the SEN series

Visual Needs

OLGA MILLER and ADAM OCKELFORD

continuum

Contents

Acknowledgements vii

Introduction 1

Part One: Understanding the World – The Senses

1 The Mysterious Case of Vision 9
Functional vision 9
Early vision 16
Assessment of vision 19
Testing children's vision 22
Contrast sensitivity 26
Colour vision 27
Visual field 27
Depth perception or three-dimensional vision (stereopsis) 28
Visual problems in childhood 29
Causes of visual impairment 37
Who's Who in vision health and care 45
Summary 47

2 Sound Track 49
Introduction 49
The development of hearing 50
The three functions of sound 53
Strategies for minimizing the impact of visual impairment on processing sound 57
Summary 71

2

Sound Track

Introduction

For children growing up with little or no vision, hearing can assume a greater-than-usual importance in the way that they perceive, understand and engage with the world and, crucially, in the way that they interrelate with other people. Indeed, from an adult perspective, many blind and partially sighted people themselves recognize the central function that hearing has played and continues to play in their lives (Goldstein 1999). However, it is not the case that hearing merely substitutes seeing as a source of information about what is going on and the nature and whereabouts of people and objects in the immediate environment. Most of us interpret our surroundings through a synthesis of sensory information in which vision takes the lead, coordinating and making sense of other input. Hence, supporting children with visual impairment in the development of their listening skills is at once important and challenging.

With this in mind, we will consider how hearing typically develops, as well as the likely impact of visual loss on that development. We will discuss strategies for encouraging the functionality of hearing to evolve,

and how these may support areas of cognitive development that visual loss can potentially impede. Most importantly, we will suggest ways in which sound, and in particular music, can be a source of pleasure and sheer fun to children – unique in its capacity for enhancing the quality of life.

The development of hearing

Hearing starts to develop early on – typically, four to three months before birth – and by the time they are born, babies are likely to be particularly sensitive to sounds with which they have become familiar in the womb, and prefer them to others: their mother's voice, for example, the language she speaks and pieces of music to which she has had significant exposure (Lecanuet 1996). The structures of the inner ear appear to be mature at birth, and the abilities of infants to perceive pitch (the 'high' or 'low' of sound), timbre (its 'tone colour') and loudness are similar to those of adults – better, in fact, at high frequencies (Fassbender 1996). So, while there is a gradual improvement in auditory sensitivity until the age of ten, what really matters for parents and carers of blind and partially sighted children whose hearing is not severely impaired is the *functional* development of sound processing. What is the significance of particular sounds: what do they mean and how do they affect the child concerned?

William Gaver (1993) suggests that there are essentially two ways in which we hear sounds: through 'musical listening', which focuses on *perceptual qualities* such as pitch and loudness, and via 'everyday listening' which is concerned with attending to *events*

such as a dog barking or a car driving by. To these two categories we should add the perception and cognition of speech sounds which, research indicates, are processed through dedicated neurological pathways (Thurman and Welch 2000). This means that, in Western cultures at least, sound fulfils three main functions which, we may assume, become gradually more delineated during the early years until, by school age, they are readily distinguishable. This thinking is illustrated in Figure 5 on page 52.

Of course, in real life, things are not as neat and tidy as this, and the three types of sound function may well be mixed up together: think of a child in a supermarket, for example, who is being assailed simultaneously by background music (ultimately intended to encourage shoppers to spend more), her father discussing the price of baked beans with a friend and the clatter of tins on the shelf. Then, two sound functions may consciously be combined, as in songs (the fusion of music and speech), or a single sound may serve a dual or even triple function, as is the case with clock chimes (comprising musical, everyday sounds which also convey symbolic meaning).

