible by sight and often depending on the drawing tools available at the time[14]. There are certain visual conventions that we learn to recognise, eg; a line for the horizon, shading representing contours, perspective representing distance. All of this means that there is more to translating from a visual image to a tactile representation than just making the outlines tangible! (though that can be helpful to someone who has some vision and could have this visual perception reinforced by feeling the outlines).

If you would like to get a clearer idea of what "seeing" by touch might mean ask a friend or member of your family to gather together different objects, some familiar, others not so familiar, and to present them to you with your eyes closed or with a blindfold on. See if you can recognise them and think about how you did it. How did you hold, touch and manipulate them? Did you just use your hands, fingers and palms, or did you use lips, tongue, cheek and other senses? Did temperature, weight, texture help? Did you use mental images to help you identify the objects?

If you can get tactile or raised pictures or diagrams from your local specialist teacher, school or centre for the visually impaired, then try making sense of these, unaided and blind folded. You will probably to ask for help as without any verbal or contextual clues you will find it very difficult, if not impossible to make sense of them.

From this experience have learned that underdeveloped tactual skills on their own cannot cope very well with interpreting the environment. The use of other senses can help, as can previous experience of the object or what is depicted and also knowing a bit about the context. Very fine detail is extremely difficult to perceive by touch even for those with well-developed tactual skills. Being "talked through" the picture helps. Bearing all these things in mind will help when you are making books or illustrations for your students.

If you have a student who would be able to cope with the equivalent of 2D representation and who has no useful vision, or a student who can see pictures but would benefit from raised outlines or other tactile clues, then contact the specialist teacher school or centre as there are materials and equipment which can produce enlargements and tactile pictures and diagrams. These can be made using an acetate - like sheet with stylus or spur wheel; a master collage reproduced on plastic sheets by means of a heat machine (thermoform); hand-drawn, photocopied or computer-designed drawings photocopied onto special paper and put through a heat machine (fuser).

Learning from the learners[15]

There is a very important source of insight and inspiration which we have not yet mentioned while considering pictorial representation: the learners themselves!

In the past we have expected blind people to accept and learn from our translations from the visual. Nowadays, thank goodness, more meaningful and beautiful diagrams are being produced for academic learning and appreciation of works of art[15].

Much, however, still remains to be done to explore how very young blind or multiply impaired children would express and depict their perceptions of the world - if given the opportunity.

At this point we would refer the reader on to work of others. Their suggestions deal in much more detail with

those children who are capable of Understanding. For those interested in the needs of learners who have residual vision, they are invited to refer to Look and Think which describes curricular development work with children who have the single impairment to vision[16].

Section 6

front page

Scottish Sensory Centre

Vision for Doing

Chapter 6 THE OTHER SENSES

SECTION 6 LEARNER'S SENSE OF SMELL

Aims of section 6

In this section we have four categories of items. These correspond to the topic headings *Awareness*, *Attending*, *Recognising* and *Understanding*. You will notice we have omitted *Localising* from the checklist. Although we are familiar with the saying: "Just follow your nose", we are not convinced that many human beings have a sense of smell sufficiently well developed to be able to follow a trail or consistently locate through odours!

In the same way as you did in Sections 4 and 5, you will be using these headings to give some idea as to the learner's level of responsiveness to olfactory information about the world. This knowledge will help when selecting which of the intervention strategies are most relevant to your learner.

How to use Section 6

Refer to the diagram. For each of the items under the four broad headings to the left you will want to record whether the learner responds *Consistently*, *Occasionally* or *Never*. If you have already carried out previous sections of this chapter, you may already be able to complete some of the items of this section. If so carry on and complete these items.

Transferring Results to Section 18

Learner shows awareness of..

For this to be the case you may not have found any specific response. Instead, you will observe only vague and non-specific responses to smells.

If, therefore, your results show that the learner responds *Consistently* or *Occasionally* to the item, go to the Summary Chart (at the end of PART TWO), find the row for Section 6 'Smell' and put a tick in the box for *Awareness*. Then move on to the next topic (**Learner attends to..**)

If instead the learner responds *Occasionally*, try again on different occasions. If the result is still *Occasionally* use *Awareness* as the level of responsiveness. If so, go to the Summary Chart, find the row for Section 6 'Smell' and put a tick in the box for *Awareness*.

If the learner *Never* responds to any of the items under this heading go on to Section 7 dealing with 'Taste'. Note that you should **not** have results in which the learner *Attends*, or *Recognises* or *Understands* by Smell but is still not *Aware*. A learner has to be *Aware* in order to *Attend* to, *Recognise* or *Understand*.

Learner attends to..

In order for you to observe an ability to *Attend*, you must first have found that the learner is *Aware*. If you are uncertain, read over the previous information on "**Learner shows awareness..**"

For the learner to *Attend* you will have observed a more specific response to different smells indicating that the learner is attending to these.

If your results show that the learner *Consistently* responds to each of the items on the checklist under *Attends*, go to the Summary Chart, find the row for Section 6 'Smell' and put a tick in the box for *Attending*. Then move on to the next topic (**Learner uses smell to recognise..**)

If the learner responds *Occasionally* try these again on different occasions. If the result is still *Occasionally* use *Awareness* as the level of responsiveness. The Summary Chart should already have been ticked.

If the learner *Never* responds to any of the items under this heading go on to Section 7 dealing with 'Taste'. Note that you should **not** have results in which the learner *Recognises* or *Understands* through smell but does not *Attend* through smell. A learner has to be able to *Attend* in order to *Recognise* or *Understand*.

Learner identifies location by smell..

There is no facility in the checklist under localises for smell. This is simply because it is taken up in the next section.

Learner uses smell to recognise..

In order to observe an ability to *Recognise* by smell, you must first have found that the learner can *Attend*. If you are uncertain, read over the previous information on "**Learner attends to..**"

For the learner to *Recognise* you will have observed specific responses to a wide range of smells indicating that these are familiar to the learner. In order for you to justifiably say that the learner *Recognises* through smell, it has to be very clear to you that the learner is making a clear distinction between a range of familiar and unfamiliar objects, people and places by smell.

If your results show that the learner *Consistently* responds to each of the items on the checklist under "**Learner uses smell to recognise..**" go to the Summary Chart, find the row for Section 6 'Smell' and put a tick in the box for *Recognises*. Then move on to the next topic (**Learner uses smell to help understanding..**)

If the learner responds *Occasionally* to one or more of the items, even if one item is *Consistent*, still take *Attend* as the level of response. In this case tick *Attend* in the Summary Chart. Do **not** move on to "**Learner understands..**"

If the learner *Never* responds to any of the items under this heading go on to Section 7 dealing with 'Taste'. Note that you should not have results in which the learner *Understands* through smell but is not first *Aware*, *Attends* and *Recognises*. A learner has to be able to *Recognise* in order to *Understand*.

Learner uses smell to help understanding of..

In order for you to observe an ability to *Understand* through smell, you must first have found that the learner can *Recognise*. If you are uncertain, read over the previous information on "**Learner uses smell to recognise..**"

For the learner to *Understand* you will have observed very clear responses including an understanding through smell of a wide range of uses of objects. It has to be clear to you that the learner is making sense of this wide range of objects, people, events and places.

If your results show that the learner *Consistently* responds to each of the items on the checklist under "**Learner uses smell to help understanding of..**", go to the Summary Chart, find the row for Section 6 'Smell' and put a tick in the box for *Understands*. Then move on to the next section (Section 7) dealing with Taste.

If the learner responds *Occasionally* to one or more of the items, use *Recognise* as the level of responsiveness. If this is so, **do not** tick *Understands*.

If the learner *Never* responds to any of the items under this heading go on to Section 7 dealing with 'Taste'. Note that you should not have results in which the learner *Understands* but is not first *Aware*, *Attends*, and *Recognises* through smell. A learner has to be able to *Recognise* in order to *Understand*.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice.

Either: you can skip the remainder of this section and proceed directly to carry out Section 7 dealing with Taste. By doing this you will complete assessment of the learner's use of 'The other senses'.

Or: postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development. These are to do with the use of smell. At some point you should still carry out further assessment of the remaining section of this chapter.

Developing a curriculum

Using the sense of smell as an intervention technique: general points

The sense of smell is sometimes neglected as an intervention technique. There are good reasons for this omission. When compared with sight, sound and touch, chemical stimulation comes a poor runner in the amount of information it can offer the learner. For most humans the sense of smell indicates direction of an object only crudely; size not at all; distance is poorly defined; and gives no clue as to the texture of an object. Lower order features such as colour, shape and orientation as well as specific features are beyond the capacity of the sense of smell.

Smell versus other senses

To see why this is so, refer back to Figure 2.1. Imagine that all the information provided by each of your senses is presented in terms of how much and what kind of information that sense can detect.

Where would you place on that dimension each of your senses of sight, hearing, touch, smell and taste? That is, how much information can be carried by each channel of information? As a rough guide we can see this in Figure 2.1. (not drawn to scale). This shows us that vision carries most information, followed by hearing, touch, smell and taste. It follows that if you want to get the best out of your intervention you should try to use the sensory modalities that carry the most information. It also follows that the sense of smell should not be given as high a priority in your intervention as for using remaining sight, using hearing and using touch.

The sense of smell is then quite limiting in terms of devising strategies for intervention. The absence of a sense of smell is, for a human being, not a disabling condition in the same way as lack of sight, hearing or touch would be. But this not mean that smell should be ignored as an avenue for our intervention.

What smell is good for

The very fact that smell is usually ignored as an area of intervention can turn out to be its real strength. Its novelty means that for the learner its use is often not tagged with the same negative associations as for other stimuli. There are three general categories in which the sense of smell is very useful. First is where the smell of objects, people(!), events, or places are **motivating** to the learner. Second, on its own smell can be very powerful in prompting information for **locating**[1]. Third it can be used in **association** with other sensory information. We can now turn to see how these can be used within the structure for intervention adopted in other sections of our procedure for assessment.

Research confirms that young babies can distinguish between pleasant and unpleasant smells. Children under five can also use scent to recognise the substances of which an object is made. Girls are stated to be more sensitive to smell than boys.

You may well have a friend who has no sense of smell. If so, you will notice that the absence of a sense of smell has had very little impact on that person's life - unless she happened to be employed in the quality control of perfumes!

Improving *awareness*:

Smell is most useful at this stage where there is little evidence of the learner being *Aware* of the events in her world. You may well have encountered the use of a 'Coma Kit'[2], used to try to stimulate people who are in comas by presenting familiar associations. The purpose there is to instil some association with events that the patient has experienced. However it is relatively simple to assemble a variety of odours from our daily living.

Smell as motivator and mood manipulator

Supermarkets have a nice little number going in blowing that wonderful aroma of newly baked bread out onto the aisles or onto the streets outside. Three other examples of the use of the sense of smell can be found in aromatherapy, Snoezelen and in massage.

Aromatherapy

At several places in this book we have stressed the need to consider not only the disabilities but also the abilities of the learner who is multiply disabled. And in a very early section of the assessment procedure we asked you to think of what the learner liked. Knowledge of the learner's motivation is a key to entering the learner's world to sharing his perspective. One aspect worthwhile investigating is whether aromatherapy is helpful. Some examples of ways in which it can be used are in discovering smells which are motivating, in offering choices, and in following the learner's lead as they explore familiar and unfamiliar aromas. Like massage, which we discussed in Section 5, it can be used in helping to establish interaction with learners.

Snoezelen

This approach, referred to elsewhere in the book, has as one option a set of bottles containing substances with different smells. The criticism often made of the Snoezelen approach is that it is passive - in its raw form it does not conform to the commandment on following the learner's lead (contingency - see Chapter 4). But it is not difficult to imagine how control by the learner may be built in to Snoezelen equipment[3]. A variety of switch operated mechanisms may be used. If you would like to proceed with this then you could get in touch with some friendly engineer. Or consult with the distributor of the equipment. At the time of writing they, along with practitioners in the field of visual impairment, are looking into ways of offering control to the learner.

You should note, though, that the introduction of control may actually contradict the philosophy behind the concept of Snoezelen. It is easy to resolve depending on whether you want to bring the equipment under the learner's control, or just to allow the learner some fun and relaxation and the opportunity to explore by themselves.

Massage

We have already mentioned the uses (and potential abuses) of massage in the previous Section on Touch. To recap what was said in Section 5, too often potential active use of massage is ignored in favour of passive massage. Whilst being massaged a learner may indicate anticipation of body position; or may make movements which could easily be taken as attempts to communicate - but it could all be lost in favour of passive stroking of areas of the learner's body.

Improving *attending*

Pleasant aromas could be utilised for encouraging the development of appropriate YES/NO responses in a learner who has severe communication difficulties. A YES response is much more easy to instil than NO - just as an able child developing language for whom the negative appears much later. Substances which are attractive can be introduced on one side and those which are disliked can be introduced on the other.

The difficulty with head turning to signify NO, in association with a pungent odour, is that the aversive response is likely to produce a head turn in the **opposite** direction! In the establishment of eye pointing, some learners may be helped by using chemical stimulation in this way. Where an asymmetric tonic neck reflex (ATNR) is present then the object could be placed on the side opposite to the ATNR. (Consult with a physiotherapist to determine if there are reasons why this should not be done with your learner.)

Using technology

Whether used as a cue heightener or on its own, interesting combinations can be made using switches. In this case, it lends itself particularly well to the situation where the smell is produced as the result of an activity. Small pipettes can be covered and uncovered by the action of a switch. This can be made to puff out a particular odour. (See Appendix I on Switches and Interfaces for a discussion on some of the relevant issues).

Redirecting attention

Use smell in association with other sensory information about objects and events to help direct attention to other events. In this way you move the learner to more difficult types of attending.

Improving *recognising* and *understanding*[4]

Cue to familiar location

No doubt you have had the experience of entering a room or visiting a place and having a strong feeling of deja-vu - you felt as if you had been there before. Different odours can have a very powerful effect on presenting that feeling of *deja-vu*.

The reason it works so well is because we generally ignore the use of smell, so when it happens to come along it can be a strong reminder. There are several ways to use this information in the form of location cues.

One or two (at most) daily activities could have a specific odour attached at their site. Try to choose odours which can also be 'portable' so that they can be used as a signifier in a tactile calendar. That way the onset of the *activity + smell* can be cued by a *signifier + same smell* on the tactile calendar.

Association

At several points in this book we have emphasised the usefulness of associating information through more than one sense. Heightening the information about an activity can be particularly advantageous at the time of introducing the unfamiliar to a learner.

Examples of its use in association could be when the learner squeezes a bright object in a stabile, resulting in a smell of mint or other pleasant odour being released. There are obvious uses within the realm of producing a tactile calendar. For example trips to the swimming baths could be signified by swimming hat or trunks suitably impregnated. (Beware though the use of chlorine which, while easily associated with swimming pools, is also **highly toxic**).

Other examples from the world of books are the familiar 'Scratch and Sniff Books' from Random House.

Section 7

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Scottish Sensory Centre

Vision for Doing

Chapter 6 THE OTHER SENSES

SECTION 7 LEARNER'S SENSE OF TASTE

Aims of Section 7

In this section we have four categories of items. You will be using these to give some idea as to the learner's level of responsiveness to taste. From this you can be more precise in selecting which of the intervention strategies outlined in Chapter 6 and Chapter 7 are most relevant to your learner.

How to use Section 7

Refer to the diagram on the previous page. For each of the items under the four broad headings to the left you will want to record whether the learner responds in a manner that is *Consistent*, *Occasional* or *Never*.

While carrying out the items in this section, remember that both smell and taste are involved in eating and drinking. Sections 6 and 7 might quite happily be scored by observation made during snack or mealtimes. The distinction between them may often be blurred but we think it still a useful task to try and isolate the responses being made. However, do not worry if you feel you cannot be one hundred percent sure.

Transferring Results to Section 18

Learner is aware..

For this to be the case you may not have found any specific response. Instead, you will observe only vague and non-specific responses to taste. Pleasant/unpleasant refers to the learner's response, **not** to your own preferences!

If, therefore, your results show that the learner responds *Consistently* to the 4 items, go to the Summary Chart (at the end of PART TWO), find the row for Section 7 'Taste' and put a tick in the box for *Awareness*. Then move on to the next topic (**Learner attends to..**)

If instead the learner responds *Occasionally*, try again on different occasions. If the result is still *Occasionally* use *Awareness* as the level of responsiveness. If so, go to the Summary Chart, find the row for Section 7 'Taste' and put a tick in the box for *Awareness*.

If the learner *Never* responds to any of the items under this heading then for the moment do not go any further with the assessment of the learner's sense of taste. Note that you should **not** have results in which the learner *Attends*, or *Recognises* or *Understands* taste but is still not *Aware* of taste. A learner has to be *Aware* of tastes in order to *Attend*, *Recognise* or *Understand* a taste.

Learner attends to..

In order for you to observe an ability to *Attend*, you must first have found that the learner is *Aware*. If you are uncertain, read over the previous information on "**Learner is aware..**"

For the learner to *Attend* you will have observed a more specific response to items of food or drink. The response should continue over a period of time no matter how short in duration. If your results show that the learner *Consistently* responds to each of the items on the checklist under Attends, go to the Summary Chart, find the row for Section 7 'Taste' and put a tick in the box for *Attending*. Then move on to the next topic (**Learner recognises taste..**)

If the learner responds *Occasionally* to one or more of the two items, and one of these two results is *Consistent*, take *Consistent* as the level of response. In this case too, tick *Attend* in the Summary Chart and move on to "**Learner recognises taste..**"

If all are *Occasionally* try these out on different occasions. If the result is still *Occasionally* use *Awareness* as the

level of responsiveness. The Summary Chart should already have been ticked.

If the learner *Never* responds to any of the items under this heading then do not continue with the assessment of 'Taste'. Note that you should **not** have results in which the learner *Recognises* or *Understands* tastes but does not *Attend* to them. A learner has to be able to *Attend* to a taste in order to *Recognise* or *Understand* it.

Learner recognises taste..

In order to observe an ability to *Recognise* taste, you must first have found that the learner is *Aware* of *Attends* to taste.

For the learner to *Recognise* you will have observed specific responses to a wide range of food and drink (and perhaps objects) which indicate clearly that the learner is familiar with these tastes. If the learner has particular preferences or aversions it will be easy to complete this section! A response might also indicate the detection of a new and unfamiliar taste or texture in food or drink. In order to score *Recognise* you must be certain that the is *Consistent* response to a wide range of tastes.

If your results show that the learner *Consistently* responds to each of the items on the checklist under **"Learner recognises taste..**" go to the Summary Chart, find the row for Section 7 'Taste' and put a tick in the box for *Recognises*. Then move on to the next topic (**Learner explores objects orally to help understanding..**)

If the learner responds *Occasionally* to one or more of the items, even if there is an item which is *Consistent*, still take *Attend* as the level of response. In this case tick *Attend* in the Summary Chart. Do **not** move on to "**Learner explores objects orally to help understanding..**"

If all are *Occasional* try these out on different occasions. If the result is still *Occasionally* use *Attend* as the level of responsiveness. The Summary Chart should already have been ticked in the appropriate box. **Do not** tick *Recognise*.

If the learner *Never* responds to any of the items under this heading then, for the time being, do not continue with the assessment of 'Taste'. Note that you should **not** have results in which the learner explores objects orally to help understanding but is not first *Aware* of, *Attends* to and *Recognises* taste.

Learner explores objects orally to help understanding..

In order for the learner to do this, you must first have found that the learner can recognise tastes.

In looking at oral exploration at this level we will be considering a coming together of the sense of touch and taste. For example, a learner might examine a shape from an inset board to help her understanding of the shape and hence where it should be inserted; or the taste of chocolate on a biscuit might enable a learner to understand that this is a special reward, as opposed to getting a non-chocolate-coated biscuit. A learner might realise he has taken his neighbour's cup by mistake if he tastes orange juice instead of the milk he poured. In short it has to be very clear to you that there is Consistent and meaningful understanding being made through the use of taste.

If your learner *Consistently* responds to each of the items on the checklist under "**Learner understands tastes..**", go to the Summary Chart, find the row for Section 7 'Taste' and put a tick in the box for *Understands*. You are now ready to go on to Chapter 7.

If the learner responds *Occasionally* to one or more of the items, use *Recognise* as the level of responsiveness. If this is so, **do not** tick *Understands*.

If the learner *Never* responds to any of the items under this heading go on to Chapter 7 dealing with assessment of vision. Note that you should **not** have results in which the learner uses oral exploration to help understanding but is not first *Aware* of, *Attends* to , and *Recognises* tastes. A learner has to be able to *Recognise* taste before using it to help understanding.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to tackle the assessment of functional vision! If you wish you could read over some suggestions on using taste in the remainder of this section.

Developing a curriculum

Food and drink are the source of immense pleasure for many human beings. As flavour is usually accompanied and enhanced by the appetising aroma and attractive look of foods and beverages it is sometimes hard to isolate the information coming through our taste buds alone.

Taste and smell are particularly closely related with the brain responding to, and combining information from the sense of smell and the taste buds to enable greater appreciation of the flavour and hence pleasure derived from it.

The texture and consistency of food and drink contribute to their acceptability and attractiveness, or otherwise,

especially for young children or those who have difficulty chewing or swallowing. Temperature, too is another factor to be considered.

FIo Longhorn[1] considers in detail taste *range, consistency, texture* and *temperature* in her advice on developing a taste curriculum and taste bank.

All of the above can be positive or negative factors in determining a learner's response to food. Introducing solids can be a traumatic experience for both child, parent and educator. Patience and ingenuity are often necessary to get new flavours, consistencies, texture and temperature accepted.

For some learners texture may be the main motivator and facilitate the introduction of new flavours. On the other hand, a favourite flavour might just provide sufficient encouragement for a learner to accept a new more challenging texture of food. It is advisable, however, not to introduce new flavours and textures at the same time.

It is not our intention here to enter into details of a feeding programme. Many good examples already exist and you may well have your own favourites among them or a well worked out feeding programme to suit the needs of your own learners. We mention three here which we felt would be helpful for further reading[2,3,4].

Improving *awareness*:

Although the major attention to developing the taste and smell curriculum will centre around meal and snack times use can made of other activities and times of the day. In fact, if feeding times are stressful, other times such as relaxation periods or passive listening to music might provide opportunities to put a touch of a new flavour on lips, tongue or inside of cheek. The flavours need not always be pleasant or insipid. A tangy touch of lemon or nip of peppermint might stimulate awareness.

If the learner has started to explore with hand and mouth, no matter how fleetingly or seemingly reflexively, then some of the items laid around the learner on a resonance board could for example be smeared with flavoured yogurt or honey. As the learner brings object or fingers to her mouth she might become aware of the smell, the feel of wetness or stickiness and the taste.

Occasionally hanging edible items among more usual ones in a mobile might also result in arousal of awareness. Dale[3] suggests toast and orange.

Improving *attending*:

It might be instinctive to compare the range of flavours, consistencies, textures and temperatures of food and drink which we experience in a week to that available to the learner. If our staple diet was mushy cereal and liquidised mince and potatoes, we also might not pay too much attention to what we were eating. Eating can also be one of the main social and bonding events throughout life. So as well as considering the type of food presented it is important to look at the whole experience surrounding the intake of food.

Is there generally a happy relaxed atmosphere conducive to attending to what is being eaten and to the social aspect of meal times? Or is it a tense, hurried routine which feels like an assembly line? Ratio of staffing to learners has a bearing on this, but more important is the philosophy behind the design of the curriculum and the timetable.

When a learner is beginning to attend to what is being eaten, it is vital to provide variety in the range of flavour, texture, etc as it is at this point that either openness or defensiveness to change will be established.

Remember the four main groups in taste: salt, sweet, bitter and sour; the range of foods and flavours coming under each of these categories; the different consistencies, textures and temperatures in which they can be presented; the glorious range of aromas and smells which can accompany them[5].

If a child or learner starts to attend to taste and thereby gets pleasure from it, the motivation provided will contribute to the general development of the child.

FIo Longhorn (*ibid*) lists some of the main goals in planning a taste curriculum as follows:

- toleration and enjoyment of tastes;
- stimulation and awareness of tastes;
- increased awareness of tastes linked to smell;
- acceptance of different flavours;
- improved feeding;
- desensitisation of the face and mouth;
- beginning of a controlled range of mouth movements;
- beginning of a controlled range of tongue movements;
- increased body movement;
- beginning of vocalisation;
- simple discrimination of tastes;
- beginning of a taste memory, ie remembering and recognising tastes.

Improving *recognising*

As has already been indicated, a taste curriculum must be developed within the broad curriculum of daily life. A learner will be helped in the recognition of a taste not only by its aroma and texture, but also by the time and context in which it is presented and the action, words or signs which accompany it.

Helped by all these clues, as the learner tastes apple fresh, pureed, in a pie, as flavoured yogurt or baked, the "appleness" of the flavour may eventually be recognised. Recognition of flavours can also have its drawbacks. It can be very challenging to try and disguise flavours and textures such as egg when trying to produce a balanced diet!

As recognition improves it can be linked to association eg; the type of biscuit or sweet that a special person, such as a grandparent, always brings. Routine and association can help form anticipation. Certain activities may be linked in the learners mind to flavours or foods. Tomato soup and a sandwich may be the usual lunch before going horse-riding. A warm, sweet drink might come after bath time and before a bedtime story or song.

These routines should follow the same guidelines as for any other: they are helpful if they do not become "unalterable". Flexibility and openness to change are more important in the long run.

Improving *understanding* (through oral exploration of objects).

This item is different from the others we have looked at when considering a learners response to taste. Perhaps it could have been placed just as well in the sections on smell or taste. We are close here to the realms of synaesthesia which might be defined as a sensation of a kind other than that which one would expect from a particular experience. The name of a book by Oliver Sachs, "Seeing Voices"[6] is an example. Perhaps more familiar to those who have worked with blind learners would be the claim that some people can feel colours.

In the areas of tactile and oral/taste perception we are still at the beginnings of knowledge. We know that congenitally blind learners can decipher tactile information and produce artistic tactile representations. We do not understand what type of mental representation results from the deciphering of say, raised diagrams, but we do know that the aesthetic products in clay, wood or stone are startlingly different in their emphasis[7,8]. Moreover, what would these blind children or artists produce if they were not schooled by seeing teachers and had not been brought up in a visual culture?

All developing infants learn from combined manual and oral exploration of objects. Able blind learners continue to use this method, sometimes throughout their whole lives. Is there such a thing as the 'taste" of a shape? The sensitive areas of cheek, lips and tongue reveal much about texture and temperature which cannot be felt by the hand or seen with the eye. We all of us use this method from time to time. We are taking in the washing from the line; how do we know the sheets are dry? We put them against our faces and mouths. We see perfect-looking fruit in a bowl; how do we find out whether or not it is real? We smell it and touch it with lips and tongue.

Consider a learner with multiple disability and visual impairment. He has been given the task of sorting shapes in a posting box or inset tray. This could, in theory, be accomplished by manual exploration only. However, exploring with mouth, tongue, nose and cheek will give much more information. It may also compensate for limitations in manual dexterity, factual perception and more importantly may ensure that a piece of chocolate, crisp or fruit, is not "posted" by mistake.

This is a lighthearted look at an activity which might some times be confused with repetitive mouthing. As an exploratory method it should never be totally discouraged, though as with other behaviour which might be deemed socially unacceptable in older learners, it has to be channelled appropriately.

Chapter 7

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Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

In the sections of this chapter, we set out different aspects of visual functioning and how to assess these.

For each section there is a diagram to help understand what we mean, and an explanation as to **why** to make observations of that type. This is followed by a description of **what** to do. The remainder of each section takes the form of trying to increase understanding of the meaning of your findings for curriculum design.

Introduction

There are a few things to note about the way we have chosen to set out this chapter.

Least to greatest visual ability

The chapter is made up of ten related sections and a Summary Chart. Within each section there is a chance to compare specific aspects of information about the visual world. For instance in assessing the effect of difference in size, there is opportunity to record the effect of using different sized objects.

Not only is *quantity* of visual information our concern. We are also interested in the different *qualitative* aspects of visual information. Therefore sections help you to investigate the effects of intensity of light, size of objects, the effect of changes in contrast between an object and its background, how well the field of view of the learner is functioning, as well as other aspects of usual visual functioning. Taken together these correspond to functional vision or *Vision for Doing*.

By the final section a great deal of vision is needed in order to be able to respond to the activities suggested. At that point we refer the user to Appendix III.

NB In order not to confuse results between items, make sure that a stimulus used in an earlier item is not still present when trying the next item. For example, suppose you have just investigated the effect of bright sunlight. You now want to determine whether a light being switched on is noticed. If this is done while the sun continues to shine at the learner, any response would be ambiguous. The response might have been to the light or to the sun.

What? No sound?

It might seem rather obvious that this section of the protocol should be carried out with no sound associated. This is much more difficult to achieve in practice than it "sounds"! Rest assured that on those occasions when you find it difficult **not** to give a word of encouragement while carrying out the assessment, it only shows how important the **whole person** is to you and your style of working. When this happens (as it surely will), don't worry. Try again.

Making things easy

Two is company

Try to arrange a time when you will be able to have another person to help. It is very difficult to present the material, observe the presence of a response, and note it down - all at the same time. If there are two people, the tasks can be shared and a second opinion made available!

Time and place

We would suggest carrying out sections of this chapter as time becomes available. Do not attempt it all at once, otherwise you will never want to see it again! It is important to re- assess after a period of time as some visual improvement may occur as motivation increases and progress in other areas take place. On a more practical note, it is important to choose a time when there are as few distractions around as possible. Time of day will probably play a part in the learner's response due to a variety of factors: medication, feeding, tiredness.

The **place** is often problematic. Very few schools have a dark room or a suitable quiet room. If the room is unfamiliar it will be important to accustom the learner to it before assessment. As well as being able to control the lighting and noise level, the distraction level from wall or hanging decorations needs to be minimised, if it is not possible to eliminate it altogether.

The accompanying example (in the caption) gives an idea how your assessment will work.

Example

SECTION 8 OBSERVING THE LEARNER'S EYES

Where to start

When working with staff in designing these guidelines they frequently commented that they had never really taken time to observe the learner's eyes. Now is the time to begin to do so.

First of all, make sure you know if the learner has an artificial eye. It wouldn't be the first time someone has tried to assess the vision of a glass eye! Also, does the learner normally have eyes open except when asleep? If they are normally closed, you will have a difficult task in one way. In another you will have learnt something without any effort - he won't see with closed eyes!

Pupils react to light

Observe the pupils of the eyes under normal lighting conditions, noting any unusual features, eg; constant small constrictions or dilations. (See Figure 7.8.1 for diagram of human eye). Then increase the amount of light and see if the pupil gets smaller. Decrease the light and see if the pupil dilates or gets larger. There are a number of ways of controlling the light, the simplest is to use a torch holding it at a distance of about 30cm. Switch it on, watch the pupil of the eye, then switch off.

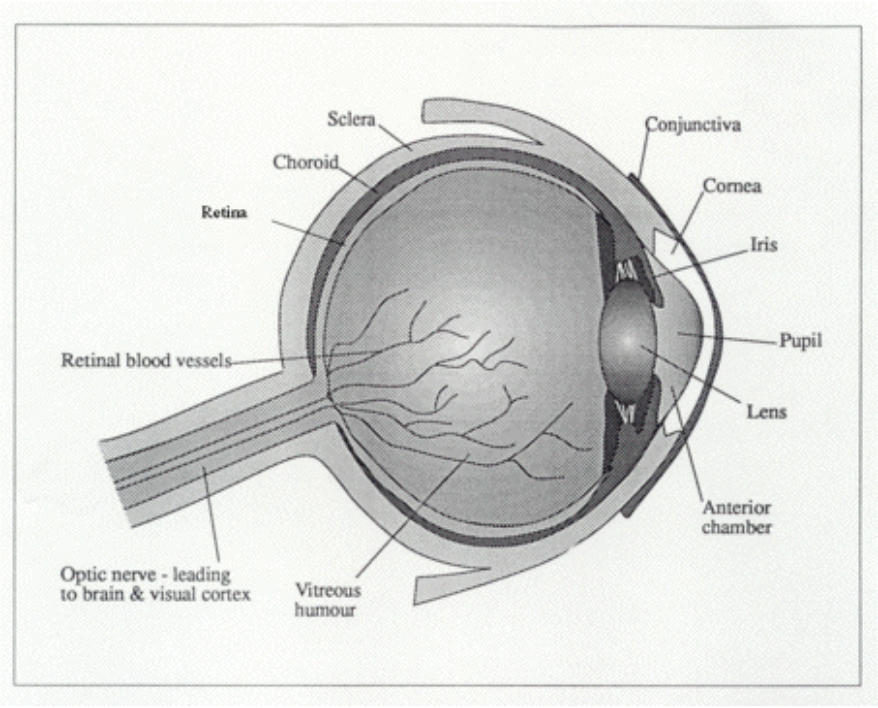

Figure 7.8.1 The Human Eye

Should the pupil change in size this is a rough indication that there is **light perception** (**LP**). Only rarely will it be found that there is no change in pupil size as the level of light increases or decreases. Pupil response is a reflex action and is controlled by a different area of the brain from that which interprets what we see. However, reaction may be sluggish or variable between eyes and this will let you know that visual adaptation between light and dark will be slow. This will have an effect when moving from one environment to another - from dim light into daylight or vice-versa.

You may find a learner will show no constriction or dilation of her pupils when a light is shone towards her eyes. A few conditions exist which prevent movement of the pupil of the eye. This does not mean necessarily that the learner does not see. It may be helpful to use darker lenses in situations where the light is bright.

Eyes are cloudy..

Begin by placing the learner in a position that she finds comfortable (if you are still uncertain as to appropriate positioning to prevent physical problems, you should consult with a physiotherapist or occupational therapist, as suggested in Chapter 5). Check that there is enough light in the room for you to see both eyes. Note whether the eyes are **clear** or **cloudy**. If the eyes are not clear it is likely that the information getting through will also be less than clear.

Eyes move together..

Here we mean that when the eyes move they tend to do so in a coordinated way. Should the eyes not move together this may be caused by muscle imbalance, which may in turn affect **binocular coordination** (the ability of the eyes to work together as a 'team'). If this is the case, there may be several consequences. Difficulties may occur in judging distance. This could also affect mobility[1].

Squint present..

Next try to determine if there is a squint or turn in one or both eyes. It is often difficult to tell which is the squinting eye because of the fact that you may be looking at the weaker eye when you think that the learner is focusing upon you. In order to decide which is the squinting eye, attract the learner's visual attention to an object, or your face, then cover one eye. An easy way to do this if the learner is co-operative is to hold a wooden or plastic serving spoon in front of the eye, if possible not touching it, as some learners do not like this. If the uncovered eye moves rapidly in any direction and stays there it is likely to be the squinting eye. Distress at having one eye covered may indicate it is the better eye or may just be pure annoyance!

Where you are still unsure if a squint is present then you could try the following technique. Shine a light into the eyes from directly in front and about 75cm to 1 metre distant. Note where the light is reflected from both eyes. If the two eyes reflect light from different positions, then it would be worth referring the learner for further testing by a specialist. Some conditions - such as **aniridia**, or no iris - make it very difficult for you to see the reflecting light.

The presence of a squint means that visual discrimination in that eye may not be so clear as in the other non-squinting eye (a condition known as **amblyopia**). Normally each eye has a slightly different image of a scene, with the brain fusing these into one image. With a squint this fusion cannot work as well. So one eye tends to dominate with information from the other eye being ignored. Otherwise two different images would be seen.

Where a squint is present in one or both eyes then it may be possible for the squint to be corrected. An operation is performed to bring the deviating eye into balance with the undeviating eye. It is an operation which, to obtain optimum results, needs to be carried out early in life - within about the first two years of life. Beyond this age, operating on the affected eye does not result in full use of vision. Between 2 and 8 years of age some visual benefit will be obtained. After this age the operation may be done for cosmetic reasons - to improve the appearance of the person. Any surgery carries risk. Medical personnel might then justifiably refuse to operate.

If caught in that predicament where the learner has a squint then two questions should be asked of the medical professionals. First, if this learner had no disabilities, other than the visual one, would the operation be carried out? Second, does this learner have additional complications which would pose a greater risk during surgery (such as heart defect)? If the operation would have been carried out had there been no other disabilities, and there are no additional complications (such as heart defect), then persist in requesting surgery. (Note though that there are other reasons why surgery may be inappropriate).

It is possible that one or both eyes has a squint. And the squint may only be *occasional*,or it may be present *consistently*. Squint is most common when it occurs with the eyes fixed on one distance, but absent when the eyes are fixed on other distances. If *'Occasional'* is ticked then it is likely that the squint is noticed at times when the learner is tired. Good contrast of materials is useful when squint is present.

Eye tremor present..

Now look to see whether the learner's eyes fix steadily when looking at an object. Uncontrolled trembling or oscillating movement of the eyes is referred to as **nystagmus**. These unusual movements of the eyes occur most often in a horizontal direction but can occur vertically or with a circular motion. Nystagmus is never a specific diagnosis, instead it refers to an effect caused by some problem. If nystagmus is present it may indicate a visual defect. Nystagmus rarely occurs in one eye only, we have, though, left space on the checklist should the nystagmus be present in only one eye.

