

# Focus on Music

**Exploring the musical  
interests and abilities of blind  
and partially-sighted children  
and young people with  
septo-optic dysplasia**

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# Preface

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This study grew out of a workshop on music and early communication that formed part of the FOCUS<sup>1</sup> Families UK Conference held in the summer, 2003. During the workshop, a number of parents reported that their children had what seemed to them to be unusually high levels of musical interest or ability, and the question was raised as to whether these characteristics were related to their medical condition: septo-optic dysplasia. If so, what were the implications for parents, teachers, therapists and others? With little information to go on, neither issue could be addressed satisfactorily at the time, and it was agreed that an exploratory study should be undertaken to see whether the anecdotal evidence that had come to light would stand up to more formal scrutiny. Beyond this, were there lessons that could usefully be learnt in order to help practitioners and parents foster their child's musical interests and abilities, with both musical and broader developmental aims in mind? The findings and recommendations set out here represent an initial attempt to address these questions.

*Although the study will be of particular interest to the parents and carers of those with septo-optic dysplasia, and the professionals who work with them, the observations that are made and the conclusions that are drawn will be relevant to those working with and caring for a wide range of children and young people who are visually impaired, including those with additional disabilities.*

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# I **Summary**

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## **Purpose of the study**

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This study investigates the musical abilities and interests of children and young people with septo-optic dysplasia, drawing on the experiences and views of parents and carers that were elicited via a questionnaire, and through direct observation by members of the research team. Although the evidence was gathered in relation to a particular group of blind and partially-sighted youngsters, the researchers believe that the findings presented here will have a wider relevance, offering insights of potential interest and value to many of those bringing up, caring for or working with children and young people with visual impairments, including those with additional disabilities.

## **What is septo-optic dysplasia?**

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Septo-optic dysplasia is a rare condition that occurs in approximately one in 16,000 children. It is defined as a combination of optic nerve hypoplasia (absent or small optic nerves), pituitary abnormalities and the absence or malformation of the septum pellucidum or corpus callosum (or both) – without which communication between areas of the mid-brain (such as the transfer of sensory information) is hampered. Among the likely effects of septo-optic dysplasia are visual impairment, hormonal problems, delayed development, behavioural difficulties and obesity. The type and range of symptoms can vary from mild to very severe (Mehta and Dattani 2004).

## **The participants**

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Thirty-two questionnaires were completed on behalf of children and young people with septo-optic dysplasia from the UK and the USA, of whom 16 were blind and 16 partially sighted. Eleven had additional

disabilities. This group was matched as far as possible by age and sex with a group of 32 children from the UK who had no special educational needs, whose parents also completed the questionnaire for the purposes of comparison (see Chapters 2 and 3). The mean age of participants with septo-optic dysplasia was six years, 11 months (ranging from less than one year to 27 years); 18 were female and 14 male. The mean age of the comparison group was seven years, nine months (ranging from one year to 12 years), of whom 17 were female and 15 male.

## **Content of this report**

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*Focus on Music* reports on parents' perceptions of:

- their children's interest in everyday sounds and music (Chapter 4);
- the time that the children spend engaged in music-making each day (Chapter 5);
- the importance of music to them (Chapter 5);
- their musical abilities (Chapter 6);
- the nature of their engagement with musical instruments (Chapter 7);
- how they learn (by copying what they see or hear, or by using notation) and their motivation to do so (Chapter 7);
- their levels of musical achievement (Chapter 7);
- the extent to which these accomplishments are publicly recognised (Chapter 7);
- the specialist music tuition and music therapy available to them (Chapter 7).

In the great majority of cases (81 per cent), it was mothers who responded on behalf of the children with septo-optic dysplasia, other respondents being grandmothers and fathers (each on two occasions), one set of parents together and a teacher. This high response rate from those whom we can assume by and large to be the principal carers, taken together with the predominantly young ages of the participants<sup>2</sup> with septo-optic dysplasia and the nature of their syndrome (which typically demands a high degree of intervention and care), means that the majority of observations recorded in the questionnaires will inevitably have been drawn from sustained periods of interaction with the children concerned. Hence, despite the subjectivity that quite naturally will have coloured the responses in various ways, it seemed to the researchers that the data they were offered afforded a particularly rich and insightful vein of information to tap.

Drawing on complementary evidence from other sources, additional issues are also addressed, including the prevalence of 'absolute pitch'



among participants (Chapter 6) and the presence of exceptional abilities in the context of learning difficulties (Chapter 6). A case study of a child with exceptional musical abilities, initially reported elsewhere (Ockelford 2003) is also set out here in more detail (see Appendix 1).

## **Main findings**

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In summary, the main findings are as follows.<sup>3</sup>

- Throughout the survey, through describing and reflecting on their own children, parents consistently judged the levels of musical interest and ability of those who are blind to be higher than those of children and young people who are partially sighted. The difference between the two groups in relation to these dimensions, together with the perceived importance of music, is statistically significant ( $P \leq 0.001$ ).<sup>4</sup>
- This suggests that the level of children's vision may be a more important factor than the presence of septo-optic dysplasia in influencing their musical development.
- In relation to those who are partially sighted, parents' accounts suggest that, irrespective of their children's age, sex or general level of development, they are more likely than their fully-sighted peers to have a particular interest in music ( $P \leq 0.01$ ). However, in the view of parents, while the musical development of those who are partially sighted may be in line with or somewhat above general expectations, there is a greater chance that it will be at a lower level than in the case of children without a visual impairment ( $P \leq 0.025$ ).
- As far as blind children and young people are concerned, however, the picture painted by their parents is rather different. Irrespective of age, sex or general level of development, they are more likely than their fully-sighted peers to have a particular interest in everyday sounds ( $P \leq 0.01$ ) and music ( $P \leq 0.001$ ), and more likely to find music important as a source of stimulation or comfort, for communication, socialisation or understanding, or to mark out events in their daily routine ( $P \leq 0.001$ ). And while, in the view of parents, their musical development may be in line with general expectations, or even delayed ( $P \leq 0.05$ ), it is much more likely to be unusually advanced than in the case of fully-sighted children ( $P \leq 0.001$ ).
- Where such advanced musical development occurs, the data from this survey support earlier findings that a common feature is the possession of 'absolute pitch' ('AP') – the ability to recognise and reproduce notes in isolation. It is estimated that this ability is generally found in only 1 in 10,000 of the Western population (see Notes 21 and 22).

- While learning difficulties may have an impact on a child's musical development, it is possible that many areas of musicality (including AP) will be unaffected. Indeed, it is evident from individual case studies beyond the current survey (Ockelford 1988) that blind children with septo-optic dysplasia may excel in one area or more of musical performance despite having learning difficulties.
- Among the group of 16 participants with septo-optic dysplasia who were blind, an exceptional interest in music, which included spending two hours or more a day in active music-making, was always present in reported cases of exceptional musical development. However, according to parents, an exceptional interest in music did not necessarily lead to exceptional musical development.
- Despite their generally high reported levels of musical interest and ability, fewer of the children and young people with septo-optic dysplasia were said to play musical instruments (at any level) than their fully-sighted peers (22 per cent as opposed to 41 per cent). Also, the range of instruments they played was more limited (four as opposed to seven). While these differences may in part be attributable to the differing age profiles of the two groups (more of the children with septo-optic dysplasia were in the early years) and to sociological factors, the data nevertheless suggest an important underlying trend.
- None of the participants with septo-optic dysplasia was reported as having had specialist lessons from a music teacher<sup>5</sup> (compared with 28 per cent of the comparison group who had). While this variation may again be explained in part by possible differences in the sociological make up of the two groups and the fact that those with septo-optic dysplasia were generally younger than the fully-sighted children, the data once more suggest a potentially important underlying trend which the researchers hypothesised may be related to unduly low expectations of musical learning and achievement in the context of disability.
- Hence we can assume that most of the children with septo-optic dysplasia who could play an instrument were self-taught and that, since none used any form of music notation (in Braille or large print), they learnt pieces by ear or through visually copying what others did or both.<sup>6</sup>
- This ties in with the fact that the proportion of children with septo-optic dysplasia who were reported to be self-motivated to make music was significantly greater than that of the comparison group (80 per cent of those who responded as opposed to 48 per cent;  $P \leq 0.05$ ).
- While 13 per cent of the comparison group had taken instrumental examinations, none of those with septo-optic dysplasia (who were apparently able to perform to a similar standard as their fully-sighted peers – almost all participants were described as 'beginners') had had their musical accomplishments formally recognised in this way. This was despite the availability of some examinations and tests in appropriate

**Photo 1**

Holly (soon to be three) explores the gong

formats for people with visual problems or learning difficulties or both. Again, the potentially dissimilar backgrounds and the differing age profiles of the two groups may have contributed to this variation, although the researchers speculated once more whether perceptions of disability could at times be constraining the possible public recognition of ability.

- Although ten of the children with septo-optic dysplasia with additional needs were said to find music important as a source of stimulation or comfort or to promote wider development or understanding, only four of them received (or had ever received) music therapy.
- There appeared to be some ambiguity in the responses of parents and professionals (in both the UK and the USA) as to their perceptions of the differing nature and function of music education and music therapy, and how each could make a distinct contribution to their children's development and well-being.

**Recommendations**

Based on these findings, the research team makes a series of recommendations, which are to be found in Chapter 8. Key among these is the

research team's belief that children and young people with septo-optic dysplasia and, indeed, blind and partially-sighted children more generally (including those with additional disabilities) should have access to music-education and therapy programmes that meet their needs and enable them to fulfil their potential – and that these should start as early as possible in a child's life.