Amazingly, learning to make sense of all these different types of auditory input – developing different ways of processing sounds according to their context and function – usually occurs without specially thought-through intervention on the part of parents or carers. However, as we shall see, much of the information that assists a child initially to distinguish the different functions that sound can fulfil, and making sense of each, comes through vision. Hence there is a danger that infants with severe visual impairment, particularly

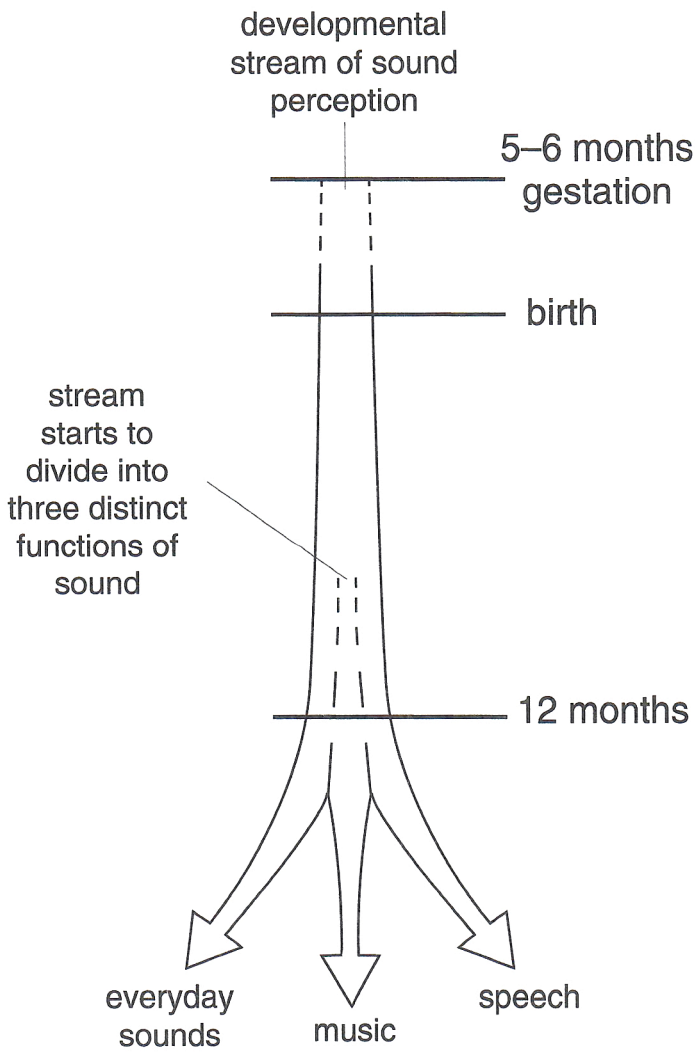

Figure 5. The development of functional sound processing in the early years

those with learning difficulties, may take longer to make sense of things in auditory terms, and that much of the world around will remain a confusing place for them well into childhood and beyond. But there is a lot that can be done in order to mitigate this risk, and as a first step it will be helpful to know more about the differences in the way that the brain handles everyday sounds, speech and music.

The three functions of sound

Everyday sounds

Just by watching, children normally learn that one set of sounds in the environment is variously connected with particular things, events, places or people. These sounds derive from the physical world through contingent or causal relationships: for example, the door closing makes a distinct 'click' (or occasionally more of a bang!), the vacuum cleaner produces a loud, continuous hum, and a range of fascinating sounds emanate from the family car. Once the connection between sound and object is known, the former can be used to identify the latter. So a child will recognize the vacuum cleaner being operated in the next room, for example, without needing to see it.

Speech

Similarly, spoken words can be indicative of things, events, places and people, but they can also represent abstract concepts such as feelings. This is because the sounds that make up words are typically linked to their

referent only through association – and so quite arbitrarily – having no particular auditory connection with that which is represented. Hence the very different sound-patterns 'bird', *oiseau*, *Vogel* and *uccello*, for instance, can all mean the same thing in English, French, German and Italian respectively. Again, at first, the necessary associative links are typically learnt through simultaneous exposure in the visual and auditory domains – by seeing something and hearing someone making a distinct utterance that refers to it at the same time.

For sure, the power and subtlety of mature human language means that, for the growing infant, things soon get a lot more complicated than this. Some parts of speech that are needed to qualify concepts or describe the relationships between them do not correspond to anything tangible in the physical world. (For example, as I write this, my two year old and another child are playing in the sandpit, wrestling over a bucket and spade, both shouting 'mine!', and each entirely clear about what the other means.) Furthermore, a great deal of language (and the thinking that it represents) is reliant on metaphor, whereby one thing is conceived in terms of another (Fauconnier 1994). Nonetheless, for most children, seeing in everyday situations catalyses the development of language: it provides the subject of shared attention, giving a reason to attend to what people are saying (and, in turn, to speak). Seeing, too, is essential to making sense of what is heard: speech is meaningful and relevant to children since it relates to entities and events that they have observed in the real world, and the relationships that they have inferred between them.