It is normal for eyes to make **very small** movements as they fixate on an object or scene. Usually it is difficult to see these eye movements. The tremors described as nystagmus movements differ in being larger. There are different types of nystagmus. One type occurs when you see the eyes making wide sweeps first to one side and then to the other. Another type is where the wide sweep may occur to one side, to be followed by jerky movements back again. There may be jerky movements in a vertical or circular direction.

One effect is often to make it difficult to focus steadily on a word or details of a picture. The more the eyes oscillate then the more difficult it be comes to retain the image of the detail. You might also observe that the learner adopts unusual head postures when up close to pictures, Where this does occur don't discourage it, as it may be an effective strategy for seeing.

There are several different causes for nystagmus. The loss of central vision (vision for detail) at an early age (the younger the age at time of loss of central vision the more likely it will develop) may often result in nystagmus.

Transferring results to Section 18:

Not surprisingly, none of the items in this section can inform us whether the learner is actually **using** her vision. Consequently, the row for Section 8 in the Summary Chart (Section 18) is shaded[2].

When you are finished this section move on to Section 9.

Section 9

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Scottish Sensory Centre

Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

SECTION 9 LEARNER'S RESPONSES TO LIGHT

Aims of section 9

This is the first of several sections in which you begin to use tools and techniques to assess what the learner actually does see. Turn to the items listed on the left hand side of the page. They are set out in a certain order. Beginning with a strong visual stimulus, they travel down with the visual stimulus becoming weaker. None of the items could be said to investigate whether and how the learner sees real objects.

Sunlight, daylight and the other items are mostly just different levels of illumination. Normally they would only be considered in our world as a means to an end. For without some combination of them in our world there would be little chance of seeing the objects and events of that world. A person who could see only one or more of these items would certainly be classed as blind. As we will find out shortly, however, there are several techniques that could still be tried with learners functioning at this level: not a great number but indeed a help

How to use section 9

Materials Needed

Of course you may not have some of the materials available (in Scotland especially you might have to wait rather a long time for sunlight!). If this is the case, skip that item. If you find that the item below is checked (tick *Consistently*), then you can assume that, had the right materials been available, the missing item would probably have been checked.

Improvising

It is easy to improvise in this section. For example, turn the learner around in her wheel chair to change the direction of light source, or open and close blinds or curtains in a room. Different kinds of response may be observed. For instance it may be that, irrespective of the location of the light source, the learner simply closes her eyes or blinks. Or if she can work out the direction of the light source, her eyes may be directed quickly to the light. It may then be possible to reduce the intensity of the bulbs used.

Cautionary Note

Remember not to allow previous stimuli used to influence subsequent items. So don't try using torchlight while the sunlight is still shining in the same area. Not only would you be making the item more difficult, more importantly, the learner might **not** detect the new item (torchlight) but still be responding to a previous item (sunlight). Because there is a response you would conclude wrongly that the response is to the new item.

Transferring results to Section 18

Refer to the checklist at the start of this section. Now you have to decide what the results of your observations mean for the purposes of curriculum development. You have to decide which boxes to tick in the Summary Chart (in Section 18). In that Summary Chart you will find that in the row for Section 9 there is only space to tick under *Aware* and *Attend*. The other three boxes are filled in. This is because any general response by the learner to light cannot tell us very much.

If, however, the learner makes a very specific response (eg; reaching out accurately to a torchlight) this would tell you that the learner could *Localise*. If the learner could also name it then that in turn would tell you even more. Naming would mean he could *Recognise* through vision. The point is that **additional information** will be needed if you are to know that the learner is doing more than *Attending*. If you have that kind of extra information by all means tick boxes in the shaded areas of Section 18, as appropriate.

No response to light?

If the learner *Never* shows any visual response to any of the items in this section, you should also not be able to observe any visual responses to any of the subsequent sections in this Chapter. A learner has to show some response to gross changes in lights in order to be able to have some visual function. If you are in any doubt, come back another day and try again.[1].

Score Attend if:

Your observations indicate the learner responds Consistently to "sunlight", "daylight", "room light" and "torchlight:. If so, go to the Summary Chart find the row for Section 9 'Responses to Light' and put a tick in the box for *Attending*. Then move on to Section 10 (Learner's Responses to Reflected Light). It is unlikely that you find the curriculum suggestions in Section 9 of much benefit.

If the learner responds *Consistently* to "Learner Light Gazes" also tick *Attend* in the Summary Chart and move on to the next section.

Or score Aware if:

The learner responds *Consistently* to "sunlight", "daylight", and "room light", but does not respond *Consistently* to "torchlight". If so, tick *Aware* in the Summary Chart. Then move on to Section 10. In this case you may well want to return and use the curriculum suggestions given in Section 9.

If the learner responds *Occasionally* to "sunlight", "daylight" and "room light", also tick *Aware* in the Summary Chart. Do not tick *Attend*. Again you would want to make use of the curriculum suggestions given in this section.

Photophobia

If the learner actively avoids lights, you should still tick *Attend* in Section 18. You may find that **very low** levels of illumination are appropriate. Using different *Settings* (changing levels of light, changing angles of light, going to different areas, asking other people), try to discover the optimum lighting conditions.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice. The choice you make will depend on the results you obtained.

Either

You can skip the remainder of this section and proceed directly to Section 10 dealing with assessment of vision. By doing this you will continue your assessment of the learner's use of vision.

Or

Postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development. These are to do with the use of light.

Developing a curriculum

Improving *awareness*:

For you to have an interest in this subject, you will have found from the completed Summary Chart that the learner is only *Aware*. Vision will be limited to perception of various forms of light. Similarly the learner's use of 'The Other Senses' will be functioning at the level of *Awareness*. Those most interested in this part of Section 4 will be working with people who have the most severe difficulties in learning about the world. Responses to information detected through sound, touch, smell and taste will, like those to visual information, seem to be inconsistent or even totally absent. They will only occur at this fairly gross level. Of course you would not only be interested in carrying out the activities of this section. You might also want to include some of the techniques mentioned in Chapter 6 which deals with non-visual information. Here we deal with aspects relevant to making use of only very limited vision.

The first thing to do is to look at your own response to the first item of Section 2. If you answered **something** to the question "*The Learner has preferences*", you need to ask the following question. How is it you **know** the learner likes something but it is so difficult to elicit any response to events in the world? For in order for him to show he likes something he needed to respond to something *consistently*. Was it a smell? Some tactile material? Or other? Whatever it is, it can be worked with. Now for some specific activities which you can try.

Watch to see whether the learner turns away from or towards the light, or perhaps reaches for it. This can be used to add to observations of responses to different positions of objects in the field of vision (Section 13).

Contingency

Try to improve awareness of the relationship between a slight movement by the learner and its effect. Decide on a movement made by the learner that you will use. As the learner is functioning at Awareness then the chances are

that the movement will be slight. It may be movement of a hand that appears on occasion or a head movement, or even an eye movement (though you should not use eye movements if in Section 8 you checked the item asking if there were unusual eye movements). The movement you select may appear random.

You are going to try to link movement with a light being switched on **Immediately** the movement is made. So the order is:

movement - light on - wait - light off

Before starting there are a couple of other things to note.

Position the light at the same side as the direction of the learner's movement. Have the light on for about the same length of time as the movement is made, or a little longer. If there seems to be no movement try passively lifting the learner's arm or hand before switching on the light. (It helps if you have a tame octopus handy). Appendix I gives additional information on using Switches and Interfaces.

Light with sound

Most of the activities we have described which make use of light can profitably be used in conjunction with other non-visual stimuli. For instance, one routine might be to associate the movement with various musical rhythms as well as a light being switched on. This would be similar in some respects to that which occurs in music and movement therapy sessions. The best of these types of sessions occurs when it is the learner who has to make a movement in order to start the musical rhythm. Where there is no active movement, one can begin with movements made passively on the learner. For instance, a leg might be lifted, while simultaneously switching on a tape recorder, following this by moving the leg or foot in rhythm with the music produced by the tape recorder. Often you will have to put up with the most awful taste in music[2].

Where there is some success, try to identify if there is a pattern to the music liked by the learner. Is it perhaps associated with parental preferences, or other pleasant activities? Do regular rhythms and strong beats help? Does repetitiveness help?

Associating

If touching or tickling some part of the body appears to give pleasure, then this can be used in association with a light source. Suppose that his/her foot curls on being tickled. Tickle the foot and shortly after switch on the light. Do this a few times. Then stop tickling but switch on the light. Does the foot curl? If so, you have managed to associate one event with another. Learning has taken place.

You can use this to try to move from *Awareness* to *Attending*. By changing the position of the light source to correspond with a different site of the body (eg; the other foot), you can note whether the new site of the light is responded to.

Raspberries to you

Now for a game of raspberry blowing for the learner who does not seem to make any connection between what he does and something happening in the world. Pair a light source (or combine this with sound and smell stimulus), with blowing a raspberry on a part of the child's body. Make the pairing very close together in time. If there is any change noticed in using this approach then you would have the opportunity to begin the kind of environmental control that we discuss below.

Using technology

Don't be frightened of this part, as we are only going to move slightly away from what you were doing with the light switch. Nowadays any part of the body which is under voluntary control can be turned into an effective controller of the environment.

The principle underlying this is exactly the same as the one we used with the light switch. (And of course the principle of control was one of our central commandments of intervention outlined in Chapter 4). There are many examples of using technology with learners who have visual and additional disabilities, such as a footkick activating a switch which in turn operates a light and tape recorder or a Pethna box.

Switches offer one way of controlling some aspects of the environment. Modern technology using microchips as the basis of switches has introduced excellent ways for increasing control of the environment. However there is a price to pay in using new technology.

Switches: a word to the wise

We have already encountered one difficulty: that is how to establish whether a movement is *voluntary*. Technology can help in this process because a movement activating a switch can have an **immediate** effect, and an effect that is consistent. Switches may be effected through blowing and sucking, eye movement, head pointing to a target, ear wiggling, not to mention foot kicking and other more conventional means of operation. Unfortunately, the use of this technology is not always carried out in a principled fashion. Consider a learner lifting his arm. This action operates a switch which turns on a light source. Seems simple enough, until one considers the learning involved, which may

make this task difficult. Here are some questions to consider.

Should the event (light switch on) occur immediately the arm is moved? In which direction is the arm movement to occur?

Will the event occur on the same side as the learner's arm or the middle or the opposite side, above or below? Should the light be bright or dim, coloured or white? For how long should the light be activated? What if the learner lowers his arm, should the light stay on or go off with the lowering. Should every arm raise result in the light being activated, if not how often should they occur? Should it always be the same light in the same position relative to the learner? Is it best to have a switch which is **latched**, or some other?. (see Appendix I for explanation of the meaning of 'latched'.) The answer to each of these will present different levels of difficulty to a learner, and an answer will depend on what his previous experience of similar and different activities have been. Consideration of the criteria we outlined earlier will give a 'best bets' for proceeding with this kind of activity. (For those who are interested in taking this further we have provided a more in-depth discussion of 'switching' in Appendix I).

Using computers

Let us spend a little time on a special kind of technology which can be used with learners who have multiple disability. Computers offer another means of developing curriculum opportunities for learners who are only *Aware* of light.

How many times have you heard that some or other multiply disabled person is "*On the computer*". Perhaps you might think this sounds a bit like being 'on the toilet'. Despite this rather negative view, use of computers can nonetheless be a helpful way of harnessing technology in order to extend curriculum opportunities for those who are multiply disabled. If you are unsure of the pros and cons of using computers in this way you may wish to read Appendix II. Here we will concentrate on specific ways of using computers with learners functioning at this 'stage'.

Useful software

Using a computer with a person who has this low level of vision takes advantage of the fact that the screen has its own light. Being backlit (as it is termed) means that the learner is never in his or her own shadow. So the amount of illumination is not reduced. If you have followed our central principles (Chapter 4) you will be wary of software of the type that simply presents a coloured screen totally outwith the learner's control. Instead look for software that can be controlled by switch input. Even better is software that allows you to change when a switch being hit causes a screen effect[3].

Using a "dark room"

Although these guidelines are designed to be used with the minimum of equipment, some schools have 'dark rooms' or suitable cupboards and staff may be wondering about the most efficient way of making use of such facilities in encouraging use of vision.

Working in a darkened environment with light can make it easier both for the pupil to become aware of a particular stimulus and for the person presenting the stimulus to notice any response. People who seem to have normal eyes and yet no obvious visual response are sometimes referred to as having **cortical blindness** or cortical visual impairment. It is thought that their difficulties are perceptual in kind, which means they have difficulty in picking out individual characteristics and recognising the same characteristics on different occasions.

To illustrate what is meant by 'cortical blindness', consider a baby becoming familiar with a feeding bottle. The first time the bottle is presented the baby will respond to the teat being put in her mouth and chew to suck. Gradually, through seeing this same object appearing at regular intervals when hunger pangs are felt, and combining the sight of its shape, colour, feel, warmth, smell and the taste of what it contains, it becomes recognised as 'my bottle'. For the learner with cortical visual impairment recognition of these features can be a long slow process.

Perception of light is the most basic of visual perceptions and without it no other vision can develop. If the learner appears not to be seeing, try to get a response using lights. In a normally-lit environment it may be very difficult to pick out or perceive a small light source, even when it is moving. Light does not have the additional characteristics of objects, ie; three dimensions, feel, smell, taste, and in order to use its properties more effectively we need to make it stand out.

A dark room can help greatly with this. Even a penlight torch seems so much brighter in darkened surroundings. Reflective objects placed in front and to the side of the learner can be picked out by torchlight of different colours starting with the primary colours of red, green, blue, yellow as well as white. Larger light sources such as overhead projectors or slide projectors can be used with coloured acetate + home-made patterns which can be projected onto the wall in front of the learner. The learner's position can be varied to near or far, and the pattern can be put in and out of focus. The only drawback is that these machines are noisy and attention may be drawn more to the sound of the fan than to light on the wall. Sometimes, just the fact of being in a different environment makes the learner more alert, interested and inquisitive.

Ultraviolet (UV) or black light

The use of this light is a little more controversial. Some medical sources claim that over-exposure to this form of light can carry some risks. Your Local Authority may well have a ruling on this and it would therefore be important to

consult its Health and Safety regulations.

Among major considerations are that the light may have to be deflected, mounted on a wall with the cornice directed upwards. Another option is to use a 'light box'.

Among staff in school who use UV light, care is generally taken to ensure that it is not just one member of the staff who becomes the 'UV person', but that members of staff will take turns or work with their own pupils for this activity.

Taking into account learner's awareness or concentration span, 10 minutes several times a week would not be threatening. The whole idea with UV light is to give the person a 'kick start' along the continuum of vision and therefore, ideally, its use should not be long-term. Why can UV light be such a potent tool in 'alerting' a learner to the visual environment? It is because fluorescent or phosphorescent colours seen under UV light are many times brighter than other colours. Another advantage is that real objects can be used and the learners own body can be picked out with fluorescent strips or paints so that there can be development in hand-eye coordination, awareness of moving body parts, awareness of colour, shape and size, tracking and visual fields. Tasks ranging from self help skills to games can be carried out under UV light if the visual components can be picked out in fluorescent paint or made of fluorescent materials.

As with all other compensatory approaches the sooner the skills developed under UV light in the dark room can be translated to the normal environment of class or home the better. After all most of our life has to be lived in places with only normal illumination.

Improving *attending*:

Several of the techniques and activities we suggested on "Improving Awareness" will also apply to this subject. In addition to these you may wish to use the following suggestions.

For those who have some limited mobility, a bright or fluorescent object can be presented in subdued lighting a few feet away, thus encouraging the learner to crawl, creep, shuffle, or walk towards that object. As with the section on the use of a dark room with fluorescent lighting, it is often better to use more than one object. This is because of the existence of what is known as the autokinetic effect[4].

In some cases a learner may seem not to be attending visually, even though he or she might well be. This usually happens because the learner cannot direct his eyes towards the light or reflecting surface. When looking at this behaviour, note then whether the learner, although not looking towards the light source, is looking consistently in another direction. We have already met this apparent aversion of the eyes when we discussed compensatory head movements (in Section 3)

Use a variety of lights, varying paper colours and thicknesses as filters. The room can be darkened too, as this will accentuate any contrast differences. If you have not already managed to discover the optimum position for the learner, this would be a good time to experiment. You may be able to enlist the help of a physio or occupational therapist for this task. Try to determine the best position for the learner being aware of light.

(NB When using a light close to the learner, ensure that there is a cover between the learner and the light to reduce the chance of a possible accident - a sheet of clear plexiglass is ideal).

Attending and mobility

As you may well appreciate, a learner's physical abilities may be impaired further by visual defect. Many writers have shown that crawling, walking, sitting, standing, reaching, and head-turning - to name but a few - may each be delayed or impaired in the learner with a sight problem. Standard approaches of physiotherapy may exacerbate rather than improve the problem. For example the young learner who is slow to walk may be prescribed a baby walker. This can often do more harm than good. While having the advantages of strengthening the legs and moving the feet, the learner with a visual impairment is in other respects disadvantaged. Without vision to guide the learner, he is likely to produce lunging movements, often to the side rather than to the front. He may move on tiptoe, exaggerating the problem of maintaining balance. Proprioceptive information is weak, and balance then becomes impaired. A simple change is to add a consistent light source to which the learner may *attend*.

Cortical visual Impairment/ blindness

We would like at this point to discuss a condition mentioned earlier.

Many learners who have multiple disability, have eyes which look perfectly normal, they move together, there is no squint, they **seem** to fix steadily. Both parents and professionals find it difficult to reconcile these apparently normal visual behaviours with the learner being registered blind. The reason is that the messages reaching the brain from the eyes are not being properly interpreted. Sometimes this is given the name 'cortical visual impairment or blindness' or 'cerebral visual dysfunction'.

Where CVI is found

During almost every visit we made to schools and other centres in which there were learners with multiple disability, we were asked the meaning of 'cortical blindness'. Before considering its meaning, and why we prefer to use the term cortical visual impairment, it might be appropriate to reflect on why it is that the question was posed so often. Why are

there so many learners with CVI in centres for learners with the most severe disabilities?

Why is CVI found there?

Within schools which have learners with the most severe disabilities, a substantial number of children will have considerable brain damage, or disorders of the central nervous system. The eyes have, through evolution, become an extension of the brain providing us with one means of obtaining information about distance. Because the brain also has to interpret the information received through the eyes, any damage to the area of the brain which does this interpreting will mean that this too will be affected. Typically the eyes of a learner with cortical visual impairment (CVI) may appear normal (though they also may not). Shining a light into the pupils may result in the pupils changing size, they may (or may not) move in synchrony. Information may travel along the optic nerve to the brain, but it is as if the telephone exchange has been disconnected: the phone was working but the call never got to its destination.

CVI and other disabilities

It is very unusual for a learner with CVI not to have additional impairments, most do. In fact, in a study of this condition carried out in British Columbia, out of 123 learners diagnosed as having CVI, only one had no additional disability. By converse, where there are children who have several disabilities, it is more likely to find some who have CVI[5].

When it appears and its causes

For the majority of learners with CVI, it is congenital or acquired within the first year of life. Most common causes are asphyxia, developmental brain defects, injury and infection. Accompanying neurological impairments are likely to be 'mental retardation, cerebral palsy, epilepsy, hydrocephalus and deafness' (Groenveld et al 1988). A visual impairment located in the eye itself may also be present, the most common being **optic atrophy**, These learners may also have refractive errors which will need correction by lenses.

Effects of CVI

The range of visual disorder varies. Some learners with CVI seem not even to have light perception, while others can perceive light and large objects. Improvement in visual functioning may take place over a period of years (Warburg 1983) and (Groenveld et al 1988). In some cases the level of visual functioning may be related to the learner's developmental level and improve as progress is made. Therefore each case ought to be considered individually. Some of its other effects include the following:-

- total blindness;
- upper or lower half of the visual field in both eyes not working- anything presented in the affected half might not be seen;
- one quarter of the visual field not working;
- holes in the visual field like a Swiss cheese;
- there may be difficulties in perception of an object from its background or, even more likely, a difficulty in perceiving the nature of a picture or photograph;
- there may be other difficulties in putting together or organising parts of an object;
- although able to see one object, after another is brought in, the first one "disappears";
- inability to recognise faces, although able to see them.

The list is by no means exhaustive, and is presented to give some idea of the problems which may be manifested with CVI.

What to do?

Because this book is concerned with the **effects of** visual impairment, then the strategies offered are relevant and can be applied to those learners with CVI. Most of the strategies for intervention will therefore be presented as appropriate in the relevant sections of this chapter. There are, though, a few general points to be noted.

Effective positioning

The discussion presented on appropriate positioning of the learner is especially important for those with sitting or hand control difficulties. Otherwise they will use energy in keeping their balance, or 'lose' their target involuntarily. If securely supported, this will help in visual tasks. This means that it is important for teachers and/or care-givers to analyse the aim of the activity. Able learners can tackle a task with several separate parts, but learners with CVl may only be able to cope with one demand at a time so it may be counter-productive to try and combine a physical exercise with a visual activity.

Make it simple

As well as avoiding complexity in the number of tasks demanded, complexity of the visual information should be kept to a minimum. It often helps to introduce the object both visually and tactually, before using it for assessing vision.

Blocking lights

At this point try introducing objects to block out light sources. In this way you will be moving away from an emphasis on simply the level of illumination.

Improving *localising*:

How can there be a possibility of Localising if Section 9 only allows you to tick *Aware* and *Attend*? The reason is of course that the Summary Chart may indicate that although vision is severely limited, 'The Other Senses' suggest higher level functioning. That being the case here are a few suggestions relevant to those who function generally at *Localising* but have severely limited vision.

Anchor points

Where you find even limited response to sunlight and daylight this can still be used in many ways. You could use this to increase understanding of position in a room. If the light source is used as a consistent point of reference there is increased opportunity to anticipate the direction in which objects and activities will be met. This consistent point of reference - often known as 'anchor points' - is important for those with severe visual impairment. Without one it becomes difficult to gain confidence to step out independently. How would you feel about taking a step when you were uncertain whether you might fall down a hole, or hit a door or a wall?

Anchor points increase opportunities for mobility (independent mobility can also occur in a wheelchair of course). However there is one important point about the facility of sunlight as an anchor point: don't forget that the sun moves and its presence is not very reliable!

Daylight

You will probably not need to do anything special to know the outcome of this item. It is the kind of everyday knowledge you will already have gained about the learner. A consistent (*Always*) response to this item is especially helpful in being able to take forward the notion of giving points of reference. Daylight at one window will have an anchoring relationship to the door entry into a room.

Passive movement

To improve on the visual capture of an object just prior to a reach/grasp, assist him to follow the object passively while placing his hand on that object. It can be moved to a new location as soon as the object is centred by his vision. It may be illuminated, by for example using a small pen torch inside a coloured brick, cup or similar object. If this does not work try brighter illumination (eg; a bigger torch). Change to using different coloured thin materials as filters.

Using light for mobility

For the young visually impaired learner, trundle truck types of walkers offer a better chance for establishing independent mobility than the makes of babywalker in which the learner is seated. Another idea used successfully has been to use a small rollator at the front of which is attached a torch, pen torch or one of these covered by the colour of 'filter' that was found to be most effective in the above paragraph 5 in the UK, Targets can be obtained from NW SEMERC or RCEVH (addresses in Appendix II).

Too much emphasis on the physical aspects of mobility often stress unnecessarily the confrontational nature of activities. By emphasising game-playing, essentially physical movements and positioning become secondary.

Dark room

The suggestions given in the previous topic ("Improving Attending") on use of a darkened room also apply here.

Use of computer

Because of such limited visual functioning you will need to ensure that the level of illumination in the room is reduced. This allows the screen to be a relatively powerful stimulus. Use of software such as **Targets** will require large shapes to be presented. Even when this is coupled with a **Touch Screen**, however, the degree of understanding required may mean you do not observe the learner carrying out the game himself. Nevertheless the changes in position of the target shapes on screen will be a useful way of increasing chances of recognition.

You can also monitor whether one or more shapes are beginning to be recognised. Do this by observing how quickly the learner gets bored with one shape. Do this by counting the number of presentations, noting this number. For each presentation see for how long the learner finds it interesting. Then change the shape on screen. Is attention regained? If so, for how long?

There are many variations on this and you can try exploring them for yourself.

Improving *recognising*:

Lights situated above EXIT signs help to identify passage ways. If you have not already done so, you should certainly investigate the influence of different Settings on how light may be used by the learner. Chapter 2 explains the

importance of using different settings.

Improving *understanding*

Light by itself has little to offer the learner who is functioning at the level of Understanding. The principal area of use is helping Mobility (see Section 17)

Section 10

front page

Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

SECTION 10 RESPONSES TO REFLECTED LIGHT

Aims of Section 10

In this section we begin to use real objects, which reflect light very well. Begin by using reflecting objects that are not too far removed from the intensity of illumination you used in Section 9. You are trying to discover whether the learner responds to real objects at different distances but still within the central part of their field of view. At the same time you will gain some understanding as to how quickly the learner is able to change her direction of attention.

(If you find that this is successful with highly reflecting surfaces, then you can move on to use large objects that are highly Contrasted. However, you don't have to as Section 15 deals specifically with differences in Size).

How to use Section 10

Materials needed

The kind of surfaces which are highly reflective include a mirror or revolving mirrors, glass, Christmas tree baubles (begin by using large ones and ensure they are unbreakable), empty foil bag from a wine box or tinsel. To make the surface reflect more light a bright torch can be shone from behind the learner's head onto the reflecting surface. Try shining it at different angles.

What to observe

Turn to the diagram. For your **observations** of the learner you will be using that part of the diagram which is **above** the dotted line. You will see part o! it is numbered from 1 to 15. These numbers correspond to the (approximate) distance and direction from the learner at which you will be presenting reflecting surfaces. This should be done around head height. Still above the dotted line, and to the right hand side, you can read off the approximate distances from the learner's face corresponding to these numbers. It looks confusing, but the diagram is simply to give you a guide - you don't need to be highly accurate.

To record the results of your observations, use a system that you find convenient. For example, use:-

ticktick to indicate *Consistently*;

tick to indicate *Occasionally*;

0 to indicate **Never**.

Example: When presenting a reflecting surface at Position Number 9, the learner responds *Consistently*, so you ticktick at Number 9.

Cautionary note

As we stressed before, remember not to allow previous items to influence subsequent items.

In this section it is difficult to separate out a response by the learner to the presenter from a response to the stimulus (reflected light). If you are unsure, observe whether the learner's response is different when the presenter is in the same position, but without the stimulus of reflected light. Other techniques include suspending the reflecting object on strong thread; presenting the stimulus at the end of a rod at arm's length with presenter to the side, or any combination.

Transferring results to Section 18

Refer back to the checklist at the start of this section. Now you have to decide what the results of your observations mean for the Summary Chart in Section 18. In that Summary Chart, you will find that in the row for Section 10 there is only space to tick under *Aware* and *Attend*. The other three boxes are filled in. This is because any **general** response by the learner by reflected light cannot tell us more than this.

If, however, the learner makes a very specific response (eg; reaching out **accurately** to a mirror) this would tell you that the learner could *Localise*. If the learner could also name it then that in turn would tell you even more. Naming would mean he could *Recognise* through vision. As in the previous section, **additional information** will be needed if you are to tell that the learner is doing more than *Attending*. If you have that kind of extra information by all means tick boxes in the filled areas as appropriate.

No response to reflected light?

If the learner *Never* shows any visual response to any of the items in this section, you may also not be able to observe any visual responses to any of the subsequent sections in this Chapter. However, you should at least try Section 11, 13, 14 and, if she can walk or guide a wheelchair, Section 17. If these too result in Never you should refer back to the curriculum suggestions contained in Section 9. If you are in any doubt, come back another day and try again. In doing so, you will be sure of using different *Settings*.

OR score Attend if:

You have ticked *Consistent* responses by the learner to all of the numbers. In this case go to the Summary Chart, find the row for Section 10 and tick in the box for *Attend*. (Again if there is extra information like accurate reaching, tick in filled boxes as appropriate). Then move on to Section 11.

AND score Attend if:

A pattern in your results indicates that a distance has been reached beyond which responses become inconsistent (some are ticked *Consistently*, others ticked *Occasionally* or ticked *Never*). Note this distance for future work and, when introducing anything new or unfamiliar, be sure to keep the 'best distance'.

Perhaps there is a specific **direction** which is better for the learner (look at your diagram and see if this is the case. Some locations might be ticked *Consistently* and others ticked *Never* or ticked *Occasionally*.) In this case too, tick *Attend* in the Summary Chart. Move on to Section 11. (You can also try some of the strategies listed below in order to try to improve responses to the poorer directions. At other times you will want to be sure to avoid presenting objects in that direction.)

OR score Aware if:

The learner shows **no** *Consistent* responses, but some are ticked *Occasionally*, then tick *Aware* in the Summary Chart. Then move on to Section 11. In this case you may well want to return and use the curriculum suggestions given in Sections 9 and 10.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice. The choice you make will depend on the results you obtained.

EITHER

You can skip the remainder of this section and proceed directly to Section 11 dealing with assessment of vision. By doing this you will continue your assessment of the learner's use of vision.

OR

Postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development. These are to do with the use of reflected light.

Developing a curriculum

Improving *Awareness*

To have an interest in this subject you will have found from the completed Summary Chart that the learner is only *Aware*. Vision will be limited to perception of reflected light. Similarly the learner's use of 'The Other Senses' will be

functioning at the level of *Awareness*. Those most interested in this part of Section 4 will be working with people who have very severe difficulties in learning about the world. Responses to information through sound, touch, smell and taste will, like those to visual information, seem to be inconsistent. They will only occur at this fairly gross level. Of course you would not only be interested in carrying out the activities of this section. You might also want to include some of the techniques mentioned in Chapter 6 which deals with non-visual information. Here we deal with aspects relevant to making use of only very limited vision.

Why reflective surfaces?

The essence of providing reflecting **surfaces**, rather than shining low levels of illumination is to increase the informational content of the events in the learner's world. We are thereby facilitating the active stimulation that we are anxious to promote. Directed reaching is encouraged if real objects are present, rather than the purely sensory stimulation offered by levels of light.

Santa's here

With the learner in a small darkened room, line the walls with cooking foil. Then hang Christmas lights (some of them blinking).

Little room

A variation on the use of gold reflective paper is to introduce it at one side of a 'Little Room'. Lilli Nielsen, whose work we report on several times introduced the idea of a "Little Room". (See Figure 7.10.1)

Figure 7.10.1 Schematic diagram of Little Room

Textured surface can be used for one side. Objects, toys can be easily attached. Wooden frame allows flexible use and can be erected in a variety of different ways. **After Lilli Nielsen, Refnaesskolen, Denmark.**

Moving mirrors

Mirrored surfaces, empty silver foil covered wine-bags, and other reflective surfaces may be tilted rapidly backwards and forwards producing accentuated changes in reflection. Avoid rotating objects at speeds which may, in some children with epilepsy, possibly induce fitting[1].

Rubbish

Where swiping is occurring a different strategy can be used. The inside of a wastepaper bucket can be altered so that one half has a reflective surface. The learner's hand or arm is placed in the centre of the bucket. As a result any movement made by that arm will result in contact with the two different surfaces. During this try to encourage looking towards this area. Should this prove successful, a variety of different materials can be adhered to the surface of the bin. This can enhance the chances of the learner exploring new areas. After some success the container may be turned so that new orientations are experienced. (This strategy can then be used in the paragraphs below on *Attending* and *Localising*).

Associating

Pair a light stimulus or reflecting light source with a stimulus to which the learner has shown a response. Using, for example, a pen torch or larger torch, present the light source while the learner is attending. Some examples would be tapping a drum while the light is on. Stop the tapping, and switch off the torch. You can do this kind of activity while the learner is carrying out activities such as rolling over a large ball. What you are trying to do is to help her to become more aware of, and attend to, the light. It is addressing the problem of the learner who seems to have very limited awareness of a relationship between what she does and something happening in the world (so-called

cause-and-effect).

Use of computer

For suggestions as to the use of computers refer to Section 9.

Use of dark room[2]

For suggestions as to the use of a dark room, refer to Section 9.

Improving *attending*

You will be interested in this topic of Section 10 if the learner showed a little more consistency in her responses to reflective surfaces. In addition the results of items in Chapter 6 will have pointed to this as being the appropriate "level" of intervention.

Two surfaces

The learner who is multiply disabled has more than one potential source of difficulty in beginning to attend to reflecting surfaces. Not only might she have difficulty seeing the object, she may have problems in organising a response - due to physical and/or cognitive impairment - as well as in coordinating seeing with moving. To assist in attending, use two reflecting surfaces found to have resulted in some awareness. Shine a light from behind the learner first on one surface, switching the light on and off slowly. Then do the same with the other surface. Try introducing a sound with the first surface while shining the light, then introduce a different sound with the second reflecting surface. Experiment with the learner in different positions, and with the surfaces at different distances.

Use of echoes

The use of surfaces which provide echoes is a much neglected area when working with low vision and totally blind children. For instance, the flat footed pattern of walking often observed with blind people may indicate not only negative but also positive features. A foot placed flat and heavily on surfaces such as wood, plastic, linoleum, vinyl and concrete can provide a rich source of information on the person's surroundings. There have been several reports of unusual sounds being emitted by young blind babies. Usually these have been discouraged by parents, being regarded as rather anti-social. Some of these unusual sounds may be attempts by the baby to obtain information about distance, direction, and size of objects. Echoes would reflect back the sound emitted by the baby to give information on these characteristics.

You could encourage use of echoes while increasing visual feedback. Do this using reflective surfaces covering a hard flat object. This gives the clearest echoes. If the learner is not producing sounds, position yourself behind the learner but slightly above. This way you will be able to produce sounds (eg; singing) which will bounce back off the hard surface. Encourage reaching too by bringing his or her hand up to locate the hard surface.

The use of hard surfaces for producing echoes can often be associated with reflecting surfaces such as a mirror, wine bag or gold coloured reflective paper. There is then an increase in the variety of opportunities to explore with both auditory and visual stimuli. You should note, however, that for a learner with a severe hearing impairment, some of these opportunities may be counter productive.

Movement

When this degree of visual loss is coupled with severe physical disability, strengthening of hand movement may help in leading to crawling, and free standing. Use towels as props under the arms allowing the child to push up more freely. Large-size therapy balls may be used in conjunction with a floor covering which reflects light, or with an area of reflecting surface onto which a light may be shone at an angle. This is an example where limited sight is used as a motivating factor in movement.

Flashing hands

Learners who have poor control of their hand movements can have highly reflective tape attached to their knuckles and wrist joints. A light, such as an angle-poise lamp can be shone onto the area of the back of the hand (position the light source from behind the learner). Any movements made will lead to interesting sequences of dancing lights. The light source can then be pointed slightly towards one side of the hand. In order for the twinkling lights to continue, the learner has to move this hand into the illuminated area. During this activity, an adult should be present so that the learner does not use her mouth on the tape.

For those learners who are in side-lying frames the reflective surface can be positioned at around a 30° angle. With this angle not only the learner's own face but objects around the body will change the pattern of reflection on the surface.

Improving *localising*:

You will be interested in following up this part of Section 10 if the responses to reflected light showed some consistency. As well as this the Summary Chart will have indicated the learner to be functioning at this "level".

Sitting

In order to further encourage independent sitting, two shiny objects made from different materials may be presented to either side of the learner.

Introduce into one hand an object such as a drumstick, spoon, chopstick. Show the learner passively how to produce sounds with this object. It may be possible to then offer two different objects, one in each hand. For either single or both hands, sing in rhythm while placing the learner's hands to either side, tapping lightly on the surface. This may help establish sitting posture while not being exposed to the possible dangers lurking for the severely visually impaired learner.

Contingency

A variety of toys and devices are available which make use of the kind of contingency detection or perception of relationships between cause and effect we have established elsewhere. As before you should try to have the duration of the stimulus approximate the time taken for the learner to carry out the movement. Avoid frequent interruptions of music which would be demotivating. A reflective mirror surface could be rotated dependent on the learner moving his leg, with the duration of the rotation being at first equal to the length of time for the learner to make the movement. (Refer to Chapter 4 for an explanation of Contingency in the Commandment *Thou shalt follow the Learner's Lead*. Further technical information is provided in Appendix I on 'Switches and Interfaces').

Looking glasses

Children especially may often appear not to make eye contact but instead direct their gaze to a person's hairline. Sometimes this is interpreted mistakenly as indicating autism. (The argument goes something like:- learner is avoiding eye contact; eye contact is a form of non verbal communication; avoidance of communication and social interaction indicates autism: therefore the learner is autistic). An explanation relying on the presence of visual impairment should not, however, be discounted.

Often the same learner will look towards a person's eyes if glasses are being worn. It is therefore worth experimenting to see if a person may be identified in this way. The reflectance of the glass may be varied by moving towards and away from a light shining from behind the head of the learner. Where possible, the activity should be encouraged, interacting with the learner appropriately and, if the learner does look towards the *Eyes + Glasses*, then make a fuss of the learner.