## 2 Background

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This study grew out of a workshop on music and early communication that formed part of the FOCUS Families UK Conference held in the summer, 2003. The workshop was led by Adam Ockelford, who had taught music for a number of years at a school for visually impaired children in south London. Here, he had observed informally that the musical development of his six pupils with septo-optic dysplasia, three of whom had additional needs,<sup>7</sup> ranged very widely, from what may be termed 'delayed' to 'exceptionally advanced'. During the workshop, these observations were supplemented by the accounts of several parents who reported that their children, too, had what seemed to them to be unusually high levels of musical interest or ability. It was also noted that an eight year old with septo-optic dysplasia, Rex Lewis-Clack, was hitting the headlines in the USA – most notably on the *60 Minutes* programme<sup>8</sup> – for his remarkable musicality and ability to play the piano. Inevitably, the question was asked: is there a link between septo-optic dysplasia and exceptional musical interests and abilities? If so, what action should parents take?

With little information to go on, neither issue could be addressed satisfactorily at the time, and it was agreed that Adam Ockelford should work with colleagues from the music education and psychology research communities to investigate the matter further. Specifically, an exploratory study should be undertaken to see whether the anecdotal evidence that had come to light would stand up to more formal scrutiny, and if so, whether there were lessons that could usefully be learnt in order to help parents, teachers, therapists and others foster the children's musical interests and abilities, with both musical and broader developmental aims in mind.

## **The research team**

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A team was duly assembled, comprising:

- Adam Ockelford, Director of Education at the Royal National Institute of the Blind (RNIB);
- Linda Pring, Professor of Psychology at Goldsmiths College, University of London;
- Graham Welch, Professor of Music Education at the Institute of Education (IoE), University of London;
- Darold Treffert, Clinical Professor in the Department of Psychiatry, University of Wisconsin Medical School.

## **The approach taken**

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Since there was no previous research in this area, it was felt that, as a first step, the best way of proceeding would be through informal visits to meet some of the children and their families,<sup>9</sup> and through a questionnaire, which could be distributed either electronically or in hard copy to parents and carers in the UK and the USA, largely (though not entirely) through the FOCUS Families Network. Through a mixed series of closed and open questions, this would ask them what they observed in their children in day-to-day situations as well as relaying the findings and accounts of others (such as doctors, psychologists, music teachers and music therapists). It would also ask parents to interact with their children in particular ways and to describe the results. It was hoped that this approach would enable the research team to gather data on a number of children from a range of backgrounds in a relatively short timescale.<sup>10</sup>

Inevitably, though, gathering information in this way had possible disadvantages. First, the respondents were self-selecting through requests in *Focal Points*, Volume 2, Issue 3, and *Eye Contact*, 38, and, despite clear requests to the contrary, it was possible that an undue proportion of parents whose children were particularly musical or interested in music would participate in the study. Second, there was a potential lack of consistency in the way that the questions and activities would be tackled. Third, it could be that any reported characteristics were not specific to septo-optic dysplasia, but arose as a more general consequence of limited levels of visual functioning.<sup>11</sup> However, while it would clearly be important to acknowledge these factors in reporting the results of the survey, it was felt that the findings would still be relevant to the parents of children with septo-optic dysplasia. For, above all, the research team was seeking to capture and analyse what parents felt to be important, and to

describe any commonalities that emerged. Informed by this initial effort, more detailed and rigorous exploration could follow in due course.

### **The questionnaire**

The questionnaire was constructed to elicit a mixture of quantitative and qualitative information, concerned with biographical details, special interests and talents (musical and otherwise), communication, behaviours, sociability, personality, memory, intelligence and any other issues that parents wished to raise.<sup>12</sup> In addition, there were three sets of activities for parents to undertake with their children, pertaining to verbal fluency, 'odd one out' sounds and memory for number sequences. This gave a total of over 100 questions and activities,<sup>13</sup> which were designed to be variously appropriate for children depending on their level of global development, and parents were encouraged to use their discretion in deciding which elements were relevant to their child and which were not.

It was evident from the returned questionnaires that these had typically been completed as comprehensively as was practicable and the often detailed observations that were presented showed a significant degree of reflection and care. The researchers were very grateful for the quality and quantity of information that was forthcoming, since it enabled them to draw a number of conclusions that gave interesting and potentially valuable indications of tendencies and trends, whose varying levels of statistical significance are indicated as appropriate in the discussion that follows.

### 3 *The participants*

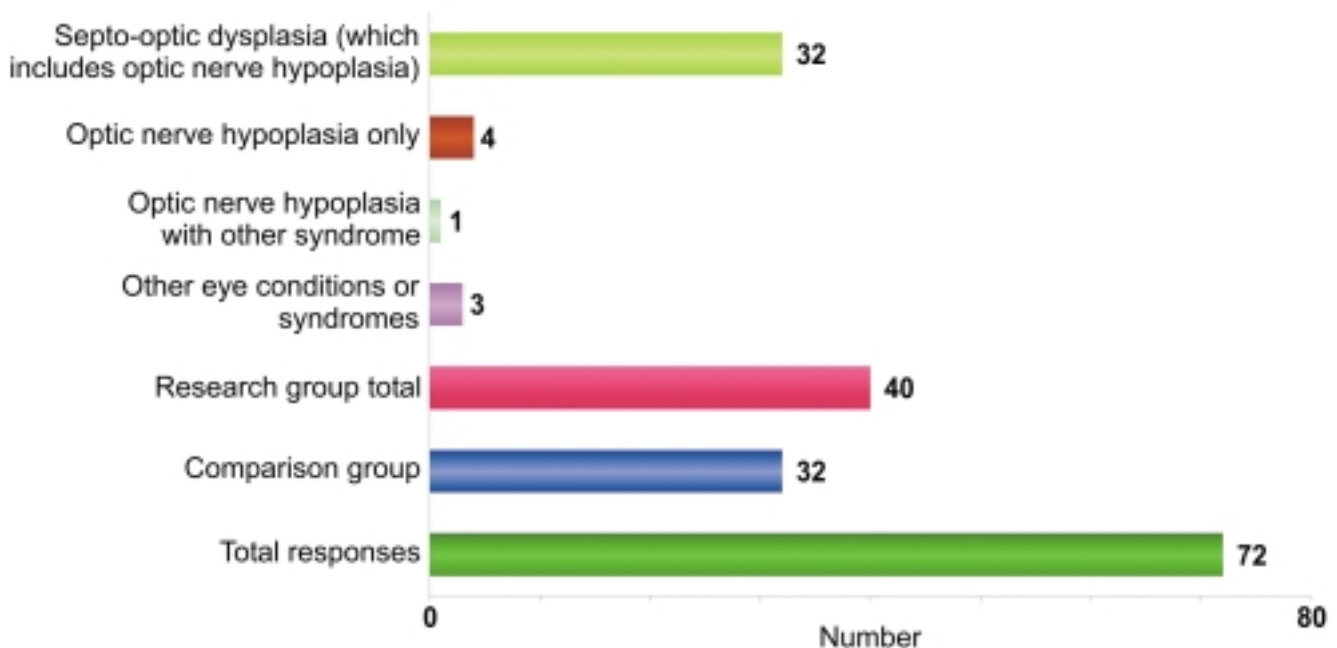
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#### **The research group**

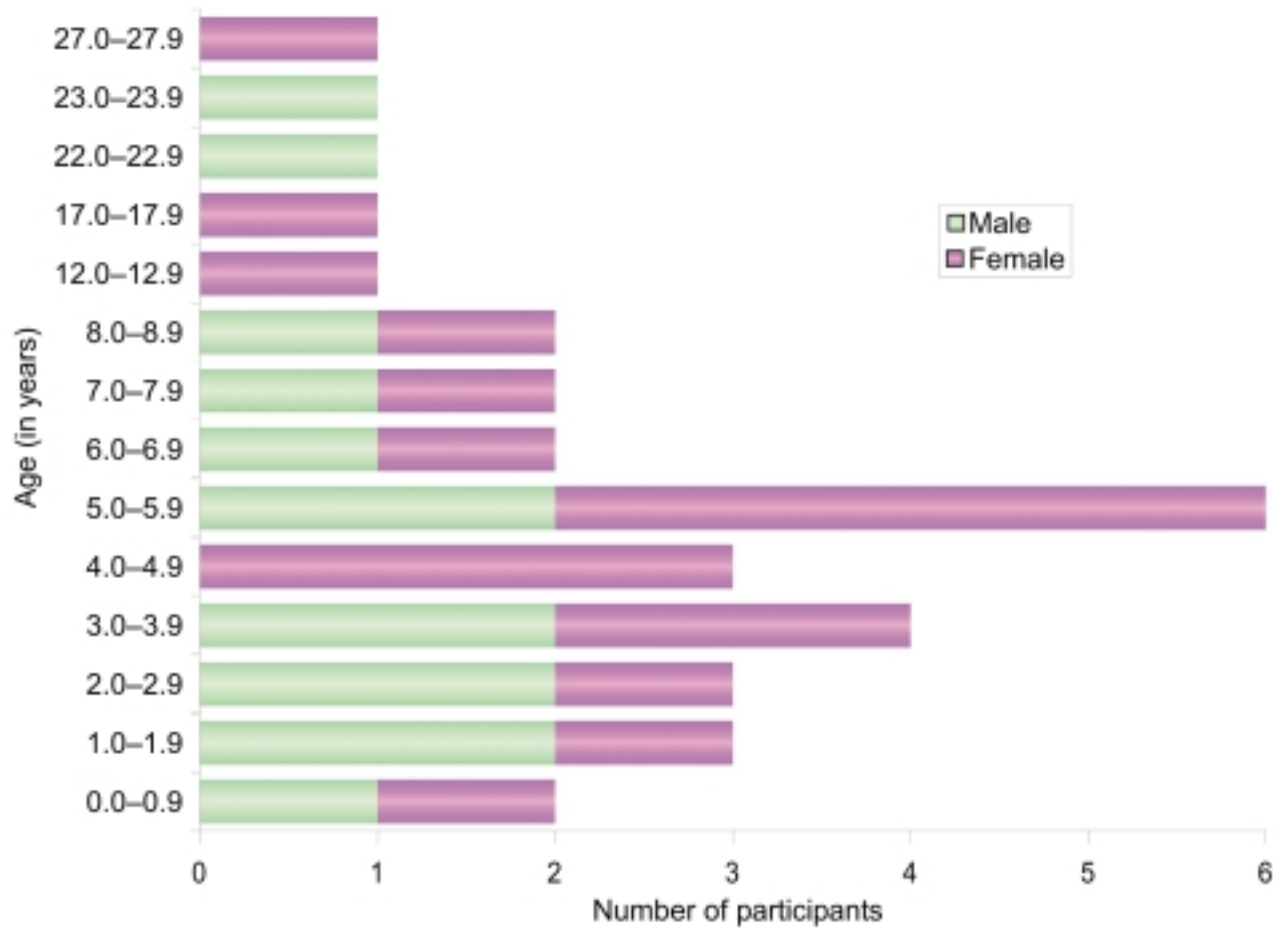
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In total, there were 40 responses to the questionnaire in the research group, of whom 32 had septo-optic dysplasia (a feature of which is optic nerve hypoplasia), four had optic nerve hypoplasia alone, one had optic nerve hypoplasia as part of another syndrome, and three had other eye conditions or syndromes. [This information was gleaned from the responses made to questions 5 and 6 of the questionnaire – see Appendix 2.] Given the small numbers of participants who had conditions other than septo-optic dysplasia, it was decided for the purposes of this initial study to focus attention on these 32 responses alone. However, the information from the remaining eight responses may well be valuable in future research. Questionnaires were also completed on behalf of 32 children with no disabilities, who served as a comparison group. These data are shown in Figure 1.<sup>14</sup>