The *emotional* content of vocal communication, however, appears to be less reliant on vision. For example, one study found that primary-aged schoolchildren, blind since birth, were just as accurate as their fully sighted counterparts at recognizing vocally expressed emotion (Minter, Hobson and Pring 1991). Similarly, at a later stage in development, the *aesthetic* aspect of spoken language, including the sounding qualities of words and their juxtaposition (expressed, for example, through rhyme and alliteration) are learnt and appreciated without the need for visual input.

Music

Music, in pure form (without accompanying words or actions), engages the most abstract of the three streams of auditory function. Indeed, music's place in early human survival is a matter of some contention; its evolutionary purpose remains unclear (Cross 2003). Unlike everyday sounds, music does not derive its meaning from direct links with the environment, and, unlike speech, it does not rely on connections made through association. So how and what does it communicate?

Since music need not refer to anything beyond itself, its architecture is necessarily 'self-referencing', whereby its constituent sounds are felt (usually non-consciously) to derive from one another – or, conversely, to generate each other – through imitation. As a piece unfolds in time, its sounds appear to copy some of those that precede, and it is this repetition that brings a sense of order to music, that makes it coherent to listeners (Ockelford 2004a). Generally speaking,

the greater the degree of replication, the more immediate the comprehensibility. So pop songs, for example, which are engineered to be assimilated by their listeners straight away, are replete with material that is heard over and over again: just consider how often the main theme – the 'hook' – of a song is heard in its three or four minutes of playing time. Whatever the style involved, the intrinsically imitative nature of music means that to make sense of it in structural terms, which is dependent on our capacity to process abstract patterns of sound, vision is not needed at all.

But what of musical enjoyment? Like speech, music has an affective component, and it is this that most people find attractive: it is not our ability to recognize the internal logic of musical structures that sells CDs and downloads in their millions each week, but music's power to engage listeners on an emotional level. Whether a piece makes them happy or sad, dreamy or aroused, people enjoy being moved by abstract patterns of sound. How does this work, and what part does vision typically play? There are a number of theories of how music conveys emotion (Juslin and Sloboda 2001). My own model (Ockelford 2004b) builds on the intuition that all musical sounds and the relationships between them potentially bear affect, a characteristic that appears to arise from two sources. One is the capacity of the general features of sound (high/low, loud/soft, quick/slow, and so on) to induce emotion, which may ultimately stem from features of maternal vocalization (Malloch 1999/2000). The other is the music-specific qualities of the sounds that are used in most genres, which are similarly capable of inducing a consistent emotional response, within and sometimes

between cultures (Scherer, Banse and Wallbott 2001). For example, in the Western tradition of the last four centuries or so, the 'major' key is often associated with happiness (as in the familiar wedding march by Mendelssohn, for instance) and the 'minor' key with sadness (as in the well-known funeral march by Chopin). But how are these capacities of sound manipulated to ensure that music offers a unified and coherent aesthetic experience over time? Just as one feature of a piece is felt to derive structurally from another through imitation, so too are their related affective responses and, since the discrete emotional impacts of successive notes, chords and themes are linked through a sense of derivation (whereby the response to one sound is felt to generate another or others), a kind of abstract narrative is built up over time – rather like a story that is devoid of concrete meaning. For sure, this intrinsically musical response may be linked, directly or indirectly, with other sensory information. But, to the extent that music is the art of combining sounds for their own sake, it requires no visual input. Hence it is unique among the three functions of sound identified above.

Strategies for minimizing the impact of visual impairment on processing sound

Everyday sounds

There are a number of ways in which vision typically informs, coordinates and even directs the perception of everyday sounds. From early in post-natal development, for example, sight makes the link between

much auditory information and its sources or causes in the physical environment. Vision answers key questions such as 'who or what is making that noise?', 'how?' and 'where is it coming from?'. Most everyday situations are characterized by several sounds jostling for attention at the same time, and since we cannot concentrate on them all, prioritization is necessary. Often, without our being aware of it, our hearing is directed to our primary visual interest of the moment, with other auditory input automatically suppressed to avoid cognitive overload. This means that the principal sound to which we are attending is made to seem louder than the others around. We will even ascribe a sound to a visual image when its source is actually elsewhere (particularly noticeable in the cinema, for example). Above all, seeing something or someone can provide the motivation to listen. It may be, for example, a mother's face in close proximity to her baby that directs his attention to her voice, a reverberating cymbal glistening in the light that attunes a child's ears to its shimmering sound, or a toy steam train racing around the track whose electronic chuffing fires the aural imagination of its young owner. In each case, visual images stimulate and sustain attention to sound.