This technique may also be used in reverse. If the learner does not seem to be attending to faces, but does seem to be attending to the reflective surface of glasses, then this can be paired with an activity that is liked by the learner. Suppose the learner likes being tickled. As soon as the learner looks at the glasses tickle him. After a time, tickle him while he is looking in that direction, even though there might be no glasses being worn at that time. (Section 16 discusses this in more detail.)

Playmats

Playmats of several different types may be made from readily available materials. It is useful to have clearly distinguishable sides in order to give added clues to orientation. Contrasts offered through sight can also be given in conjunction with changes in texture. In this way, visual contrast is combined with tactile contrast. For example, a smooth reflective surface may be set against a rougher surface of a lighter colour. Sheets, quilts, or blankets can be decorated with crepe paper, small bean bags, bells, etc.

Rolling play

If rolling a learner, it is helpful to provide a consistent light source as this encourages awareness of place in space. It can also be helped with additional sound sources such as washing machine, fridge, running water. Do not expect the learner to understand that which is occurring outside his visual sphere.

Yes/No

If you have found that one surface elicits a fairly consistent orientation towards ("likes"), and another a fairly consistent orientation away from ("dislikes"), you then have an opportunity to introduce a rudimentary YES/NO. If the learner looks to the side with the surface "liked", shine the light on it. If to the other side, do not shine the light.

Grasping

For young children, use objects of a size that may be grasped as opposed to simply being palmed or batted while reaching. Typically these might be non-breakable/shatterproof reflective Christmas tree baubles, tinsel, egg boxes, pieces of sandpaper, soft squeaky toys. These positioned within reach at first and the grasp rather than hit the objects. There should then be variety of touch information depending! the object contacted. Once success is obtained at this distance, the arrangement can be positioned elsewhere at different distances. Reflective tape may be attached

to one of the objects and torchlight shone from behind the learner on this. So, too, can fluorescent glow-worm toys be used.

Signing

See section 5 for a little more explanation of the use of signing. In similar ways to a sighted learner acquiring signing, the learner with visual disability may be able to come to understand that other people make consistent responses to movements made by the learner. Consider an example. The learner is swung in a blanket, an activity which all the staff agree is enjoyed by the learner. Staff could easily turn this around and look for the learner to make a movement. This movement is then associated with being swung in the blanket, a fun activity. Repeat the swinging if during the session he or she happens to vocalise or make an arm or a head movement. The link with this particular section is to accentuate the feeling of motion by having a reflected light at one end of the arc of the swing.

Improving *recognising*:

You will be interested in following up this part of Section 10 if the responses to reflected light showed some consistency. As well as this the Summary Chart will have indicated the learner to function at the "level" of *Recognising*.

Mixed messages

On many occasions, the learner who is multiply disabled will be confronted by several therapists, teaching and ancillary staff. How can you make use of this time so that one activity does not interfere with another? Here we would like to make a distinction between what goes on in a single area of interest versus that which may happen across several areas of interest. In fact it was so important that we introduced it in two of our principles underlying practice (*Thou shalt not compartmentalise* and *Thou shalt think of tomorrow*). It is the distinction between the micro and macro effects of what we do. For our purposes the micro effects are the surface levels of what we do. They are the stuff of a particular activity occurring in a specific situation at one time of the day or week. They constitute that which we believe to be our curriculum objectives. The macro effects of each isolated activity might be very different. It is important to try to bring together these areas of micro- and macro-teaching and learning. This helps to make sense within the world of the learner who has multiple impairments.

The macro view works towards linking together the individual events in which a learner is placed, in order to present a coherent whole. A day which is structured successfully for discovery tries to ensure that there is a relationships between parts, which brings coherence to the individual activities of the day or week. It sounds grand in theory but it is also simple in practice.

The point of this is that we can never be sure how a learner who is multiply disabled will perceive each possible occasion for learning. If we provide mixed messages across each of the weekly activities, as well as mixed messages for changing from one activity to the next, the learner's task of achieving meaning will be made much harder. Of course we could take this argument to an absurd level and, as caring people, lead ourselves into no end of depression. Turn this problem on its head, however, and consider it as looking for ways to glue each individual occasion for learning into a web with consistent features.

Here is one way of doing so.

Tactile calendar

One way of easing this situation is to utilise a type of calendar to prompt the learner on the order of upcoming events. Section 5 provides a detailed discussion of *Tactile calendars*. For the present we concentrate on the use of reflective materials.

Reflective materials may be used to signify the different days of the week. Arrange the days of the week vertically and at a height the learner can reach. To represent each day use a bright colour or reflective surface. Use a different one for each day. It is fine to mix these with tactile material. For example:

Monday = gold reflective paper

Tuesday = Felt;

Wednesday = kitchen foil and so on.

You might wonder why we are not suggesting that reflective surfaces should be used to represent individual activities. This is because the relationship between such a surface and an activity would usually be too abstract. However, there are instances when the reflective surface could be very concrete and meaningful to the learner. A silver paper wine bag may have some very interesting and real connotations! A small mirror might be relevant to a learner who enjoys face painting. Attempts at augmenting communication are aided greatly when the thing to be communicated is intrinsically motivating to the learner.

Improving *understanding*:

You will be interested in following up this part of Section 10 if the responses to reflected light showed some consistency. Also the Summary Chart will have indicated the learner to be at the "level" of *Understanding*.

Shape recognition

Improvement in shape recognition is enhanced by using descriptive qualities of real objects. This is true not only for sighted more able learners but is even more desirable for those who are multiply disabled. The concept of a circle can be offered through glasses, cups, door knobs; that of a square by windows, milk cartons; a triangle by the roof of a toy house, the top of a milk carton; a rectangle by some styles of windows and doors. These can be looked for in toys. Again try to accentuate these cues by using reflective surfaces. Of course you do not want to confuse the learner by using the same reflective surface in association with different shapes.

Section 11

front page

Scottish Sensory Centre

Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

SECTION 11 RESPONSES TO APPROACHING OBJECT

Aims of section 11

In this section we are going to take a degree of poetic licence. The diagram indicates an object moving on a certain path, and within a fairly restricted distance from the learner. Despite this restriction, we intend in this section to discuss opportunities for the learner to perceive objects and events, which are at distances outwith this range. We will, however, develop some of these points in Section 15 (Responses to Size).

How to use section 11

Turn to the diagram. For your observations of the learner you will be using that part of the diagram which is above the dotted line. The diagram consists of three slanted 'squares' plus a drawing of a person's head. The three sizes of 'squares' represent how a square might look to a person as it moves to approach his face. Although the drawings look like three different sized squares, it is actually the same square drawn at different distances from the person. The arrowed line below this indicates the starting distance (1 metre) and the end distance.

You need not use a square, instead use any object which is well contrasted. Sometimes even your own hand may serve the same purpose (though it may not be well enough contrasted). Try to move the object at a speed fast enough to appear to be on a collision course. But not so fast that it causes a large movement of air. For a response from the person may then be a reaction to that air movement on the face.

Below the dotted line there is a little table. On it record the results of your observations. This is where to record the learner's responses to the object's approach. The kind of response to look out for is an eye blink, or his head moving back, or hands coming up to the midline - or any combination of these. You will see that there are two rows on the table. The top row (hit path) is for recording responses to the object approaching right up to the person's face. The second row (miss path) is to record results when the object starts off at the same spot, but moves off to the side past the person's face. Instead of the approaching object coming straight on, it veers at a slight angle.

Transferring results to Section 18

Now you have to decide what the results of your observations mean for the Summary Chart in Section 18. In that Summary Chart, you will find that in the row for Section 11 there is only space to tick *Aware*, *Attend* and *Localise*. The other two boxes are shaded. This is because any general response to an approaching object cannot tell us more than that there is an ability to *Localise*.

As before, if he makes a very specific response (eg; naming the object approaching), this would mean he could *Recognise* through vision. **Additional information** will be needed if you are to tell that the learner is doing more than *Localising*. If you have that kind of extra information by all means tick boxes in the filled areas as appropriate.

No response to approaching objects?

If the learner *Never* shows any visual response to any of the items in this section, try again on subsequent occasions with different objects and in different lighting conditions (that is in other *Settings*). You should at least try Section 12, 13, 14 and, if he can walk or guide a wheelchair, Section 17. If these too result in Never you should refer back to the curriculum suggestions in Sections 9 and 10.

Or score *localise* only if

The learner *Consistently* distinguishes a 'hit path' versus a 'miss path'. That is when the object comes on a path which will miss the learner, he notices the new path of movement. (To score *Consistently* he does not have to

respond on every single presentation, just enough for you feel comfortable that the response is consistent.) Then move on to Section 12. It is unlikely that the suggestions for curriculum development contained in this section will be of much interest.

Or score *attend* if:

You have Ã *Consistent* responses only to the 'hit path'. He does not notice the different path of movement made by the object on a miss path. In this case go to the Summary Chart, find the row for Section 11, and tick in the box for *Attend*. Then move on to Section 12. You will probably want to return to the suggestions for curriculum development given later in the present Section.

Or Score *aware* if:

The learner shows **no** *Consistent* responses, but some are tick *Occasionally*. If so, tick *Aware* in the Summary Chart Section 18). Then move on to Section 12. In this case, too, you may want to return and use the curriculum suggestions given in this Section.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice. The choice you make will depend on the results you obtained.

EITHER

You can skip the remainder of this section and proceed directly to Section 12, dealing with assessment of visual fields. By doing this you will continue your assessment of the use of Vision.

OR

Postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development.

Developing a curriculum

Improving *awareness*

To have an interest in this subject you will have found from the completed Summary Chart that the learner is only *Aware* through vision. Similarly the learner's use of 'the Other Senses' will be functioning at the level of *Awareness*. Those most interested in this part of Section 11 will be working with people who have very severe difficulties in learning about the world.

It might seem a little odd to consider a positive response to an object approaching as being restricted to Awareness of the world. Surely, you may ask, such a response would indicate an understanding of distance? To understand why a learner may respond in this way, but may still only be Aware rather than Iocalising or recognising objects, we need to think of what purpose might be served by this response to an approaching object.

Response to threat

A clue to its purpose is suggested when we realise that a great many of the animals in the world show a similar response. Cats, frogs, goats and many other animals all show this response. Not only that, but the animals with which this response has been studied do so from a very early age. Evolution seems to have conferred on human beings and other animals a useful means of avoiding threats from other predators.

The fact that the response occurs in very young animals also suggests that the response is inbuilt at birth. Both of these conclusions, while tentative as the evidence is not certain, suggest that response to approaching objects is a very basic response. That being the case it might well be only one way of gaining information about distance, one that is somewhat rudimentary and available to those who are less cognitively able.

How it works

The information that comes to the eye when an object approaches is of an expansion on the retina (the 'camera film' at the back of the eye - see Figure 7.8.1). At half the distance the object appears twice as big on the retina. This is known as an optic expansion pattern. While everything else remains the same size, the approaching object appears to increase in size.

Is it useful?

We have already pointed out that this response is so useful that it has probably evolved to become inbuilt into the genes of higher animals (including humans). It is also useful to learners who are multiply disabled. For just as objects in the world can move while the learner stays still, so too can the learner move while the world stays still. That movement may depend on other people pushing a wheelchair, or a self-controlled wheelchair (see Section 17 for a

more detailed discussion of this topic), or independent mobility may be possible.

This allows you to be creative in designing surroundings through which the learner will pass. By carrying out the other sections, you can then use results obtained in these sections to discover the kind of visual information the learner is able to use. Is it only reflected light? Do certain contrasts work better than others? What about size? What about the position of objects in relation to the learner?

Using other senses

A useful way to proceed to help awareness of an object's approach is to call into play the other senses. For example, use a squeaky toy, a scented object; a balloon with the air being expelled; a human face approaching while blowing, whistling, singing or talking.

Improving *attending*

You will be interested in this topic if you found that the learner responded to items of Chapter 7 at this level. It is also possible that the learner responded differently when the object was on a hit path versus a miss path,

Hit path = *Consistently* ticked

Miss path = *Never* ticked

You may have found a similar level of attending when you carried out Section 10.

Using other senses

Refer to the topics on Improving *Awareness*. Also use the information given in Sections 9 and 10, as well as information on use of Contrast given in Section 14.

Improving *localising*

Where the learner responds differently to an object approaching to touch the face (hit path), as opposed to one which is on a miss path, this offers good evidence for the learner seeing some differences in direction as well as in depth. This is dealt with in greater detail in Section 15.

As in the other sections you will be most interested in this topic if you have already carried out the items of Chapter 7 and found that the learner responded at this stage. You will want to ensure that, for the purposes of curriculum development, you refer also to these other sections.

Under this topic heading we propose to subsume most of our suggestions on how the learner perceives distance. We do this because it was our experience that staff usually thought of an object moving in depth as part of an understanding of how the learner perceived distance. (A reasonable enough assumption).

Reaching and grasping

For those who are physically able to reach with some degree of accuracy, the act of reaching itself indicates that the learner is able to localise objects in space. What about where reaching goes wrong?

Swiping

This is a bit like the old good news / bad news joke[1]. Swiping is good news in that it demonstrates that the learner is trying to contact objects "out there". But it is also bad news. Swiping can prove highly destructive. Not only is it destructive to favourite ornaments. It discourages active exploration that is meaningful in constructing an understanding of objects.

Failure in coordinating eye with hand movements may result in objects being swiped at rather than vision being used to guide the hand to an object. Because we do not wish to see the learner fail, we may often unknowingly encourage this kind of response. We do so by placing objects in positions to which a swipe will be accidentally successful, contacting the object. It is important to try to establish visually guided reaching rather than swiping, which although visually elicited is not guided by vision. One possibility is for the object to produce a sound when placed in a new position.

The source of poorly directed reaching in a child with a visual impairment can often be traced back to the period of infancy. At this time sounding mobiles are occasionally placed around the child's bed but **beyond** the extent of the child's reach. Two things happen. First because reaching will result in failure, it tends to diminish in both frequency and accuracy. Second, swiping becomes the action most likely to result in contact with the object - on those occasions where it does happen to be within reach. A vicious circle is set up.

People frequently try to alleviate this by using a variety of widely available mobile arrangements. The problem with a **mobile** is that a child with this level of sight is unlikely to produce either an accurate reach or a precise grasp. Naturally for the child with additional physical disabilities, the errors are compounded. It can be helpful to set up a stabile rather than mobile arrangement. Try to avoid using the universally available plastic materials, which tend to look good but feel monotonous.

The stabile can be constructed using a variety of materials. The range of materials is vast and can be tailored to the level of vision ascertained using this book. One stabile could use mostly highly reflective surfaces such as wine bags, tinsel, or unbreakable Christmas tree baubles. Which can be cut to size and fixed in position.

Some activity centre type toys are more appropriate than others. Those which have variations in colours and plastic may offer little that is of interest.

How do we judge distance?

Traditional understanding as to how we perceive distance is not entirely accurate. If binocular vision (two eyes working together to perceive distance) is absent, other visual information can specify distance. An understanding of these 'cues for distance' helps to show how these same stimuli might be employed to aid the learner with visual defect to obtain more information as to the distance of objects and events in her surroundings. First we need to give a little more detail on the more traditional understanding of how we perceive distance.

Binocular parallax

As the name implies, this depends upon the eyes working together. There are two elements comprising binocular parallax. One is the angle of convergence, the other binocular disparity. Convergence angle changes with the distance between the person and the object being looked at (decreasing as the object gets further away). Binocular disparity is a feature of having two eyes, each side by side. This means that an object not being fixated is projected onto points which do not correspond in the two eyes.

Not enough

Without going into too much detail, we may question whether this should be regarded as the primary means specifying distance. We need only reflect on the fact that the distance between our eyes must change from birth the first few years of life to understand that this the case. If it were primary, then absolute distance would have to be specified from birth. As the distance between the two eyes changes in this early period, binocular disparity (and therefore binocular parallax) cannot be the primary means of specifying distance.

Optic expansion

Other stimuli specify distance. Optic expansion, which we have already met, is unaffected by changes in growth during a child's development. It is therefore much more likely to be a primary indicator of distance. It is also more likely to be available to a learner with even severe visual disability. When we move toward an object, its image on our retina expands (as we saw earlier). The amount of this expansion may, in some situations, inform us of the distance of the object. For instance, ball rolling and catching are useful games to utilise the depth cue of optic expansion. This too does not require access to information being provided by two eyes. Punch bags may be covered with suitably contrasted materials and swung from a variety of directions at different speeds. (Be gentle!) Prior to use of precise information on time to contact, this is the kind of information used for mobility.

Motion parallax

Motion parallax describes the changes in the image on the retina which occur when we move our head to the sides. Although independent of the distance between the eyes, and therefore constant throughout a child's development, it is unlikely that motion parallax gives absolute information as to distance. One would need to have some other way of indicating the distance of a point of fixation.

How do babies do it?

Experiments with infants suggest that the visual system dodges this conundrum of absolute calibration of distance. It does so by being able to detect the association between hand and object. One then sees why there may be great problems where both visual and physical abilities are impaired. It becomes much more difficult to judge one against the other. Hence the reason for the suggestion, given in Section 10, of accentuating the existence of the hand using reflective tape.

What to do

We can conclude that there are not one but several ways of gauging distance (as we will see from Section 15, there are in fact other cues for distance). Any or all of the following may be used as techniques for aiding intervention.

- Lateral head movements can be demonstrated to the child passively, while using objects that are reflective or highly contrasted.
- Attention may be drawn to changes in depth by varying the contrasts of two surfaces.
- Compensatory head postures are often useful to a child in improving depth perception.
- Where there is some colour perception this can be associated to provide other conceptual discrimination. For example a large object can be of one colour. A half-sized object of a different colour can be presented at half the distance. A child could have fun saying "Zoom "to show that he/she is detecting the nearer half- sized object.

Using prism lenses

With learners who have additional physical disability it is often difficult to determine a cause for poor reaching in depth. It could be due to visual problems in perceiving depth, or it could be due to the physical difficulties experienced in reaching for objects, or it could be a combination of both. To test for this, one possibility is to compare reaching to an object which has a transparent surface, such as a clear ball containing a small toy. Observe whether the hand reaching out is shaped to that of the transparent surface before contact. The best time to do this is on the first occasion the transparent object is presented to the learner. Otherwise hand shaping may have been learned on the previous presentations.

There are other more refined techniques such as having the learner wear distorting prism lenses for a very short time, and observe whether reaching in depth is affected (see Figure 7.11.1). As a long term strategy this is not recommended. Use on one or two occasions can however be of benefit, helping to determine the presence of visually guided reaching.

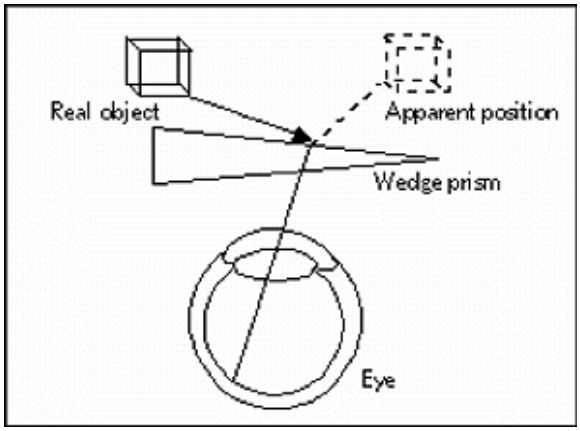

Figure 7.11.1 Prism displacing apparent position

Improving *Recognising*:

You will be interested in following up this part of Section 11 if the responses to approaching objects showed some consistency. As well as this the Summary Chart will have indicated the learner to be functioning at the "level" of *Recognising*.

Use of contrast and lighting

Try varying contrast and lighting so that cues to distance are heightened (Section 14 gives information on contrast, and Chapter 2 suggests uses of lighting and contrast).

Improving *Understanding*:

You will be interested in following up this part of Section 11 if responses to approaching objects were *Consistent*. Also the Summary Chart will have indicated the learner to be at the "level" of *Understanding*.

To the more major cues specifying distance that we outlined above, might be added the so-called 'painter's cues'. These include linear perspective, in which separation of lines decreases with increasing distance (like railway tracks going into the horizon); interposition or occlusion (one object covering another) gives information on object distance as does a differences in height between objects. For the child with visual disability, you may have to introduce these cues in the form of games, rather than simply expecting the learner to be able to understand their significance. One of these "painter's cues" are depicted in Figure 7.11.2.

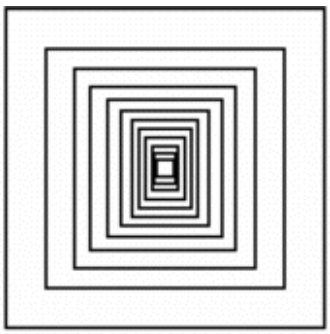

Figure 7.11.2. Painter's cue showing density gradient

Eye pointing

Some learners may benefit from the introduction of eye pointing to objects. Especially those who have severe forms of physical disability, as well as those who have language delay, and those who have a mental handicap, may be

able to demonstrate communicative intent through eye pointing. Unfortunately, the label of visual disability may, in the minds of some, preclude this avenue from being explored. As we have seen in many instances throughout this book, this view may be no more than a self-fulfilling prophecy. The criterion to go by is this. Would eye-pointing have been considered as a route for communication, had it not been known that the learner was visually disabled? If the answer is yes, and the learner has a degree of vision which encompasses the range of objects which could be pointed to with the eyes, it may be worthwhile attempting eye pointing.

Eye pointing is an early form of communication. It is a clear demonstration of a move towards active use of vision. As such it should not be in itself. In the presence of visual disability, additional effort will be required to improve the learner's facility in eye pointing.

The information given earlier on optimum conditions of lighting, improving contrast between foreground and background, securing good positioning, are all relevant. Augment these by using an object size and distance from the learner that are comfortable rather than at the limits of the learner's visual abilities. To these essentially visual enhancements should be added the rather obvious notion that the best way to obtain eye pointing is to use objects and events which are known to be motivating for that learner (in answer to the question "What does the learner like?").

Section 12
front page

Scottish Sensory Centre

Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

Section 12 Responses to Objects

Aims of section 12

In this section you introduce objects moving in different directions in front of the learner. In this way you can ascertain if there are difficulties experienced in moving the eyes to follow objects. This would have important implications for positioning of materials.

How to use section 12a

Materials to use

It is best to use materials that have proved successful in other sections. You could for instance use a small torch, a highly contrasted object, or reflective object such as an unbreakable Christmas tree bauble. Refer to the first page of diagrams beginning this section.

What to observe

Refer to the diagram for 12a. The top half of the page shows a drawing of a face. In front of the face, at a distance of around 10 - 30 cm are two arrows. The arrow nearest the face (dashed lines) is split into two. One dotted arrow represents an object moving **from the midline** to the left and returning to the midline. The other dotted arrow represents movement **from the midline** to the right and back.

The arrow furthest from the face (continuous lines) represents an object moving **across** the midline from the right side to left and back **across** the midline. Make all movements slow and continuous.

In the bottom half of the page there is a room to insert the results of your observations. There are four rows in the box. Each row corresponds to one of the different kinds of movement described above. You will also see that the rows are divided into three columns - labelled *smooth*, *jerky* and *none*. You won't be surprised to learn that these correspond to the sort of eye movements the learner may make in following an object. These labels are very similar to what you used in earlier sections of *Consistently*, *Occasionally* and *Never*.

The last thing to note for yourself is whether the learner moves her

- head and eyes together;
- OR only eyes;
- OR only head.

You should treat 'only eyes' the same as 'head + eyes' (otherwise a learner who cannot turn her head because of physical disability would not be given credit for being able to see).

If, for each of the directions suggested, you are sure the movement has been followed smoothly, tick *Smoothly*. If inconsistent where she seems to catch sight of the object and then lose it and then fixate it again, tick *Jerky* . If the eyes did not follow the object, then tick *Never*.

How to use section 12b

For this diagram, instead of horizontal movement, there is vertical movement. The top half of the page shows the kind of movements to make with the object. Again the dashed lines represent stopping **at the midline**. The continuous lines represent movement **across** the midline.

The bottom half of the page offers a table for you to record the results of your observations in the same way as for 12a.

How to use section 12c

The last of the three diagrams in this section is for you to observe eye movements in response to objects moving in a circle and allows you to record results of your observations.

The top half of the page gives a diagram to show the kind of object movements to be made - clockwise and anti-clockwise. The bottom half of the page gives room to record the results of your observations.

Transferring results to Section 18:

As with the other sections, you now have to decide what the results of your observations mean for the Summary Chart in Section 18. In that Summary Chart, you will find that in the row for Section 12 there is only space to tick under *Aware* and *Attend*. The other three boxes are shaded, except for row 12c. Here you are allowed to *Localise*. Any general response by the learner to an object's movement in these directions cannot tell us more than that there is an ability to *Attend*.

Of course, if she makes a very specific response (eg; naming the object moving), this would mean she could *Recognise* through vision. Additional information will be needed if you are to tell that the learner is doing more than *Localising*. If you have that kind of extra information by all means tick boxes in the filled areas as appropriate.

No response to object movement?

If the learner *Never* shows any visual response to any of the four items in this section, try again on subsequent occasions with different objects and in different lighting conditions (that is in other *Settings*). You should at least try Section 13, 14 and 15. If she can walk or guide a wheelchair, try Section 17. If these, too, result in *Never* you should refer back to the curriculum suggestions contained in Sections 9, 10 and 11.

Or score Localise if:

the learner responds with *Smooth* eye movements to follow objects moving in all directions, including circular movements (for rows 12a, 12b, 12c). Tick in boxes for Localise in rows 12c, then move on to Section 13.

OR Score attend if:

you have ticked *Jerky* eye movements to all directions. (This is as if she is trying to follow, attending to the object's movement, but is not quite able to do so). In this case, too, go to the Summary Chart, and tick in the boxes for *Attend*. Then move on to Section 13. You may still want to return to use the suggestions for curriculum development given in this present Section.

OR Score aware if:

the learner shows no *Smooth* responses, and only a few that are tick *Jerky*. If so, then tick *Aware* in the Summary Chart. Then move on to Section 13. In this case you may well want to return and use the curriculum suggestions given in this present Section.

If you are in any doubt as to whether you should tick *Aware* or *Attend*, choose *Aware*. You will certainly not lose out by doing this. If, by doing this, you make an error, results obtained in other sections will compensate.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice. The choice you make will depend on the results you obtained.

EITHER

You can skip the remainder of this section and proceed directly to Section 13, dealing with assessment of visual fields. By doing this you will continue your assessment of use of Vision.

OR

postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development.

Developing a curriculum

Improving *awareness*:

To have an interest in this subject you will have found from the completed Summary Chart that the learner is only *Aware* through vision. For the checklist items you observed in this particular section, you may have found a few eye

movements that were ticked *Jerky*. Similarly the learner's use of 'The Other Senses' will be functioning at the level of *Awareness*. Those most interested in this part of Section 12 will be working with people who have very severe difficulties in learning about the world.

Passive head movement

'Tracking' is the term commonly used to describe movements directed to follow objects, people and events. Where there is no tracking response, you may try passively to aid the learner's head movements. To try to separate out eye from head movement, you could try to gently hold the head, and see if you can elicit eye movements in the direction of a moving light source.

As horizontal movements are established earliest it is usually better to concentrate on these first.

Other senses

It is also helpful to allow the learner to use other sensory information. For instance you could make a sound at the position of the light. There are many ways of doing this. For instance, you could move a cat bell along with the light source (use two hands as the light movement will then remain steady). Other examples are given under *Improving Attending*. Should the learner have strong 'likes', you may be able to use that preference in association with the direction of movement that is difficult. Or the learner could hold a torch as you move it from side to side. Or give verbal cues, smell or taste cues - or indeed any combination thereof. It may also be useful to associate a different combination of non-visual cues with different directions of movement.

Tonic neck reflexes

When engaging in training of tracking movements, it is important to remember that, for learners with some forms of cerebral palsy, separating head and eye movements may be difficult. To do so may well set off an asymmetric tonic neck reflex. Consult with a physiotherapist or occupational therapist, to determine correct positioning. As we mentioned earlier it may be possible to come to some sort of agreement on aiming to carry out this activity for very short periods. (This applies to all topics, it is certainly not confined only to *Awareness*).

Improving *attending*:

You will be interested in this topic if you found that the learner responded to items of Chapter 7 at this level.

Tracking may be present in all directions but poorly sustained. Eye movements will typically not be smooth but jerky[1].

Use of other senses

You will still be interested in pursuing the use of non-visual cues in association with visual cues. Another example is to allow the learner to hold a light source as it moves, giving verbal cues as well as the tactile cues. Contrast can be enhanced by carrying out finger play with cream spread on a mirror or table. Again try to use all of the senses other than just vision.

Range of objects

Use a range of objects. These might include balloons, puppets, wind up toys and bubbles.

Disco lights

This applies to other topics in this section. Long plastic tubes can be purchased. These give the impression of a light moving rapidly along a track. You can then arrange the tube so that the light appears to move in almost any direction. Beware of all disco lights which are based on the use of lasers. These should be avoided.

UV light

Refer to Section 10.

Use of computers

There is a range of software which may be useful in encouraging appropriate eye movements[2].

Improving *localising*:

As in the other sections you will be most interested in this topic if you have already carried out the items of Chapter 7 and found that the learner responded at this "level". In this case there may be a discrepancy in what the learner's general ability is from what their tracking ability is.

It may be helpful to associate a sound with the seen movement. Abnormal movement of the eyes may be evident in any of a number of ways. The eyes may not track the complete sweep of an object's movement, stopping at the midline even though the object has moved beyond this point.

Rehabilitating

Again you can try the non-visual associations described under *Improving Awareness*. Having done so you may find that it does not make any difference trying to associate sounds (or smells, or touch or any combination of these) with the visual component of the movement. The learner may never demonstrate such movements. But if you do not try, then this will certainly be the case.

Gradually change the non-visual cue so that it is given only at the point when the learner stops tracking the object. Watch closely to see the learner's response when one sounding object is replaced by another less familiar object.

Compensating

If exhaustive attempts at associating visual with non-visual cues are indeed unsuccessful, you may be able to encourage the learner to make appropriate head movements in isolation from eye movements. This will help to compensate for the impoverished eye movements.

If compensation is the aim, use the sound at the point at which the learner appears to lose sight of the object. Encourage directional head movements with the sound source. As indicated, this can be also be carried out using olfactory or tactile information.

Outdoors

Play at throwing objects such as bean bags, fluorescent tennis balls, balloons, giving practice at following and catching moving objects under various lighting conditions, of bright sunlight (if you find any), shade, cloudy sky.

Improving *recognising*:

You will be interested in following up this part of Section 12 if tracking responses were not Smooth. As well as this the Summary Chart will have indicated the learner to function in other areas of ability at the "level" of *Recognising*. You therefore want to adjust your intervention techniques to suit someone at this "level".

Daily living

All kinds of daily living activities are relevant to this topic. Familiar "objects" might be people; journeys to and from school or other location; food at mealtimes; and a host of others which you will find through experimenting in different *Settings*.

Improving *understanding*:

You will be interested in following up this part of Section 12 if tracking responses were not Smooth. Also the Summary Chart will have indicated the learner to be at the "level" of *Understanding*. You want to adjust intervention to suit.

You might also want to consider the following suggestions if the learner has difficulty in following the object (or light source) in any particular direction. The term "Vertical or horizontal gaze ophthalmoplegia" may have been used in medical records.

Here you will find that in one or more directions of object movement, the learner follows the movement quite smoothly. But in the other direction(s), tracking responses are absent. For instance he may track the object's path up from bottom to midline and then his eyes go no further. Or he may track from left to midline and midline to left but not midline on to right. There are of course a host of other possible combinations, too numerous to list individually.

Difficulties in vertical movement

In this case it is likely that there will be associated problems with mobility. You may notice the learner is uncertain in unfamiliar surroundings; experiencing problems when approaching changes in the surfaces of the ground. He will also have problems when confronted with lines of text or lines of pictures, drawings and symbols. Where the tracking problem is vertical, then shifting gaze to the next line after the end of the first line will be difficult. Copying work will be made easier if the piece to be copied is positioned to the side of the paper being copied.

Difficulties in horizontal movement

In contrast a problem in tracking objects in any horizontal direction will mean that work presented alongside will be made **more difficult.** Reading, which goes from left to right may be especially difficult. You may find the learner returning to the start of the line just read - especially when, as so often happens, there are associated short term memory problems. Partly this can be compensated for by the learner moving his head. This may have to be taught. It might help to place work for copying above or below.

Section 13
front page

Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

Section 13 Responses to Objects in Visual Field

Aims of Section 13

In this section we try to explore a little bit more the learner's field of view. In Section 10 you did this in passing. However, Section 10 still concentrated on the area of the learner's field of view which is around the centre. In this section we move away from the centre to the periphery. Because we are interested in looking at the periphery, to consider peripheral vision and what is known as **peripheral visual field** testing.

For most tasks, it is helpful to know whether a learner is seeing all positions or only certain areas of his surroundings. As we will discover, restriction of the visual field may result in only a small area at the centre in front of the learner being seen, with the learner not perceiving any position surrounding this central area. Or, as is common with learners who have severe physical disabilities, there may be certain areas of the periphery which are 'blank'.

How to use section 13

Materials needed

Try to avoid using materials that are so large that they take up too much of the visual field. At the same time you need to use materials that you have found may be seen by the learner. You need not use a ball, instead use any object which is well contrasted. Often it is best to begin with a small light source such as a pen torch. Use different coloured filters if you like. If successful try smaller objects. Other objects might include a ping-pong ball stuck on a thin rod, finger puppets or a favourite toy. You may have to suspend the object on invisible thread. You can always come back and try again using a smaller size of object you find (from Section 15) that he is able to see. Be flexible and be prepared to try again another day.

What to observe

Turn to diagrams 13a and 13b. These are very similar and we will shortly deal with them together. Later on we will deal with Section 13c. It has a slightly different emphasis, and we will therefore return to it immediately after discussion of Sections 13a and 13b.

The only difference between the two is that 13a deals with the **Upper** visual field and 13b deals with the **Lower** visual field. 'Upper' means above eye level and 'Lower' means below eye level.

To carry out these you will require a helper. One person stands behind the learner and presents the objects. The second person tries to gain the learner's attention. If this is not possible, the second person needs to notice the direction of the learner's gaze **at the time the object is presented**.

For your **observations** of the learner you will be using those parts of both diagrams which lie **above** the dotted line. Each diagram consists of two drawings. The one on the left shows how to bring an object into the visual field. The diagram on the right shows a person's head, surrounded by the Numbers 1 to 6. These numbers indicate positions in space. For 13a, the positions are **above** eye level. For 13b, the positions are **below** eye level.

Person 1

Stand behind the learner. Slowly introduce the object from above or below on the left or the right side, around 20 cm from the eyes. Choose the side of presentation randomly so he does not anticipate on which side it will be presented. Repeat to vary the distance of the object from the learner's head.

Person 2

Gain the learner's attention. If you cannot gain his attention, try to notice the direction of his gaze as the object is introduced. Watch for any response indicating that the object has been noticed. The response might consist of a flick of the eye in that direction, a head turn or something more obvious such as reaching out to the object. Note the

position of the object at the time it was noticed by the learner (Numbers 1 to 6).

Below the dotted line there is a little table. On it record the **results** of your observations. This is where to record whether the learner responds to the object and in which positions. If you are sure the object has been noticed, tick*Consistently*. If inconsistent, tick*Occasionally* ; if not noticed, then tick *Never*. (If you find it easier you may want to ignore the table and record the results of your observations alongside the numbers themselves). So,

ticktick to indicate *Consistently*;

tick to indicate *Occasionally*;

0 to indicate *Never*.

Choose the system that is most convenient to you.

The most difficult instruction to follow is that while making observations, you need to take into account the direction of the learner's eyes. If the direction of eyes is pointing off to one side, then you will need to think of the Numbers 1 to 6 in positions corresponding to this direction of gaze. This may lead to inconsistent results, so take your time and, if necessary, return to try again.

Cautionary Note

As we stressed before, remember not to allow previous items to influence subsequent items.

Transferring Results to Section 18:

As with the other sections, you now have to decide what the results of your observations mean for the Summary Chart in Section 18. In that Summary Chart, you will find that in the row for Section 13a and 13b there is only space to tick under *Aware*, and *Attend*. Section 13c allows *Aware*, *Attend* and *Localise*. The other boxes are shaded. This is because any **general** response by the learner to an object's position in the visual field cannot tell us.

Restriction to an area of the visual field means that, should the learner respond to areas outwith the restricted area, this may occur because it is the **only** area in which he is aware of objects. It does **not** follow that he can *Localise*. He may still only *Attend*.

Of course, if he should make a very specific response (eg; naming the object being presented), this would mean he could *Recognise* through vision. **Additional information** would be needed if you are to tell that he is doing more than *Attending*. If you have that kind of extra information by all means tick boxes in the filled areas as appropriate.

No response in visual field?

If the learner *Never* shows any visual response to any of the positions in 13a and 13b, try again on subsequent occasions with different objects and in different lighting conditions (that is in other Settings). You should still try the remaining sections in this chapter. If these too result in *Never* you should refer back to the curriculum suggestions in Sections 9, 10, 11 and 12. You may also want to try Section 14, 15, 16 and 17.