**Figure 1**  
Number of participants in the research







	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	12.0	17.0	22.0	23.0	27.0
	0.9	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9	12.9	17.9	22.9	23.9	27.9
Male	1	2	2	2	0	2	1	1	1	0	0	1	1	0
Female	1	1	1	2	3	4	1	1	1	1	1	0	0	1

**Figure 2**  
Age profile of the participants with septo-optic dysplasia

Of the participants with septo-optic dysplasia, 18 (56 per cent) were female and 14 (44 per cent) were male – a reasonable reflection of the equal prevalence of the syndrome in boys and girls (Mehta and Dattani 2004). The distribution of age and sex is shown in Figure 2: there were two children or more from every year between 0 and 8, as well as individuals who were 12, 17, 22, 23 and 27 at the time of completion of the questionnaire. The mean age was 6.88 years, with a standard deviation of 6.73.<sup>15</sup>

### The comparison group

The comparison group was matched as closely as was practicable in terms of sex, having 17 girls and 15 boys, and age, where the range was 1.4 years to 12.4, with a mean of 7.76 and standard deviation of 2.96. So

although there was substantial overlap in the age profiles of the two groups, there were important differences too, whereby the participants with septo-optic dysplasia covered a greater range, with an emphasis on the early years (see Figure 3). In summary, the fully-sighted subjects were more tightly clustered around their mean age, which was approximately a year higher than that of the group with septo-optic dysplasia.

## **Comparisons between the groups**

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Despite the differences in the age profiles of the two groups, the researchers considered that it was reasonable to draw straightforward comparisons between them in relation to certain issues. These included those where age was clearly not a factor, for example, where parents were asked to reflect on what their children did at a particular age, or where they were asked to make judgements that took into account how old their child was. In relation to some other issues, however, age did appear to be significant, and where this is so, it is considered as a discrete element in the analyses that follow. The fact that in a number of cases a participant's *functional* age differed from his or her *chronological* age due to developmental delay or learning difficulties is also given due regard.

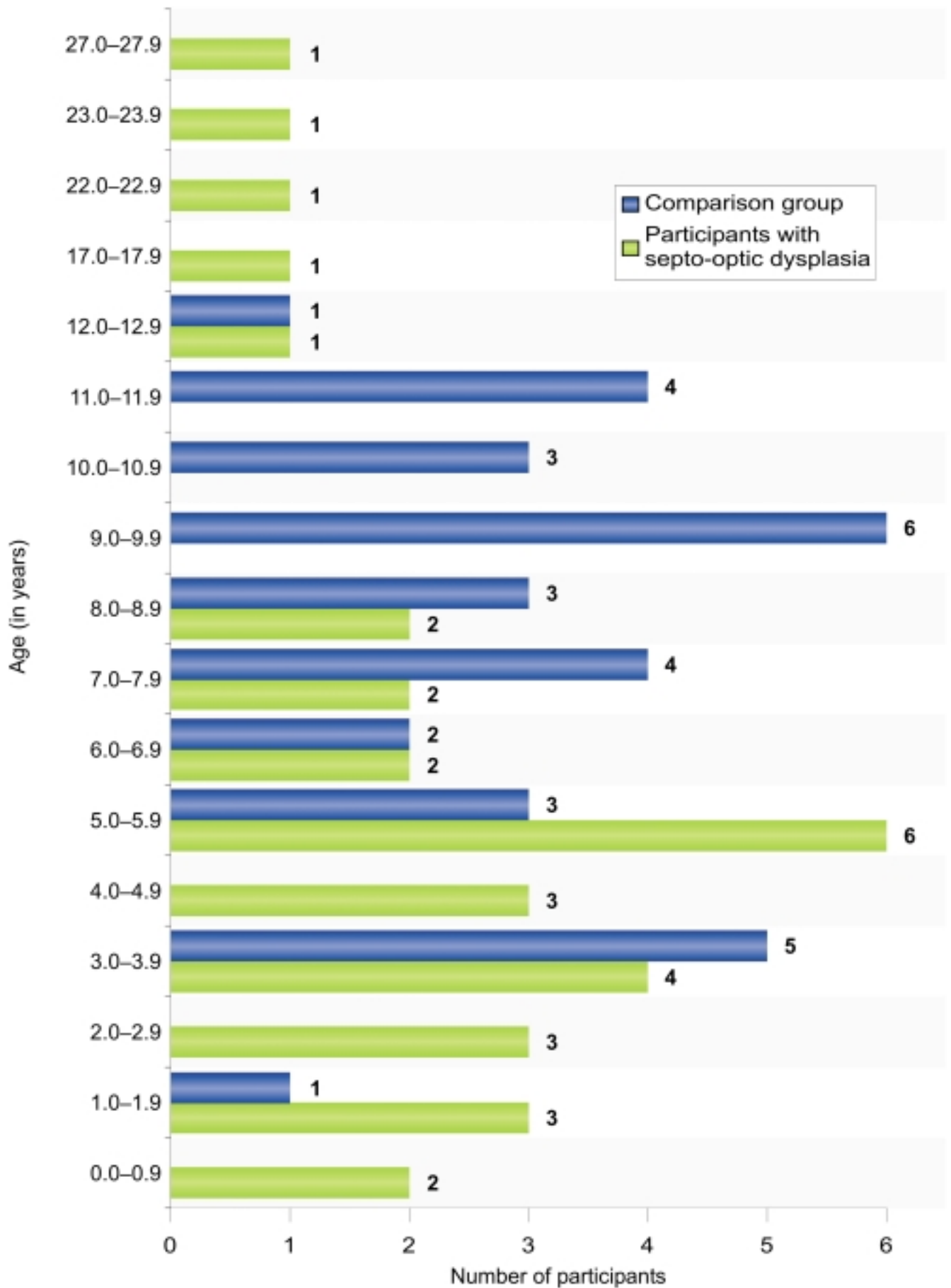
## **Visual functioning**

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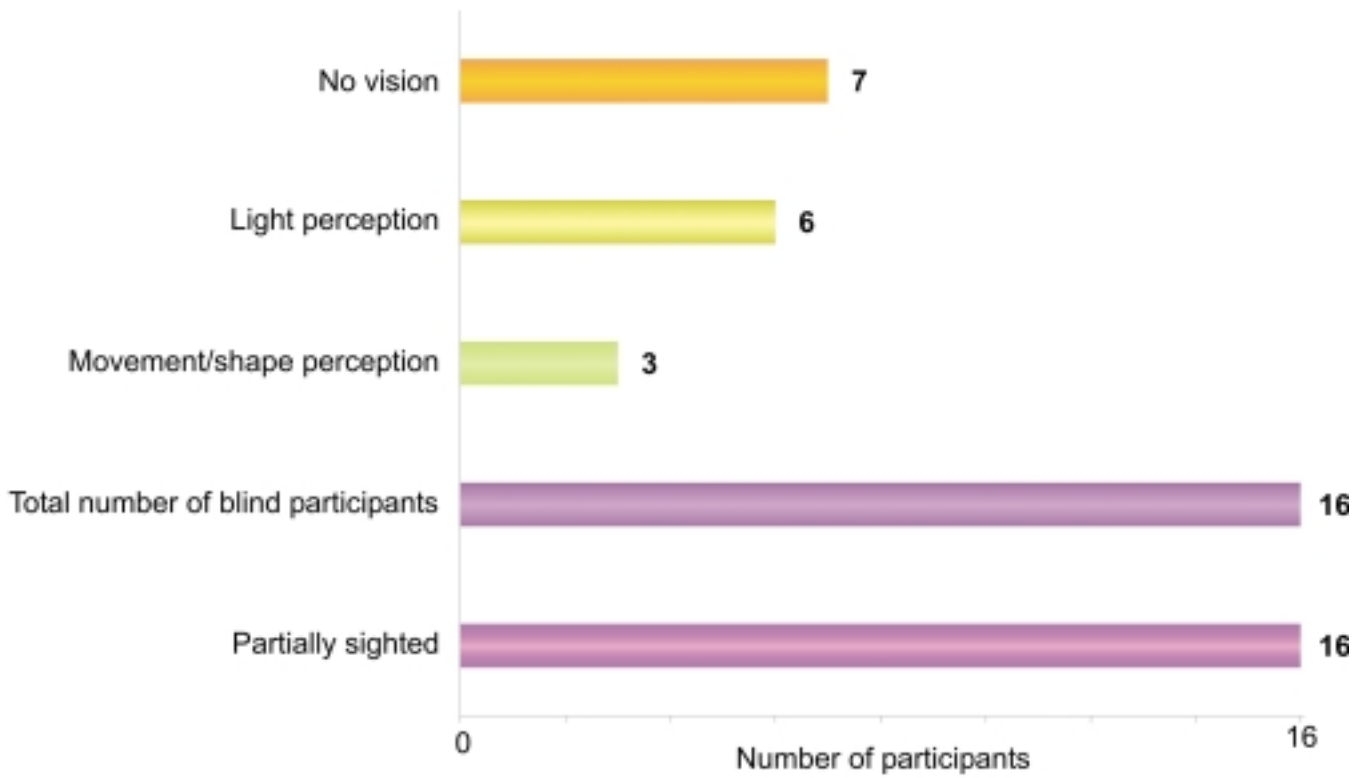
Within the group of participants who had septo-optic dysplasia, the prevalence of four levels of visual functioning (see Figure 4) was established as follows:

- 'no vision' (seven participants or 22 per cent);
- 'perception of light' (six participants or 19 per cent);
- 'perception of shape/movement' (three participants or 9 per cent);  
and
- 'partial sight' (16 participants or 50 per cent).