So what can be done to support babies and young children who are blind or partially sighted in developing their listening skills? The very first thing to offer them is your own voice. There is nothing more appealing to babies' ears, and instinctively parents and carers adjust their vocal production to suit their children's still-evolving auditory senses, using a higher pitch-range than normal, for instance, and employing a sing-song

style of speech in which expressive contours are exaggerated and words are articulated slowly, repeated often and combined with other non-speech sounds. When interacting with a child who is visually impaired, aim to capture these intuitive approaches, exploit them and expand upon them. Use vocalization to substitute for the visual reassurance a baby would otherwise have through seeing you without the need for constant physical contact (Sonksen and Stiff 1999).

> Three-month-old baby Amelia has no sight, and her mother Jayne uses her voice in a number of ways to compensate for their lack of visual contact. For example, she tells Amelia when she is about to touch her or pick her up by talking to her gently and telling her what she is going to do. Although Amelia does not understand the words, she is comforted by the reassuring tone of her mother's familiar voice and anticipates that something is about to happen. Jayne also provides an unobtrusive commentary for Amelia as she changes her, bathes her and feeds her, explaining in a natural way what she is doing. Amelia loves this continuous auditory contact – it helps her feel safe and secure – and she coos happily in response. When Jayne cuddles Amelia she sings to her, often using the tunes of nursery rhymes but personalizing the words. Amelia can feel Jayne's breath on her face, hear her voice and feel it resonating through her body as her mother holds her close. She lies quite still in rapt attention: Jayne knows that she is listening and gives her a loving squeeze.

From this restricted, intimate world, parents and carers should seek to broaden children's aural horizons without overextending them, weaning them gradually

onto a rich and varied diet of auditory experiences. Parents can start with their own interests and consider whether their child would benefit from sharing in them. Maybe he or she would relish the roar of the crowd at a football match, for instance, the sound of birds in full song, the crash of waves on the beach or the revving of engines at a car rally (Harrison and Crow 1993). In addition, as we shall see, music, the art of organized sound, can play an especially important part in the development of listening skills. Whatever the nature of the sounds concerned, try to encounter the world anew through the ears of the child, being imaginative but systematic in your choice of stimuli and noting particularly those things that cause excitement or give pleasure. Think too about the environments in which sounds are heard: some children love to explore places that echo (caves and large buildings, for example), while others may be intrigued by the way that their voice seems to disappear into nothing at the top of a hill. Children need to learn that the same people or things can sound very different depending on the acoustic qualities of the surroundings in which they are heard (Zimmermann 1997), rather as an object changes in appearance according to the light in which it is seen.

Virtually all objects and events have multisensory potential, and, if it is feasible, support children in experiencing them holistically, using any vision they may have, as well as hearing, touch, smell and taste (Lowenfeld 1974). Encourage them not just to listen to things passively, but to engage with them functionally wherever possible. Young children may be interested in helping to load the washing machine, for

example, assist in adding the detergent, close the door with a click, press the right buttons, listen to the rush of water entering and then feel (as well as hear) the vibrations as the cycle progresses. In this way, the fragmented auditory experiences that vision usually integrates can be brought together to form coherent concepts. Gradually, the children will learn what things make which sounds and how. They will come to realize that sound can be a useful indicator of cause and effect.

Bear in mind, though, that vision is often useful in enabling people to predict the sounds that are about to occur (seeing a stick raised above a drum, for example), and, almost inevitably, children with visual impairments will be startled by the unexpected more often than their fully sighted peers. Wherever possible, warn them when sudden sounds are likely, and introduce them to especially noisy environments with care. If possible, let *them* make the sounds first (banging the drum, for example) so that they become accustomed to what is going on in situations where they have control. Over time, through being introduced to a wide range of listening experiences, children with little or no sight may come to tolerate, and hopefully enjoy, an increasing range of noisy sounds. Indeed, sounds of all types may become the principal means of establishing and maintaining their attention.