OR score attend if:

the learner notices objects *Consistently* in all of the positions shown. In this case go to the Summary Chart (Section 18), find row 13a or b, and tick *Attend*. Return to carry out Section 13c.

OR score attend if:

he notices objects *Consistently* in one or more of the positions shown. In this case go to the Summary Chart (Section 18), find row 13a or b, and tick *Attend*. Note for your own records any positions that present difficulties. You will probably want to return to the suggestions for curriculum development given in this present Section. But you should still try Section 13c.

OR score aware if:

the learner shows **no** consistent responses, but there are tick *Occasionally*. If so, go to the Summary Chart and tick *Aware* . Then move on to Section 14. In this case you may well want to return and use the curriculum suggestions given in this present Section.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice. The choice you make will depend on the results you obtained.

EITHER

you can skip the suggestions offered for developing the curriculum,and move on to carry out Section 13c. By doing this you will continue your assessment of the learner's use of Vision.

OR

postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development.

Developing a curriculum

What is a visual field?

For learners who are multiply disabled, it is quite common to find gaps in the 'visual field' of one or both eyes. Visual Field means simply that part of the surroundings the learner can see **without** moving eyes or head. It extends up and down, from left across to right, and from near to far. (Usually the latter is ignored and, in any case, different parts of this chapter deal with distance).

further details

Difficulty in testing

Often no indication of visual fields is mentioned in any background information on a learner (you can refer to Section 2 to find out if this was true for your learner). The reason why a measure of 'visual fields' is not usually available for learners with multiple disability, is that it is often extremely difficult to obtain an accurate measurement. The kind of accurate measurement which is aimed for by ophthalmologists requires a fair degree of cooperation on the part of the 'patient'. It may also require a high level of understanding, consistent and reliable responses, and often rather quick reaction times. You can therefore see why accurate measurement of visual fields is not often available for the learner who is multiply disabled.

The method you are using offers no more than an **approximation**. That approximation will, none the less, be useful in your identification of any significant field losses. This in turn will help you to understand why it is that the learner displays certain unusual behaviour or has difficulties in particular tasks. Using the procedure outlined will also assist you in optimal design and presentation of materials.

What does it mean to have a visual field defect?

This question is a bit like asking "How long is a piece of string?" Impairment to one's visual field can have a number of effects on everyday activities:

- on reading and writing;
- on perceiving a whole object or picture;
- mobility may be affected; tripping over obstacles or falling down stairs;
- if communication by signing is used, the person may only see the other's hand movements within a very small area.

Different visual field defects will produce different effects. A few of the most common visual field defects are shown in Figure 7.13.1.

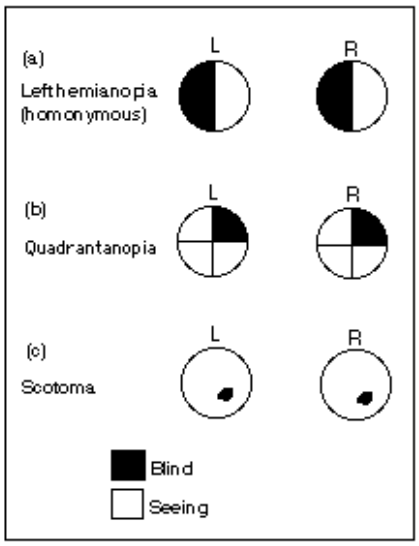

Figure 7.13.1. Visual field defects (a) Hemianopia (b) Quadrantanopia (c) Scotoma

Figure 7.13.1a

This is a common type of visual field defect known as **hemianopia** (from the Greek where hemi = half; an = not; opia = sight). Notice that it is the same area of both eyes that is blanked out. This is because the visual field defect is located in the brain. This can be the result of a stroke in which, if the **right** side of the brain is affected, the **left** side of both **fields** of view will be lost.

The hemianopia can occur to the right or left side as well as to either the top or bottom half of the visual field. So for example your results for Section 13a might show *Never* or *Occasionally* being Ticked. Whereas results for Section 13b might show *Consistently* being Ticked. This would indicate an hemianopia in the upper half of the visual field.

Figure 7.13.1b

Here we see that instead of half of the visual field being affected, a quarter of the field is affected. Again the defect is the same in both eyes. If this was the case with your learner then you might find that for Section 13a Numbers 1, 2, 3 *Never* applied. For Section 13a and Numbers 4, 5, 6 *Consistently* would be Ticked. For Section 13b Numbers 1 to 6 would all read *Consistently*.

Figure 7.13.1c

In this Figure there is a subtle visual field defect. It is where a small part of the visual field has a blank spot. This is usually known as a *scotoma*. It is one that you may not detect as its discovery requires sophisticated equipment, cooperation and a good level of understanding by the learner. Even with sophisticated extremely expensive equipment, it may go undetected. In some instances, more than one, or indeed several, such scotomas may exist. This is commonly known as "Swiss cheese vision" for obvious reasons. In the latter case, it is usually easier to test, and such results may be available from medical records.

A scotoma may be present in one or in both eyes. If in both eyes, the scotoma may occur in the same place or in different places. It may be present in the eye or in part of the network sending messages to the brain, or even in the part of the brain itself which deals with vision.

Just as the site of the scotoma may vary so, too, the effect on the person's visual field may vary. A scotoma may only be noticeable in unusual circumstances, such as when the person is extremely tired. Or it may be noticeable and affect the person's reading ability. Even a small blind spot in the area of the eye which deals with reading (known as the macular area) may have a significant effect. For instance here we have the effect on reading a paragraph of text of a small blind spot in the macular area.

> **Eve a small lind s ot in the rea of the eye whi deal with re ing (kno as the acular a a) may ave a s nificant e ect. For insta e here we ha e the eff of a sma blind in the m ular a ea on a p agraph of text**

What did you notice about the text?

You probably noticed it was difficult to read! With those who have only visual impairment, reading is aided by checking back, by familiar words being recognised without having to actually see the whole word, by using eye movements, and through past knowledge filling in missing gaps. An **unfamiliar** piece of text containing scientific jargon would be much more difficult to read. The learner who is multiply disabled, especially with severe learning difficulties, will be at a great disadvantage. What is true for reading words and letter is also true when looking at symbols or pictures. Bits of the picture or symbol will be missed. If the learner has experienced this from birth or from a very early age, he will be even less likely to be able to tell you that there is a problem.

Another point to note is that the effect will change as distance from objects being looked at changes. The same scotoma which at normal reading distance blanks out 2 letters will, at 400 yards, blank out an area the size of a bus!

It is a popular misconception that the areas which are not functioning are like holes or black spots. This is not true. Instead it is as if the brain 'fills in' the area. In fact we all have a blind spot in each eye. This happens because the optic nerve, which carries the visual messages to the brain, has to leave the eyes at some point. This point becomes 'blind'. Yet you do not experience blind spots, except in very artificial conditions. Your brain has filled in the area[1].

Because many learners who are multiply disabled have impairment to cognitive abilities it is likely that this "filling in" will be affected. To what extent the "filling in" is affected is not, however, clear. After you have read the rest of this section, you may wish to return to the short list above and consider what effects would be produced by different visual field defects.

Presence of other disabilities

Another important point to note is that the **same** visual field defect will have **different** effects in two different learners. This is because the severity of the visual field defect will depend on the particular combination of additional disabilities. Someone with a severe short term memory disorder, coupled with a visual field defect, will not be able to remember one part of a picture already looked at while he looks at another part of that picture. Whereas a learner who has no short-term memory problems will be able to integrate the whole picture in his memory. You may like to consider the different ways in which the field defects shown in Figure 7.13.1. would be compounded by different types of disability.

Having set out briefly the nature of visual fields along with some examples of different defects, we are now in a position to be a little more specific on suggestions for curriculum development.

Improving *awareness*:

To have an interest in this topic you will have found from the completed Summary Chart that the learner is only *Aware*. Vision will be limited to perception of reflected light. Similarly the learner's use of 'The Other Senses' will be functioning at the level of *Awareness*. Those most interested in this part of Section 13 will be working with people who have very severe difficulties in learning about the world. For the most part intervention will have to begin using Sections 9, 10, 11, 12 and 14. However, there are some general points that are worth mentioning at this point.

Compensate or Rehabilitate?

What we mean by this question is that you can either adjust materials and activities to suit the area which is missing from the visual field - **compensating**. Or else you can try to restore the part of the visual field that is absent by appropriate stimulation. A good analogy is to think of an orchestra. Suddenly, just before a concert, all the members of the string section die. What can the orchestra do?

It could compensate by changing the repertoire, avoiding pieces which demand a contribution from the string section. That is it could **compensate**. Or it could find new members who play strings and carry on with their original repertoire. That is it could **rehabilitate**[2].

Compensating

This is more straightforward, and would involve you avoiding presenting objects in the parts of the visual field that showed no response in your assessment. It is not so easy to do in practice as it entails keeping a constant vigil over how objects are introduced; from which side to approach obstacles; where to present pictures, symbols and words. The presence of physical disability to the same side as the field defect also compounds problems. For it may be that not only does the learner have difficulty moving an arm or hand, say, but lack of vision to that side means he cannot even see the arm or hand. It is truly a case of 'out of sight, out of mind'.

So although compensation is a valuable approach to take, it should not be done to exclusion. As a rule of thumb, **unfamiliar** events should be brought to the 'good part' of the visual field.

Rehabilitation

The reason why compensation is often emphasised with visual field defects is that most assume that a visual field defect is 'here to stay'. After all, if part of the brain is affected, what would be the point in trying to make it work? However, two examples should suggest that this view might be over pessimistic.

The first piece of evidence comes from California, the second from England.

The girl with no visual cortex

This child's eyes seemed to the ophthalmologist to be fine, but she was found to have no visual cortex. According to accepted opinion, the visual cortex interprets and makes sense of the information coming from the eyes to the brain: it is the part of the brain that 'sees'. Therefore without a visual cortex, the child should have been totally blind. But she is not blind. Her vision is by no means perfect, but she can use it for moving around her surroundings, for recognising many objects and for a number of other tasks. How can this be possible? It would be possible if other parts of this

child's brain had taken over the function normally carried out by the visual cortex.

(Our second example, contained in the caption, describes animal experiments. Some readers may therefore wish to pass it over.)

Improving *attending*:

You will be interested in this topic if the learner showed consistency in responses to one or more areas of the visual field. In addition the Summary Chart will have pointed to this as being the appropriate "level" of intervention.

Field defect or attention problem?

In the previous topic we indicated that there was another good reason for trying to establish seeing within areas of visual field defect. It is worthwhile because difficulty in **attention** can lead to apparently similar difficulties as a defect of the visual field. The learner acts as if the object is not there.

The best ways to try to improve attention difficulties of this type are to use:-

- events that are of interest (referring to the learner's preferences in Section 3). Occasionally introduce these events in the area corresponding to the visual field defect;
- pair the visual object with other sensory information - a simple trick is to use cat bells (from the pet shop) with a mirror or pen torch or other object;
- in the same vein don't forget passive movement of the hand (or foot) to touch the object.

Use of dark room

In a similar fashion to that described in Section 9, a dark room may be used to accentuate the presence of objects.

Improving *localising*:

In this case, the Summary Chart will have suggested the learner to be functioning at *Localising*. You now want to ensure that intervention techniques are suited to this "level".

Using the learner's preferences

Refer to Section 3 and, using what you found the learner to prefer, try to arrange so that preferences are presented in various positions. Some of these should correspond to the areas for which you have observed defects in the visual field.

Use of computers

'Targets', which has been mentioned elsewhere, is a useful program for encouraging both location and recognition of objects. Use of a Touch Screen is optimal, offering a helpful routine for restricting the position of shapes on screen. This allows you to encourage visual scanning through head and eye movements to locate shapes on screen. By varying the foreground and background colours on screen you will also be able to identify appropriate colour contrasts. From this you will be able to arrange that some materials adopt these colour contrasts.

It is likely that many learners functioning at this level will not understand how to use a Touch Screen.

Improving *recognising*:

You will be interested in this topic if the learner showed consistency in responses to one or more areas of the visual field. In addition the Summary Chart will have pointed to *Recognising* as being the appropriate "level" of intervention.

When she drops an object out of her visual field then for that same object to reappear may seem to the learner like magic. Some have termed this the 'good fairy syndrome'. To avoid this and to help the learner understand that objects have permanence, encourage the learner to physically follow an object and recover it. This can be done by following the object with her hand; or have her move towards the object; or have her retrieve an object attached to a string. Note however, that you should not do this on every occasion. It is also important for the learner to understand that she can be rid of objects once she has tired of them.

Improving *understanding*:

You will be interested in this topic if the learner showed consistency in responses to one or more areas of the visual field. In addition the Summary Chart will have pointed to *Understanding* as being the appropriate "level" of intervention.

In this case, and with *Recognising*, it is less likely that an **attention** problem is masquerading as a visual field defect. It is more likely that it is a true visual field defect.

Sign communication

We mentioned earlier that a learner being signed to may have difficulty seeing signs made if there is a visual field defect. For instance, for those with dual sensory impairment ('deaf-blind') who rely upon signing, visual field restrictions may mean problems in detecting sign language. One of the more obvious examples is that of a learner who has **retinitis pigmentosa**, a condition which often results in loss of peripheral vision. Unfortunately, around 3-7% of children born deaf will in later life (usually appearing first between the ages of 10 and 15 years) experience this kind of visual loss. The syndrome is known as Usher syndrome, and it is often characterised by poor balance. If you have a child who is congenitally deaf and who has poor balance, ask for a medical check, as this condition can be diagnosed through biochemical and electrical tests.

Without going into the details of visual angles, there is a useful and fairly straightforward way to determine the size of the communication field. Lea Hyvarinen, an ophthalmologist from Finland, suggests asking the learner to look at the signer's nose, and indicate when the signer's hands are seen moving from the periphery towards the middle. Repeat for each side and for above and below. In this way the signer more easily remembers the possible "working space" for signing to be carried out. Of course not all learners will understand that task. You may then resort to your observations carried out using the diagrams at the start of this section.

Relation of Visual Field to Mobility

One of the most important functions of peripheral vision is for safe navigation through the environment, thus avoiding sudden hazards. This is developed more fully in Section 17.

Section 13c RESPONSES IN VISUAL FIELDS (PREFERENCES)

How to do Section 13c

Materials needed

Use a variety of objects. You will be using two at a time.

What to observe

It is also useful to determine whether the learner has a particular visual field which is preferred. Objects may be **preferred** in one area over others. Refer to the diagram on the previous page. During the course of several sessions, place two items in two different quadrants in front of the learner. This is shown in the diagram **above** the dotted line in 13c.

Try to distract the learner's attention while placing objects. Begin with a distance of around 50cm. Observe whether the learner consistently reaches for or fixates in a particular quadrant. This is another indication of preference for a particular field of vision. You can vary this routine by using two identical items placed in quadrants.

Where you do discover a distinct preference, the suggestions given in this section on encouraging attention will also apply.

Section 14
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Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

Section 14 Learner's Responses to Contrast

Aims of Section 14

In this section we consider how to make best use of changes in contrast in the learner's world. We will also include some assessment of the learner's perception of colour. There is some evidence to suggest that some people may have good ability to see the fine detail of objects but have difficulty when even quite large objects are poorly contrasted against their background. It is usually good teaching practice to use relatively good contrast between an object and its background. Nevertheless, it is often the case that a person with good sight **believes** a contrast to be strong, whereas the person with poor sight believes the contrast to be poor (we saw an example of this in Chapter 1, where we discussed a child's problem with a blackboard).

Optimising the use of contrast seems a simple problem: to solve it surely all one needs to do is arrange activities that ensure maximum difference using black for a foreground and white for a background. Or is it such a simple problem?

How to use Section 14

Materials needed

Begin with materials that are highly contrasted and are real **objects**. These include bright orange balls; black against orange; black on white (and try white on black); sky blue with black; white on blue and so on. The shapes to use are not dictated by those given on the diagram - you will be using real objects. Be flexible and be prepared to try again another day. To start with use fairly large objects and work down. Try not to change both the contrast and the size of the object in one step. You may want to postpone changes in size until Section 15.

Also use positions of objects which you have already found to be easiest. Refresh your memory by looking at the results you obtained in Sections 10 and 13.

What to observe

Turn to the diagram. For your **observations** of the learner, as a guide you will be using the sketch at the top. The one on the left is an example of using **high contrast** - black on white as stripes, checks, large spots and so on. The middle diagram at the top shows **medium contrast**; that on the far right indicates **low contrast** - such as cream or beige against a white background.

In the middle of the page there is a table allowing you to record the results of your observations. This is where to record whether there is a response to the object and for which contrasts - high, medium and low. If you are sure it has been noticed, tick*Consistently*. If inconsistent, tick*Occasionally* ; if not noticed, then tick *Never*.

After this, it need not be during the same session, try out various colour combinations, such as black foreground with orange background; yellow foreground with blue background, and others. Do not forget white foreground with black background. Try to identify what works well with that individual learner. Record this in the box at the bottom of the diagram. Often you will be following up your own hunches, gleaned from sessions when you have thought the learner did not function as well when using certain colour combinations.

Cautionary note

As we stressed before, remember not to allow previous items to influence subsequent items.

Transferring results to Section 18:

As with the other sections, you now have to decide what the results of your observations mean for the Summary Chart in Section 18. In that Summary Chart, you will find that in the row for Section 14 there is space to tick under a variety of boxes. It depends on which particular contrast you are using. Consistent response to objects that are **high contrast** allows you to tick *Aware*. Those to medium contrast to tick *Attend*; and low contrast to tick *Localise*.

As before, if the learner makes a very specific response (eg; naming the object being presented), this would mean he could *Recognise* through vision. If you happen to have **additional information** by all means tick boxes in the filled areas as appropriate.

No response with any contrasts?

If the learner *Never* shows any response, try again on subsequent occasions with different objects and in different lighting conditions (that is in other *Settings*). You should still try the remaining sections in this chapter. If these too result in *Never* you should refer back to the curriculum suggestions in Sections 9, 10, 11, 12 and 13.

OR score localise if:

she notices objects of high, medium and low contrast *Consistently*. In this case go to the Summary Chart (Section 18), find row 14, and tick *Localise*. In this case it is very likely that you will be able to obtain additional information to show that she can also *Recognise*.

OR score attend if:

the learner notices *Consistently* objects of high and medium contrast, but not low contrast. In this case go to the Summary Chart (Section 18), find row 14, and tick *Attend*. Note for your own records any colour combinations that present difficulties. You will probably want to return to the suggestions for curriculum development given in this present Section.

OR score aware if:

the learner shows responses only to high contrast objects. If so, go to the Summary Chart and tick *Aware* . Note any colour combinations that give the optimum response. Then move on to Section 15. In this case you may well want to return and use the curriculum suggestions given in this present Section.

AND score Aware if:

He shows responses *Occsaionally* to objects of the three contrasts. Again, go to the Summary Chart, tick *Aware* in the appropriate row.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice. The choice you make will depend on the results you obtained.

EITHER

you can skip the remainder of this section and proceed directly to Section 15, dealing with responses to objects of different size. By doing this you will continue your assessment of the learner's use of Vision.

OR

postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development.

Developing a curriculum

General comments about use of contrast

First, some general comments about contrast. As we mentioned these earlier in the book (see Chapter 2) we will confine ourselves to a few main points:-

- almost every activity carried out will present more than one contrast. Keep an open mind on other sources of contrast which may be interfering with your intended contrast;
- a plain background makes it easier to distinguish objects in the foreground. A patterned surface for a background offers less contrast between object and background. The more 'busy' a pattern, the more difficult it is to distinguish the object(s) (see Figure 2.3 in Chapter 2);
- in many cases, movement of the object relative to its background often helps the object to stand out (see Figure

7.14.1);

- similar colours merge together. For instance, the clothes one wears may make it very difficult for a learner to locate one's presence. You may want to have available a jacket, apron or overalls easily distinguished by the learner;
- try to avoid too many shadows;
- depth changes (such as steps and stairs) may be accentuated by improving the contrast between two surfaces;
- experiment with these in different Settings such as in a classroom, out shopping, in the garden.

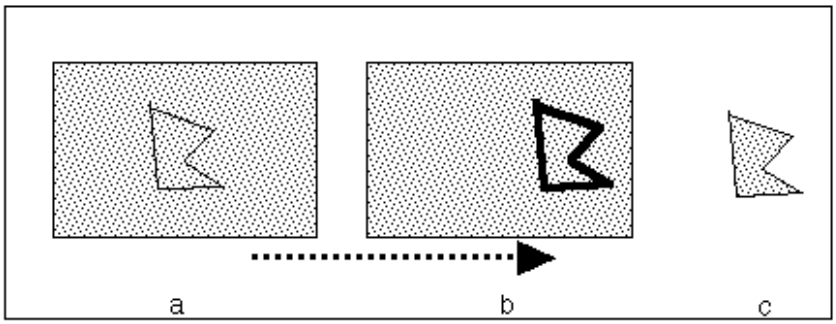

Figure 7.14.1 The effects of movement of an object relative to its background (a) object difficult to see; (b) object stands out as it moves; (c) shape against different background

The notion that a learner would not make use of any residual vision is, it would seem, counter-intuitive. After all, if vision is so useful, why would the learner not make maximum use of it? Long experience of poor information given through sight can however lead the learner to ignore any potential success that this source of information could give. Often one finds a different picture emerging with a learner having lunch. In this situation he may be **motivated** to use vision. Hence the emphasis placed throughout this book on trying out different Settings with a learner, rather than relying solely on touch or sound stimulation.

Having set out some general comments on using contrast we can now turn to more specific areas of curriculum development.

Improving *awareness*:

You will be interested in following up this section if results in the Summary Chart suggest the learner is functioning at the level of only being *Aware* of the objects and events in the world. You will probably have found only response to objects which are highly contrasted.

Heightening contrast

A large white card against which dark objects are presented may be used to accentuate contrast. Gloss surfaces should, however, be avoided as these may reflect too much glare. For a child who is lying down or inclined over a wedge, a white sheet or towel may be useful as a background.

Cortically blind?

Recall the comments on cortical visual impairment (or cortical blindness) made in Section 10. These learners may benefit from very highly contrasted objects, and experimenting with the use of colour. They may not perceive an object as such, instead perceiving disembodied colours. Enhancing colour contrast helps to accentuate the boundaries of objects from their backgrounds.

Improving *attending*:

You will be interested in following up this section if results in the Summary Chart suggest the learner is functioning at the level of only being able to *Attend* to the objects and events in the world. You will probably have found *Consistent* responses to objects which are of medium contrast.

Associating

Where your observations have suggested that in situations which are motivating, the learner seems to attend to poorly contrasted materials, try associating the introduction of an object with a pleasurable experience. Just what that pleasurable experience might be will be different for each learner. Use these in an opportunistic fashion to encourage the learner to look carefully, to scan and search.

Interesting hands

In an earlier section we showed how to increase awareness of hands using reflective tape. Where the learner is able

to see highly contrasted surfaces, you may use this idea but with different materials on the hands. The hands would in this case be outlined with non-toxic paints or markers. Any hand movement the learner makes will have a pronounced visual association. At first the learner may be encouraged to see the results of his 'pointing'. If successful, it may be possible to have him point to a certain spot. Contrast cues can then be varied depending upon the level of vision. To do this use different foreground versus background colours for papers and paints.

Contrasting flooring

If encouraging the strengthening of hand and leg movements in leading to crawling, and free standing, use towels as props under the arms allowing the child to push up more freely. Therapy balls may be used in conjunction with a well-contrasted floor covering. Familiar high-contrast materials increase visibility of the surroundings, thereby lessening feelings of vulnerability.

Glove puppets

Glove-puppets can be adapted so that features are highly contrasted. For the learner whose language is affected, through hearing impairment or other difficulty, movement of the puppet may be made consequent upon her vocalisation. The specific kind of vocalisation would depend upon the ability of the learner. For some, the action of the puppet may be gross and related to the child producing **any** utterance. This can later be refined as success is obtained. Speech and language therapists often have superb routines with glove puppets.

Feeder cups

A feeder cup of highly contrasted materials is helpful to a young child.

Improving *localising*:

You will be interested in following up this section if results in the Summary Chart suggest the learner is functioning at the level of *Localising* objects and events in the world. You will probably have found *Consistent* responses to objects which are of low contrast.

In games such as ball rolling, catching, batting of objects use materials which vary in contrast. If successful with one set, the amount of contrast can be reduced or the size of the object reduced. If this becomes successful, then both size and contrast may be reduced.

Also refer to the general comments on use of contrast set out earlier in this section.

Dark adaptation: Difficulties experienced with low contrast will often be associated with the learner having problems negotiating dimly lit rooms (not dark rooms, we all have difficulty navigating around a dark room). If this appears quite suddenly, you should have him referred to an ophthalmologist.

Improving *recognising*:

You will be interested in following up this section if results in the Summary Chart suggest the learner is functioning at the level of *Recognising* objects and events in the world. You will probably have found *Consistent* responses to objects which are low contrasted.

Mealtimes

Although we do not endorse the view that says every mealtime should be turned into a work session, try to reconcile this with the fact that every mealtime can be a wonderful learning experience. Additional 'tasks' should only be added on occasion. These are best done in the form of a game. By paying attention to the kind of cues afforded to the learner, you also avoid the problem of visual information on food and drink being taken for granted. Using good contrast between table top, plates and food items helps make food more interesting and more visible. Visual search can be enhanced by playing an *occasional* hide-and-seek game using cup, spoon or plate. Rather than making this a chore for the learner, be prepared to boost chances of discovery by tapping on the spoon or plate.

If not immediately successful in locating the object by vision, give him some other form of sound, smell, taste or tactile (texture) cue. Be prepared to use any knowledge gained in this way to confirm or add to that which is found in non-visual sections of Chapter 6.

Finding the familiar

Presentation can be made more personal by including the learner's name - although he may be unable to read, the attraction may well remain. To increase enjoyment a specific symbol of high contrast may appear consistently across many different formats. This encourages searching and scanning across pictures exploring and finding the familiar within unfamiliar surroundings. Specific things to be searched for could be changed each day. One day it could be a search for all of the squares, another the biggest, yet another the one that is different and so on.

This promotes a transition from *Recognising* to *Understanding* (compare same/different; large/small; and other variations).

Contrast with tactile properties

Use tactile qualities to reinforce visual information offered with materials of high contrast such as pictures or symbols. Attach to the background materials such as coloured cardboard shapes, stickers, buttons, shiny lids (it is usually best to avoid the use of sandpaper). Texture can be added to different thicknesses of line drawings by sewing over lines with thread. Or reverse the paper using a sewing machine without thread to prick holes along the lines. Another possibility is to daub clear glue along line surfaces. For tactile cues it is easier for the learner to trace broken or corrugated lines than unbroken lines - change is easier to detect).

Use of computers[2]

Some programs are helpful in rapidly providing an individual profile of optimum colour contrast between foreground and background. Settings can be adjusted without any fuss. The resulting optimum contrasts can then be used for foreground and background card paper.

Improving *understanding*:

You will be interested in following up this section if results in the Summary Chart suggest the learner is functioning at the level of *Understanding* objects and events in the world. You will probably have found *Consistent* responses to objects which are of low contrast.

Same difference

Even though the learner may be competent at placing objects into containers, stacking and nesting, it is quite a cognitive leap to the understanding of concepts such as same and different. But these abilities are involved in sorting and matching. A couple of ways of improving sorting are first to have the learner practice stacking identical plastic plates. Then do the same with nesting plastic cups. Try to use materials that are highly contrasted. If successful, place one single plate and a single glass on the table (you might want to glue these in position). Give the learner an identical plate or cup and help locate the matching object, placing it on top. Eventually she will learn to keep together two plates and cups. Once this is successful, other objects can be introduced in the same way.

It is also helpful to use different containers as a sorting cue. Suppose the aim is to get the learner to sort items into two piles. Select two sorts of objects that are quite different in size, shape, texture and colour for contrast. To make this easier, use two different sized containers. For example use a metal box or wicker basket for one type of object and a long narrow cardboard box for the other. It is best if each container will only take one and not the other type of object. Once she is able to sort in this manner then try with two containers of similar size or similar material.

Purses

As with most children, brightly coloured purses or handbags represent useful objects to explore by opening them and searching.

Eye pointing[3]

For the learner who has severe physical disability, eye-pointing may be used to establish a means of communication. Use high contrast objects against background. Only when the learner is very successful in eye pointing to objects should you progress to large changes in position of food and drink materials. If successful, this will offer a lead-in to more abstract forms of eye-pointing as a means of communication (such as eye coding).

Generalisation[4]

Teaching of specific activities can often result in a great deal of success, but only in those activities with little transfer beyond. Rolling balls may be helpful to incorporate an element of problem solving. Use rolling balls of different colours. After several presentations of the same ball rolling backwards and forwards and watching visual tracking, a different colour of ball can emerge from say under a cloth, behind a short "wall" or through a tunnel.

Use of computers[5]

The same control over foreground and background colours is available on a number of computers. Sometimes this control takes place in the hardware (the machine itself), while at other times it is controlled through the software. If uncertain ask for help from a computer buff and refer to Appendix II for information on useful resources.

Visual Illustrations

Parents and educators usually know whether a young person responds to illustrations or pictures. Those that are brightly coloured will have most appeal, attracting the eye more easily. Sometimes, however, knowing that a learner has visual impairment puts people off from giving him or her visual material. If you already know that pictures evoke a response or if your student can see at least medium-sized objects with good contrast, then it is worthwhile including coloured illustrations as part of your teaching materials.

Bright colours attract the eye and give pleasure. However, contrary to what one might expect, the colour and size of a picture may not necessarily make it easier to perceive than the black and white letters used for eye tests. An interesting study of ability in children with refractive errors to "see" pictures, showed that this ability was much poorer

than might have been expected from their distance visual acuity for black-on-white Snellen letters (Sonksen, 1987). This is explained by the fact that the letters are images with clear-cut form and maximal contrast, foreground to background, with variation only in the size of letter. Coloured pictures have a combination of factors which make them more complex. They vary in contrast between subject and background, there may be overlap of one image on another and they may be "busy" with many items in one picture. How can we then explain how learners who do not have vision for great detail, recognise pictures? Sonksen explains it as a combination of remembering visual clues such as colour and overall size and shape along with remembering what they have been told about the picture or the name of an object in the picture. Even although the learner may not perceive an illustration with the same clarity for detail as we do, it does not detract from the pleasure and feeling of achievement for the learner who points or names correctly.

Section 15
front page

Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

Section 15 Responses to Size Differences

Aims of Section15

You will be interested in this section if you have established from the other sections in this chapter that the learner responds visually to objects. If you have not already discovered that some visual responsiveness does exist, you should return to do Sections 9 through 14 before embarking on this section.

You now want to find out the size of objects to which the learner responds. As we will see, however, any investigation you make of the effect of size must, in some way, also include the factor of distance. Rather than offering two quite separate sections, we thought it would be more intuitive for the reader if these were combined. In any case to some extent you have already observed the effect of distance from the object or event to the learner.

> Responses to distance were observed in both Section 10, in relation to reflected light, and in Section 11 for approaching objects.

Knowledge of the effects of size and distance helps you to adjust materials so that they are more appropriate to the learner.

How to use section 15

Materials to use

Large: furniture , large toys, balls, dolls, soft toys, clothes.

Medium: lego, duplo, small toys, smarties.

Small: hundreds-and-thousands, crumbs, beads, very small toys.

Begin by using large objects which offer good contrast against the background, and for which you have found the learner to have some success. Present objects in a position that you have found to work well (often this will be in the midline); begin with the object at around arm's length. After this use different distances and observe any inconsistency in the learner's responses at these distances.

What to observe

Refer to the diagram. The diagrams are not drawn to scale but are offered to give you an impression of what to observe. **Above** the dotted line you will see three diagrams which show the observations you will make. The top left diagram represents use of **large** objects. Below this represents use of **medium** sized objects. To the right is the use of **small** objects (these are placed on a table top).

Below the dotted line there is a table on which to record the results of your observations. The usual system is presented of *Consistently* (for consistent responses), *Occasionally* (where responses are present but not consistent), *Never* (for no response).

Cautionary Note

As we stressed before, remember not to allow previous items to influence subsequent items.

Transferring results to Section 18:

As with the other sections, you now have to decide what the results of your observations mean for the Summary Chart in Section 18. In that Summary Chart, you will find that in the row for Section 15 there is space to tick under a variety of boxes. It depends on which particular size of object you are using. *Consistent* or *Occasional* response to objects that are large size allows you to tick *Aware*. *Consistent* responses to medium size to tick *Attend*; and *Consistent* responses to small objects to tick *Localise*.

As before, if the learner makes a very specific response (eg; naming the object being presented), this would mean he could *Recognise* through vision. If you happen to have additional information by all means tick boxes in the filled areas as appropriate.

No response to objects of any size?

If he *Never* shows any response, try again on subsequent occasions with different objects and in different lighting conditions (that is in other *Settings*). You should still try the remaining sections in this chapter. If these too result in *Never* you should refer back to the curriculum suggestions in Sections 9, 10, 11, 12, 13 and 14. It would be unusual to have obtained responses to Sections 12, 13 and 14 without having any responses in the present section.

OR score localise if:

the learner *Consistently* notices objects that are of large, medium **and** small size. In this case go to the Summary Chart (Section 18), find row 15, and tick *Localise*. In this case it is very likely that you will be able to obtain additional information to show that he can also *Recognise*.

OR score attend if:

the learner *Consistently* notices objects of large and medium size, but not small objects. In this case go to the Summary Chart (Section 18), find row 15, and tick *Attend*. Try objects in different positions and note these for your own records. You will probably want to return to the suggestions for curriculum development given in this present Section as well as using the ones contained in other sections.

OR score aware if:

he shows responses only to large size objects. If so, go to the Summary Chart and tick *Aware*. Again trying different positions for objects and under different lighting conditions, noting optimum responses by the learner. Then move on to Section 16. You may well want to return and use the curriculum suggestions given in this present Section as well as those in previous sections.

AND score aware if:

you observe *Occasional* response to large or medium size objects.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice. The choice you make will depend on the results you obtained.

EITHER

you can skip the remainder of this section and proceed directly to Section 16, dealing with assessment of visual responses to people. By doing this you will continue your assessment of use of Vision.

OR

postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development

Developing a curriculum

Improving *awareness*:

If from the Summary Chart you have found the learner to be functioning at this "level" then you should refer back to Sections 9 to 14 for suggestions on intervention. In addition there are suggestions to be found in Section 17 and the four sections that make up Chapter 6 (The Other Senses).

Improving *attending*:

The same argument applies as set out in the above topic 'Improving Awareness'. Refer to Sections 9, 10, 11, 12, 13

and 14 in this Chapter, and to the sections in Chapter 6.

Improving *localising*:

You will be interested in referring to the suggestions given here if the learner is found, from the Summary Chart, to function at the level of *Localising*.

Size and distance

When you come to think about it, Size must pose a bit of a problem for all of us. After all the size of an object's image on the retina (the 'camera film' at the back of the eye) will vary according to the distance of that object from the learner. How then can an object be seen as being of the same size despite being at different distances? As an example look at a small child about 2 metres from you. Now look at an average size adult 20 metres away. Which is bigger? Of course its a silly question. But its not so silly when you realise that the image of the *adult on your retina is smaller than the image of the child on your retina*. Where this works fine it is often known as size constancy. That is, we tend to see an object as being of the same size despite changes in distance from the viewer.

In the able sighted person size constancy may be regarded as being less of a problem than how we actually perceive distance in the first place. We have already pointed out (in Section 11) that this is not as simple as it might seem. After all the retina is relatively flat or 2-dimensional. How can it perceive distance in 3 dimensions? We saw that many different stimuli may be used to help in distance perception. And it is usually assumed that anyone (or indeed any animal) capable of perceiving distance should be capable of size constancy. However this may not be the case in those whose sight is impaired. In the case of the learner who is multiply disabled, there may be an even greater difficulty in perceiving size and distance correctly.

One of the things that may go wrong in the learner who is visually impaired is that his eyes may not adjust for changes in distance. As an object approaches an observer, the lens of the eye must 'bulge' in order to keep the object in focus. Those who are visually impaired from birth may well not have developed this ability. Their eyes may not accommodate to changes in distance. In your own observations of the learner try to discover whether greater difficulty is experienced when smaller objects are brought nearer to the learner.

In general you would want to present unfamiliar materials or new activities at a size that is known to be perceived by the learner and at a distance that is most easily coped with - often this will be in the midline but you should refer to Sections 10 and 13 to determine the most effective positions. We have in several places referred to this as compensating for the visual defect by making changes in the environment.

But you would also want to try to increase the range of sizes to which the learner does respond. When doing this use objects that are familiar and which are therefore most likely to utilise any abilities in size/distance constancy that the learner possesses. Clearly you will at some time reach the limit of visual ability.

Jumping jacks

Use a variety of four to ten centimetre objects placed into and out of containers. Continuancy toys like jumping jacks and 'worm in the apple' encourage attention to more complex detail.