The first three levels will be referred to here as 'blind', in accordance with the common usage of the term, reflecting the fact that most experiences occur through other than visual means. Fifty per cent of participants were in this category. There was no correlation between the sex of participants and their level of functional vision.



**Figure 3** Comparative age profiles



**Figure 4** Differing levels of vision among the participants with septo-optic dysplasia



**Figure 5** Numbers of participants with septo-optic dysplasia who were reported as having additional disabilities

## **Other disabilities**

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Other disabilities identified by parents were:

- ‘developmental delay’ (six participants or 19 per cent);
- ‘autism’ (three participants or 9 per cent); and
- ‘learning difficulties’ (two participants or 6 per cent).

Further research would be required to clarify the extent to which these labels represent truly discrete categories. For example, it may be that ‘developmental delay’ and ‘learning difficulties’ are being used to describe the same type of disability, while the relationship and interaction between autism and blindness can be highly complex (Pring 2004). In 19 cases, no additional disabilities were mentioned or could be inferred from other responses, and in two instances (at or below the age of one year), the researchers judged that it was too early to say whether a child would be developmentally delayed (for example) or not; see Figure 5. Within the group, neither level of vision nor sex were significant factors in the existence of additional disabilities.

## 4 Parents' perceptions of their children's interest in everyday sounds and music

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### Interest in everyday sounds

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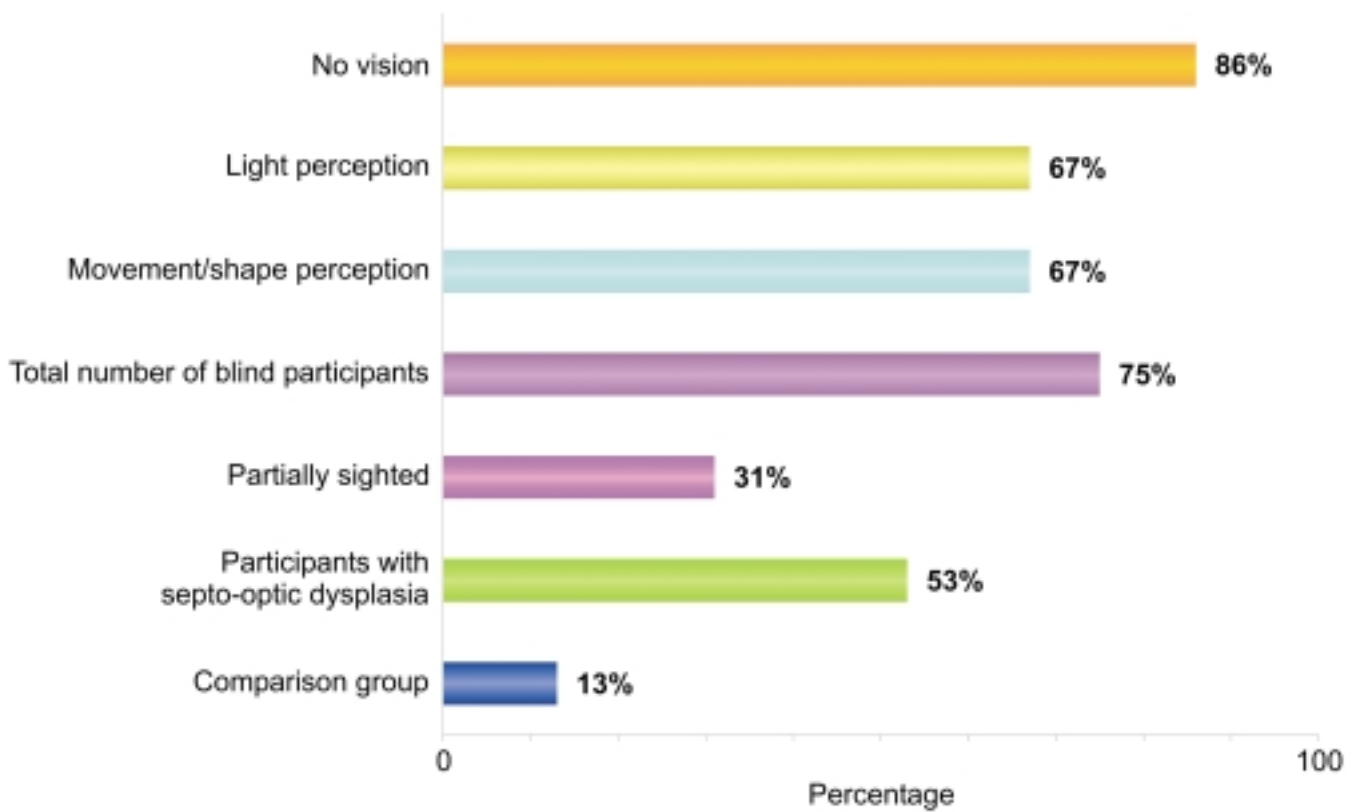
Parents' perceptions of participants' interest in everyday sounds and music were probed in the second section of the questionnaire [questions 7 and 10]. In response to the question 'Is your child particularly interested in everyday sounds (for example, vacuum cleaners, car engines)?', replies of 'a lot' were given on behalf of six of the seven participants with no vision (86 per cent), four of the six who had perception of light (67 per cent), two of the three with perception of shape/movement (67 per cent), giving a total of 12 of the participants described in this study as 'blind' (75 per cent). In contrast, only five of the 16 who were partially sighted (31 per cent) were reported as having a particular interest in everyday sounds (yielding a total with septo-optic dysplasia of 17 or 53 per cent) and just four of the 32 who were fully sighted (13 per cent); see Figure 6.

Statistically, using chi-square analysis,<sup>16</sup> the results showed that there were significant differences in the number showing a particular interest in everyday sounds between:

- the participants who were blind and those who were partially sighted ( $P \leq 0.025$ ); and between
- those who were blind and those who were fully sighted ( $P \leq 0.01$ ).

However, there were no significant differences between the categories *within* the group who were blind or *between* the partially-sighted participants with septo-optic dysplasia and the comparison group; nor were there significant effects for sex or additional disabilities.

So, according to parents' observations, blind children and young people with septo-optic dysplasia, irrespective of their sex or general level of development, are much more likely to be interested in everyday sounds either than their partially-sighted peers with septo-optic dysplasia or fully-sighted youngsters. This is a consequence of visual impairment that the



**Figure 6** Participants reported as showing a particular interest in everyday sounds

researchers had expected to find.<sup>17</sup> It is worth noting that although the septo-optic dysplasia group's high level of interest in everyday sounds showed no sign of diminishing as the participants grew older, the few fully-sighted children who were reported to share this fascination with sound were all in their early years, aged three and four. These findings suggested to the research team that, among children whose vision is developing normally, an early interest in sound may subsequently wane due to the increasing dominance of visual input as they begin formal education – something that would not, of course, affect blind youngsters. Further research would be required to test this theory on representative samples of children.

In any case, it seems clear that in the absence of vision, sound offers a ready source of interest and stimulation. As one mother commented, her blind three-year-old daughter was interested in sounds of 'anything and everything since this is a huge part of her learning experience'. Some children appeared to be attracted to sounds for the sheer pleasure that they could bring. For example, the mother of a five-year-old boy noted that he 'loves repetitive sounds – [he] will press toys which make noises over and over to hear the sounds'. Sound-making may also have an exploratory element. For instance, one 18-month-old boy constantly 'takes everyday objects and toys and attempts to make sounds out of them by banging them together, shaking, throwing'. The functionality of sound was evidently important to a two-year-old girl who 'has excellent



**Photo 2**

Ashley (aged four and a half) explores the sounds of the violin (photograph supplied by The Cedar Special School, Southampton)