As well as learning about the real world in day-to-day situations with the help of empathetic adults selecting sounds for them that are salient, blind or partially sighted youngsters may need special opportunities for developing their listening skills in an environment which is devoid of 'auditory clutter' – a small, quiet room, for

example, with minimal extraneous noise (Best 1992). Here, it will be easier for children to focus on interacting with just one or two adults, perhaps with some especially chosen objects, to explore their sound-making and other properties thoroughly, and, through sound, to learn to locate them in relation to their own bodies and other sound-makers (Warren 1984). Everyday items have as much potential interest as any others, and in the early stages of development may include, for example, crinkly paper, rattly containers, pots and pans, lengths of chain, and trays of pebbles and shells. Suspending some objects will make them more resonant and easier to relocate once they have been initially explored and discarded. To maximize the effectiveness of learning, the golden rule is to ensure that activities are fun! And it is vital to give young children the space and time to allow them to initiate their own play and to make their own discoveries. Particularly for those who cannot see at all, it is important to strike an appropriate balance between guided activity and self-directed exploration (Nielsen 1992).

Once the development of everyday auditory perception is underway, it can be used to support other areas of learning and a child's evolving independence. For instance, young people's mobility and orientation skills will advance through their increasing ability to derive information from sounds in and the acoustic properties of different environments. Congenitally blind children in particular may develop the skill of 'echolocation', whereby the distances to objects and, to some extent, their physical properties are ascertained by the way sounds reflect off them. Quite intuitively, some children may use vocalizations such as 'clicks' and other

sounds to gauge something of the nature of their immediate environment.

Language

Just as the knowledge and understanding of many everyday concepts are usually acquired through vision, so (as we noted above) is the language associated with them. Therefore it is important for parents and carers to ensure that they use sufficient and appropriate language to label, describe and explain to blind and partially sighted children what is around them and what is going on. Similarly, a reasonable proportion of everyday conversation should pertain to things that the children have either encountered directly or can extrapolate from first-hand experience (Webster and Roe 1998).

> Aaron is 4, and does not have enough sight to see images on television or pictures in books. In his reception class, the children are finding out about animals and the countryside, and the teacher is holding up a poster of a fox and discussing this with the group. The teacher knows that Aaron's family have a pet dog, and, by using descriptive language carefully to draw a comparison between this and the fox, Aaron's teacher ensures that he gains a good initial idea of what foxes are like. Later, this information will be reinforced by a visit to a local natural history museum, when Aaron will be able to feel a stuffed fox for himself.

There is some debate as to whether a stream of language accompanying activities may interfere with

children's learning, in the belief that it may be difficult for them to focus on linguistic and sensory input at the same time. Clearly, a judgement needs to be made on the part of the adult who is guiding or facilitating things: while it is important not to overwhelm children with excessive description or instruction, neither should they be left in a communicative vacuum (see the case of Amelia above), and both language-assisted and language-free modes of learning may be important at different times. Similarly, the view has been expressed that one should avoid making reference to concepts that a child has not experienced or may not be able to sense directly, such as colour. This is generally felt to be an unnecessary and unhelpful restriction, however: after all, the language to which every young person is typically exposed contains information which he or she only imperfectly understands. The important thing, particularly for children with no sight, is not to *assume* comprehension on their part, and to ensure that they have plenty of opportunities to test and if necessary improve their developing conceptual and linguistic competence.

If insufficient connections are forged between language and the world it is intended to represent, then children's linguistic development may be adversely affected (Wills 1978). Characteristics of speech that have been observed to be unusually prominent in blind children include the confusion of pronouns, 'verbalism' (using words without understanding what they mean) and 'echolalia' (the apparently senseless repetition of words or phrases) (Andersen, Dunlea and Kekelis 1984). Various theories of echolalia have been

advanced (for example, Fraiberg 1977). In terms of the three-strand model of functional hearing set out above, echolalia can be interpreted as the transfer of music-structural techniques (the repetition of sounds or qualities of sound) to the verbal domain, whereby the sounding qualities of words are treated as abstract properties to be manipulated free of any semantic ties. In fact, as we shall see, music can be a powerful tool in promoting the development of language, and, ironically, the very repetition that underpins echolalia can be used in musical contexts to help children move beyond it.