Place an interesting toy or object in a box with a brightly coloured string dangling. Hold the box at the child's eye level and encourage him/her to pull on the string to make the toy jump out. Vary this by lowering the box so that she has to pull upwards for the object to appear.

Improving *recognising*:

You will be interested in following up this section if results in the Summary Chart suggest the learner is functioning at the level of *Recognising* objects and events in the world. You will probably have found Consistent responses to a range of sizes of objects.

"Peering close"

Often you will observe the learner who is visually impaired bringing objects up close to the eye or else moving so that his eye is close to the object. In this way a greater surface of the retina is covered by the image. It is important to appreciate that this does not indicate good accommodation. This may be quite the wrong conclusion to be drawn. For the learner may be preferring a large, but very blurred, image to a smaller, sharper image.

Use of computers

Information on places to obtain sugestions for use of computers is provided in Appendix II.

Improving *understanding*:

You will be interested in following up this section if results in the Summary Chart suggest the learner is functioning at the level of *Understanding* objects and events in the world. You will probably have found *Consistent* responses to a

range of sizes of objects.

A child being introduced to the language of action could be shown a glove-puppet acting in some appropriate way; for example on the child saying "jump!" the puppet would do so. If this is successful, the puppet may be reduced in size, be hidden **under**, **over**, **behind**, **inside** other objects. Again use language appropriate to these concepts.

Concept building

Descriptive terms we commonly use in a sighted world constantly reinforce such basic concepts as in, on, behind, under, on top, big, small. To offer a similar understanding to the learner with severe visual disability we need to offer more direct learning experiences than those that can come through touch alone. As the vocabulary of a learner with multiple disability will often not be large, verbal descriptions need to be supported by cues from the other senses.

We have to be careful to identify for the learner the intended characteristics of sameness. For example, a yellow plastic model of a pussy-cat may **look** like a pussy-cat, but does not feel like one to the learner. It is very easy to confuse figures that look similar but do not feel similar while at the same time trying to teach the learner how to understand sameness.

Size may be explored through nesting pots and pans, plates, saucers and clothing. Also comparisons of large and small be given through people, chairs, portions of food. Over/under may be related to the branches of trees or in stepping over puddles. In/out given through boxes, different spoons in pots, seated in a car, placing feet in shoes and entering or leaving the house. Top and bottom can be given in relation to the body, shelves, drawers and clothing.

Refer also to Section 14 on contrast.

Use of computers

Information on places to obtain sugestions for use of computers is provided in Appendix II.

Testing visual acuity

If you have progressed to the point at which the learner can see small objects, you may want to proceed to carry out a simple test of **visual acuity** - ie; the ability to resolve detail. Although not highly precise the results you obtain could certainly be useful for the purposes of further curriculum development.

We would refer the reader on to Appendix III. There we discuss use of the BUST. This is a simple and reasonably accurate test of visual acuity carried out in the form of a game. The materials can be used flexibly, adjusting the manner of introduction to suit the learner. It is not appropriate for learners who are operating below the level of *Recognising*, and in fact is most suitably used with those functioning at the level of *Understanding*. Although we do not present the materials in Appendix III, we do offer a short and systematic guide to how to use the materials.

Section 16

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Scottish Sensory Centre

Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

Section 16 Visual Responses to People

Aims of section 16

This section is designed for you to discover if there is any major discrepancy between what the learner sees when confronted with people rather than objects in the world.

How to use section 16

What to observe

Try to discover if there are *Consistent* responses to any of the four items on the checklist at the start of this section. For *Occasional* responses you should try again on subsequent occasions in various conditions of lighting and with different people.

Cautionary Notes

As we stressed before, remember not to allow previous items to influence subsequent items. Throughout the sections in this chapter we have been concerned to point out that it is important to carry out each section without sound. Often this is difficult to do. In this particular section it is **extremely** difficult to carry out the items while not speaking. It is very unnatural so do not worry if you find this difficult. Reassure yourself that you will not be doing this too often.

Transferring results to Section 18:

As with the other sections, you now have to decide what the results of your observations mean for the Summary Chart in Section 18. In that Summary Chart, you will find that in the row for Section 16 there is space to tick under a variety of boxes. It depends on which particular responses you observe.

No response to any of the four items?

If the learner *Never* shows any response, try again on subsequent occasions with different people and in different lighting conditions (that is in other *Settings*). If these too result in *Never* you should refer back to the curriculum suggestions in Sections 9, 10, 11, 12, 13, 14 and 15. You should still try Section 17 in this chapter.

If you found that the result for Section 15 on Size indicated she sees small objects *Consistently* but not faces or parts of faces, you should also read the suggestions in the present section.

OR score recognise if:

the learner *Consistently* recognises people by sight. If so, go to the Summary Chart, find row 16, and tick *Recognise*. You should certainly try to obtain a measure of visual acuity (see Appendix III for further information on one example of how to do so).

OR score localise if:

she *Consistently* makes eye contact but does not *Consistently* recognise people. In this case go to the Summary Chart (Section 18), find row 16, and tick *Localise*.

OR score attend if:

the learner *Consistently* looks at people's hairline or when glasses are worn, but does not easily make eye contact.

In this case go to the Summary Chart (Section 18), find row 16, and tick *Attend*. Again come back and try again under different lighting conditions. You will probably want to return to the suggestions for curriculum development given in this present Section as well as using suggestions contained in the other sections.

OR score aware if:

she shows responses *Occasionally* but only to hairline or glasses. If so, go to the Summary Chart and tick *Aware*. Try different positions and under different lighting conditions, noting optimum responses by the learner. Then move on to Section 17. You may well want to return and use the curriculum suggestions given in this present Section as well as those in previous sections.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice. The choice you make will depend on the results you obtained.

EITHER

you can skip the remainder of this section and proceed directly to Section 17, dealing with assessment of the learner's mobility. By doing this you will complete your assessment.

OR

postpone further assessment and read the remainder of this section. In it we suggest activities for curriculum development.

Developing a curriculum

Improving *awareness*:

You will be interested in this topic if the Summary Chart has shown the learner to be functioning at this "level". The suggestions given in Sections 9 to 14 and in Chapter 6 will be more useful to you before trying out suggestions given in this chapter.

Improving *attending*:

You will be interested in this topic if the Summary Chart has shown the learner to be functioning at this "level". In addition you are likely to have found that the learner looks only at hairlines, and this response will probably be *Occasional*.

Learners may appear not to make eye contact but instead direct their gaze to a person's hairline. Because in the process the learner **appears** to be avoiding making eye contact this may be interpreted mistakenly as indicating autistic features. An explanation relying on the presence of a visual impairment should not, however, be discounted. Just as different colour combinations or of black and white shading give different effects in contrast, so too do different features of the face give varying levels of contrast. On many occasions, contrast between a person's hairline and background of a wall will offer enhanced contrast - more than that afforded by the same person's eyes. This is by no means true in every instance. Where possible, encourage the learner to look towards the eyes, making more of a fuss of her if she does so.

Looks at faces if wearing glasses

Often the same learner will look towards a persons eyes only when that person (not the learner!) is wearing spectacles. It is therefore worth experimenting to see if a person may be identified in this way. The reflectiveness of their glasses may be varied by moving towards and away from a light shining from behind the learner's head.

This technique may also be used in reverse. If the learner does not seem to be attending to faces, but does seem to be attending to the reflective surface of spectacles, then this can be paired with something that the learner prefers. Suppose a young child likes being tickled. As soon as the child looks at the glasses, tickle him. Then remove your glasses. After a time, tickle him while he is looking in that direction, even though no glasses may be worn at that time.

Light from behind head

A light shone from behind the learner on to the face of the teacher or other person interacting helps to accentuate the person's features and facial expressions. This enhances the possibility of encouraging imitation and of establishing eye contact. The most salient facial expressions to be used in encouraging imitation are through mouth opening, tongue protrusion, smiling and fluttering of the eyelashes. Different kinds of make-up such as eyeliner may be used to help highlight these features.

It may be helpful to introduce a variation on this theme by designing diagrams of faces, and have the learner point or otherwise locate different parts of the face.

Try encouraging turn-taking games. This conveys the idea that the learner can take the initiative in communication. This is something which is often difficult for a blind child to understand.

Improving *localising*:

You will be interested in this topic if the Summary Chart indicates *Localising*, and if there appears to be *Consistent* eye contact.

Should the learner actively **avoid** making eye contact then you should begin some further questioning. As a sign of **visual** competence, consistent **avoidance** of eye contact is as good an index of a degree of visual functioning as is the establishment of eye contact. However the question then becomes one of **why** the learner should avoid making eye contact. Some possible reasons include:-

- being forced into making eye contact;
- the presence of autistic features.

Forced eye contact

Often professionals mistakenly force the learner into making eye contact. This usually happens when making eye contact is regarded as a "stage" which the learner must be able to achieve, prior to moving on to greater things. However unless there is a very clear aim in mind then it can be an irrelevance for the learner. Ask yourself what is in it for the learner to engage in this activity. Some indications that this is the underlying reason for avoidance of eye contact could come from a difference in results when different people are interacting with the learner. If this avoidance occurs only with certain individuals this would suggest the need for a change of task - and perhaps a change of person.

It is important to try to explain consistent avoidance of eye contact. For such avoidance may indicate sufficient visual functioning to merit an investigation of the use of well-contrasted pictures or symbols as a system for augmenting communication. This would be particularly appropriate if the learner does not use speech as a method of communication.

Some learners may be sensitive seeming invasion of their personal space by someone coming very close to achieve eye contact. One way around this is to use a "third party" that is not a human eg; a puppet or doll. This may serve to relieve the stress of a situation and make it good fun to participate.

Autistic features

There is little to be gained by simply **labelling** a learner as autistic. You would still want to pursue methods of developing a curriculum for the learner.

The working principles set out in Chapter 4 would still apply. Moreover much of the information contained in the sections of this book would also apply. Lilli Nielsen has also done much to promote a re-consideration of rigidly held views[1].

Improving *recognising*:

You will want to pursue this topic if results in the Summary Chart indicate the level of *Recognising* to be appropriate. Moreover, the learner may be recognising people's faces.

You will no doubt want to pursue this to determine at which distances face recognition can be obtained. As the individual features of a human face are mostly objects with fairly poor contrast (cheeks, lips, chin) this level of ability represents a fairly high degree of visual functioning.

Prosopagnosia

If the learner shows tick *Never* able to recognise faces but he can recognise small objects, pictures, symbols and/or text then you may be interested in this topic. In most instances it is not too surprising to discover that those who have visual impairment are less able to recognise faces than are the able sighted. However it may be surprising to learn that a few people, who are quite able to see smallish objects and to identify their features, are still unable to recognise faces. They may not even recognise the faces of close relatives whom they have known for many years. This unusual condition is known as prosopagnosia. Most people who suffer from this condition are elderly where the condition has arisen following a stroke, affecting a particualr area of the brain. Nonetheless a few children have also been reported as having the same disability.

There are different kinds of prosopagnosia. First there are those who can identify familiar faces. More severe cases cannot even recognise faces that are very familiar. In the latter case friends, teachers and even family members go unrecognised. Nevertheless those learners, while not recognising people, will still be able to see small objects, pictures and often text of the size you are reading now. It is not therefore a problem of visual acuity.

What to do?

Often recognition can still occur by voice and this should be encouraged. Also, interestingly, specific facial expressions may still often be readable even though the whole face is not. Mnemonic tricks may then act as an aid to

memory. This is where the learner is encouraged to build up associations between a feature of a face, the context in which that feature was seen, and who belongs in that context. Clearly this requires fairly good cognitive functioning[2].

Use of computers

A couple of computer based games are available which allow a child to 'touch the clown's nose'. But you do not need a computer to do this kind of activity. Use dolls, draw them life-size and accentuate specific features. For further information on useful software, consult some of the sources listed in Appendix II.

Improving *understanding*:

At this level of ability in visual functioning, you will certainly want to obtain a measure of visual acuity (see Appendix III). The learner will have access to a range of non-verbal communication abilities. These include shared gaze, joint focus of attention, facial expression, and others.

At this point the reader is also referred on to other sources such as *Look and Think* (see Reference section of the present book).

Section 17

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Scottish Sensory Centre

Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

Section 17: Learner's Mobility

Aims of section 17

In this section we will examine how well the learner uses her vision for moving around her world. We propose to define mobility as: "**Going where you want to go. Leaving when you want to leave**."

Such a definition does not restrict us to consider only those who can walk or run. It also encompasses those who are independently mobile but in a wheelchair: that is they themselves control the wheelchair. The items all bear upon some aspect of visual functioning. For instance bumping into obstacles may suggest an impairment to one or more areas of the visual field. Where obstacles are not avoided below knee height this may suggest a lower visual field defect. Refer to Section 13 to find out any other observations you made which support your conclusion.

Similarly if objects to one side are collided with this may suggest a field defect to that side. Again more information will be gained from the results of your observations contained in Section 13.

Confident easy negotiation of both familiar and unfamiliar settings requires the ability to detect contrast changes, fairly well functioning visual fields (though as seen in Section 13, even quite large 'blind spots' may not have a noticeable effect on functioning), as well as some ability to resolve detail (visual acuity).

How to use section 17

Refer to the diagram at the beginning of Section 17. You are offered the by now familiar scheme of *Consistently*, *Occasionally*, *Never* .

Settings to use

Early in this book (in Chapter 2 where we explored the 'cycle of assessment'), we emphasised the need for you to make observations across different *Settings*. And peppered throughout the sections in this chapter and Chapter 6, we have provided examples of the use of *Settings*. In the present section, it is especially important to observe mobility in both **familiar** and in **unfamiliar** surroundings. Try different lighting conditions - outdoors, indoors, dim light, bright light. Try surroundings that are cluttered with obstacles, and those that are clear of obstacles (of course, you must be cautious that you do not present hazards unnecessarily). It is up to you which *Settings* you use - the more the merrier.

Try to discover any difference between the learner's mobility in familiar versus unfamiliar surroundings. We offer you a choice from one of two broad categories for making your observations. Both may be regarded as independent mobility. The first is **unaided mobility**. Alternatively, if she has access to a self-controlled wheelchair, you would observe **aided mobility**.

Only read the section below that is appropriate to your learner (aided **or** unaided).

Transferring results to Section 18:

As with the other sections, you now have to decide what the results of your observations mean in terms of the Summary Chart in Section 18. In that Summary Chart, you will find that in the row for Section 17 there is space to tick under a variety of boxes. It depends on which particular responses you observe. Note that you should do either *Unaided mobility* or *Aided mobility*, not both.

EITHER unaided mobility

Score recognise if:

you observe responses *Consistently* to most of the items. In order to score *Recognise*, you must observe *Consistent* responses to the items "Goes to Preferred Places" and "Avoids places disliked and hazards". Ensure that you have made your observations in a variety of *Settings* &emdash; both unfamiliar as well as familiar. If so, go to the Summary Chart (Section 18) and tick *Recognise*.

OR score localise if:

there are *Occasionally* or *Never* responses for "Goes to Preferred Places" or "Avoids dislikes and hazards". Also two or more of the other items should be ticked *Consistently*.

OR score attend if:

there are less than two items ticked *Consistently*.

OR aided mobility

(self-operated wheelchair)

Score recognise if:

you observe *Consistent* responses to the items"Goes to Preferred Places" and "Avoids places disliked and hazards". Also the learner should *Consistently* avoid obstacles. Ensure that you have made your observations in a variety of *Settings* - both unfamiliar as well as familiar. If so, go to the Summary Chart (Section 18) and tick *Recognise*.

OR score localise if:

there are *Occasionally* or *Never* responses to "Goes to Preferred Places" or "Avoids dislikes and hazards". Also the other two items should be ticked *Consistently*.

OR score attend if:

there are less than two items ticked *Consistently*.

Where to go now?

Having noted the results of your observations and transferred these to the Summary Chart, you are then ready to make a choice.

EITHER

you can skip the suggestions offered for developing the curriculum, and move on to read Section 18. You have completed your observations.

OR

read the remainder of this section. In it we suggest activities for curriculum development.

Developing a curriculum

General issues:

Exploration of the topic of mobility is important because:-

it *reinforces* the investigation of *Settings* as an essential part of the cycle of assessment;

- mobility is highly motivating;
- it places emphasis on continuity existing across the "levels" of responsiveness;
- mobility is a fine demonstration of our commandment *Thou shalt think of tomorrow*;
- mobility implies movement.

Let us spend a little time developing these points.

Settings

In Chapter 2 we presented details of a cycle of assessment, part of which required investigation of the different surroundings or Settings in which the learner found himself. In the various Sections of Chapter 6 (and of Chapter 7) there is a temptation to forget to carry out an investigation of *Settings*.

By its very nature mobility forces us to look at the learner in different surroundings. For instance what happens in familiar versus unfamiliar surroundings? What does the learner do when confronted with a flight of stairs?

Motivation

In many places in this book we have identified the need to consider abilities as well as disabilities. One of our earliest items asked you to investigate the learner's interests and likes. Mobility - in, or out, of a wheelchair - has potential for imaginative use as a motivator.

Later we will present some interesting results of work carried out with learners in electric wheelchairs - showing the sheer fun of being offered the chance to negotiate the world independently.

Continuity

We stressed in the Introduction to this chapter that there is a need for continuity in our intervention. By continuity we mean that you don't take up one new activity one month only to jump off to some completely different activity the next month. However we accept that it is easy to forget the need for continuity. In fact the strategy used for identifying where to begin intervention seems to steer away from continuity.

Topics under *Awareness*, *Attending*, *Localising*, *Recognising* and *Understanding* suggest breaks in development between these topics. This kind of model is suggestive of stages or jumps; that is discontinuity. So to redress this imbalance we intend to use mobility as one example of continuity in approach. In the other sections there are usually strong links between individual suggestions, although less time is spent on making these links explicit. To have done so in each and every section for each and every suggestion would have made this book even longer.

Thou shalt think of tomorrow

The stress we lay on the need for continuity does of course reflect one of our Ten Commandments (see Chapter 4). The importance of planning for tomorrow when thinking of what to do today cannot be over-emphasised. We will use Mobility as one example of planning for tomorrow.

Movement

Mobility means movement - of oneself in relation to the world. A great deal of valuable visual information relies upon the detection of movement. Movement attracts attention, accentuating the relation between foreground and background through shearing at the edges, lighting and shadow changes, perspective cues and in other ways. An example of how important movement can be in supplying visual information was demonstrated in the Figure 7.14.1.

No doubt you will question how it is possible to consider Mobility if the learner is only at the level of being *Aware* of the world. Surely, all of the items listed at the beginning of this section correspond **at the very least** to an ability to *Localise*? In a strict sense you would be right, the learner would at least need to be able to *Localise* (whether by sight, hearing, touch or smell). You would also be right that none of the items to be recorded relate to *Awareness*.

However, recall our definition of *Mobility* given at the beginning of this section. We chose a broad definition to enable us to highlight the need for continuity in intervention - from *Awareness* through *Understanding*. Let us now consider the threads which can run through effective development of the curriculum.

Improving *awareness*:

Familiarity or trust

There are many examples contained in this book of ways to establish trust with the learner. Formalised approaches also exist. These include *Intensive Interaction* (or Education) , *Movement Therapy* and *Resonance*. Appropriate use of *Massage Therapy, Aromatherapy, Snoezelen, Music Therapy and Facilitative or Child-oriented play* can all be used to help build up a close trusting relationship[1].

Of course formal approaches are not necessary. The essence of any of these approaches is consistent and meaningful responsiveness to the learner. Any slight movement of the learner is "given back" **contingently** to the learner. (And if *Thou valuest the learner*, you will not restrict your responsiveness to specific times of the day given over to an activity. To do so would not comply with the commandment *Thou shalt not compartmentalise*).

Unless you have established familiarity and trust with the learner it is extremely difficult to proceed. After all in the future you could be asking her to step out into the unknown.

Improving *attending*:

Unaided mobility:

The major feature of being able to attend that is relevant to Mobility is the beginning of a distinction between self and the world. There are many play techniques which can aid this process. These include the use of:-

- resonance boards to lay down the foundations for developing concepts of up/down, in/out and so on.
- action songs (see Section 4)

Each of these is far easier to progress with if you have first of all established a relationship of trust with the learner.

Aided mobility:

One very special instance of the learner discriminating self from the world is that of Aided Mobility. We have chosen to separate aided from unaided mobility for one very important reason. There have been many instances where a learner, diagnosed as totally blind and unable to walk has, as a result of that diagnosis, not been given the chance to control his own mobility. He would be placed in a wheelchair and, because the diagnosis is one of total blindness, would be pushed by another person, going to places to which he has no wish to go, and leaving at times he does not want to leave.

A variety of research has shown that where children (and adults) are given appropriate control over the movement of an electrically operated wheelchair, they may demonstrate use of vision and a route finding capability which goes far beyond any label of "profound multiple disability". An important point to note is that many of the people who were given this opportunity to exert control over their mobility had to wait for that opportunity until they were adults.

The notion of using independently controlled wheelchairs at this stage of *Attending* seems to fly in the face of logic. Doesn't a learner have to **first** be able to understand things like near/far; right/left; back/forward **before** being offered the chance of independent control of an electric wheelchair?

Some very interesting work suggests that this is not true. Different studies in the UK, Australia and Sweden have shown that independent mobility - given by an electric wheelchair - can be a **cause** of progress in development (rather than being dependent on a stage having being reached)[2]. Learners with very severe cognitive impairment have shown themselves to be able to learn to operate an electric wheelchair. The activity is fun, highly motivating, exploratory and not at all abstract, but based in real experience.

A story about mobility

In terms of the learner's visual disability independent mobility through an electric wheelchair has another distinct advantages. It encourages full use of functional vision. The story in the caption illustrates the effect this can have.

Does aided inhibit unaided mobility?

For those who are concerned that a wheelchair might discourage any further attempts at unaided mobility there is no need to worry. There is every reason to continue with both aided and unaided mobility. Indeed some writers have reported that the use of a self-controlled wheelchair may give renewed interest in all forms of mobility[3].

Improving *localising*[4]

Intuition tells us to take the learner to objects outwith his grasp. The problem in doing this is that it is still relatively passive - it is not the learner who has initiated the movement. By using well contrasted materials and textures, exploration is encouraged.

Distraction-free

Find a quiet area (or room if you are fortunate enough to have one). Place a favourite object beside the learner - especially one that has a 'cue to distance'. These could include one with a pleasant smell, a sound or light. Try to make it a game to reach out towards the object. You will have to help in leaning towards the object, showing her how to support herself through resonating with her own movements.

Once success has been achieved you can gradually introduce additional objects to serve as distractions. You will probably have to repeat the exercise once the learner is able to stand.

Pram or rollator

Movement to the unfamiliar can be helped by having to push around a rollator or trolley. This enables independent (but aided) control over her visual surroundings while offering a degree of security. In the process she is beginning to distinguish what was once unfamiliar. Thereby you are moving into the territory of *Recognising*.

Touch as a prompt

Being led by even one finger is a long way away from complete independence in mobility. To help make the transition it may be worthwhile to lightly touch the learner after each step. Gradually increase the time between you making contact, always being prepared to return to short intervals if needed.

You don't need to carry out any of these for long periods at one time. Up to 10 minutes means the fun can be retained while learning still takes place.

Unfamiliar settings

Look for any specific problems which may occur out of doors. Often we confine tasks indoors to those which occur on one level, and this is not possible when outside. In unfamiliar settings, especially when outdoors, the learner will have to negotiate many different surfaces. Use available conditions of bright sunlight, cloudy sky, shade and various times of the day. Under these conditions, give the learner practice in negotiating drop-offs at kerbs and stairs, encouraging lateral head movements to increase cues from **motion parallax** (see Glossary). Some learners who are affected by glare may benefit from use of sun glasses, visors or caps. Try placing the learner in a variety of positions in relation to

the direction of the sun. Compare her preferences under these various conditions.

Improving *recognising*:

Trailing

This is one technique commonly used in mobility training with those who have the single impairment of vision. For any chance of success with those who are additionally disabled, a lot more work has to go into the technique.

Again make use of objects which are found to be of interest to the learner. Attach these to the wall, making it interesting to trail along. Instead of having only the fingers trailing, you will probably need to encourage the learner to use his whole body. Egg cartons, felt, paper, shiny or crinkly paper, polystyrene might be useful.

Symbols outdoors

If the learner is able to recognise symbols or everyday signs, then try to discover the conditions out of doors which are best suited to this function. This can be done using billboards, identifying objects and relating these back to activities at school.

Note that many learners who have visual impairment are likely to seem to perform poorly outdoors after snow has fallen. The glare may impair their sight severely. A similar effect may occur from bright sunshiine after showers of rain, and with low sun in winter. Allow time to explore the playground at school, or other surroundings. Help him to discover the presence of swings and other play areas, plants and flowers.

Compare abilities under familiar (if you get the chance see him in the area around his home), and unfamiliar routes where the learner is able to move independently. Look again at unfamiliar routes under different lighting conditions of sun, shade, cloud.

Improving *understanding*:

Just to give you some idea of how difficult it can be to get around the world if you are visually disabled here is a story. It is based on a real learner. But it is written as if the learner is himself telling his story. In brackets are some comments to help you to identify what is wrong. If you like you could follow these up in the relevant sections.

ANDY'S STORY

Hello my name is Andy and I'm 9 years old. I was born with Rubella so I've got a lot of problems with my vision and as if that wasn't enough I've got a hearing impairment and a few physical problems. Here is what it is like for me to get around in the world.

What about my sight?

I'm not totally blind, no sir. But the area I can see without moving my eyes is cut down (**restricted visual field**). This makes it difficult to walk outdoors especially in unfamiliar surroundings. Even in familiar surroundings, I am easily caught out by objects and people - they seem to appear as if by magic. They tried to give me an eye test (**Snellen, E-test, finger counting**). They didn't seem in the least bit relevant to how my sight affected my walking. And the doctors say I cannot cooperate with them to do a proper visual field test. Why don't they just open their eyes and look at me?

You might think I'm better off on a bright day. But outside there is a lot of glare. That can make it even more difficult to see objects. (**Andy had congenital cataracts**). Outdoors is where the biggest hazards are, you know, cars and stuff like that.

Soon after I was born I had my cataracts removed (**early surgery is most effective for congenital cataract**). But now my eyes don't focus very well at different distances and I have to wear glasses (**difficulties in accommodation**). Its alright for older folks who get that op. They can compensate for these problems in focussing - they have got a lot of knowledge from their past when they could see OK about the things to expect to see in the world. I don't.

This is a really important point that a lot of people miss. And I'm worse off than others. I cannot compensate by using my hearing to get clues about my surroundings and approach of traffic. I can't use echoes to indicate presence of significant landmarks. I cannot use those everyday sounds which a person who is 'only' blind takes for granted.

What about my hearing?

If it's quiet I can make out clear, even speech, so long as people don't shout. But this isn't much good for getting about outside. The average level of noise makes it really difficult to understand speech and all other sounds. This is really dangerous, so one of my parents has to supervise me whenever I'm near a road.

Other effects of Rubella

I'm also not so good at the motor control. This makes it difficult with balance. This too means I need supervised when out of doors. Some folks say I'm impulsive and wilful. I don't like to follow instructions. I tend to go off and do my own

thing, whereas I'm supposed to be doing something constructive: such as crossing the road. But if I just did what other people wanted me to do all the time, I'd never learn , would I!

Section 18

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SECTION 18
SUMMARY CHART

Section Number	Assessment Area		*Aware*	*Attend*	*Localise*	*Recognise*	*Under-stand*
Section 1	The Learner						
Section 2	Background information						
Section 3	Observing the learner						
Section 4	Responses to sound						
Section 5	Sense of touch						
Section 6	Sense of smell						
Section 7	Sense of taste						
Section 8	Observing learner's eyes						
Section 9	Responses to light						
Section 10	Reflected light						
Section 11	Approaching object						
Section 12	Movement	horizontal					
		vertical					
		circular					
Section 13	Visual fields	upper half					
		lower half					
		preferences					
Section 14	Contrast	high					
		medium					
		low					
Section 15	Size	large					
		medium					
		small					
Section 16	People						
Section 17	Mobility						

The filled area indicates that it is not possible to obtain this information from the assessment alone.

Scottish Sensory Centre

Vision for Doing

Chapter 7 ASSESSING VISION FOR DOING

Section 18: Summary Chart

Introduction

This short section is designed to provide you with a general profile of an individual learner's abilities. This allows you to refer to the appropriate suggestions for curricular development. Alternatively, you may use it as an 'at-a-glance' chart.

How to use summary chart

Figure 7.18.1. presents in the form of a diagram what you will be doing with the Summary Chart. There are four steps to take:-

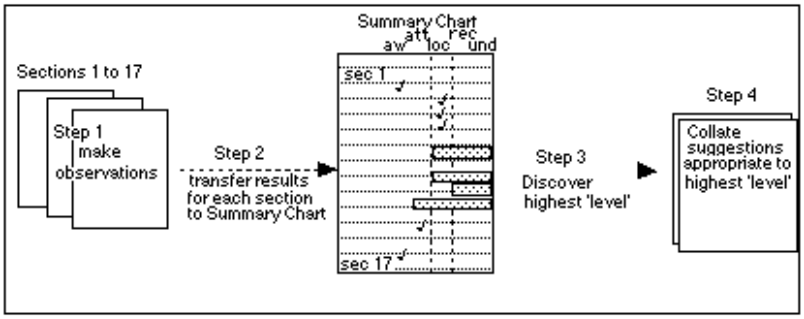

Figure 7.18.1 Steps to take in obtaining suggestions for curriculum development

Step 1:

for each of Sections 1 to 17 in turn, make your observations. Record the results of your observations on the checklist at the beginning of each section. Then

Step 2:

transfer a summary of the checklist for each section to the corresponding row on the Summary Chart

(Row 1 = Section 1 and so on);

Step 3:

once the Summary Chart is complete, discover the 'highest' level of functioning;

Step 4:

using this 'level', collate suggestions for curricular development from each section.

Step 1: Making observations

For each section in Chapters 5, 6 and 7 you were invited to record the results of your observations. You do this on the checklist beginning each of Sections 1 to 17.

Step 2: Transferring results

As you complete each section, this is the time to transfer a summary of results to the corresponding row in the Summary Chart. Within each section you are given guidance on how to translate a summary of results to the Summary Chart. Each section has a corresponding row in the Summary Chart.

Row 1 = Section 1

Row 2 = Section 2 and so on

Each row is split into five columns. These relate to *Awareness, Attending, Localising, Recognising* and *Understanding*. (Chapter 3 explains the rationale for these five broad categories).

On the Summary Chart you simply put a tick into the box which is appropriate to your results. For example if your results for Section 4 suggest that the learner is only *Aware* of Sound, then find the row for Section 4, travel along it until you come to the box for *Aware*, and place a tick in the box. If, however, results suggested *Localising*, you would insert a tick under *Awareness*, *Attending*, and *Localising*. To guide you, information is provided in each section on how to interpret your results, and where to insert them in the Summary Chart.

Step 3: Discovering highest 'level'

(read this part after you have completed all of Sections 1 to 17).

We assume that you have now completed observations for all of the sections in Chapters 5, 6 and 7. There is one other thing to know about the Summary Chart. You will notice that some of the boxes of the chart are of a different shade. This is because for that particular section, any results you obtain cannot give you information as to the shaded part. You will see that for almost every section to do with **visual** assessment, you cannot tell more than that the learner is *Localising*. Indeed for several sections on visual assessment, the most you can infer is *Attending*. Of course, you might have other information which could tell you whether to tick a shaded box. For example, if a learner **tells you the name of an object** you would know she *Recognises* the object. Only if you have this additional information should you tick in a shaded box.

Now it becomes clear why you needed to assess use of 'The Other Senses'. For it is this part of the assessment that will help you discover if the learner is in fact functioning at a higher 'level' than you can tell by assessing only her vision. Look at your completed Summary Chart, find out what is the highest 'level' you recorded. Use that 'level' to collate suggestions. But only do this for vision, hearing and touch. Do not use smell and taste in order to determine the 'level' for curricular development! In the example given in Figure 7.18.1. we see that there are no boxes ticked above the 'level' of *Localising*.

Step 4: Collating suggestions

Now you are ready to bring together the curriculum development topics appropriate to this "level". You will recall that most sections in Chapters 5, 6 and 7 contained examples of suggestions for developing the learner's curriculum. The suggestions are sub-divided into those relevant to learners who are *Aware*, those who *Attend*, those who *Localise*, those who *Recognise* and those who *Understand*.

Having discovered from the Summary Chart the learner's 'level' (eg; *Localising*), you can then go back through each section, and pick out the suggestions relevant to that 'level'. Then apply these to the curriculum. If you find that this is too high a level, then simply drop down one and use the suggestions for this new 'level'. In the example given in Figure 7.18.1. you would collate suggestions to do with *Localising*.

Strengths as well as weaknesses:

A glance at your completed Summary Chart will show you three things:-

- it will indicate a **general level** for your **intervention**;
- second it will show you the **limit** of the learner's **visual abilities**;
- third it will show you the **optimum sense** around which to concentrate your intervention.

Let us explore each of these in turn.

General level for intervention:

Not surprisingly, you may find that for different senses the Summary Chart shows different "levels" of ability:-

eg;

hearing = *Attend*

touch = *Aware*

vision = *Localise*

For the general level for intervention you should take the highest "level" among vision, hearing and touch. Collate suggestions for curriculum development around this "level". In the example given above you would collate suggestions from each section to do with *Localising*. If this is unsuccessful you can always drop down a "level". (Those interested in questioning our 'model' for intervention may want to read the accompanying text in the caption).

Limit of visual abilities:

Not surprisingly you may find some rows of the Summary Chart to be blank (tick not recorded). This tells you that at this point you have reached the limit for that learner's **visual abilities**. Where this is the case, curriculum suggestions in that particular section will probably be of little benefit. Be sure though to follow up the suggestions given on Mobility (Section 17).

And of course, as it is a **cycle** of assessment, you would want to come back another day and try again. Perhaps at that point your previous efforts will be rewarded and a new area of opportunities may be afforded to the learner.

Optimum sense:

This statement is simply to suggest that for the best chances of success you should concentrate on what the learner is best at. So if hearing shows the highest 'level', use this as a principal route for learning.

You will also have noticed that we have left out Smell and Taste from this comparison. That is because the most important routes for learning are Vision, Hearing and Touch. **Of course you must not neglect Smell and Taste. That is why each section contains suggestions for curriculum development**. Normally, we do not use our senses in isolation. It has only been done for the purposes of refining our own understanding of the learner. That after all is the purpose of assessment.

Technical point

Part 3

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Vision for Doing

PART THREE: TOPICS REVISITED

Introduction to part three

In the final part of the book we present a few topics in a little more depth. It comprises four short Appendices dealing with:

Appendix I 'Switches and Interfaces'

Appendix II 'Use of Computers'

Appendix III 'BUST'

Appendix IV 'A Tool not a Test'

We finish with a short description of future developments.

Appendix 1: Switches and interfaces[1]

Background

At several points in the main text we mentioned the use of switches. Here we delve into a little more detail. Nowadays, any site of the body which is under voluntary control may be enabled, through choice of the right switch, to operate a variety of devices. Switches may be effected through blowing and sucking, eye movement, head pointing to a target, ear wiggling, not to mention foot kicking and other more conventional means of operation. Unfortunately, the use of this technology is not always carried out in a principled fashion. Consider a learner lifting an arm, which then turns on a light source. Seems simple enough. However, you might remember the questions which were first raised in Section 9, in the discussion on *Improving Awareness*. The questions were:-

- Should the event (light switch on) occur immediately the arm is moved?
- In which direction is the movement to occur? On the same side as the arm movement or the middle or the opposite side - above or below?
- Should the light be bright or dim, coloured or white?
- For how long should the light be activated?
- What if the learner lowers his arm, should the light stay on or go off with the lowering?
- Should every arm raise result in the light being activated, if not how often should they occur?
- Should the light always be presented in the same position relative to the learner?
- Is it best to have a switch which is latched, or momentary or timed; and should it be normally on or normally off?

The answer to each of these questions will present different levels of difficulty to a learner, and the answer will depend on what his or her previous experience of similar and different activities have been. In what follows we outline some information which may be helpful when you come to consider these questions. Finding your way and making sense of catalogues, reference materials and reports dealing with technological devices operated by 'switches' requires some knowledge of the range of different terms that are used. For a more detailed description of switches and interfaces the reader is referred to the ACE Centre documents 'Switches and Interfaces' and 'A Common Terminology for Switch Controlled Software'.

What are switches?

The term 'switch' is usually used to refer to a mechanically-operated device, which, when pressed, touched, pulled, squeezed, approached, yelled at, or jumped on by a user, will send an electronic signal to a toy, computer or other piece of equipment.

'Switch' should really only be applied to devices which actually switch signals from one state to another, eg from off to on or vice versa. Switches can range from simple 'lever' types to devices that detect the angle of a user's limb, to

sensors which detect muscle activity itself. There are single, double, 3 or 4 way and multiple switches: keyboards and concept keyboards are simply multiple switch arrays for example.