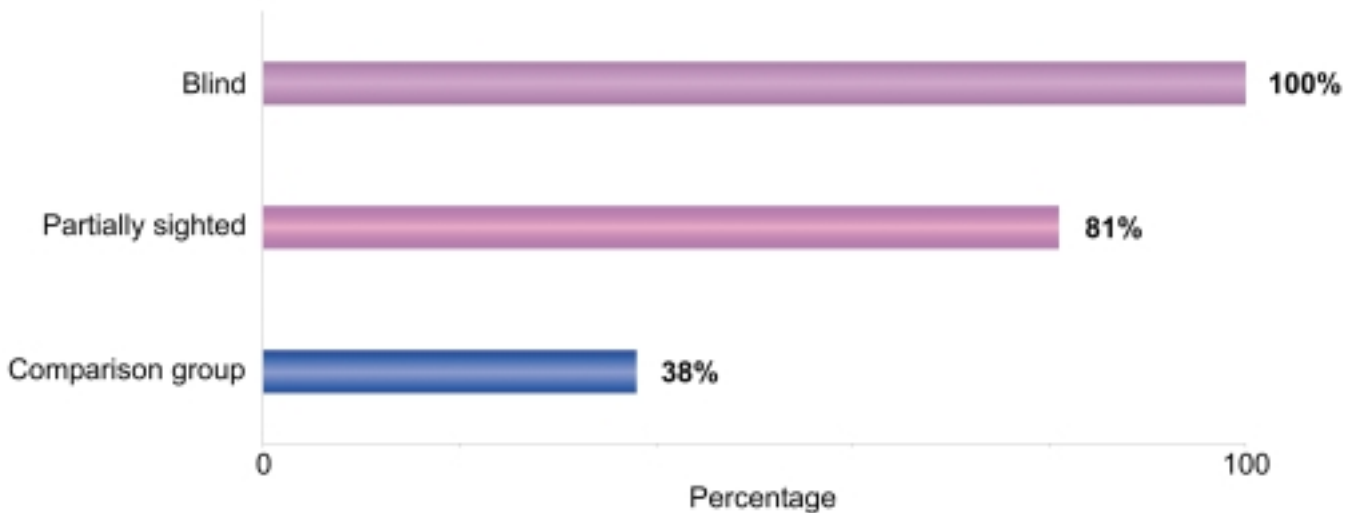
hearing and immediately recognises the sound of cars pulling up and parking outside of our house'; she 'often motions that someone is at the front door before her mother has heard them'. As well as through particularly attentive or sustained listening, the importance of sound to children and young people may become evident through their mimicry. For instance, the 18 month old who was reported to enjoy exploring toys through the sounds they make 'also mimics a lot of sounds – not just words – like clearing your throat', while another boy of the same age imitates unusual animal sounds.

**Interest in music**

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Parents were next asked [*in question 10*] whether their child showed a particular interest in music. The response 'a lot' was given in relation to all blind participants (16 out of 16, or 100 per cent), 13 of the 16 who were partially sighted (81 per cent) and 12 of the 32 in the comparison group (38 per cent); see Figure 7.





**Figure 7**  
Participants reported as showing a particular interest in music

Statistical analysis shows that with regard to showing a particular interest in music there are significant differences between:

- the blind and the fully-sighted participants ( $P \leq 0.001$ ); and between
- the partially and fully-sighted participants ( $P \leq 0.01$ ).

However, there was no significant difference between the reported levels of musical interest of the blind or partially-sighted participants, and within these groups, neither additional disabilities, sex nor age was found to have a significant effect.

So, according to parents' observations, children and young people with septo-optic dysplasia, irrespective of their age, sex or general level of development, are much more likely to have a particular interest in music than those who are not visually impaired ( $P \leq 0.001$ ). As one parent, speaking about her seven-and-a half-year-old daughter, put it:

Her music is always with her. If there is not music playing, she is singing. She listens to music while in the car, while falling to sleep, and loves to play the piano and any other instrument. It is definitely her strength in life.

Another simply said that her daughter was 'obsessed with music'.

The type of music young people with septo-optic dysplasia prefer [questions 12 and 13] appears to vary just as much as with any other group with similar cultural backgrounds – resulting, we may surmise, from a complex cocktail of exposure, predisposition and an evolving sense of identity (Tarrant *et al.* 2002). In 17 cases (53 per cent), parents noted particular musical preferences in their child.<sup>18</sup> Stylistically, these varied from 'classical' to rock and pop, from nursery rhymes to 'pub songs' and Bhangra. On a number of occasions, specific works were mentioned,

ranging from 'Yankee Doodle' to the 'Blue Danube' waltz, or particular artists or groups, including Paul Weller, Simon and Garfunkel, The Who, Queen, Robbie Williams and Dido. One seven-year-old boy was reported to be wholly obsessed with the music of Rod Stewart. Children – particularly those in the early years or with learning difficulties – sometimes appeared to be attracted by a particular sound, such as the panpipes, women's voices or the drums, or by a certain dynamic ('loud music') or tempo (pieces with a 'fast beat'). A few dislikes were noted too: classical music ('too slow'), modern music ('too loud and raucous') and, in the case of one three-year-old, 'songs where a particular note is held for a long time'.

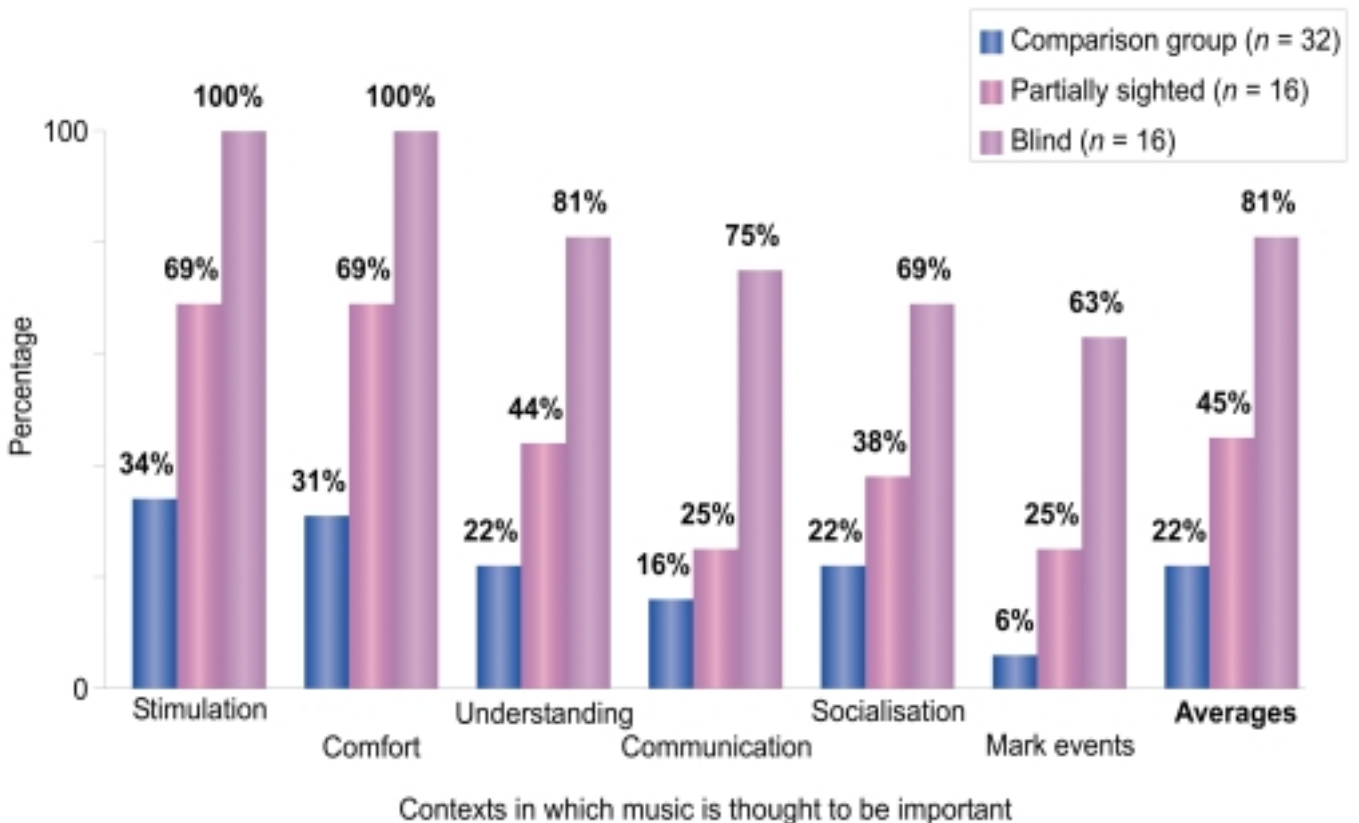
## 5 Parents' perceptions of the importance of music to their children in different contexts and at particular times

### Importance of music in different contexts

Parents were asked whether they thought that music was or had been important to their son or daughter in a range of suggested contexts, in which music served as a source of stimulation or comfort, to promote communication, socialisation or understanding (for example, through 'counting' songs), or to mark out events in the daily routine [question 11]. The results of those who replied 'a lot' were as follows (see Figure 8).

**Figure 8**  
The perceived importance of music to participants

Although in each context the blind participants scored higher as a group than those who were partially sighted, who in turn scored higher than the fully-sighted children, the only differences that were consistently





**Photo 3**

Anežka (shortly to be four) loves to play the piano: 'quick and slow' and 'loud and soft' (see front cover)

statistically significant were those between the blind subjects and the comparison group, with  $P \leq 0.001$  for all contexts except 'socialisation', where  $P \leq 0.01$ . That is to say, in the view of parents, blind children and young people with septo-optic dysplasia were much more likely to find music important for stimulation, comfort, communication, socialisation, understanding or to mark out daily events than their fully-sighted peers. No consistent effect was found for age, sex or general level of development.

Parents made a number of vivid observations concerning the importance of music to their child. Two reported having listened to particular pieces while they were pregnant which subsequently had a powerful effect on their children. A three-month-old girl still 'reacts to her mother when she sings "Tiny Dancer" by Elton John which was played all the time she was in the womb. Her eyes get really big and she starts to try to look around.' A one-and-a-half-year-old boy cannot or will not go to sleep without the sound of the music box that was played to him *in utero*. The potentially relaxing or comforting effect of music, particularly for younger children, was noted by other parents too: 'Singing calms him down if he is upset' (a two-year-old boy); 'She calms to soft gentle music' (a one-year-old girl); and 'He has had many traumatic times in hospital and the best way of soothing him is to sing to him' (an 18-month-old boy). As well as using familiar nursery rhymes

to develop an understanding of body parts (such as ‘Heads, shoulders, knees and toes’, for example), some parents reported devising ingenious other ways of using music to promote wider learning and development. For instance, in the case of one six-year-old boy who is apparently ‘more fluent with repeating songs word for word than he is for carrying on a conversation . . . Songs have been made up to teach him his phone number and also how to spell his name’. It is worth noting that the connection between memory and music was mentioned by parents on a number of occasions.