Music

As well as being a source of pleasure in its own right, exposure to music – the art of organized sound – can assist in developing a number of aspects of listening skills, depending on the type of music involved (Ockelford 1998). So, from the earliest stages, consider introducing children to pieces in a variety of styles. There are a great number of possibilities: from fugues to folksongs, for example, from symphonies to spirituals, and ragtime to rap, involving acoustic and electronic instruments ranging from the piano to the panpipes, the drum kit to the didgeridoo, and the gamelan to the electric guitar. Live performances may well have a greater impact than recordings: being near a band, orchestra, choir or solo performer in full flow can be electrifying.

It has been suggested that congenitally blind children in particular may have an unusual propensity to develop an interest in music and, as a consequence, to

develop exceptional musical abilities. For example, among a group of 50 children blind since birth or shortly afterwards who attended a special school in London in the 1980s, 20 (40 per cent) had 'perfect pitch', the very unusual ability to recognize or produce notes in isolation that normally occurs in around one in 10,000 of the population (Ockelford 1988). Moreover, around half these children had learning difficulties in addition to their visual impairment, and three were classified as 'musical savants' (people with exceptional musical talent in the context of learning difficulties) (Ockelford 2000b). The most prevalent eye conditions of those with perfect pitch were retinopathy of prematurity, Leber's amaurosis and septo-optic dysplasia. Hence, parents of children with these conditions, in particular, may wish to be alert to the possibility of the development of unusual sound-processing abilities in a musical context. Remember, though, that such abilities may, but need not, be part of a more generally evolving musicality.

David was born three-and-a-half months premature, and, in the course of the intensive efforts to keep him alive that followed, his retinas were irreparably damaged, leaving him only with the perception of light in one eye. During the first two years of life, it also became clear that David had global developmental delay, with severe learning difficulties and problems in processing language. However, he showed a consistently strong interest in music, listening intently and with unfailing concentration whenever a CD was played, for example. Then, when he was 30 months, his mother and father noticed something remarkable: David started to pick out tunes on his little

keyboard they had bought him, and that he had been exploring entirely on his own since he was about one-and-a-half. Through a support group, David's parents made contact with a teacher who specialized in working with children with special abilities and needs, and she devised a programme for David that both promoted the development of his musical talents as well as using music to support his emerging cognitive, linguistic and social skills. To this day, music remains a central feature of David's life: now in his mid-twenties, playing the piano brings him immense personal satisfaction as well as providing a vehicle for socialising with a wide range of other people.

Blind and partially sighted children may take part in music-making of any type and at any level, and parents and teachers are referred to other publications for detailed accounts of the acquisition of vocal and instrumental technique with little or no sight, specialized notation in large print or braille, learning by ear and approaches to playing in groups (Ockelford 1996a). Here, we consider how music-listening skills can be used to promote other areas of development: movement, learning, language, and socialization (Ockelford 2000a).

From around the age of 6 months, babies will typically move spontaneously to music (Moog 1976). Later, the movements that children make in response to pieces may be freely expressive, or characteristics of the music they are listening to may determine, more or less specifically, the actions that accompany it. Hence music can provide an auditory frame of reference for movement, something that may be particularly

significant for those who have no visual model to guide them, or to clarify what may be a confusing picture of events for others who have little sight. The strongest link between music and movement is to be found in rhythm, which sets the pace for action, although other connections are possible too. For example, loud sounds may be associated with large movements and quiet sounds with small ones. A rise in pitch is widely considered to correspond to movement in an upward direction, and vice versa. While this correspondence is generally conveyed through the more or less conscious efforts of teachers and others, there is some evidence that it also occurs as a natural part of the way thinking develops in blind and sighted children alike (Welch 1991).

Music can promote wider learning in a number of ways. For example, purposefully listening to pieces engages concentration and memory, and such engagement may transfer to other areas of experience, particularly those that also involve listening (Bunt 1994). Other concepts may be extracted from the experience of music too, such as the opposing notions of 'quiet' and 'loud', 'slowly' and 'quickly', and 'the same' and 'different'. Objects may be identified through their sound-making qualities and classified accordingly. For instance, children may be encouraged to contrast the ringing, bell-like sounds of metal with the more mellow resonance of wood, and to sort items on this basis. Conversely, supplementary auditory information may be incorporated more or less permanently into the environment. A room may be identified through a distinctive set of wind-chimes suspended in the doorway, for instance. Finally, note that all pieces of music and

musical instruments are ultimately products of the society in which they originated, and offer a rich source of cultural information for children who are blind or partially sighted.