However, 'switch' is sometimes also used to refer to devices whose signal changes **gradually** between 'on' and 'off' as the user controls it (like the volume control on your hi-fi which can vary anywhere between zero and maximum). This set of devices are more properly classed as 'analogue', 'proportional', 'pointing' or 'direct selection' input devices. Examples are mice, analogue joysticks, light pointers and touch screens.

There are advantages and disadvantages of both: analogue devices obviously offer more control and speed over the computer/wheelchair/toy/appliance, but usually demand quite fine motor control.

Types of switches

The ACE 'Switches and Interfaces' document categorises switches as follows:

Limb & head operated

lever - simple mechanical switches operated by pressing, pushing or pulling. Important considerations are the size of the switch, the travel (how far you have to move it until it operates), and the operating force required.

grip - switches which respond to being squeezed, eg between fist, or thumb and finger.

pressure pad - rather than being activated by clicking a mechanical lever or plunger, these switches operate by detecting a change in air pressure. They have a different 'feel' to mechanical switches.

light sensitive - switches which detect the presence or absence of light - the user therefore points a light source at them, or uses a body part to block a beam of light.

touch/proximity - switches which react when a user comes close, or just touches them.

foot switches - foot operated switches are basically heavy-duty lever switches.

wobble - wobble switches or sticks are robust wands which can detect movement or a blow in any direction.

specialised - other switches exist which detect very small muscle movement ('P-switch'), eye movements ('Twinkle'), eye-brow wrinkling, etc.

Joystick

The switches above translate one user action into one signal. Joystick switches are different in that their operating lever can move in different directions, each of which can give a different signal. Joysticks are usually more efficient than the equivalent number of separate switches, but require better motor control.

Mouth and tongue

For users with no other motor control, there are a large number of 'suck-puff' switches available, together with other switches that can be operated by the tongue.

Sound

Sound switches can be set to detect sounds of certain volume (and sometimes pitch) produced by the user.

Contact and non-contact

Switches can either require the user to make physical contact with a target, but can also detect the user's activity from a distance. Such 'non-contact' switches demand different cognitive, perceptual and physical skills from the user, because the only feedback available to the user is from the device that is being controlled - there is not necessarily any tactile, visual or auditory response from the switch itself. This can make the switch hard to use because neither the user nor the teacher/therapist can tell when the switch is being activated: an example is a mercury tilt switch, which tends to produce a jittery 'on-off-on-off-on-off' sort of signal. It's therefore a very good idea to either purchase a switch which does have some form of added feedback, or to obtain a separate unit to provide such feedback.

Bounce and other imperfections

The jitter from the mercury switch is an example of 'switch bounce', which is something that almost all switches suffer from. For most of them, the signal settles down within a few milliseconds, so the effect on the toy or whatever is unnoticeable, but for some devices or computer programs, the effect of switch bounce may cause problems. Various electronic boxes and some programs have settings which can remove or damp out switch bounce.

Some switches produce a 'pulse' rather than a change of state, so that the toy activates momentarily, then goes off again and again, there is hardware and software to make the switch more useful.

There are several other more obscure switch characteristics which are described more fully in the ACE 'Terminology'

document.

Normally on/normally off

Most switches are 'normally off' ie. they are off and when pressed or activated, turn on. It is also possible to obtain switches which are 'normally on', and which turn off when they are activated.

Momentary/latched/timed

Many switches and toys are described as 'momentary', 'timed' or 'latched'. Momentary switches operate like bell-pushes -they stay on for as long as the user activates them. Latched switches are like on/off power switches - a first press and release switches on, and a second switches off. Latched switches are sometimes said to 'toggle' between the two states. Timed operation means that the user activates the switch, and the device comes on for a set time period, then goes off by itself.

Each type requires different skills and can be used for different purposes and devices.

Momentary switches are most common and possibly most useful to the user full control is offered over the switching on and off of the device. Momentary control is the same as 'user scan' a form of 'scanning'. However, momentary control requires that the user be able to activate, hold, and deactivate the switch when desired. These switches may be beyond the abilities of many users who are physically disabled, and they are cognitively more difficult.

Latched switches also enable the user to have full control over the device, but rather than holding the switch on then releasing to switch off, the user presses the switch a second time to switch it off. The technique can therefore be used by learners who have difficulty maintaining the switch activation - however it does require more accurate activation. A variation on latched control using a single switch is latched control using two switches: one switch controls 'on', and the other 'off'. Latched control is the same as 'auto-scan'.

Timed control only requires that the user activate the switch, and leaves the deactivation of the switch up to the electronics. In addition, the device normally ignores any further inputs from the user until the timed period has elapsed, and so it can be useful for jittery switches (or jittery users). Not all 'timed' devices are created equal however - for some, if the user holds down the switch after the timer has finished, the device is still kept on. Others will switch the device off regardless of the condition of the switch, and so the user can only switch it on again by releasing the switch then activating it again. The former method gives more control to the user but may be more confusing both for user and for teacher/therapist. Timed control may provide the most useful introduction to switch and toy control for many learners because the 'reward' is maximised for minimum input. On the other hand (depending on the switch and the device being controlled), momentary control may give a better and more consistent relationship between cause and effect.

[1]**Further Reading**: **Switches and Interfaces** ACE Centre; Ormerod School; Waynflete Road; Headington; Oxford OX3 8DD.

'**A Common Terminology for Switch Controlled Software**' ACE Centre.

Connections

Most switches have a cable with a 'jack' plug on the end and most toys and other hardware have corresponding jack sockets into which you plug the switch. However, some equipment is supplied with different connectors and using it may require an adaptor which can be obtained from audio or electronic shops such as Tandy.

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appendix II

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Vision for Doing

PART THREE: TOPICS REVISITED

Appendix II Use of computers

Use of technology

Frequently it is suggested that computers offer a useful way of working with those who are multiply disabled. This may be for instance, in introducing notions of cause and effect, to enhance the possibility of the learner receiving contingent feedback from his world. In the main text we looked at some specific ways in which technology may be helpful when developing activities to be used with those who have multiple disability. In this short section we consider some general issues to do with the use of technology. Here we will consider the use of computers. In Appendix I we commented on *Switches and Interfaces*, another aspect of technology in common use with those who are multiply disabled.

Why use computers?

By now, it should be obvious that access to a computer is by no means necessary in order to understand how well, and in which ways, the learner with multiple disability may see. Nor, if only computers are used to understand a learner's functional vision, would the results be at all sufficient. Nevertheless, both you and the learner may have access to a computer, and would like to incorporate into the learner's current activities some sort of use of new technology. Let's explore some of the advantages and disadvantages of using computers, for both assessing and using the vision of learners who have multiple disability.

Advantages of using computers

Anticipating

As a different learning environment, the computer can become a tool to observe how quickly the learner understands and consolidates a new source of information. It is likely that the computer will be housed in an area different from the usual surroundings. Travelling to the equipment may itself offer a means for looking at anticipation. Does she seem to know what is coming next? Anticipation may occur at many levels. She may recognise particular software, or peripheral equipment (like a colour printer), or the area in which the work-station (computer plus its extras) is housed. The computer activity - if motivating to the learner can then be part of a signing, signifier or symbol display for communication purposes. And the route to its location can become part of a mobility game.

Single plane

A second advantage is that most of the visual activities take place in one place and in one plane (although this is not the case for the keyboard, concept keyboard, joystick or switches) . The learner can then position herself at the optimum distance for seeing materials. Objects in the real world tend to be in cupboards or drawers, behind or underneath other objects. The activities carried out on a table top occur at varying distances, requiring continual re-focussing to be made. A computer screen does not suffer from these disadvantages.

Backlighting

A third advantage is in the way in which material is presented on a computer screen. The shapes, colours, words, pictures do not 'borrow' light from lamps, daylight or overhead lights. The screen provides its own lighting. Therefore no matter how near the learner approaches to the screen, she cannot get in her own shadow. (Problems of safety are discussed below). This backlighting, as it is known, allows enhancement of contrast and lighting.

Quick change

A fourth advantage is in the potential for good programs or software to facilitate rapid change of different shapes and colours. To change these conditions using ordinary materials might take a very long time and prove expensive. (Always assuming that you are not going out to buy a computer especially for this activity!) Some software may have features which allow individual records to be kept for each learner to chart improvement.

Maximise interaction

Good software will not only allow some level of interaction between learner and computer, it will also have different ways for learners to perform that interaction. For instance, some will be able to use a keyboard, others will require switches, others still will have only their voice to make things happen. To maximise the understanding that the learner's actions will have an effect on the screen, the use of a Touch Screen is recommended. The link between action and effect is then more direct.

Disadvantages of using computers

Before embarking on using computers, there are some limitations to consider. You should assess the costs of these versus the benefits outlined above before arriving at a decision for your learner.

How long is too long?

Being fixed in one position in one room or one area, as most machines are, can be extremely limiting if you find the learner does not respond. The temptation is to leave the learner on it a 'bit longer'. The result can be a kind of computer constipation. Whilst interacting with a computer, it is often difficult to duplicate hard won optimum seating and positioning. Though you should not be afraid to position the equipment in ways best suited for that learner.

What constitutes use?

There is also a huge dimension along which a learner could be said to be 'using the computer'. The two week old infant of one of the authors consistently pressed keys in order to obtain a beep from the screen. By no stretch of the imagination could she be said, on this basis, to be able to use a computer. Is training in that kind of limited cause-and-effect an improvement on trying to establish more natural forms of communication?

No standardisation

Another disadvantage lies in the fact that there are many different makes (and makes within makes) of computers on the market. The chances are that the lovely bit of software you saw running at an exhibition does not work with your machine. Even for the same machines, different makers of software may have different understandings of the learner. An especially helpful line that has recently been taken is for one or two software writers and distributors to adopt a standard across different programs.

Not real world

Other limitations have to do the ways in which information is presented on screen. We have already indicated as an advantage that, by using a computer, information can be presented in a fixed plane. But this can also be a disadvantage. For the real world is not confined to one fixed plane. It extends in distance, depth and direction, is made up of objects of varying size, shape and texture. Understanding of concepts such as in front and behind, up and down, backward and forward, will be wildly different if taken directly from a computer screen. For example, the 2-dimensional representation is that up means forward and down means back. To one with learning difficulties, it is not immediately obvious why this should be the case.

Expected learner responses

Major limitations exist as to how software is set to interpret responses. Some software will allow its operation by switches connected to the computer. Press a switch and an effect is produced. At first glance, switch operation seems a simple concept to attain. There are, however, many ways in which a switch press can affect the running of a particular piece of software. In all probability the ways in which one switch activates an effect will be quite different from that of another program's use of switches.

And yet the learner is expected to understand these associations. The problem is that people who design such software often have in their heads some intuitive assumptions about the ways in which those who are multiply disabled learn and perceive. Often they are wrong.

Stationary objects which fill up colours with no interactive control by the learner are not motivating. Various learning parameters have to be considered. These include: how long the stimulus comes on for (duration); how quickly following an action by the learner the stimulus will appear (latency).

If free presentations are received by the learner's interaction, how many times or how long a switch is pressed with no stimulus effect. Careful consideration needs to be given to the appropriate response measure or input. Decisions have to be made as to the aims behind the activity.

(Other aspects of switch control are discussed in Appendix I).

Some suggested uses of computers[1]

Before being filled with despair thinking computers are of no value, let us retrieve the situation a little. Where relevant more specific details are given in the Sections of Chapters 6 and 7.

Awareness and Attending

Following the structure used in these earlier sections, computers are most helpful in encouraging **awareness** - that there is something out there. Secondly, they are helpful in encouraging directed attention. In a darkened room, they may be very attractive to those with severe visual impairment, often acting as a source of motivation.

Changing switches

Where switches are being considered, then it may be helpful to have two rather than one modality of output. One action may result in a change visually; a second may result in sound change through controlling cassette tapes containing favourite music. As the choices would operate across different sensory modalities, this would serve as an introduction to a two choice system. The switches operated should vary along criteria such as colour, material, and size. This could then serve as an early introduction to a Concept Keyboard.

Music

If the taped sounds are rhythmical patterns as opposed to melodies, then stimulus duration can be two or three seconds. This is roughly equivalent to how long it might take the learner to carry out the manoeuvre necessary to operate the switch. If, however, the tape is of a melody (East Enders has been a favourite for many for several years), the duration of the melody should be long enough for the tune to be recognisable, around 5 seconds. One or two in every ten presentations should be made without the learner having any control over it. Moreover, once or twice every ten times, switch operation should not result in any effect. Compare response to a moving versus a stationary target. Use sound with and without vision to contrast.

Localising

Many programs claim to enhance localised responses - that is directional responses such as scanning and tracking of a visual stimulus. Often in reality, the learner sits staring at one spot or randomly fixating areas of the screen rather than following the stimulus. Here you might look for programs which encourage differential responses, and avoid those which carry on running regardless of the learner's activities.

Touch Screen

Use of a Touch Screen with relevant software promotes use of differential responses. As with many other areas of assessing Vision for Doing, you will need to experiment to achieve optimum positioning. A learner who is immobile may require the monitor to be raised if using a standing frame for position.

Microphone as a switch

For learners who experience difficulty in vocalising, some software may be operated by voice input. The most primitive is that which treats the microphone input as a simple on/off switch. Any vocalisation will result in the program carrying out its appropriate command. Some variation is possible in controlling the kind of sound needed to operate the device. Of course there is a very long way from operation of this kind of program to the point where individual utterances are taken to have shared intention and meaning. Nevertheless it may be a useful tool for those who have breathing difficulties in vocalising - especially in s versus sh. It is important to enlist the help of a communication therapist.

Visual scanning

Computers are also valuable in promoting localising through preventing the learner from using tactile information when scanning. Many learners habitually use tactile information to substitute for or to augment visual input. If they are motivated by a computer program, they may come to use visual information to locate shapes and patterns.

Recognising and Understanding

Concept Keyboard

Some software is also useful to promote recognition of familiar materials on screen, requiring a specific response to be made. Finally, they may aid understanding the meaning of a stimulus object on screen. In both of these areas, the use of a Concept Keyboard may prove useful. This is a board with an overlay which replaces the standard computer keyboard. It can be programmed to give the same response when touched anywhere on its surface. Alternatively, it can be divided into smaller squares, by which a touch on each square may be produce a different result. The overlay (which may be made of paper or other thin material) might have contours, pictures, numbers, shapes drawn or printed on it or in tactile or raised form. Or you might use signifiers to stand for real objects, or small objects themselves. At this stage, you might want to consider the use of a speech synthesiser which provides modest speech quality, if moving to use of phrases, whole words or letters.

Functional communication

In all of these areas, attempts should be made to have real communication associated with these computer events. For instance, instead of saying 'stop' , it may be possible to introduce a sign for 'stop' and then stopping the activity. This encourages control. The sign can be presented visually if there is residual vision or - for the more severely visually impaired - tactually by modelling on the hands.

Sources for further information

To explore this area properly requires a lot more discussion than the paltry amount we have devoted to the subject. There are a variety of sources of relevant materials, a few of which are presented in the accompanying text. Consult these sources to gain a wider understanding of the topic. These include further reading and both commercial and non-commercial sources for hardware and software.

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appendix III

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Vision for Doing

PART THREE: TOPICS REVISITED

Appendix III BUST "Staircase Procedure"

When to use the BUST

You will only refer to this Appendix if you have already been successful in carrying out all or most of the sections of the Procedure for assessing vision (the Sections in Chapter 7). Alternatively you may already be certain that there is some measurable visual acuity. For those learners known to be able to see detail of objects and pictures the issue of assessment of vision may centre around how much detail they see.

For full details of the test, and accompanying booklets, the reader should consult the relevant literature -

BUST-LH playing cards - Playful vision testing. Manual and the accompanying Conversion / Comparison Tables for Vision Tests. Both by Eva Lindstedt (1986). Stockholm, Sweden.

Description of BUST

The name BUST is in Swedish short for 'Form Perception Visual Acuity Test'. Designed in Sweden the BUST test of vision gives a measure of the resolving power of the eye. It offers a good approximation to a measure of visual acuity. Its main advantage is in being designed to work with small children and/or people with multiple disability. The material proceeds from simple to slightly more complex tasks during assessment. It can be used for training learners to see detail as well as assessing how much detail is seen. It is also designed to prepare the way for introduction of more conventional tests of sight. Uses have been found in working with learners of a developmentally young age, those with learning difficulties, those with hearing and/or speech impairments, those with multiple disabilities, and for children and adults who come from minority cultures.

The material consists of a set of BUST playing cards; LH playing cards; stickers; a manual with tables for comparing other tests of vision; instructions and a useful booklet.

The 72 BUST playing cards offer pictures of 8 different objects each of which is presented in different sizes. These are used together with larger cards for matching and can be used in conjunction with the real objects which correspond to the pictures (MUG, SPOON, FORK, GLASSES, SCISSORS, FLOWERS, WHEEL, CLOCK). The stickers are offered in addition to the BUST cards. They are intended to be used by learners requiring more time to acquaint themselves with pictures. These enable abstract concepts such as big/small and same/different to be introduced. The LH playing cards require more advanced learning abilities. Some learners may be able to proceed to these following familiarisation with the BUST playing cards and stickers. For those learners who will not be able to advance beyond comprehension of BUST playing cards a useful approximation of visual acuity (ability to see detail) is still offered.

If it is felt that the learner has some understanding of the objects represented (spoon, fork, glasses, etc) then you may be able to proceed directly to the use of the BUST test. Alternatively, you may have decided on the use of this material only after carrying out the rest of the assessment procedure contained in the sections of this book.

Unlike other tests of visual acuity for children there are fewer different pictures crowded on one card. The testing distance is shorter making it easier for the learner to be interested and to understand. The most reliable way of measuring visual acuity is to eventually present the pictures as pairs. The learner must rely on ability to see detail in choosing between a spoon and fork or scissors and spectacles.

The BUST/LH manual gives suggestions on how to carry out the assessment. After much use we developed a slightly quicker way of using the approach. You may, or may not, find this useful. We developed a logical structure to proceed more rapidly through the BUST assessment. For those who would like to use it, this Appendix sets out the process. It is called a 'Staircase Procedure', to give the idea of proceeding in step-wise fashion through the items, not covering every item but quickly homing in on the size of picture which is causing difficulty.

Preparation for Staircase Procedure

1. Have available a set of BUST/ LH playing cards and objects.

2. Find out if objects used in the procedure are available in school or other venue. Prepare life-size copies of the pictures. If it is expected that the learner might be able to cope with up to four objects only, then use these. Familiarise the learner with these, and take as long as is needed to do so. There is no need to hurry this test.
3. Ensure lighting, positioning and seating are optimal for the learner (ask those who know the learner best).
4. In as much of a social setting as possible, introduce the cards, starting with those familiar to the learner. The size used here is **Size 0 - the largest**. Use the abilities of the learner - physical, communicational, intellectual - to adjust the methods of presentation. For example, if the learner cannot name, can s/he point, or else can s/he match?
5. Decide on the learner's response that is to be used - such as a nod, eye blink, pointing movement, or other.
6. If the learner can handle the pictures, allow him/her to take them and note down the distance from the learner and position taken in doing this.
7. Use a ruler to measure the distance from the learner's eyes to the picture card.
8. Make sure that one of the testers is in a good position to observe the learner and record his/her responses. A second person will sit beside (or in front of) the learner to present the cards to him/her.
9. Once a measure is obtained using both eyes, record for each of the learner's eyes, individually.

The arrangement of the cards is such that:

A = cup

B = scissors

C = glasses

D = spoon

E = fork

F = clock

G = flower

H = wheel

Number the cards (on reverse side) for ease of use. Let:

0 = largest size

9 = smallest size

On the following pages, we have adopted the format where:

(+) = **recognises** (that is the learner recognises that card (eg; the clock, size number 6)

(-) = **does not recognise** (that is the learner does not recognises that particular card)

The staircase is built up of different Procedures and Stages. You simply follow the instructions and go to the Procedure and Stage indicated.

Begin with Procedure 1, Stage 1.

Procedure 1

Stage 1

select Number 1 from A to H (one card only) and present this to the learner

(+)	(-)
select No 1 of another A to H (a familiar picture)	go to Procedure 2
(+)	(-)
select No1 of another A to H (unfamiliar)	go to Procedure 2
(+)	(-)
go to Stage 4	go to Procedure 2

Stage 4

select No 4 from A to H (familiar picture)

(+)	(-)
select No 4 from another A to H (unfamiliar)	go to Stage 2

(+)
select No 4 from B, C, D or E
(+)
go to Stage 7

(-)
go to Stage 2
(-)
go to Stage 3

Stage 7

select No 7 from B, C, D or E

(+)
select No 7 out of B, C, D, E (not used)
(+)
select No 7 from B, C, D or E (not used)
(+)
go to Stage 9

(-)
go to Stage 5
(-)
go to Stage 5
(-)
go to Stage 6

Stage 9

select No 9 from B, C, D or E

(+)
select No 9 of B, C, D, E (not used)
(+)
select No 9 of B,C,D or E (not used)
(+)
READ OFF TABLE FOR NO 9
AT APPROPRIATE DISTANCE

(-)
go to Stage 8
(-)
go to Stage 8
(-)
READ OFF TABLE FOR NO8
AT APPROPRIATE DISTANCE

Procedure 1

Stage 2

use this when learner has been unable to complete three correctly of Stage 1

select No 2 out of A to H (use familiar picture)

(+)
select No 2 out of A to H (not used)
(+)
select No2 out of B, C, D, E (not used)
(+)
go to Stage 3

(-)
go back to Stage 1
(-)
go to Stage 1
(-)
show No 2 of A to H
until three consecutively
correct

If the learner is successful in Stage 1, but cannot complete 3 correct in a row at Stage 2, then READ OFF TABLE FOR CARD NO 1 AT THE APPROPRIATE DISTANCE

Stage 3

use this when the learner has been able to do two in a row successfully from Stage 4. Or else, the learner may have been correct for three consecutive from Stage 2.

select No 3 out of A to H (use familiar picture)

(+)
select No 3 out of A to H (not used)
(+)
select No 3 out of B, C, D, E (not used)
(+)
go to Stage 4

(-)
go back to Stage 2
(-)
go to Stage 2
(-)
show No 3 of B,C, D or E
until three consecutively
correct

If the learner is successful in Stage 2, but cannot complete 3 correct in a row at Stage 3, then READ OFF TABLE FOR CARD NO 2 AT THE APPROPRIATE DISTANCE

Procedure 1

Stage 5

use this when learner has been able to complete three correctly of Stage 4, but has been unable to do three in a row from Stage 7.

select No 5 out of A to H (use familiar picture)

(+)	(-)
select No 5 out of A to H (not used)	go back to Stage 4
(+)	(-)
select No5 out of B, C, D, E (not used)	go to Stage 4
(+)	(-)
go to Stage 6	show No3 of B,C, D or E until three consecutively correct

If the learner is successful in Stage 4, but cannot complete 3 correct in a row at Stage 5, then READ OFF TABLE FOR CARD NO 4 AT THE APPROPRIATE DISTANCE

Stage 6

use when the learner has completed three in a row successfully from Stage 5.

Or else, the learner was able to do only two in a row successfully in Stage 7.

select No 6 out of A to H (use familiar picture)

(+)	(-)
select No 6 out of B,C,D or E	go back to Stage 5
(+)	(-)
select No 6 out of B, C, D, E (not used)	go to Stage 5
(+)	(-)
go to Stage 7	show No 6 of B,C, D or E until three consecutively correct

If the learner is successful in Stage 5, but cannot complete 3 correct in a row at Stage 6, then READ OFF TABLE FOR CARD NO 5 AT THE APPROPRIATE DISTANCE

If the learner was successful in Stage 6, but could not complete three in a row for Stage 7, then READ OFF TABLE FOR CARD NO 6 AT THE APPROPRIATE DISTANCE

Procedure 2

Stage 1

select No 0 out of A to H (one card only) This is returning to the very large card with which the learner has been familiarised.

(+)	(-)
select No 0 of another from A to H	return to Preparation
(+)	(-)
select No 0 out of B, C, D, E (not used)	return to Preparation
(+)	(-)
go to Procedure 1, Stage 1	return to Preparation

If the learner is successful in this Procedure 2, but cannot complete Procedure 1, Stage 1, then READ OFF TABLE FOR CARD NO 0 AT THE APPROPRIATE DISTANCE

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appendix IV

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Vision for Doing

PART THREE: TOPICS REVISITED

Appendix IV Vision for doing: A tool not a test

Background

Vision for Doing makes no claims to be a "standardised test" of vision. We offer it as a Procedure or set of Guidelines to educators and care-givers. As we have said we do this to help them in turn offer the most appropriate learning environments and activities to their learners who have visual and multiple disabilities. We did not want to offer a rigid, inflexible format. That is not the way to carry out work with learners who are multiply disabled. If sequences of learning are followed too rigidly, then there is a very real danger of restricting learning opportunities. We realise that this does not sit very comfortably with present policy within education circles in the UK - and elsewhere - where set procedures and attainment targets are becoming the norm.

In this short Appendix we would like to discuss in a little more depth our reasons for taking this route and, moreover, to discuss what we believe emerge as the real strengths - not weaknesses - as a result of our approach.

A word about Standardisation

The two major features of test standardisation; whereby a test measures what it is supposed to measure are:

- the way in which the test is administered;
- whether the test results in the establishment of norms.

Administering Vision for Doing

We suggest in *Vision for Doing* that it is more important to carry out this procedure over a time determined individually for each learner. What will be right for one learner in one situation, will be inappropriate for the same learner at a different time or place; and would be different for two or more different learners. In this respect, then, standardisation has not been carried out on the *Vision for Doing*. Therefore it is not a test in the strict sense. We would, however, argue that our approach is entirely appropriate to the particular population to which these guidelines are directed. We do not see the multiply disabled as conforming to some normative process which is commonly applied in other spheres.

Norms

We would argue that the field of education with learners who are multiply disabled is a very young field. Indeed until only a few years ago, many of the people who might have been offered learning opportunities were hidden away - often in hospitals. The time is not yet right for standardisation. But more than this, we question whether it will ever be possible to standardise on 'testing' with the most severely multiply disabled learners.

Assessment for what?

The need expressed by the people who became involved in this study was not just for an assessment of how much vision a learner had. Requests came for indications as to what might be tried with that learner - on the basis of his or her functional vision. Suggestions were needed on appropriate materials and development of the curriculum.

Curriculum development requires a long lead time before one can unreservedly decide whether this or that intervention technique works. In the short term a specific technique may well work, but its success may well be to the detriment of longer term abilities. We would venture to suggest that the field of visual impairment in the presence of multiple disability is not yet ready to make categorical statements on issues of what has worked and what has not worked. Some insights have been gained, much remains to be learned and developed.

Validity

Our selection of items for the assessment of vision and 'The Other Senses' was predicated on the few measures already available. Our emphasis was more on what could be interpreted from these measures. As suggestions for

practice, we incorporated a range of accepted techniques - both our own and those of others. The categorisation system we used - *Awareness, Attending, Localising, Recognising* and *Understanding* - was one which encapsulated the structures used by several practitioners in the field. This particular wording was in fact in agreement with that used by Laura Pease of Whitefield School, London (after such as Jose et al (1980), Langley and Dubose, 1976). The nomenclature used is in essence the approach carried out by others in the field. Our contribution was fourfold:

- to widen its applicability;
- to apply the model across the other senses as a general model of the learner;
- to introduce a hierarchical model based on these principles;
- and finally to tie the model to specific suggestions for developing the curriculum of the learner.

Therefore a strong, testable and refutable model lies at the core of *Vision for Doing*.

We also set out to complement the framework proposed by such as Chapman et al (1989) with *Look and Think*. This particular checklist was developed for learners who have the single impairment to vision. Its content is less appropriate to those who have multiple disability with visual impairment. We endeavoured to concentrate most heavily on the areas for which Look and Think is less useful. *Vision for Doing* is most appropriate when used with learners who have multiple disability. It is less applicable for those who have "only" visual impairment, though may be appropriate with very young children.

Reliability

While each of the authors did not set out to obtain inter-rater reliability measures for each item, a criterion of agreement was invoked which was more functional and therefore probably more useful for the purposes of these guidelines. For each of the learners we followed up (around 90 in number), a report was written giving suggestions for curricular development. This report was to be used in the learner's activities. In order to write the report, the two authors had to agree as to its contents. At this stage, we were performing a functional inter-rater reliability.

Indeed, we would argue that this was probably more powerful as a measure of reliability than any standard inter-rater reliability. Its success was after all measured by the **outcome** of the suggestions made. We then followed up our recommendations by asking a sample of professionals whether our suggestions had proved to be of any value. In other words, not only was face validity[1] of items being measured, so too was criterion validity[2] : if it had not worked, the item would have been junked!

Adult Learners

The oldest of the learners with whom we have used *Vision for Doing* were in their late 20's. Although we frequently use the term 'child' in the main text, we consider that, by using age-appropriate materials, the procedures described may be used successfully with adult learners.

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a look to the future

front page

Vision for Doing

PART THREE: TOPICS REVISITED

A Look to the Future

In several places we emphasise that the 'state-of-the-art' in the field of multiple disability is still not well developed. Here we would like to present a glimpse into one avenue which may be worth exploring in moving forward the field.

Problem of Reading a Book

We hope *Vision for Doing* will be useful to staff who are not specialists in visual impairment working with children and adults who have visual/multiple disability. It was, however, as a result of many training presentations that we realised there is a severe limitation on the use of the book. It is an obstacle from which other materials - relying on the written word - also suffer.

The problem is that assessment and training materials are mostly in the form of the typed page - just like the one you are reading. A book or paper or report or assessment form presents its material in a form that is serial. For the user, it is tedious to have to continually cross-refer to extract information that is relevant to a specific individual. The tool can become unwieldy. As a result, the user may lack confidence in the interpretation he or she is making, even where that interpretation may be perfectly valid. You yourself may have found it difficult to keep in your head all the instructions on how to carry results over to the Summary Chart. Wouldn't it be nice if you could get a computer to do it for you? That's what we thought!

Computer-based version of assessment materials

An alternative to the printed form may be helpful, one which can access information just like that contained in this book. But getting the computer to do all the leg-work of interpreting results. The printed version could be complemented substantially by developing computer based tools as a powerful means of service delivery in training non-specialists. Our computer version will be called a Practitioner's Assistant.

What the future will hold

We are developing a flexible set of educational software tools consisting of:

- a 'Practitioner's Assistant', initially offering a means of producing individually tailored reports based on assessment findings;
- a database for previous cases, designed to facilitate both longitudinal studies and the updating of rules underpinning the 'Practitioner's Assistant';
- later the 'Practitioner's Assistant' would be capable of generating assessment materials either through interactive training with the professional concerned, or from information drawn from an initial one-page proforma.

The proposed system will be flexible enough to be used in several different ways, depending on the user's needs. By designing tools which can be used flexibly, individual needs can be better met for each school, hostel, group home, or adult training centre.

How it will work

Suppose a person in an Adult Training Centre has a young man who is severely visually impaired. They would like to assess the man's vision. They have no access to anyone with previous experience in this area, and they have no time to read this or any other book.

They begin with a single page of general questions about the young man's abilities. They then post this to a place which will send them information on **how to assess the man's vision and other abilities**. They begin to understand **why these observations are useful**. They send off the completed schedules (very similar to the ones you have been using at the start of each section.)

The next thing they would like is to have some suggestions on what to do with the young man. So they post the completed checklist. The results are inserted into the computer, which then prints out a report **tailored specifically to the young man's set of disabilities**.

New techniques for intervention are added into the computer's 'memory'; someone writes a rule 'telling the computer when it is appropriate to use that technique'. Next time the report has added to it that new technique - **if it is appropriate. Who knows, perhaps your techniques will be the ones that work**.

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glossary

front page

Vision for Doing

Glossary

accommodation - the ability of the lens of the eye to vary in thickness, so that a sharper image falls on the retina. To experience its effect try this exercise. Close one eye and, while looking at your finger at arm's length, slowly bring your finger towards your nose. You can feel the tension in your eye as the lens thickens. Some writers have suggested that for learners who are multiply disabled, they have poorer accommodation. However, no hard evidence exists for this. If it was true, it would have implications for prescribing of spectacles. It would mean that it would be more important for glasses to be prescribed for learners who are multiply disabled - even when the refractive error is quite low.

amblyopia - where central visual acuity of an apparently healthy eye is reduced because of lack of use for certain visual functions. Often it occurs because the "good eye" is preferred. It is usually associated with squint.

aniridia - absence of the iris which controls the amount of light entering the eye as in a camera's shutter. The learner will be photo-phobic, therefore it is helpful to use dimmed lights and she may benefit from filtered lenses.

binocular coordination - use of both eyes together so that the separate images from each eye (which are slightly different) are interpreted by the brain as a single image. At its highest form - stereopsis - an impression of depth can be obtained by the brain superimposing two slightly dissimilar pictures of the same objects.

binocular parallax - for any point you fixate, the images on the two eyes must be slightly different. But the two different images still allow us to perceive a stable visual world. Binocular parallax refers to the ability of the eyes to see a solid object and a continuous surface behind that object even though the eyes see two different views.

cataract - lens of the eye is cloudy or completely opaque, the result is a loss of vision for detail. If the cataract is located in the centre of the lens then dim lighting should be used. If on the peripheral part of the lens then it is usually helpful to have brighter lighting.

coloboma - present from birth, a cleft or wedge is missing from the Iris. It is likely that visual field problems will exist. This may affect mobility and scanning such as symbols, pictures or text.

contrast - the way that a foreground (say an object) stands out from its background. Contrast is not a property of visual edges on the retina but of visual edges in space. This is important in allowing us to vary the learner's visual world in order to enhance contrast.

contrast sensitivity - the term is used in a technical sense to refer to the minimal amount of contrast needed to perceive a test pattern. Some writers argue that contrast sensitivity gives a better indication of ability to see the form of objects than does a measure of visual acuity. Section 14, while not being as accurate as a true test of contrast sensitivity, does give useful practical information on the basis of your results. `

cortical blindness - implies that the brain does not interpret the signals received from the eye. Often the learner appears to have better peripheral vision. Use good illumination and high contrasted materials.

cortical visual impairment see Cortical Blindness

dark adaptation - refers to the gain in sensitivity as the eye remains in the dark. It is a relatively slow process, taking around 40 minutes to complete. Where the ability of the eyes to adapt to the dark is slower, this is likely to be associated with poorer contrast sensitivity. Should the learner suddenly exhibit poorer dark adaptation than is usual for that learner, you may want to request further examination.

diabetes - this is a major cause of blindness in industrialised countries. Blindness is associated with older people who have diabetes (the reason poorer countries do not have diabetes as a cause of blindness is that those who contract diabetes are unlikely to be treated and will die prematurely).

emmetropia - the normal eye focuses light at a point on the retina (with the lens at rest). (See Figure 5.2.1)

glaucoma - raised pressure within one or both eyes. The cornea or outside surface of the eye clouds and peripheral vision decreases. The learner may be uncomfortable in bright light (photophobia) and if mobile have difficulty with travelling.

hypermetropia - long sightedness. Parallel rays entering the eye come to a focus behind the retina. Note that it does not mean that vision is very good (eyes like an eagle!). It means that the muscle controlling the thickening of the eye

(see accommodation) has to continually work when reading and for other close work - the eyes literally do then get tired. (See Figure 5.2.1)

light adaptation - is the loss of sensitivity when an eye (or both eyes) has become adapted to the dark. Complete light adaptation is much faster than dark adaptation. Much of the adaptation to light takes place within a second, the remainder requiring only a few minutes.

linear perspective - a painter's cue to represent distance on a two dimensional photograph. (See Figure 7.11.3 for example of another painter's cue).

motion parallax - information at the retina caused by relative movement of objects as the observer moves to the side (or his head moves sideways). Motion parallax varies depending on the distance of the observer from objects. The observer's movement also causes occlusion (covering of one object by another), and as movement changes so too does occlusion. This can give a powerful cue to the distance of objects from the observer.

myopia - short sightedness. Parallel rays entering the eye come to a point in front of the retina. (See Figure 5.2.1)

nystagmus - Rapid uncontrollable movement of the eyes, impaired vision for detail, although peripheral vision may be better. Problems in depth perception may result. It is unusual for nystagmus to occur in isolation, usually indicating other difficulties. Experiment to find if there is a stable point ; ie position of objects in relation to the learner's eyes in which the movements become less obvious.

occlusion - provides information as to the relative depth of objects. Very helpful when depth cannot be perceived by binocular coordination (or binocular vision)

optic atrophy - nerve fibres transmitting information from the eye to the brain are affected. Use bright illumination of objects and high contrast of materials.

optic expansion pattern - the information at the eyes which specifies an approaching object (see Section 11 for further details).

painter's cues - These include linear perspective, in which separation of lines decreases with increasing distance (like railway tracks going into the horizon); interposition or occlusion (one object covering another) gives information on object distance as does a differences in height between objects.

photophobia - when light hurts the eyes and the person keeps her eyes away from bright lights. In extreme forms the person performs best in very low light levels.

proprioception - sensations from the joints and other sites of the body. These help the individual to sense the positions in space of parts of the body.

prosopagnosia - a rare condition which describes when faces cannot be recognised even though other visual abilities would suggest that this would be possible.

refractive error - light coming from a distant object (6 metres or more) enter the eye in parallel. If the object is to be seen clearly, the eye must focus on a point on the retina. This depends on four things:- the amount the eye curves; the length from the cornea at the front to the retina at the back of the eye; the position of the lens inside the eye; the state of that lens. The normal eye is emmetropic. (See Figure 5.2.1 for illustrations of refractive errors).

retina - made up of specialised cells called rods and cones (around 120 million rods and 7 million cones) this acts a bit like the film of a camera. The most sensitive part of the retina is the fovea, which you use for seeing close detail &emdash; like reading this book.

retinitis pigmentosa - where peripheral vision is affected first. There are several different types of RP. With reduced vision in dim light and blurring of images, the condition is often progressive. May be associated with deafness (Usher syndrome), in which case the learner is born deaf and later may become visually impaired.

retinopathy of prematurity - where the retina is scarred due to immature blood vessels in the eye reacting to changes in oxygen pressure soon after birth. Some learners affected will have residual vision and this will usually be accompanied by short sight (myopia) and a squint may be present. Good illumination and plus lens refraction may be helpful.