### **Importance of music at particular times**

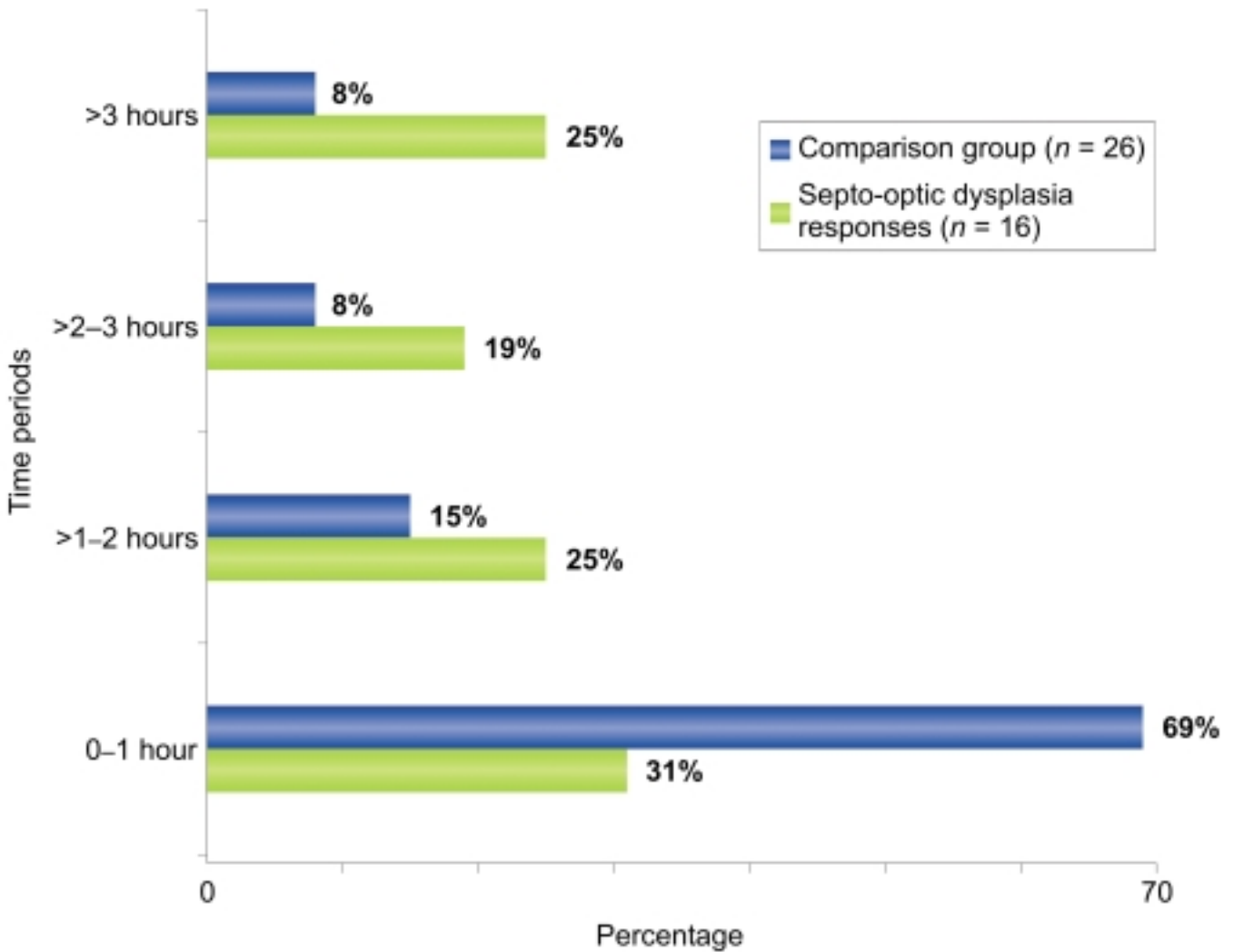
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Parents were also asked whether music was important for their son or daughter at particular times, or with particular activities, in particular places or with particular people [*question 14*]. Although there was no statistically significant difference between the ‘yes’/‘no’ responses given on behalf of participants with septo-optic dysplasia and the comparison group, the comments that parents made were again of interest. The importance of music on journeys – especially car journeys – was noted several times. For a number of children, music was important at bedtime, and for one, during mealtimes. Transitions (such as changing activity, moving from one place to another, or having to relate to a different person) appeared to be potentially difficult for some of the children, whose parents and teachers reported using music to help. For example, one mother described playing certain music to her son (who is rising two) ‘depending on where we are or where we’re going’, while the mother of a three-year-old girl commented that ‘For transitions, music helps her go from one activity to another.’ The parent of a three-year-old boy who found the end of sessions at his nursery upsetting relayed how ‘his specialist teacher will sing their goodbye song. He now associates this song with home time and is then happy to leave nursery.’ Finally, consider this telling account of a girl (now rising eight): ‘She could sing songs before she could expressively communicate. Singing was used to motivate her or transition her from one activity to the next when she was younger or she would throw a tantrum. She would sing those songs aloud.’

### **Time spent on music**

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As well as asking parents directly about their children’s interest in music and its perceived importance in their lives, the researchers enquired as to how much time the children and young people spent singing and playing on average each day [*question 23*]. The results are shown in Figure 9.



**Figure 9** Time spent singing or playing per day

Although the data indicate that the participants with septo-optic dysplasia tended to spend more time engaged in active music-making than those in the comparison group, as there were relatively few responses to this question, it was not possible for the researchers safely to say whether these findings are more widely typical or not; further research would be required.

## 6 **The children's musical abilities: parents' perceptions and other evidence**

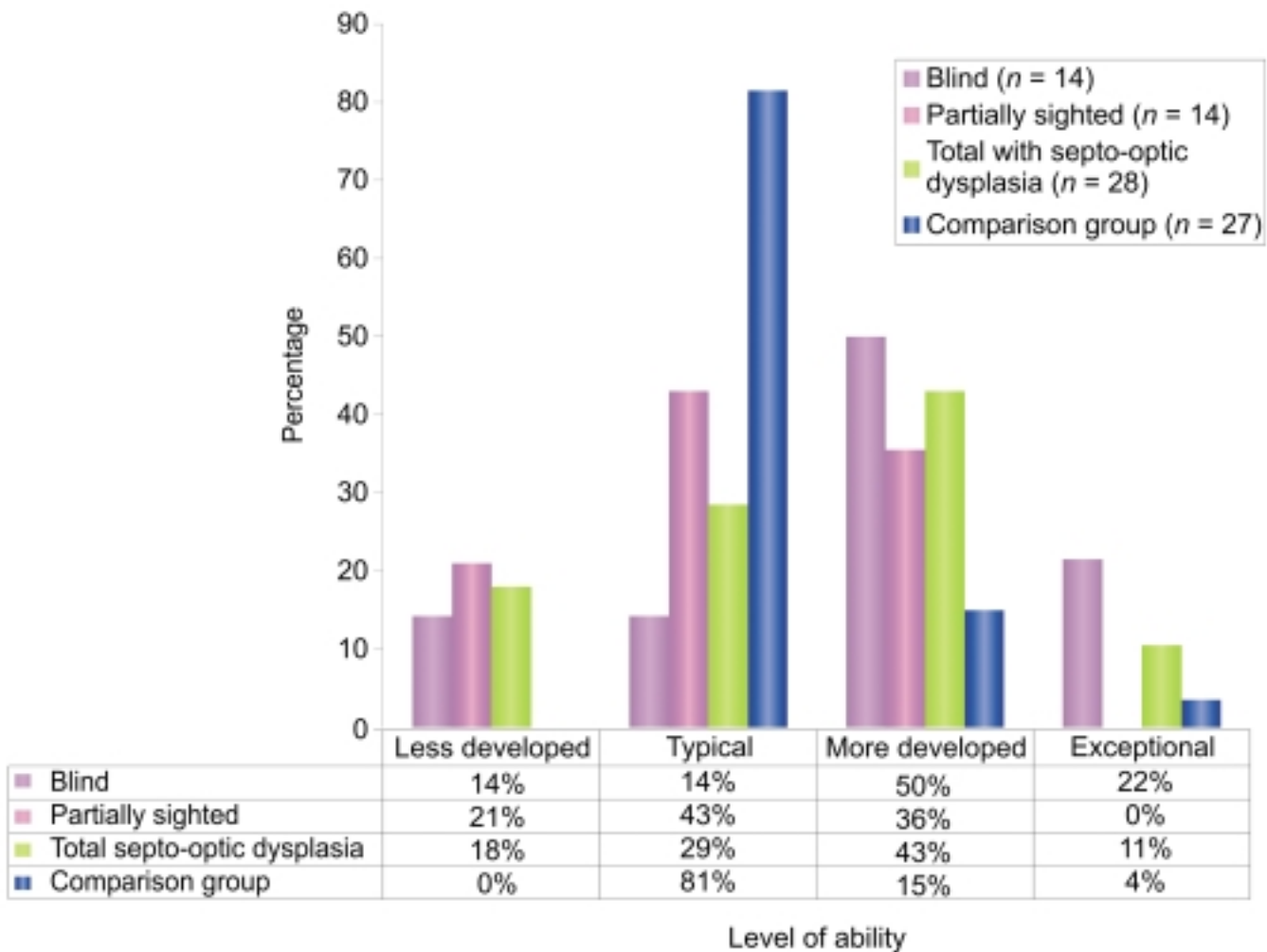
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### **Parents' accounts of their children's musical abilities**

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Parents were asked whether, in their opinion, their child's musical ability was 'not as developed as you would expect for her/his age', 'about what you would expect for her/his age', 'more developed than you would expect for her/his age', or 'exceptionally highly developed' [question 16]. The results are as follows (see Figure 10). They indicate that the subjects with septo-optic dysplasia had (in the view of their parents) a wider spread of musical ability than those in the comparison group, with around one in ten reckoned to be showing exceptional talent, and seven out of ten with a higher level of development than their parents would have expected for their child's age. However, almost one in five showed lower levels of musical ability than their parents regarded as typical. Among the group of participants who were blind, it is worth noting that around one in five were regarded as exceptional, and three out of four above average. At the same time, the musical development of around one in ten was thought to be delayed. Among the partially-sighted group, none was thought to be exceptional, around one in three were considered more advanced than average, two out of five were regarded as average, and around one in five less developed musically than parents would have considered typical. The pattern with the fully-sighted children was very different, however, with four out of five being regarded as average, none being below and around one in five above.