Music and words are closely linked products of the human psyche, enjoying a special relationship that from time immemorial has found expression in songs and chants. This affinity can be particularly useful in promoting the development of language in visually impaired children. From the earliest stages, for example, exposure to music may elicit vocalization (Moog 1976), and those working with youngsters who have special needs may exploit this tendency to promote the production and control of vocal sounds. Later, music can play a significant role in motivating children to use language, through the many songs that have been especially written or have evolved over the years for their edification and pleasure. Whether nursery rhymes or counting songs, playground chants or action songs, game songs or songs that tell a story, music adds another dimension to the verbal messages presented, enlivening everyday expressions and imbuing them with extra colour and interest. Music can also assist in structuring language. This may be particularly important for children who are blind or partially sighted and have learning difficulties, who may have to contend with a baffling array of different words and phrases for concepts that in any case they only imperfectly understand. Yet what children seeking order and regularity need most is simplicity and consistency. Here, music can help. By setting selected phrases to characteristic snatches of melody, reinforced where appropriate with other augmentative communication

such as signing and objects of reference, the consistent delivery of key messages is assured (Ockelford 1996b). That is not to say that carefully structured musical fragments should be all that is communicated, but that they should form salient features in a rich and diverse landscape of multisensory interaction. By allocating important words and phrases short tunes of their own, one form of complex auditory input (speech) is supplemented with a simpler overlay (melody). The message is given a stronger identity, which is consequently more memorable, and which blind and partially sighted children with learning difficulties may find easier to recognize.

Music sessions offer a unique and secure framework through which many of the skills and disciplines of social interaction can be experienced and developed. This is particularly true for youngsters who are visually impaired, whose awareness of other people may be more than usually reliant on the sounds they make. Teachers, therapists and carers may provide structured opportunities for children to listen to the sounds that others are making, in a variety of contexts, and to respond appropriately to them. Music can be particularly effective in supporting the development of early social interaction. It is, as we have noted, highly repetitive (Ockelford 2004a): pieces are generally made up of sequences of identical or similar events, which divide time into manageable chunks, and constitute predictable patterns. Hence, it provides a secure framework for the risky business of reaching out into the far from predictable world of other people, setting parameters and establishing the boundaries within which socialization can occur, and building confidence

through a medium which the great majority of children find enjoyable and motivating. Finally, it is worth remembering that musical activities give young people who are visually impaired the opportunity for experiencing a wide range of social situations. Music-making takes place indoors and outdoors, in concert halls and sitting rooms, with small groups of friends and among thousands of strangers. Each has its own sense of occasion and atmosphere. The key thing is for teachers and carers to find ways of offering visually impaired children fulfilling musical experiences: experiences which typically occur in the company of other people. Finally, remember that familiar music may offer individual emotional security too. A favourite tape at bedtime, for example, may comfort children who cannot see, in the same way that their fully sighted friends are reassured by glancing at well-known objects as they prepare to sleep: the gently repeating patterns of notes soothing the ear in the same way that the sleepy eye is calmed by tracing familiar images on the wallpaper.

Summary

For people with little or no sight, hearing assumes a greater importance than would otherwise be the case. However, visual impairment does not automatically lead to the development of superior hearing skills, and there are a number of strategies that parents and carers can use to support blind and partially sighted children in learning to use their hearing to best effect. Those offering such support should bear in mind that sound fulfils three distinct functions, in

- everyday life
- speech, and
- music

which are processed in different ways. Children usually rely on vision as they learn to make sense of everyday sounds and speech, and sometimes, particularly if they have learning difficulties in addition to a visual impairment, the different strands of auditory development can become confused. For example, if children do not understand what words mean (or that they mean anything), they may treat them rather like the abstract sounds of music, and combine them using music-structural principles – particularly repetition – rather then linking them syntactically to form linguistically coherent utterances. There is much that can be done to assist children in this position, though, and music itself is one of the main tools available to parents and carers. It provides a predictable (and therefore safe) context for communication, ensures consistency in verbal exchanges, potentially offers alternative neurological pathways for the processing of language, and, above all, can be a great source of pleasure and motivation.