Retrolental fibroplasia see RETINOPATHY OF PREMATURITY

scotoma (pl. scotomata) a blind spot in one or both eyes, or occurring between the eye and part of the brain which interprets information detected through the eyes.

size constancy - whenever the perception of object size remains constant even with changes in the object's or observer's position. (See Section 15).

squint - imbalance of the eye muscles may result in the eyes turning either towards the nose or outward, the latter having sensitivity to bright light. As a result if one eye is straight this takes over, leading to the image from the affected eye being ignored (amblyopia). Often with severely physically disabled learners one eye does not suppress the other and double vision (diplopia) occurs. This results in difficulties with discriminating form and patterns of distinguishing figure from background and with depth perception, eye/hand coordination and fine motor skills. Good contrast is important, as well as using good even illumination.

strabismus see squint

stereopsis - highest form of binocular vision (see above). Great fun used to be had in Victorian times with the use of Stereoscopes, devices which artificially created slightly different views of the same scene. The same technique is used in 3-Dimensional cinema

trachoma - along with conjunctivitis this is a very common cause of blindness in poorer countries, and is transmitted by certain types of flies.

Usher syndrome - see RETINITIS PIGMENTOSA.

VIS (Visual Impairment Service) [now Sensory Information Service] - a database with an extensive amount of information on services, equipment, rights, curriculum materials relevant to visual impairment and blindness. Available on CAMPUS 2000, on Prestel, and on Apple Macintosh, with adaptations for blind and visually impaired users. (See Appendix III for further details).

visual acuity - the ability of the eyes to see detail. There are a variety of ways of measuring visual acuity.

visual field - see Section 13.

xerophthalmia - this is the major cause of blindness in pre-school age children in many poor countries. It is caused by a severe shortage of Vitamin A in the diet.

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references

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front page

Scottish Sensory Centre

Scottish Sensory Centre

For everyone who is involved in the education of deaf and visually impaired children and young people, the young people themselves and their families.

Scottish Sensory Centre promotes and supports new developments and effective practices in the education of children and young people with sensory impairments ie visual, hearing or dual (deafblindness) sensory impairment. SSC collaborates with: education authorities; schools and groups of teachers; voluntary organisations; parents groups; young people themselves.

- SSC organises **Short Courses**
- Produces a regular **SSC Newsletter**

The **Sensory Information Service** is a resource of information, articles and reference materials produced by and housed at the Scottish Sensory Centre

- **Bibliographies** - online
- **Online resources** - documents on this website
- **Resource Centre** - available by mail to subscribers
- **SSC Publications** - can be ordered via email
- **SSC videos**
- **Sensory Information Service database** - online
- Other **Sensory resources**: SEN documents - mostly sensory impaired specific - from various education websites around the world (English language only)
- **Video for Visually Impaired Learners**: A resource for teachers, students and educational materials producers - online

Sister website: VI Scotland is a new service is currently being developed by the Scottish Sensory Centre. A complementary website is being developed by the VI Scotland Team. This site will develop over the next 2 years but a taster is now available at **http://www.viscotland.org.uk**

The information contained above is freely available to anyone on the internet. The Centre staff regret that they cannot deal with individual enquiries except from people in Scotland regarding VI and Deaf young people in the 0-19 age group.

When you telephone the Centre you will probably first speak to:
Helen Robertson, Receptionist, or
Ruth Simpson, Administrator, who will either answer your query or pass you on to another member of the team:

Marianna Buultjens, SSC Co-ordinator; Lecturer specialising in educational services for visual impairment;
Andrew Blaikie, Ophthalmology Research Fellow, VI Scotland
Mary Brennan, Lecturer specialising in deaf education;
Yvonne Cairney, VI Scotland Secretary/Receptionist;
Marian Grimes, Research Associate, Achievements of Deaf Pupils in Scotland Project
Emily Healy, Secretary, Achievements of Deaf Pupils in Scotland Project
Elizabeth Izatt, Database Development Officer;
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SSC is centrally located, just off the Royal Mile, in the Holyrood Campus of Moray House Institute of Education, University of Edinburgh.

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[1]**Further reading: Thomson, GOB et al** (1985) Meeting the special educational needs of the visually impaired: The process of decision making. Edinburgh: University of Edinburgh.

[2]**Buultjens M & Aitken S** (1987) Assessment of vision in multiply impaired children - a consideration of evidence. British Journal of Special Education 14:1120114

[3]**Aitken S & Buultjens M** (1991) Visual assessments of children with multiple impairment: a survey of ophthalmologists. In Journal of Visual Impairment and Blindness 85(4):170-173

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[4]**Further reading: Budge A et al** (1987) Visual impairment: its causes and the quality of information as perceived by parents of visually impaired children. British Journal of Visual Impairment Vol V(2):51-53

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[5]**Further reading: Warburg M** (1975) Blindness in mentally retarded children, a survey of the causes of blindness in 201 notified patients. Doc. Ophthalmol. 39:343-349

[6]**Ellis D** (ed) (1986) Sensory impairments in mentally handicapped people. London: Croom-Helm.

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[1]For many years, Soviet dissidents were incarcerated in the far North of USSR. Psychiatric assessment was used to describe the dissidents as menatlly unstable.

[2]One of the early uses of IQ testing was to determine who would be allowed into the USA as immigrants. Poles, Slovaks, Lithuanians, Estonians and many more were herded together at Ellis Island. They were then given the Terman-Merrill IQ test. Needless to say those from another culture failed and were returned to their countries of origin. Ellis Island supports the Statue of Liberty.

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[3]**Further Reading: Teller et al** (1986)

[4]Recently some researchers have argued that we need to move away from this type of measure of acuity and consider 'hyper' or 'Vernier' acuity requiring, they argue, slightly higher cognitive ability. Even so there are other problems with the use of FP.

For the Technically Minded: In the early days of using FP, researchers would often follow an operant conditioning paradigm. Psychologists have spent many years perfecting techniques of operant conditioning. When incorporated within clinical settings using operant procedures, FP often produced peculiar results. For instance, one of the authors once witnessed the following scene. An infant was brought into a lab and confronted with a large apparatus. Gratings versus grey squares were presented and if the child looked to the correct stimulus, a rabbit popped up, played a dance and beat a drum. Meanwhile the experimenter lurked behind the apparatus, occasionally popping up when he should have stayed down. The result was the child's conditioning took place, but not to the 'gratings then rabbit'. Instead it took place to the "grey square then laughing experimenter'. The child was diagnosed as blind, which only goes to prove that there are none so blind as those who will not see!

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[1]**Proprioception** is the feedback given from joints and positioning of parts of the body.

[2]We leave aside some extremely interesting work by for instance Alan Bickerstaffe. Using a range of technology, his work has suggested that even for learners who have no apparent movement of any kind, there may still be learning occurring.

Bickerstaffe A (1987) A new approach to special care. In Talking Sense 33(1):6-7.

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[3]**Further Reading Nielsen L** (1990) Are you blind? Promotion of the development of children who are especially developmentally threatened. Sikon, Denmark.

An invaluable guide to assessing and understanding the emotional level of especially developmentally threatened children.

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[1]Recent work by Eva Lindstedt gets around the inherent difficulties imposed by ICD, by correlating different ICD indices with her own index based upon such as diseases of the Central Nervous System. This approach gets nearer to a functional classification.

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Technical point: The reader may wish to consider what would be a minimum set of requirements in order for learning to take place - and for observers to know that that learning had taken place. In the case of a learner who is only aware we might expect severely limited functioning in detection of information through the senses; poor ability to move; severely affected ability to distinguish own actions; poor ability to distinguish events in time and space.

Technical point on 'attention': We recognise that we could easily have spent time discussing a five stage model of attention. Indeed this helps greatly in structuring methods of intervention. Focussed Attention, the first stage, is the beginning of the capacity to respond to discrete events in visual, hearing, touch etc, stimuli. It is often accompanied by other cognitive problems. The concept of focussed attention is useful, relevant in suggesting intervention techniques such as multiple cueing, using additional sensory modalities as well as suggesting occasions when to cue using new situations.

The second stage, that of Sustained Attention, could in fact have substituted well for our next 'theme', localising. We adopted the alternative terminology for two reasons. One, the nature of the audience to which this book is directed. Second the fact that features of this structure were already in use by some of those working in the field of visual impairment and multiple disability. Sustained attention is characterised by dramatic fluctuations in responses or abilities over seconds. If it is present then the chances are that working memory is not functioning well.

The third stage is that of Selective Attention. At this stage the learner is able to select among a few or indeed several objects, events, people or places - in any combination.

It marks a freedom from distractibility. Again we propose at the relevant section of this book to utilise appropriate methods, most of which were not in any case derived from the theory. They originated at the practical end, and the theory was later constructed around them.

The fourth stage, that of Alternating Attention, represents a serious shift into what we are calling recosning. The learner is now able to shift his focus of attention and move between tasks which have different demands on cognitive abilities. Does the learner tend to perseverate on task, st In everyday life there are very real demands for this kind of control over one's attentional capacities.

The fifth and final stage of the 5 stage model of attention is that known as Divided attention. It is seen when a learner is able to respond simultaneously to several tasks at once. These tasks might even require two different behaviours at one time, or keeping track of two or more different objects or places in the world. Whenever simultaneous demands ate made upon you, a capacity to divide one's attention is required.

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Technical point on Localising: We accept that this is an other potentially divisive theme, divisive that is to those who like to concern them. selves with these problems. To give an example. If a child turns her head to a sound does that mean she can also see that object making the sound? Empirical evidence (as well as some research evidence) would suggest not. Babies born blind are often not diagnosed as such for some months. Remarks are made that the baby turns to locate sounds with his eyes. But they may be merely centralising a physical stimulus ie from sound. In-depth discussion of this topic is presented in Aitken (1981).

The corollary is that babies who are born blind are often later diagnosed as not just blind but also deaf. Try to imagine being a parent and having that put to you. "Sorry we were wrong. He is not just blind, he is also deaf".

Why should this happen?

Early in development a blind baby stops turning to sound.

When presented with a rattle at his right ear, he does not turn to the sound. He is diagnosed as deaf. There are good functional reasons for not turning to sound for a blind baby. No rustle of clothing occurs, he is not going to gain much more information by turning, stilling will allow him to concentrate on the sound. We will have to return to this topic when we discuss methods of intervention.

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[2]**Further Reading**: Chapman EK et al. (1989) Look and Think: Visual Perception Training for Visually Impaired Children (5-11 years). Royal National Institute for the Blind, London.

VERY Technical point: The thematic structure adopted above was selected and then altered to suit our own requirements on the basis of a logical progression. It is a layered structure. Each layer is dependent on the one below, and potentially able to support the one above (but not requiring it).

if p > p (where p implies p)
if q > p (for q to exist; ie the next level up, then so too must p, eg; Attending needs Awareness
if not p > not q (if p does not exist then neither does q, nor those levels above).

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Experimental Evidence: [1]**Kittens in Carousels** Consider what this experiment, carried out by Dick Held in the early 1970's, tells us. In the experiment two kittens, raised in darkness for 8 weeks, were placed in two different carousels attached at either end of a boom. The kittens, carousel and boom were placed inside a circular room. The walls of the room had a uniform visual pattern.

The crucial difference between the experiences of the kittens was the amount of control they had over their artificial world. One kitten was free to move the boom whenever it wanted, and where it wanted (within the limits of the rigid boom). It could stop, start, go back or forward. The movement of the other kitten was determined solely by the first kitten's activity. This passive kitten received the same visual information as the active kitten. But its actions had no effect on visual outcomes.

After some time the kittens were removed from the room and carousels and their behaviour observed. The first active kitten did typical kitten things. The behaviour of the second passive kitten was unusual, seeming to have difficulty in making sense of its visual environment. In both situations, the kittens received the same information through their eyes. One had this information under active control, for the other kitten it was a passive process.

[2]**Depressed Dogs:** Now consider a second experiment, carried out by Martin Seligman, also in the 1970's. In this experiment two groups of dogs were subjected to electric shocks (one dog at a time!). One group had, in an earlier arrangement, been able to escape from the shock by jumping over a barrier. The previous experience of the second group was that electric shock was inescapable. After a while both groups (again individually) were placed in a different arrangement in which electric shocks could be escaped. What happened? The first group did doggy things, escaping nonchalantly. But the second group, despite being able to now escape the shocks, behaved quite differently. They whimpered and lay down, waiting helplessly for the next shock to come. The dogs were described as behaving in ways similar to human depression.

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[3]**Consider** this example which shows the effects of compartmentalising a learner's abilities: Suppose a child produces a great deal of echolalic speech (others may even suggest that this demonstrates the presence of autistic features). Remediative efforts which concentrate on specific areas of speech and internal language of the child may be doomed to fail.

It may well be just as likely that the cause of the echolalic speech in this child is due to lack of opportunity for initiating communication. If you could not see another person, did not know if it was you or another being spoken to, had been asked closed questions (such as "Have you been out today?" Answer: "Yes" or "No"), in answer to which there is no means available for embellishing the answer through non-verbal means, all of these would conspire to make 'echolalia' a useful means for you to continue the social interaction.

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[4]**Further Reading**: Better Meetings. Open University Press

Starting early: an extra commandment? Some readers will be familiar with the notion that, in order for greatest success of intervention to be achieved, an early start in life is recommended. We too agree that, where possible, intervention should begin early. However, we would like to add a note of caution to an unqualified acceptance of a particular form of this notion of early intervention. For the suggestion is often made that intervention should begin within certain time limits. Usually, these time limits occur at early ages. The term 'critical periods' has been designated for these narrow time constraints. What would acceptance of fixed 'critical periods' mean for us in practice

In practical terms, when a non- specialist hears that "to be effective, work should really have started before the child was 18 months", and their learner is now 8 years old, a feeling of abandonment may follow. Because it is 'too late' should be or she forget about trying that strategy and get on with other things1 We would take the view that if one adopts this argument, the self-fulfilling nature of the proposition will emerge. Better to try and not succeed, than never to have tried at all.

Another practical problem with this view is which particular age one takes to be covered by a critical period. Should it be the child's chronological age, or his conceptual age1 With high-tech equipped intensive care units, there may nowadays be a four month gap between the two ages. Also most of the evidence on critical periods for vision covers the single impairment of vision. Perhaps multiple disability extends rather than reduces the sup posed critical period.

Evidence that would allow us to decide one way or the other as to the validity of the critical period argument is simply not good enough. Note, how ever, that this is not the same as saying that if you get the chance to begin intervention early, then you might as well wait. It is merely to argue that if you meet a learner who has gone beyond the 'critical period', you should still try.

There are also emotive consequences of following the critical period notion without question. These stem from the practical consequences we have summarised above. One difficulty would be that we might end up saying to parents that there is no point in trying to improve the child's use of residual vision.

There is though a related difficulty in wholesale rejection of the idea of critical periods. Parents and professionals who have seen change taking place often assume that this process is set to continue at the same rate. If we see over one year that there has been X percent of improvement, this does not, however, necessarily mean that over three years, there will be 3 times X per cent of change. It can be difficult to have this apparent pessimism accepted. It does not stop us trying, serving instead as a cautionary note.

Need for evaluation: Cliff Cunningham and his re search group followed up a large group of children with Down syndrome who received a variety of forms of home visiting. They were interested in looking at three variables:

age of commencement of home visiting - was it better to start early?

frequency of visits - did more visits give more benefit?

the nature of the intervention - some children were observed only, some were given more formal visits. Other families were given written instructions. Did more intense work pay off?

Their results were surprising to any who express the view that early intervention is a "good thing". There was no evidence that age at commencement of intervention in the first year was associated with improvements in development at late ages (aside from in one specific feature). The main effects of age of commencement of visiting were in parental adjustment. and counselling aspects. The second set of results showed no evidence to support the notion that greater frequency of visiting led to improvements in development. Likewise, intensity of visiting showed no effect: it did not matter the type of work carried out during visits.

The results of this study teach a salutary lesson. The effects of our intervention are not always what we would like to believe them to be. Evaluation helps keep a perspective on our work. (See Aitken 1988, Cunningham, 1980)

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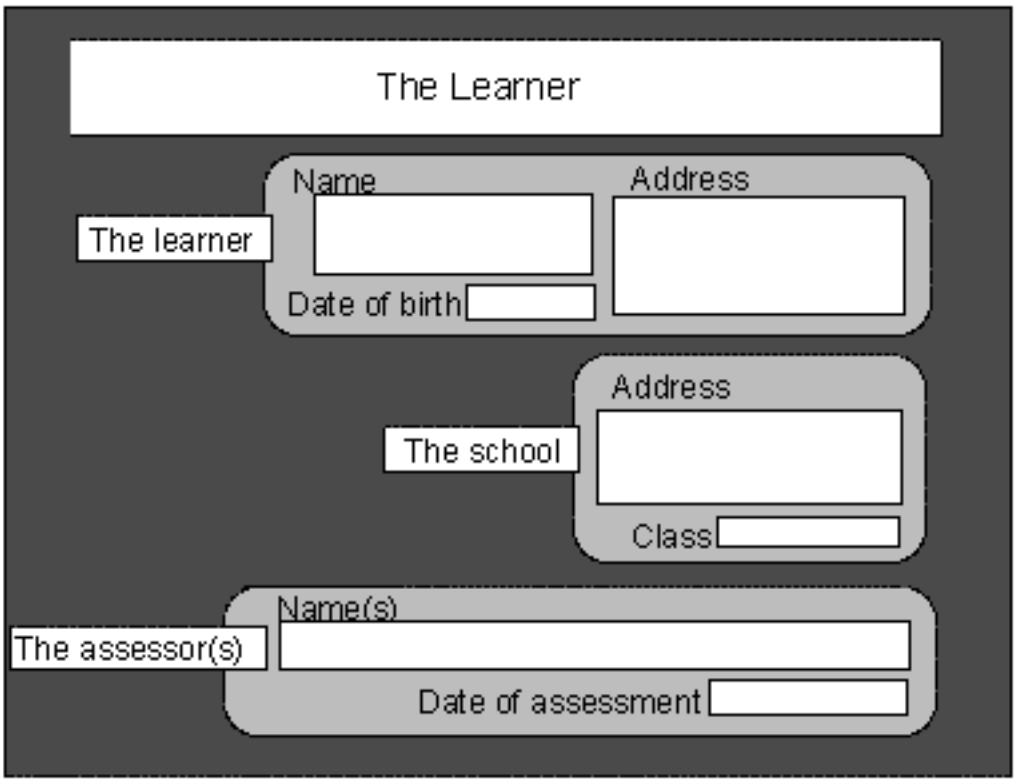
SECTION 1
THE LEARNER



This section is short and self-explanatory. Use it to record some fairly obvious descriptive information - the learner's name and address (though the latter is not necessary), date of birth. For future reference it is helpful to add the date of assessment, the person doing the assessment and the school and class attended.

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SECTION 2
BACKGROUND INFORMATION

Learner is described as: ☐ Blind ☐ Partially Sighted

General Diagnosis

Name of Eye Condition

Visual Acuity

	Both eyes	Left eye	Right eye
near vision without correction:			
near vision with correction:			
distance vision without correction:			
distance vision with correction:			

Refractive Errors

	Both eyes	Left eye	Right eye
long sighted:			
short sighted:			
astigmatism:			

Glasses

	Both eyes	Left eye	Right eye
prescribed:			
worn:			
refraction:			

Low Vision Aids Used:

Visual Fields Known:

Any other information:

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Visual ability	Visual sphere	Approximate visual acuity	Remarks
Recognise people and facesat close quarters. Big toys, dolls, soft toys, balls tableware, feeder bottle, cutlery, furniture, clothing. Mobility vision, differences in level of difficulty. Ball games usually impossible.	0.5-1.5 metres	0.01-0.05 (<3/60)	Possible with peripheral vision without good focussing, given reasonably good contrast vision
Small toys, marbles, balls, jigsaws, large pictures, card games, Lego, raisins, flakes, Smarties Mobility vision quite good. Ball games doubtful. Cycling often possible. For visual tasks at close quarters, "close-peering" behaviour.	3-4 Metres	0.05-0.1 (6/60)	Some focussing capacity necessary.
Very small toys and objects, assembly kits, details of pictures, wooden beads, needlework (large stitches), hundreds-and-thousands. Letter of alphabet, figures (not small print). "Close-peering" behaviour, not car registration numbers at distance. Sits close to TV, trouble seeing blackboard.	No details at distance	0.15-0.3 (<6/18)	Focussing capacity and accommodation necessary. Impairment not very noticeable before school age if vision is otherwise normal.
Reads ordinary text at normal working distance. Watches TV and can see the blackboard	not noticeably reduced	0.3 (>6/18)	May still be visual impairment if contrast vision is reduced or there are great oclomotor problems
Severe restrictions of the field of vision affect visual abilities at all levels of function			

Reproduced with kind permission from E Lindstedt (1986) How well can your chid see? Conversion/Comparison Tables for Vision Testing, Stockholm.

Table 5.2.1 Abilities possible with different levels of vision

SECTION 3
OBSERVING THE LEARNER

	Consistently	*Occasionally*	*Never*
Learner has likes:	☐	☐	☐
Learner adopts unusual postures:	☐	☐	☐
Learner shows unusual mannerisms: describe mannerisms:	☐		
Learner has challenging behaviour	☐	☐	☐

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[1]A detailed discussion as to how coordinated use might be made of the "Principal Players" can be found in McKendrick O (1991) Assessment of Multi-handicapped visually impaired children. Royal National Institute for the Blind, London.

Other principal players: In the main text we have set out the roles of professionals to be found in the statutory sector. Do not forget the wealth of experience to be found in the voluntary sector.

In the context of this book, within the UK, there is a selection to be found;

Royal National Institute for the Blind

Enable (Spastics Society (England and Wales))

Enable (Scottish Council for Spastics)

MIND

MENCAP

Scottish Society for Mental Health.

Parents may find help and support from local or national parent support groups. Fortunately for parents, these are too numerous to list in this book

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[1]**Further Reading:** Groenveld M et al (1990) Cortical visual impairment: Facts, Theories and Rehabilitation. In S Aitken, M Buultjens and S Spungin (eds) Realities and Opportunities. ICEVH Proceedings, American Foundation for The Blind.

Morse MT (1990) Cortical visual impairment in young children with multiple disabilities. Journal of Visual Impairment & Blindness May: 200-203

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[2]**Nielsen L** (1990) Are You Blind? Promotion of the developmen t of children who are especially developmentally threatened. Sikon, Denmark.

Rogers & Newhart-Larson S (1989) Characteristics of Infantile Autism in five children with Leber's congenital amaurosis. Developmental and Child Neurology.

Troster H, et al (1991) The age dependence of stereotyped behaviours in blind infants and pre-schoolers. Child: Care, Health and Development 17:137-157.

Warren DH (1984) Bindness and Early Childhood Development. (Second Edition). American Foundation for the Blind, New York.

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[3]**Further Reading:** Leonhart M (1990) Stereotypes: a preliminary re port on mannerisms and blindisms. Journal of Visual Impairment & Blindness May.

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[4]**Further Reading:** Phillips G. (1989) Challenging Behaviour: Severe behaviour problems of children who have learning difficulties. Report to Scottish Education Department

One of the modules on multiple disability being produced by the Royal National Institute for the Blind is on Challenging Behaviour.

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[5]**Further Reading:** Wood RU & Fussey I (eds) (1990) Cognitive Rehabilitation in Perspective. Taylor & Francis, London.

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SECTION 4

LEARNER'S RESPONSES TO SOUND

	Consistently	Occasionally	Never
Learner is aware of:			
loud or harsh sounds:	☐	☐	☐
Learner attends to:			
sounds:	☐	☐	☐
female voice:	☐	☐	☐
male voice:	☐	☐	☐
Learner locates sound:			
to the left:	☐	☐	☐
to the right:	☐	☐	☐
Learner recognises:			
familiar sounds:	☐	☐	☐
familiar female voice:	☐	☐	☐
familiar male voice:	☐	☐	☐
Learner understands:			
familiar words:	☐	☐	☐
wider vocabulary:	☐	☐	☐

go back to p58

[1]Notice that we emphasise *may*. In the case of Sound our 'model of the learner' is not quite as clear-cut. After all it is a simple matter to think of occasions when a learner will be able to recognise a sound but be unable to localise that sound. In the case of localising the model works best for vision itself. This does not, however, affect the way the Summary Chart will be used or the curriculum development advice obtained.

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[2]**Further Information:** In addition Sense is a UK organisation dealing with the needs of dual sensory impaired learners. It has regional offices in various parts of the UK.

'Contact' Moray House Publications: This is a training package consisting of 8 modules on dual sensory impairment. It is based on work carried out at Carnbooth School, Glasgow, a special school for children who are deaf-blind.

[3]**Further Reading**:This index of auditory-visual coordination has been found in newborn babies as young as 10 minutes of age.

You should note that this re mains a somewhat controversial area. Some believe the head turning of a newborn to be a reflex. Others, while not questioning the occurrence of head turning in newborns, would question the validity of the conclusion: they believe it is not a reflex. Others still would disagree that newborn s turn their heads to sound. See: Bower TGR (1989) The Logical Infant. San Francisco, Freeman.

[4]If you happen to be working with such learners, perhaps you would be interested in carrying out your own research on this topic.

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[5]A variety of technological innovations can be used in similar ways. One example is a 'soundbeam', by which any movement of the learner can produce a musical effect.

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Vision for Doing

Action Songs

Round and round the garden

Round and round the garden
Goes the teddy bear;
One step, two step,
Tickle you under there.

(vary "you" to be Mummy, Daddy, name of brother, sister, favourite doll)

Five fat sausages
Five fat sausages sizzling in a pan
All of a sudden one went "BANG!"

Four fat sausages, etc
Three fat sausages, etc
Two fat sausages, etc
One fat sausage, etc
All of a sudden one went "BANG!"
and there were NO sausages left!

Clap, clap hands

Clap, clap hands, one, two, three,
Put your hands upon your knees,
Lift them high to touch the sky,
Clap, clap hands and away they fly.

Incy, wincy spider

Incy, wincy spider
Climbing up the spout.
Down came the rain
And washed the spider out.

Out came the sun
And dried up all the rain,
So incy wincy spider
Climbed up the spout again.

Row, row, row your boat

Row, row, row your boat,
Gently down the stream,
Merrily, merrily, merrily, merrily
Life is but a dream.

Here are Granny's spectacles (glasses)

Here are Granny's spectacles,
And here is Granny's hat,
And here's the way she folds her hands,
And puts them in her lap.

Shoes

Baby's shoes
Mummy's shoes
Daddy's shoes
Policeman's shoes
GIANT'S SHOES!

Increase distance between hands as shoes get larger, while increasing loudness with each size.

Hickory, dickory dock

Hickory, dickory dock
The mouse ran up the clock,
The clock struck ONE,
The mouse ran down,
Hickory, dickory dock.

Head, shoulders, knees and toes

Head, shoulders, knees and toes, knees and toes
Head, shoulders, knees and toes, knees and toes
Eyes and ears and mouth and nose
Head, shoulders, knees and toes, knees and toes.

Eyes, nose, cheeky cheeky chin

Eyes, nose, cheeky cheeky chin
Cheeky, cheeky, chin, nose ME
(give big cuddle)

Humpty Dumpty

Humpty Dumpty sat on a wall.
Humpty Dumpty had a great tall.
All the King's horses
And all the King's men
Couldn't put Humpty together again.

Two little dicky birds

Two little dicky birds sitting on a wall
One called Peter, one called Paul.
Fly away Peter!
Fly away Paul!
Come back Peter, come back Paul.
(use bright reflective tape for low vision child)

I can

I can tie my shoe lace,
I can brush my hair,
I can wash my hands and face
And dry myself with care.

I can clean my teeth too,
And fasten up my frocks.
I can say 'How do you do'
And pull up both my socks.

Thumbkin

Thumbkin, Tommy Thumbkin,
Where are you, where are you?
Here I am, here I am,
How do you do?

Peter Pointer, etc
Middle finger, etc
Ruby Ring, etc
Baby small, etc

This little pig

This little piggy went to market,
This little piggy stayed at home;
This little piggy had roast beef,
This little piggy had none,
And this little piggy cried,
'Wee wee wee wee'
All the way home.

Pat-a-cake

Pat-a-cake, pat-a-cake, baker's man,
Bake me a cake as fast as you can.
Pat it and prick it and mark it with B,
And put it in the oven for Baby and me.

Others..

Use of a mouth organ
Sound games on the teeth
Hand to foot songs

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Chapter 6

[6]**Further Information:** Royal National Institute for the Blind; 224 Great Portland Street, London W1N 6AP

Eye Contact available from RNIB gives useful ideas for there working with visually and multiply disabled young people.

Information Exchange is a useful regular publication, giving ideas on use of sound and other senses. Formerly published by the Royal National Institute for the Blind, it is now available from:- Royal Schools for the Deaf; Stanley Road,Cheadle Hume,Cheshire SK8 6RF

Best A (1987) Steps to Independence. BIMH, London.

Longhorn F (1988) A Sensory Curriculum for Very Special People: a practical approach to curriculum planning. Human Horizon Series, Souvenir Press. (Ch.5:108-127)

Kekelis LChernus S & Mansfield M (1984) Talk to me: a language guide for parents of blind children. Los Angeles: Blind Children's Foundation.

Brown D Simmons V & Methven J (1986) OR Project. The Oregon Project for Visually Impaired and Blind Pre school Children. Jackson County Education Series.

Ferrell KA (1986) Reach Out and Teach: Meeting the training needs of parents of visually and multiply handicapped young children. American Foundation for the Blind, New York.

Scott EP (1972) Can't Your Child See? University Park Press, London.

Wyman R (1986) Multiply Handicapped Children. Souvenir Press, London.

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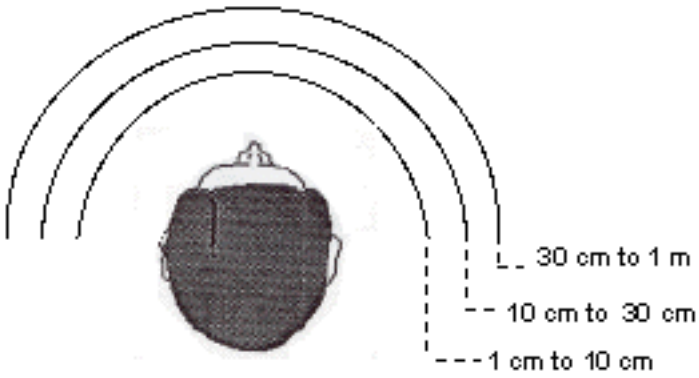
SECTION 5

LEARNER'S SENSE OF TOUCH

	Consistently	*Occasionally*	*Never*
Learner shows awareness of touch by:			
startling:	☐	☐	☐
withdrawing:	☐	☐	☐
other:	☐	☐	☐
Learner attends to touch by:			
exploring by hand	☐	☐	☐
exploring by mouth	☐	☐	☐
exploring by other means	☐	☐	☐
Learner localises by touch: (draw on diagram positions touched by learner)			
Learner recognises by touch:			
familiar objects:	☐	☐	☐
familiar person:	☐	☐	☐
Learner understands uses of objects by touch:			
appropriately	☐	☐	☐

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[1]Notice that, as we did for sound in the previous section, we emphasise may. In the case of Touch our 'model of the learner' is not quite as clear-cut. In the case of localising the model works best for vision itself. This does not, however, affect the way the Summary Chart will be used or the curriculum development advice obtained.

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[2]**Further Reading:** Nielsen L (1988) Spatial Relations in Congenitally Blind Infants. Refsnaesskolen, Denmark.

[3]**Further Reading:** van Dijk J (1965) The first steps of deaf-blind children towards language. Proceedings of Conference on the Deaf-Blind: Refsnaesskolen Denmark. Boston: Perkins School for the Blind.

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[4]Contact (1992) Moray House Publishers

van Dijk J (1986) An educational curriculum for deaf-blind multi-handicapped persons, In D Ellis (ed) Sensory Impairments in mentally handicapped people. London, Croom-Helm.

Mirenda P & Santogrossi J (1985) A prompt-free strategy to teach pictorial communication system use. Augmentative and Alternative Communication I: 143-150

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[5]**Burford B** (1990) Children and young people with profound handicaps. Video, Author Copyright.

[6]**Further Reading:** Siegel-Causey E et al (1988) Non-symbolic communication in early interactional processes and implications for intervention. In M Bullis & G Fielding (eds) Communication Development in Young Children with Deaf-Blindness: Literature Review. Monmouth, Oregon.

Nielsen L (1990) Are You Blind? Sikon, Denmark.

Longhorn F (1988) A Sensory Curriculum for Very Special People: a practical approach to curriculum planning. Human Horizon Series, Souvenir Press. (Ch. 6:128-145; and Ch.8:155-

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[7]**Nielsen L** (1988) Spatial Relations in Congenitally Blind Infants. Refsnaeeskolen, Denmark

[8]**Further Reading:** For further information on these techniques, the reader is invited to refer to the original sources such as:

van Dijk J (1965) The first steps of deaf-blind children towards language. Proceedings of Conference on the Deaf-Blind: Refsnaesskolen Denmark. Boston: Perkins School for the Blind.

van Dijk J (1967) The non verbal deaf-blind child and his world: his outgrowth towards the world of symbols. Holland: Institute for the Deaf

van Dijk J (1986) An educational curriculum for deaf-blind multi-handicapped per sons, In D Ellis (ed) Sensory Impairments in mentally handicapped people. London, Croom-Helm.

Other authors have taken up these themes applying them in broadly similar contexts.

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[9]Learning to learn was first described by **John Watson** in a paper called "Smiling, Cooing and the Game". He describes how associations built up by infants can affect the way they come to under stand future opportunities for learning.

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[10]**Further Reading** Clark P (1988) Adapting signs for deaf-blind children. Talking Sense 34(1):16-17.

Dean L & Aitken S (1986) Functional communication in blind multiply impaired children. In British Journal of Visual Impairment and Blindness Spring Vol. IV(1):I-I I

Evans J (1985) Total communication and handicapped children. In Talking Sense 31 (22:

[11]There are useful schedules for assessing functional communication in learners who are multiply disabled. These include:

Coupe J et al (1983) Affective Communication Assessment. Hester Adrian Research Centre, Manchester.

Kiernan C & Reid B (1987) Pre-Verbal Communication Schedule. N.F.E.R. - Nelson. Both of the above can be used to complement each other.

van der Caag A (1988) The communication assessment profile for adults with a mental handicap. (CASP)Speech Pro files Ltd, London.

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[12]**Aitken S** (1990) See reference list at the end of the book.

Meyer L (1984) Unique contributions of micro-computers to language intervention with handicapped children. In Seminars in Speech and Language Development 5:33-34

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[12]Aitken S (1990) See reference list at the end of the book

Meyers L (1984) Unique contributions of microcomputers to language intervention with handicapped children. In Seminars in Speech and Langauge Development 5:33-34

[13]It is not our intention to enter into detailed discussion of the techniques described. However here a few references should you wish to follow up the discussion:

Halle J Baer D & Spradlin J (1981) Teacher's generalised use of delay as a stimulus control procedure to increase language use in handicapped children. Journal of Applied Behavioural Analysis 14:389- 409

Halle J (1982) Teaching functional language to the handicapped. An integrative model of natural environment teaching techniques. Journal of the Association for the Severely Handicapped 7:29-37

Mirenda P & Santogrossi l (1985) A prompt-free strategy to teach pictorial communication system use. Augmentative and Alternative Communication 1: 143-150

Rogers-Warren A and Warren S (1980) Mands for verbalisation: facilitating the display of newly trained language in children. Behaviour Modification 4:362-382

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[14]A Japanese pamphlet on the topic of cloth and tactile picture books highlighted the fact that these books can be de signed exactly to suit the personality and needs of the child for whom they are being made: "the only book in the world that has been made just for you" (Imamura 1981). They can be made from a variety and combination of materials: paper, cloth, foil, straw, thread, card, wool, wood, mirror, bells, leather, vinyl, perfumes and scented items; the list is endless, limited only by the ingenuity and creativity of whoever is making the book

Coordinating Committee (1981) The Future of Cloth and Tactile Picture Books. Kaisei-Sha, Tokyo.