Statistically, the difference between the reported music-developmental profile of those with septo-optic dysplasia and the comparison group was significant ( $P \leq 0.001$ ), as were the differences between the fully-sighted children and those who were blind ( $P \leq 0.001$ ) and those who were partially sighted – though less so ( $P \leq 0.025$ ). No significant effects were found for sex, age or general level of development.



**Figure 10** How reliable are the data?

Parents perception of their child’s musical abilities

To what extent are these data – based on parental observation and opinion – likely to offer reliable indications of the children’s differing levels of musical ability?<sup>19</sup> There are a number of issues here. First, parents were requested only to make a subjective ‘snapshot’ judgement of their child’s level of musical development based on their awareness of other children and young people. This was because it would have been impracticable for most parents to use a refined set of criteria for the assessment of ‘musical ability’ that would have required specialist knowledge. Second, it may be that some parents gave unduly favourable accounts of their child’s musical abilities without realising it. This is a particularly the case with those whose children had septo-optic dysplasia, since these parents chose to undertake a task which they knew concerned their child and music.<sup>20</sup> Third, therefore, irrespective of potential bias in parents’ accounts, the sample of children with septo-optic dysplasia may in any case have been skewed in favour of those with particularly high levels of musical interest or ability.



A number of points are worth bearing in mind in relation to these potential difficulties, however.

- It was made clear in the literature requesting participation in the survey that as many parents as possible should respond – whether or not they considered their child to have noteworthy musical abilities – in the interests of obtaining a representative sample. And, as the responses show, almost one in five of parents whose sons or daughters had septo-optic dysplasia declared that they considered their children's musical abilities to be less developed for their age than they would typically have expected. (Interestingly, there were no such responses among the comparison group.)
- A number of parents were evidently influenced by the views of the professionals working with their child. For example, one comment reads 'S's teachers have said that he has perfect [which is the same as 'absolute'] pitch. This was found as a surprise [to us]', and another (which again relates to possessing AP), 'R [his teacher/therapist] says that he does. His mother and I would not know.'
- It is worth noting that the responses given by the parents of those with septo-optic dysplasia accord with the limited evidence that is already available. For example, Ockelford's (1988) account of six such children with whom he worked as a specialist teacher indicated that two who were blind (of whom one had additional needs) had exceptional musical abilities. The musical development of a further two, of whom one was blind and one partially sighted, neither having additional educational needs, he judged to be broadly typical. The musical abilities of the remaining two, both of whom were partially sighted and with additional needs, were, in his estimation, less developed than those of most children of their age. Subsequently, the well-publicised accounts of eight-year-old Rex Lewis-Clack, who has an outstanding ability to process musical sounds, remember what he has heard and reproduce the pieces he knows on the keyboard (in any key), have shown that even severe learning difficulties need be no barrier to exceptional musical achievement.

Hence, it is clear that further research into the development of musical abilities in children with septo-optic dysplasia (and those who are visually impaired for other reasons) is needed.

### **Absolute pitch**

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The survey included one question that sought to probe a particular aspect of musical ability that psychologists usually refer to as 'absolute pitch'



**Photo 4**

Grace (five) has a remarkable sense of rhythm

(‘AP’) and musicians call ‘perfect pitch’ [question 25]. This ability to reproduce or recognise the pitch of notes in isolation from others is extremely rare – estimated at only 1 in 10,000 among Western populations as whole.<sup>21</sup> Indications that children may have AP include them consistently singing songs at the pitch-levels at which they were learnt and being able to name notes that are heard without reference to any others.

Unfortunately, it appears that the explanation of AP in the questionnaire was insufficiently clear, since five of the responses made on behalf of the fully-sighted subjects suggested that they had AP, made on the basis of such observations as ‘[can] sing in tune’. Five positive responses were also made on behalf of participants with septo-optic dysplasia, of which only one was unambiguously appropriate. This pertained to a six-and-a-half-year-old blind girl, who, it was reported, can name chords and their constituent notes, recognise ‘any key music is being played in’ and sing in any key when asked. Other responses may have been ‘false positives’ (particularly in the case of child who was not yet two), and there were some responses that, judging by the associated comments, could represent ‘false negatives’. For example, in relation to a girl rising eight, diagnosed with autism, who was deemed not to have AP, it was stated: ‘She sings on key. Her music therapist thinks she may have perfect pitch but she is just learning what letters to associate with the keys on the piano’ (see Appendix I p. 44). Certainly, based on previous research into the possession of AP with children born with little or no sight (though not specifically those with septo-optic dysplasia), it would

be unsurprising to find within the group of 16 blind participants in the current survey that around five did indeed have AP.<sup>22</sup>

While AP is not a prerequisite of musicianship of the highest order (less than 20 per cent of professional musicians possess it),<sup>23</sup> and while not all people with AP become musicians, it is nonetheless regarded in some quarters as a necessary element in the development of exceptional musicality among people with learning difficulties (Miller 1989). Such people, sometimes referred to as 'savants', who tend to be blind or with severe visual impairment and are often classified as 'autistic', are evidently present among the population of those with septo-optic dysplasia (as Rex Lewis-Clack and the example given by Ockelford (1988) show), although there were no responses on their behalf in the survey. Interestingly, too, people with septo-optic dysplasia have not to date been identified in the psychological literature on savants; hopefully the publication of this study will stimulate activity to make good this omission.

### **Expectations of musical development**

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Given this complex and rather patchy picture of research evidence, what is it reasonable for parents whose son or daughter has septo-optic dysplasia to expect in terms of the development of musical abilities? The data provided by other parents suggest strongly that their son or daughter is less likely to follow a broadly 'typical' path of musical development than would otherwise be the case, though further research is required to determine with greater assurance just how these developmental differences are likely to manifest themselves in individual cases. Nonetheless, the findings presented here combined with the six cases described in Ockelford (1988) and the recent accounts of Rex Lewis-Clack give *preliminary indications* of tendencies as follows; these must be regarded with caution pending further research.

First, it appears that children with septo-optic dysplasia who are partially sighted may well display musical abilities that are broadly typical or slightly advanced, although there is some likelihood that they will be delayed and it is unlikely that their musical abilities will be exceptional. Second, it seems that children with septo-optic dysplasia who are blind, whether or not they have learning difficulties, may well display musical abilities that are beyond what is typical ( $P \leq 0.001$ ). In a few cases, these may be exceptional, manifesting themselves in the presence of AP and a highly developed capacity to sing or play an instrument (by ear). However, if the child concerned does have learning difficulties, these are likely to impact negatively on musical development, which may therefore be less advanced than in most fully-sighted children with no special educational needs ( $P \leq 0.05$ ).

If these preliminary findings do indeed represent an accurate reflection of broader tendencies, why is it that young blind children with septo-optic dysplasia should be so much more likely than the general population to develop exceptional musical abilities such as AP? There is currently no clear answer to this, and more detailed investigation is needed alongside the wider search that is currently going on for genetic and non-genetic components of AP. For example, in a study of over 600 musicians, Siamak Baharloo and his co-workers<sup>24</sup> (1998) concluded that early musical tuition is an important component in the development of AP, since 40 per cent of musicians with AP had commenced music education by the age of four. However, it was also the case that self-reported AP-possessors were four times more likely to report another AP-possessor in their families than were non-AP-possessors, suggesting that a genetic predisposition may also be needed for the development of AP. Given the high level of musical interest reported here among children with septo-optic dysplasia (largely, as we shall see, in the absence of formal music education) it could be that a particular *focus* on music (and sound) in the early years, brought about through lack of vision, is the crucial environmental factor in the development of AP. This may, though need not, form part of early music education. With regard to the potential genetic component, the reported incidence of AP among blind children would suggest that this must be very widespread in the population as a whole (even as high as 50 per cent, if we take an approximate average of the Welch and Ockelford figures cited in Note 22), since there are no other known genetic factors that would otherwise link this diverse group of people. Indeed, these data would support the theory that AP begins as a universal ability, whose continuance is negated for the majority through interaction with an environment in which, as we observed above, an interest in sound for sound's sake usually diminishes, it seems, beyond the early years, as visual input comes to dominate more and more (see also Welch (2001: 10)).

### **Savants**

A further question that parents may ask is why do some children with septo-optic dysplasia who have additional needs go on to develop an exceptional level of musicality while others do not? Again, this is a question that cannot currently be answered with certainty. Darold Treffert, in his recent thinking on the subject<sup>25</sup> suggests that, in prodigiously talented people with learning difficulties – 'savants' – predisposing factors are a combination of idiosyncratic brain circuitry (incurred through damage to the left hemisphere with right brain recruitment and compensation) and some inherited or genetic elements. Upon this base the savant talents are built through obsessive

preoccupation, practice and repetition that is often (though not necessarily) encouraged and (hopefully) directed into socially acceptable channels by family, teachers, therapists and others. The current study cannot directly support Treffert's theory, since no savants were identified. However, with one exception,<sup>26</sup> neither were there reports of *obsessive* preoccupation, practice or repetition, so some of the key building blocks for the establishment of savant skills were missing from the group under investigation. Indeed, even among those who were reported as having exceptional levels of musical development, there were no characteristics (such as particular personality traits or passing developmental milestones unusually early or late)<sup>27</sup> that were consistently present, which parents in the future could possibly use as predictors of high musical achievement. Certain connections were found, though, that may help in making such predictions in very young children, and while a greater number of responses would be required to bring these up to the level of statistical significance, they are nevertheless worth reporting as indications of potential trends.