Further Reading: Odor JP & Buultjens M (1988) Computer based raised diagrams and pictures f young visually handicapped children. Paper presented at ICEVH, Edinburgh; August 1988.

Fukurai (1969) How Can I Make What I Cannot See? Van Nostrand Reinhold, New York.

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[15]**Further Reading:** Hinton RAL (1991) Use of tactile pictures to communicate the work of visual artists to blind people. In Journal of Visual Impairment and Blindness Apd185(4): 174-175

[16]**Chapman E K** et al (1989) See reference list at end of book.

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SECTION 6

LEARNER'S SENSE OF SMELL

	Consistently	*Occasionally*	*Never*
Learner shows awareness of:			
pleasant smell	☐	☐	☐
Learner attends to:			
smells:	☐	☐	☐
Learner uses smell to recognise:			
familiar person:	☐	☐	☐
different foods:	☐	☐	☐
familiar objects:	☐	☐	☐
different places:	☐	☐	☐
Learner usues smell to help understanding of:			
events:	☐	☐	☐
objects:	☐	☐	☐
places:	☐	☐	☐
people:	☐	☐	☐
time:	☐	☐	☐

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[1]You are probably asking why we do not suggest that you assess *Localising* through smell. After all we are saying smell is good for identifying location. The reason we omit *Localising* is that the best use of smell is in locating familiar places and events. In other words it assumes some sort of *Recognising*. This of course comes under the section given over to *Recognising*.

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[2]A example of a supplier of Coma Kits is Richard Hirtstwood; Litework; Unit 2; Woodgate Park; White Lund Industrial Estate; Morecambe; LANCS LA3 3PS.

Another example is Aroma Disc Player from Toys for the Handicapped, Avon.

Yet another is Fragrance Kit from Avon.

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[3]**Hulsegge T & Verheul A** (1988) Snoezelen: Another World. Trans by R Alink, Rompa.

Within the UK, several people are interested in pursuing the idea of incorporating learner control of Snoezelen equipment. Contact Rompa to find out developments in this area.

Multi-Sensory Toys such as 'Jimmy's Waistcoat' are avail able from Toys for the Handicapped. This can be used not only for smell but also for touch and hearing.

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[4]**Longhorn F** (1988) A Sensory Curriculum for Very Special People: a practical approach to curriculum planning. Human Horizon Series, Souvenir Press. (Ch. 4: 94- 107)

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SECTION 7

LEARNER'S SENSE OF TASTE

	Consistently	*Occasionally*	*Never*
Learner shows awareness of:			
pleasant taste:	☐	☐	☐
unpleasant taste:	☐	☐	☐
food textures:	☐	☐	☐
food temperatures:	☐	☐	☐
Learner attends to:			
a range of tastes:	☐	☐	☐
a range of food textures:	☐	☐	☐
a range of food temeratures:	☐	☐	☐
Learner recognises taste of:			
foods:	☐	☐	☐
sweets:	☐	☐	☐
drinks:	☐	☐	☐
objects:	☐	☐	☐
***Learner explores object orally to help understanding of:**			
objects:	☐	☐	☐
events:	☐	☐	☐
places:	☐	☐	☐
people:	☐	☐	☐
time:	☐	☐	☐

*this item combines the sense of smell, touch and taste

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[1]**Longhorn, F** (1988) A Sensory Curriculum for Very Special People: A Practical approach to Curriculum Planning. Chapter 3. Oral exploration.

[2]**Anderson, C** (1983) Feeding - A Guide to Assessment and Intervention with Handicapped Children. Available from: Publication Department, Jordanhill College of Education, Southbrae Drive, Glasgow G13 1 PP.

[3]**Dale, FJ** (1990) The Stimulation Guide: A source book of suggestions and activities for multi-sensory impaired children and others with developmental difficulties. Chapter 6.

[4]**Ferrell, KA** (1986) Reach Out and Teach. Meeting the Training Needs of Parents of Visually and Multiply Handicapped Young Children. Parent Handbook Reach book

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[5]Lilli Nielsen tells a wonderful anecdote about a blind multiply disabled girl who presented great problems with eating and would not feed herself independently. Lilli describes how she arrived to visit this girl - we'll call her Katie - at lunch time. Lilli herself was hungry she sat down beside the girl, unpacked her lunch of bread and cheese and while gently chatting to the girl proceeded to eat her lunch. She was half way through her meal, when Katie reached out and started helping herself to the bread and cheese. Could it have been the lovely strong aroma of the Danish cheese which prompted her action - as well of course as wanting to share socially with Lilli. (with apologies to Lilli for any inaccuracies in the story!)

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[6]**Sachs, O** (1991) Seeing Voices Picador.

[7]**Fukurai** (1969) How Can I Make What I Cannot See? Van Nostrand Reinhold, New York.

[8]**Imamura, H** (1981) The Future of Cloth and Tactile Picture Books. Kasei-Sha, Tokyo

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Example

Suppose after a couple of weeks (you may take longer) you record from the beginning to the end of this chapter. For a learner with a little amount of vision you may observe the following:

In the first couple of sections you find on several occasions that the results are Consistent. As you move through the sections you find more Occasionals. Before long you see mostly None, designating no response to that kind of visual stimulus. You have reached a cut off point.

You are then able to build up a picture over several occasions and compare with the many naturalistic observations you can make of the learner in the dining room, swimming pool, on the bus and so on. For each section you will have been given an understanding as to why you would be interested in the area of visual functioning being tested.

Having transferred your results for each section to the Summary Chart in Section 18, you can compare results for visual and non-visual sections.

The suggestions offered for intervention (curriculum development opportunities) can then be obtained from the relevant sections. Section 18 gives more guidance on how to do this.

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SECTION 8

OBSERVING THE LEARNER'S EYES

	Consistently	*Occasionally*	*Never*
Pupils react to light:	☐	☐	☐
Eyes are cloudy:	☐	☐	☐
Eyes move together:	☐	☐	☐

Squint present	*Both eyes*	*Left eye*	*Right eye*
consistently:	☐	☐	☐
occasionally:	☐	☐	☐
never:	☐	☐	☐

Eye tremor present	*Both eyes*	*Left eye*	*Right eye*
consistently:	☐	☐	☐
occasionally:	☐	☐	☐
never:	☐	☐	☐

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[1] **Further Reading**

Hyvarinen, L (1988) Vision in Children. Meaford, Ontario

Lindstedt E (1986) How well Does a Child See? Elisyn, Stockholm

[2]There are some conditions of testing these items which could tell you that vision is being used, which would in turn have implications for Section 18. These will, however, be taken up in subsequent sections.

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SECTION 9
LEARNER'S RESPONSES TO LIGHT

Learner responds to:	*Consistently*	*Occasionally*	*Never*
sunlight	☐	☐	☐
daylight	☐	☐	☐
camera flash	☐	☐	☐
room light switched on	☐	☐	☐
room light switched off	☐	☐	☐
torchlight	☐	☐	☐
torchlight with coloured filters	☐	☐	☐
Learner light gazes	☐	☐	☐

Further Information

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[1]There are a few exceptions to the rule of trying again another day. One obvious one is if the learner has no eyes! Should this be the case, you may still find the suggestions given in Chapter 6 of use. Nevertheless the main objectives of this book lie in use of remaining residual sight. So you should certainly go beyond the suggestions offered in Chapter 6, if the learner shows any awareness of light.

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[2]**Further Reading: Longhorn, F** (1988) A Sensory Curriculum for Very Special People: An Approach to Curriculum Planning. Human Horizons

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[3]Two useful addresses for information and suggestions on hardware and software are:

RCEVH; Department of Special Education; University of Birmingham; Birmingham.

NW SEMERC; Fitton Hill CDC, Rosary Road, Oldham OL8 2QE.

(see Appendix II for additional sources of information).

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[4]**Autokinetic Effect:** You can experience this for yourself. For those with normal sight, an unusual effect is noticed when, in a totally dark room, a small candle flame is watched. After a short time, the flame appears to dance around the room. It appears that our vision works best when we have information that al lows a frame of reference. A single light source in an other wise dark room does not afford a reference frame.

Now consider the learner with a severe visual impairment. As sighted people we may be able to see those objects which offer a frame of reference for the object we are presenting as stimulus. But the learner's visual disorder may result in these reference objects going undetected. They may be experiencing something similar to an autokinetic effect. This will result in the object being rather a disturbing experience. For this and the description on using a dark-room with fluorescent lighting, it is therefore worth having more than one object present.

[5]In a study in British Colombia by Groenveld, Jan and Wong (1988), it is stated that cortical visual impairment (CVI) was the cause of legal blindness in 10% of all children with visual loss. Ellis (1986) found it present in about 20% of severely visually impaired 'mentally retarded' children.

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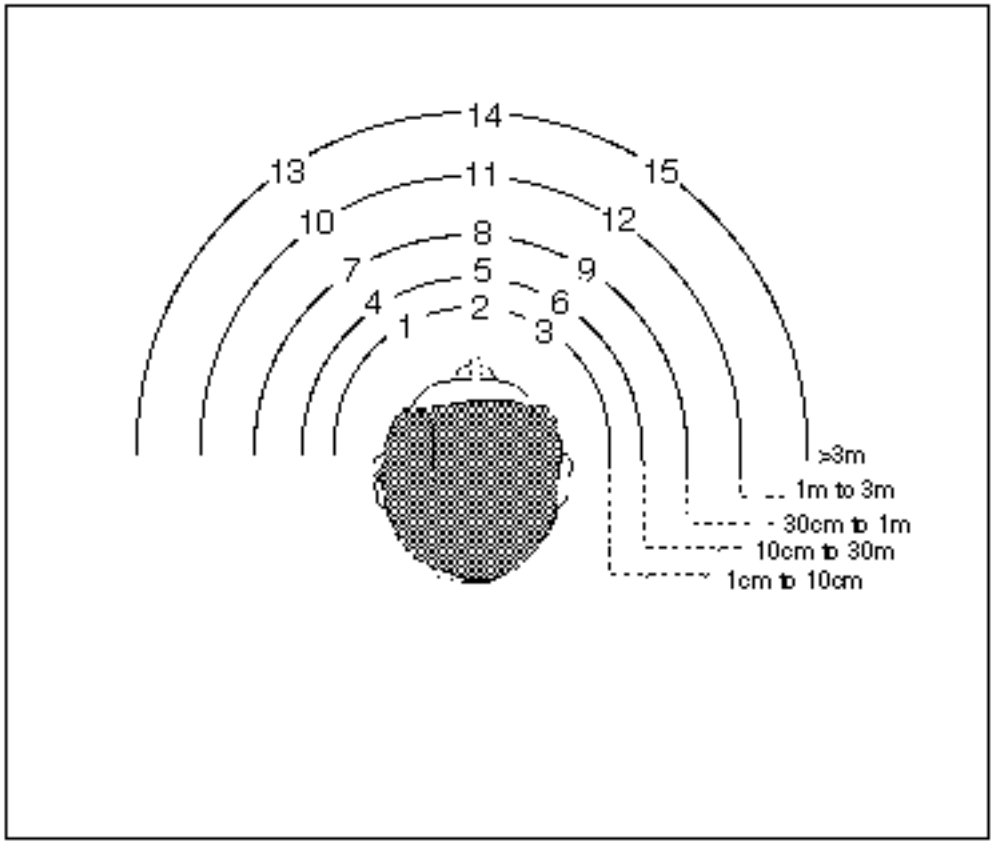
SECTION 10
RESPONSES TO REFLECTED LIGHT



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[1]There are a number of commercially available toys which produce interesting, attention-holding patterns of reflected light. Several examples are given in SIS database. Here are a few:

Cheerleader Pompom; Toys-R-Us.

Illuminated Mirror; Avon.

Rotating Diffraction Cube; Rompa.

Spinning Wheel Toy; Rompa.

(For further explanation of SIS, see Appendix II).

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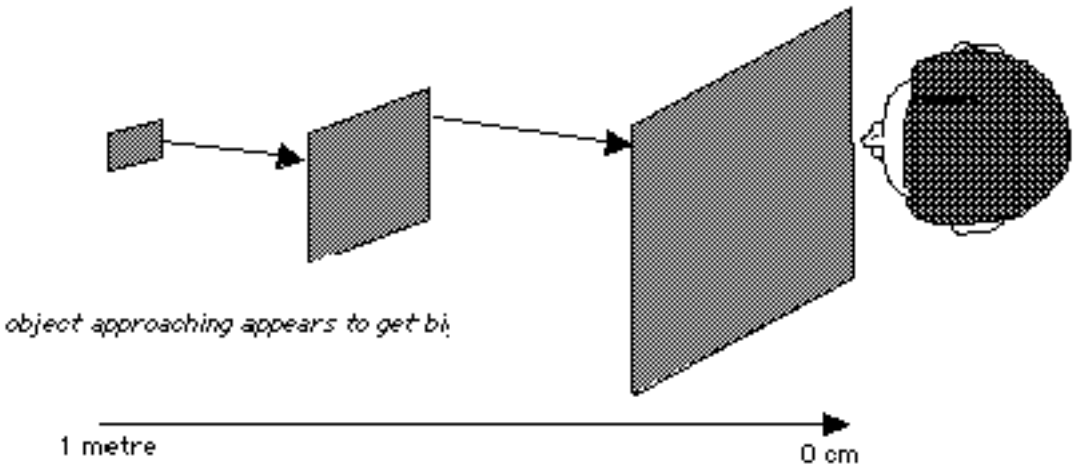
SECTION 11

RESPONSES TO APPROACHING OJECT



Object approaches on:	Response: Consistently	Occasionally	Never
hit path:			
miss path:			

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[2]**Longhorn F** (1988) A Sensory Curriculum for Very Special People: a practical approach to curriculum planning. Human Horizon Series, Souvenir Press. (Ch 2:55-62)

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[1]Time for some light relief. Three golfers used to argue about whether there is golf in heaven. They agreed that the first one to die would come back and let the others know. Next weekend sadly, one of them died. No more was heard until a few weeks later when he joined his earthly companions at the 16th hole.

"Well, tell us, is there golf in heaven?", they eagerly enquired.

"Do you want the good news first or the bad news first?" the apparition said.

"The good news first", they agreed.

"OK. The good news is that there is golf in heaven".

"Brilliant, what could possibly be bad news knowing that?"

Came the reply: "The bad news is you're both in a foursome on Saturday".

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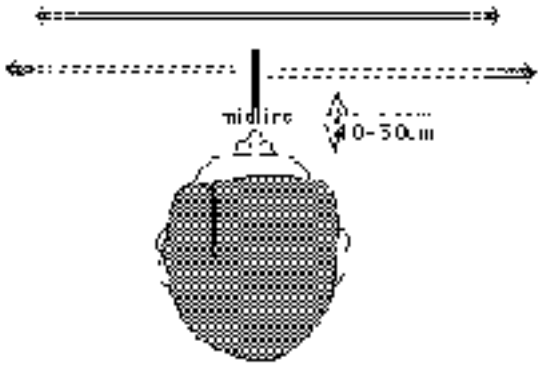
SECTION 12a
RESPONSES TO OBJECTS MOVING HORIZONTALLY



Eyes move to follow object

smoothly jerky none

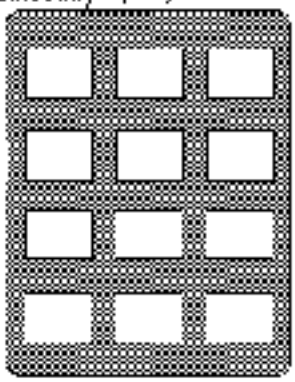
Object moves:

From midline moves left and back to midline:

from midline moves right and back to midline:

across midline from right side to left side:

across midline from left side to right side:



Note whether both head and eyes move
OR only eyes move
OR only head moves

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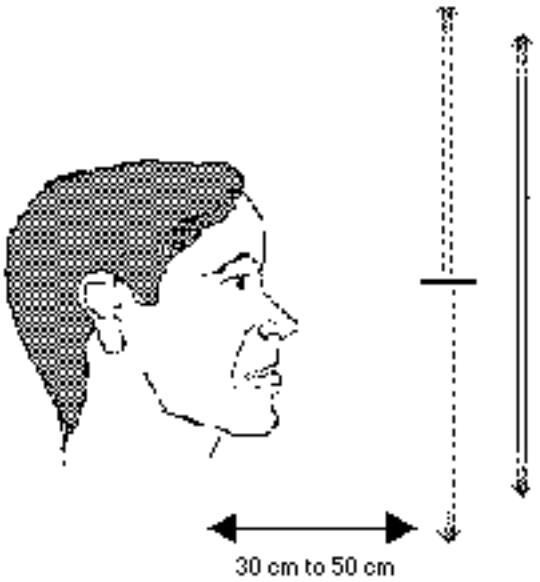
SECTION 12B
RESPONSES TO OBJECTS MOVING VERTICALLY



Object moves:

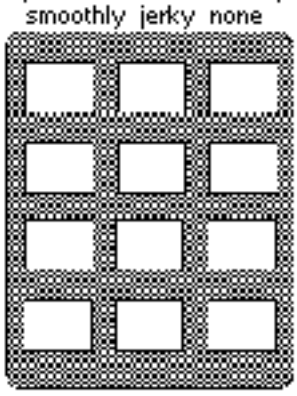
Eyes move to follow object
smoothly jerky none

From midline moves left and back to midline:

from midline moves right and back to midline:

across midline from right side to left side:

across midline from left side to right side:



Note whether eyes and head move
OR only eyes move
OR only head moves

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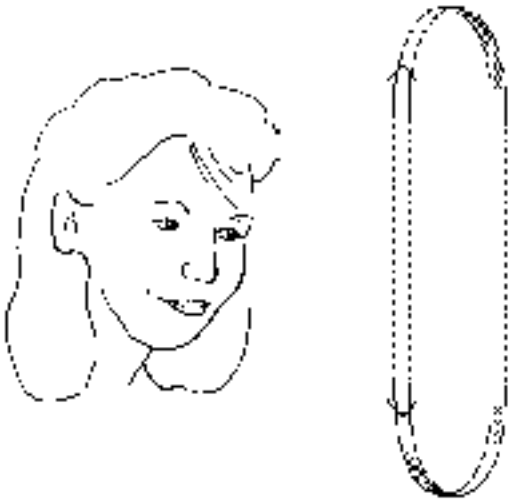
SECTION 12C
RESPONSES TO OBJECTS MOVING IN 'CIRCLE'



	Eyes move to follow object		
	smoothly	jerky	none
Object moves clockwise	☐	☐	☐
Object moves anti-clockwise	☐	☐	☐

Note whether <u>both</u> head and eyes move
OR only eyes move
OR only head moves

Note whether <u>both</u> head and eyes move
OR only eyes move
OR only head moves

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[1]**Eyes + head?** In the text we have mentioned that you should try to distinguish between occurrence of movements which are either:- eyes only; head only; or both eyes and head.

It is not necessary to be able to do both head and eye movements. However, you should be sure to give enough time for the learner to 'organise' a response. Often one movement can precede the other. If the stimulus is sufficiently close, the learner may be able to follow it with eyes only.

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[2]**Useful software** A variety of software can be obtained from:- For the UK, a list of agencies (such as RCEVH, NW SEMERC), and useful publications, are provided in Appendix II.

Crossing the midline You may find the learner does not continue to follow an object's movement once it passes the midline (ie. an imaginary line passing at right angles to the two eyes). For some learners no amount of intervention will results in successful crossing of the midline. Nevertheless, before assuming this to be true, try the following:- hands following objects; association with other sensory information; verbal cueing of position; use of self-produced echoes for position.

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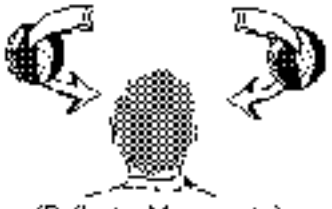
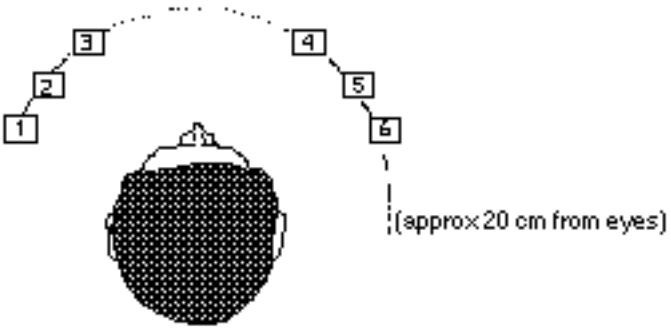
SECTION 13A
RESPONSES IN VISUAL FIELDS
(UPPER HALF)



(Reflector Movements)



Learner's response

Position of Object (Box Number)	*Consistently*	*Occasionally*	*Never*
1			
2			
3			
4			
5			
6			

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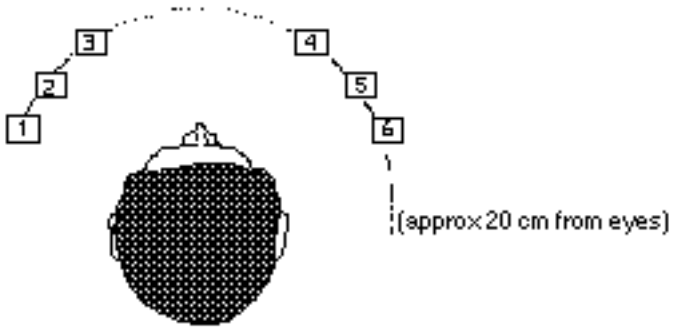
SECTION 13b
RESPONSES IN VISUAL FIELDS
(LOWER HALF)

(Reflector Movements)



Learner's response

Position of Object (Box Number)	*Consistently*	*Occasionally*	*Never*
1			
2			
3			
4			
5			
6			

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Further details

For the learner who is severely physically disabled, muscle control of the eyes may be affected. Indication that the object has been seen in a part of the visual field may be signified simply by change in response. Change in response can take one of many forms. As before for some learners it may also take some time to organise a response. In this case, rely upon your knowledge of the learner.

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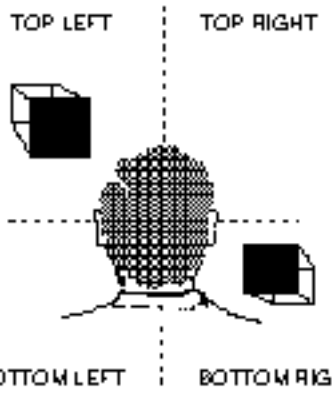
SECTION 13c
RESPONSES IN VISUAL FIELDS
(PREFERENCES)



Learner notices both objects

Positions of the Two Objects	*Consistently*	*Occasionally*	*Never*
Top Left with Top Right			
Top Left with Bottom Right			
Top Left with Bottom Left			
Top Right with Bottom Right			
Top Right with Bottom Left			
Bottom Left with Bottom Right			

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[1]It is not quite true that the brain 'fills in' the blind spot for a scotoma. A moment's thought will tell you why. What would the brain fill in the blind spot with? Obviously, some conditions will mean that the missing part of the visual field is very noticeable to the sufferer. For many circumstances the person with the visual field defect will be able to tell very easily **exactly** which parts of the field are affected.

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[2]The reader should note that the original use of this analogy is in fact more complex. Should the reader wish to pursue the analogy, it can be found in Buffery and Burton (1982) and Wilson (1988) who suggested it in a different, but related, context.

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Experiments with monkeys: Our second example, of at least **trying** to rehabilitate, is of a few monkeys who had holes in their visual field (scotomata). When food pellets and other objects were placed in positions on the table corresponding to the holes in their visual field, the monkeys did not notice them. The accepted opinion is that there would be no point in trying to train the monkey to see the food pellets. Instead, in this view, it would be better to place the food pellets in positions which could be seen (that is *compensating*).

However the experimenter decided to try to train the monkeys to see in these 'blind spots'. Nothing special was done in the training. A great deal of time was spent in rewarding the monkey for 'looking' at the right area. Eventually the monkeys were found to act as if they could indeed see in those previously 'blind spots'. And when the brains of the monkeys were cut up (much later!) it was found that the scotoma was greatly reduced.

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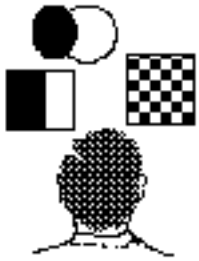
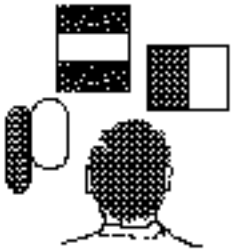
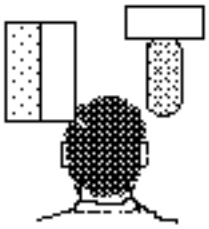
SECTION 14
LEARNER'S RESPONSES TO CONTRAST



HIGH CONTRAST



MEDIUM CONTRAST



LOW CONTRAST

Learner's Responses

Contrast Differences	*Constantly*	*Occasionally*	*Never*
HIGH CONTRAST			
MEDIUM CONTRAST			
LOW CONTRAST			

Note here combinations of colours which are perceived more easily.

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[2]**Useful software**: There is a variety of useful software which can be used to enhance contrast. A number of commercial programs provide the same facility. In the UK, NCET produces a series of Briefing Sheets, one of which is dedicated to visual impairment. These are distributed through Northwest SEMERC (address in Appendix II).

One program which is especially good because of its interactive component is Kid Pix, a drawing program produced for the Apple Macintosh. It does all sorts of fun things like producing sounds as the user draws pictures. Its interactive nature allows learners to design their own colour combinations. (See Appendix II for further details).

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[3]**Further Reading on Eye Coding: Nolan C** (1987; play,1989) Under the Eye of the Clock. Pan.

[4]**Further Reading on Generalisation: Bower TGR & Wishart JG** (1972) Stages in the development of the object concept. Cognition 1(1).

[5]**See Appendix II** for information on obtaining software for use in enhancing contrast.

Colour perception: If the learner can track objects (Section 12) and you would like to improve your knowledge about his perception of colour, you might want to try this technique. Present a ball of one colour and roll it back and forth. If he follows the movement consistently, then roll it from side to side through a tunnel (or behind a screen) to emerge at the other side. If he follows the ball and then becomes disinterested, have a different coloured ball emerge. If surprise is registered, you then know he can perceive the difference between these two colours.

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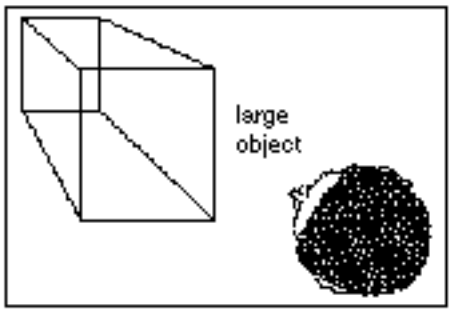
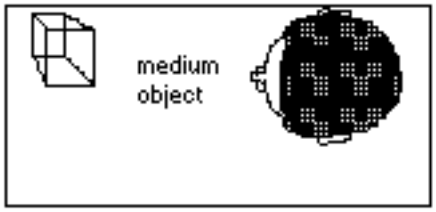
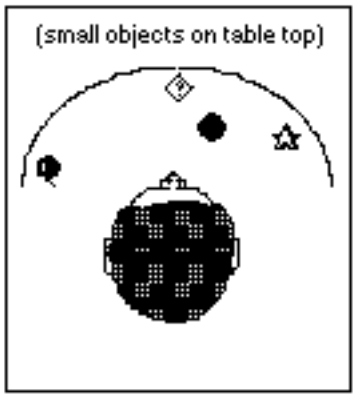
SECTION 15

RESPONSES TO SIZE DIFFERENCES







Learner's Responses

Object size	*Consistently*	*Occasionally*	*Never*
Large:			
Medium:			
Small:			

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SECTION 16
VISUAL RESPONSES TO PEOPLE

	Consistently	*Occasionally*	*Never*
Learner looks at people's hairlines	☐	☐	☐
Learner looks at faces ONLY when people wearing glasses	☐	☐	☐
Learner makes eye contact	☐	☐	☐
Learner recognises people's faces	☐	☐	☐

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[1]**Autistic features:** cross-cultural comparisons. The reader should be aware that there are potential misunderstandings in the use of the term autism. Principally this is due to different criteria being set in different countries. Therefore one would not be comparing like with like.

Bearing this point in mind you may find it helpful to browse through a book by Nielsen L (1990) Are You Blind? Promotion of the development of children who are especially developmentally threatened. Sikon, Denmark.

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[2]**Ellis H D et al** (1988) Karen and George: face recognition by visually impaired children. British Journal of Visual Impairment. VI (3): 95-98.

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SECTION 17
LEARNER'S MOBILITY

Unaided Mobility
(eg; walking, crawling, shuffling)

	Consistently	*Occasionally*	*Never*
Objects avoided at:			
- waist height:			
- to one side:			
- below knee height:			
Negotiates steps/stairs easily:			
Mobility better in good light:			
Aided mobility (wheelchair controlled by self)			
Obstacles avoided:			
Mobility better in good light:			

	Consistently	*Occasionally*	*Never*
Goes to preferred places:			
Avoids places disliked and hazards:			

NB To score Consistently you must be certain that the learner does as well in unfamiliar Settings as in those that are familiar.
If you are not sure of this, score Occasionally

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[1]**Further Reading**: Each of the techniques mentioned in the accompanying text has a slightly different emphasis.

Intensive Interaction (or Intensive Education) both rely on active participation of the learner. *Aromatherapy and Massage Therapy* make use of Smell and Touch (discussed in more detail in Sections 6 and 5, respectively). *Snoezelen* makes use of a specialised environment and is discussed further in Chapter 6. *Movement Therapy* focusses on the learner's movements, and may be used by itself or in conjunction with..... *Music Therapy* which relies on the use of musical patterns (not necessarily requiring hearing). *Facilitative Play or Child-Oriented* play is geared towards the learner who, in our scheme of things, is at least functioning at *Localising*.

Three fundamental components are (or should be) common to all of the above:-

- Wait for the child to initiate.
- Interpret the behaviour as meaningful - value the learner.
- Respond to the behaviour in a manner that is communicative.

There are many other formal techniques, detailed discussion and comparison of which are beyond the scope of this book.

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[2]**Further Reading: Douglas J & Ryan M** (1987) A preschool severely disabled boy and his powered wheelchair: a case study. Child: care, health and development 13:303-309.

Nisbet P (1989) The Smart Wheelchair. In Korba LW (ed.) International Inventory of Robotics Projects in the Health care Field. National Research Council Canada.

Paulsson K & Christofferson M (1986) Psychosocial aspects of technical aids: how does independent mobility affect the psychosocial and development of children with physical disabilities? RESNA 27.

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The power of mobility A few years ago one of the authors was asked to assess the vision of an 8 year old boy who also had severe cerebral palsy. There was uncertainty as to his level of cognitive ability. The most puzzling thing was that he spent a great deal of time with his head at an angle of 90 degrees. There was speculation that his visual impairment caused the world to appear at an angle. Therefore it was thought he needed to turn his head in order to see the world at the correct angle.

Time passed. Much later colleagues involved in developing a Smart Wheelchair (see above) reported on one learner who was participating in their research. Before being seated in the wheelchair, they reported, his head had been at an unusual angle. It was the same young man. As soon as he was able to control the wheelchair himself he showed great facility for negotiating his surroundings: shooting off to rooms of his choice, deliberately bumping into people, demonstrating good understanding of direction and all the time with his head in a 'normal' position. Before having access to independent mobility through the electric wheelchair he may simply have been bored!

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[3]**Further Reading: Douglas J & Ryan M** (ibid.)

[4]**Further Reading**: **Thomas M** (1991) Vision, motivation and movement. Focus 3:12-15.

Mobility poorer in dim light? You will have noticed that one of the items in the checklist referred to mobility in dim light. If you found mobility to be poorer in dim light than in good light, you may wish to explore further the possible reason.

There is no hard and fast rule as to what is meant by dim versus good light. "Dim" does not mean "dark" - we all experience poorer mobility in a dark room! It is more of a qualitative judgment. If you and others get around easily in dim light but the learner's mobility is quite different from that in good light, there may be several reasons. If this has suddenly occurred you should investigate further.

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[1]You may be questioning why we have excluded the senses of smell and taste at this point. We do believe both to be very useful routes for implementing suggestions for curricular development.

However, neither of these senses has the capacity to merit influencing the selection of the appropriate 'level' for intervention.

You may well recall Figure 2.1. which indicates how little information about the world smell and taste can convey.

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Technical point

For those who find different 'levels' for different senses, you will probably be wanting to know our defence. For if this discrepancy occurs doesn't this indicate that the model presented in Chapter 3 is faulty? We can see several possible reasons for this emerging.

- the first possible reason for the discrepancy is that our model is indeed wrong. We would not be overly worried about this, as we are not especially interested in protecting a position or ideology. If indeed this were the case and it were to lead to a more powerful way of handling the kind of problems we outlined in Chapter 3, we would be very pleased to apply the new model.
- another possible reason for this discrepancy is one we also highlighted earlier (see Chapter 3). For rather than a continuity of intelligences there may well be a discontinuity. The example we gave in Chapter 3 was that of a stroke victim. With intact hearing, touch and other abilities, many people who have a stroke may simultaneously have visual, speech or other difficulties.

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[1]This Appendix is based heavily on joint seminar work carried out by Sally Millar, Paul Nisbet and Stuart Aitken; CALL Centre; University of Edinburgh; 4 Buccleuch Place; Edinburgh. The text is reproduced with their permission.

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[1] In this section, we would like to acknowledge the help of Laura Pease, Whitefield School, London for several useful suggestions.

Further Reading: Bickerstaffe A (1987) A new approach to special care. In Talking Sense 33(1):6-7. Some useful information on using a variety of technology.

Closing the Gap Closing the Gap, Inc.; PO Box 68; Henderson; Minnesota 56044; USA. A bi-monthly publication on the use of microcomputer technology in special education and rehabilitation. Information relevant mostly to U.S.A.

Contact (1991) Moray House Publishers, Edinburgh. 8 module package for training those working the field of dual sensory impairment. Although geared to dual sensory impairment much of the material is relevant to multiple disability.

Odor JP (1986) Judging Mr. Chips.

R.C.E.V.H. Occasional pamphlets on use of technology. See under Research Centre for Education of Visually Handicapped.

Touch Screen Software ACE Centre (see below).

Commercial Sources: Brilliant Computing; PO Box 14; Bradford; BD9 5NF. A comprehensive range of software and interfaces.

Non-commercial: Ace Centre; Ormerod School; Waynflete Road; Headington; Oxford OX3 8DD. Blue File Software is freely copiable programs (at cost of production). A wide range of useful programs originally developed by those involved in the Micro-electronics Education Programme (1981-86) developed for special needs pupils. These are constantly updated and titles for Archimedes machines were introduced in 1990. Briefing sheets are produced on a variety of topics in Special Education (see NCET).

CALL Centre; Department of Education; University of Edinburgh; 4 Buccleuch Place; Edinburgh EH8 9LW. Sometime home of Stuart Aitken who co-wrote this book.

National Access Centre; Hereward College; Bramston Crescent; Tile Hill Lane, Tile Hill; Coventry; CV5 9SW. Federation of ACCESS Centres. Contact for one nearest you.

National Council for Educational Technology; National Council for Educational; Technology Unit 6; Science Park; University of Warwick; Coventry CV4 7EZ. Produce a number of publications including a substantial RESOURCES catalogue, a regular bulletin called Special Update, an information summary "Supporting Children with Special Needs" and a set of Briefing Sheets for teachers.

NW SEMERC; Fitton Hill CDC; Rosary Road; Oldham OL8 2QE. Distribute Blue File software on behalf of NCET. Have published a number of documents of practical use to classroom teachers, and produce a regular newsletter called COPY. Co -publish useful information sheets with NCET. Distribute Green File software nationally (i.e. all Apple's public domain software). Distribute the CALL Resource. Write for order form/publications list..

Research Centre for the Education of Visually Handicapped; Department of Special Education; University of Birmingham; Edgbaston; Birmingham. They have been instrumental in developing and distributing information packs and software for use with the visually disabled.

Scottish Sensory Centre (previously Visual Impairment Centre; Moray House Institute; Holyrood Rd.; Edinburgh. Collators and distributors of V.I.S. involved in Raised Diagrams projects. Home of Marianna Buultjens who co-wrote this book.

Visual Impairment Service (V.I.S.) - see Glossary for description. Address:- Moray House Institute; Holyrood Road; Edinburgh.

Royal National Institute for the Blind; 224 Great Portland Street; London W1N 6AA.

International: TRACE Centre; S-151 Waisman Center; 1500 Highland Avenue; Madison; Wisconsin 53705-2280; USA.

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Colorado Easter Seal Society; Colorado; USA.

[1]**Face validity** refers to what a test superficially appears to measure.

[2]**Criterion validity** indicates the effectiveness of a test in predicting behaviour in certain situations. In-depth discussion of these and related topics is beyond the scope of this book.

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