First, in the group of children with septo-optic dysplasia studied here, parents' reports indicate that an exceptional *interest* in music was a necessary though not a sufficient factor in the development of exceptional musical *ability*. That is, exceptional interest appears to be needed to produce exceptional ability, though it does not guarantee it. Second, on a related point, the time spent engaged in musical activity (including listening) seems to be an important factor in the development of exceptional musical abilities. The data in the present survey show that, according to parents, no child who spent *less* than two hours a day engaged with music went on to make exceptional musical progress, while no child who spent two hours a day or *more* undertaking musical activity was described as having a low level of musical achievement.<sup>28</sup>

# 7 **Parents' accounts of the provision of music education and therapy, and their children's own approaches to learning**

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## **Specialist musical input**

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Given the importance that music is thought to have for many children and young people with septo-optic dysplasia and their perceived levels of musical interest and ability, the researchers were surprised to learn how few of them received (or had ever received) specialist musical input [questions 15 and 22].

## **Music therapy**

With regard to music therapy, for example, only six of the 32 participants (19 per cent), of whom four had additional needs, were said to have (or to have had) sessions. Moreover, the nature of the therapeutic activity evidently varied considerably from one child to another. Some of the sessions appeared to be on a one-to-one basis, while others involved a group. For instance, a three-year-old girl with no additional disabilities 'attended a music group with singing and instruments once a week for three eight-week sessions. This really helped her rhythm and her speech blossomed through singing.' Some descriptions of the therapy seem to indicate that in reality what was being offered was music education – a lack of conceptual clarity that is characteristic of the field in the UK (Ockelford 2000) and which may (these findings suggest) obtain in the USA too. For example, it was reported that one seven-and-a-half-year-old autistic girl 'works with her music therapist on learning the piano and also a variety of instruments'. On other occasions the nature of the activity was not clear. For instance, an eight-year-old girl who is developmentally delayed 'has music therapy at school once a week: keyboarding, piano, drumming'. At least one account suggests that there is little communication between the therapist and parents. For example, a 17-year-old girl with severe learning difficulties 'has had music therapy at school for many years. Little known about the current therapist.'

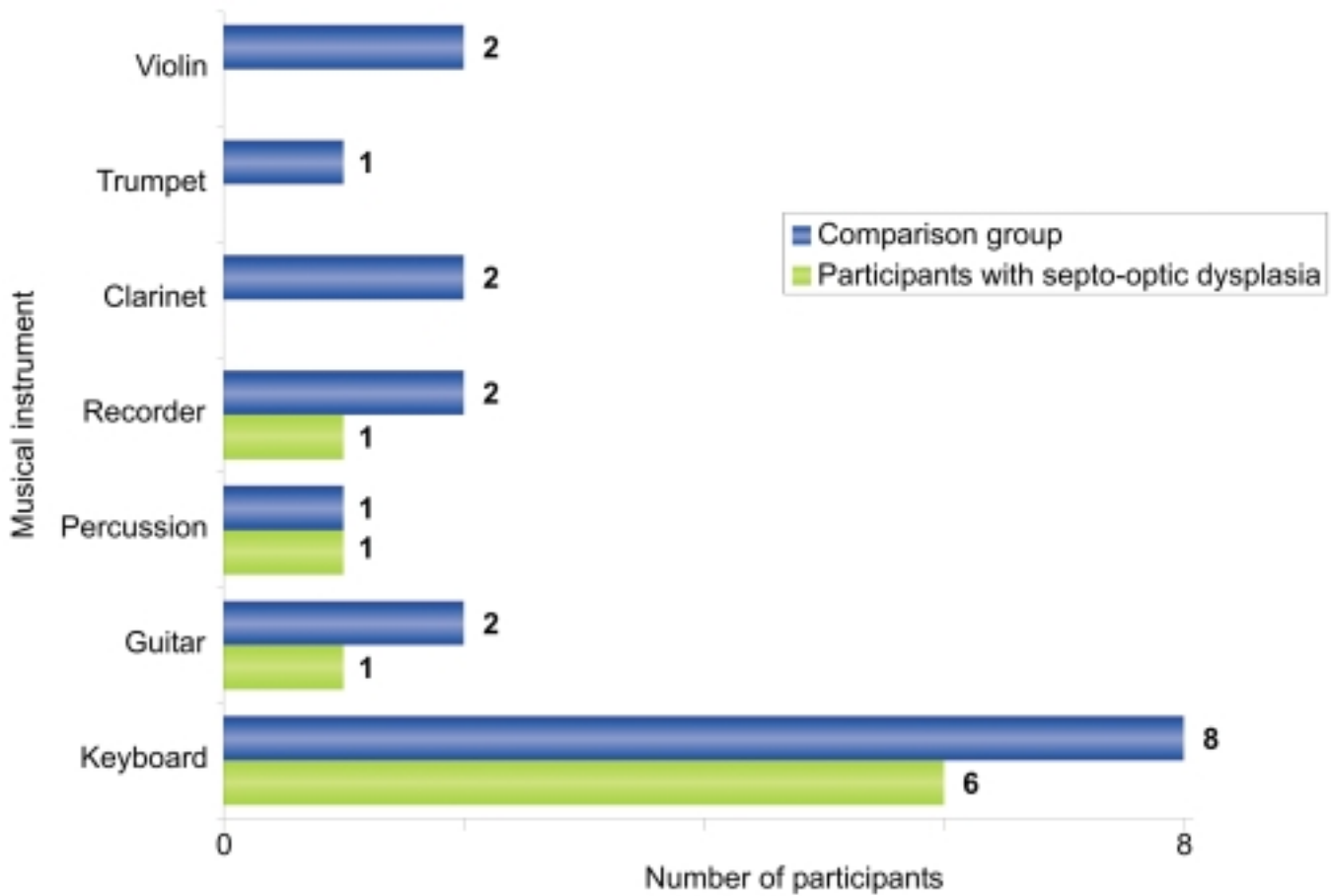




**Photo 5**  
Jen (18) explores  
a seed shaker  
during a music  
therapy session

### **Instrumental lessons**

None of the children with septo-optic dysplasia was reported to have instrumental lessons, with the exception of the seven-and-a-half-year-old autistic girl mentioned above whose music therapist teaches her the piano. Nonetheless, seven of the participants with septo-optic dysplasia were said to play an instrument (22 per cent),<sup>29</sup> with two being described as able to play two instruments, giving a total of nine separate instances distributed as shown in Figure 11. This contrasts with 13 of the comparison group whose parents indicated that they played an instrument (41 per cent), with five of them playing two, making 18 in total. Nine of these 32 children (28 per cent) were said to have instrumental tuition. Although the totals of instruments played are not



**Figure 11**  
Number of participants playing different instruments

significantly different in statistical terms between the groups, the participants with septo-optic dysplasia were evidently more constrained in their choice, with only four categories mentioned (piano, guitar, drums and recorder)<sup>30</sup> as opposed to seven (piano, guitar, drums, recorder, clarinet, trumpet and violin) among the fully-sighted children.

### Levels of achievement

With regard to the standards of performance achieved by participants, those with septo-optic dysplasia were, with one exception,<sup>31</sup> judged to be at the level of beginners. Those in the comparison group were, on the whole, also described as beginners, although one girl of 11 was said to be at an 'intermediate' level on the piano and clarinet, as was another girl, almost nine years old, on the violin. She had recently received a distinction in her Grade 1 examination and had been chosen to take part in a week's tuition at a Suzuki school of music in the USA in 2005. Clearly, the labels 'beginner' and 'intermediate' were subject to different interpretations, since another child who had achieved Grade 1 on the piano and was at the level of Grade 1 or 2 on the violin, was described as a 'beginner' on both instruments.





**Photo 6**

From the left, Nicholas, Summer and Georgina make music together in their local primary school

### **Singing**

There were no reports of vocal tuition among either group despite the fact that 11 of the participants with septo-optic dysplasia (34 per cent) and eight of the fully-sighted children (25 per cent) were said to have a 'special talent for singing'. The comments made by parents of the septo-optic dysplasia group include:

'At a very young age [he] sang songs in tune.'

'She has a pretty on key voice for a three year old.'

'She could sing songs before she could expressively communicate.'

'He memorizes songs word for word with some improvization . . . He seems to be in tune all the time.'

'She can copy music vocally very well.'

'She has long expressed a wish to become a singer, and has sung solo in school performances.'

### **What do these findings mean?**

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How can we account for these findings? With regard to music therapy, a recent study of the provision of music in special schools in England (Welch *et al.* 2001) suggested that, among children with severe or profound and multiple learning difficulties in the UK, the level of provision

is very low (around 2 per cent). In comparison, the proportion reported here – almost one in five children with septo-optic dysplasia, irrespective of whether they are British or American – appears to be encouraging. Of course, this could be due to a number of factors, including the relatively small sample of children with septo-optic dysplasia being unrepresentative, and the fact that music therapy may be less prevalent among children with profound needs. In any case, the data presented here suggest that there is still some way to go before the level of provision meets need, and it may be that in some cases, at least, communication between therapist and parents could be more effective.

With regard to specialist instrumental tuition, the fact that none of the participants with septo-optic dysplasia had lessons<sup>32</sup> (as opposed to 28 per cent of the comparison group) may in part be due to the fact that more of them were in the early years – before it is generally deemed appropriate for children formally to learn to play instruments.<sup>33</sup> A further (and more serious) concern, however, is the possibility that instrumental tuition may not have been considered an option on account of the children's disabilities. The research team is strongly of the view that neither age nor disability should be deter parents from accessing instrumental lessons for their children – particularly as so many of the milestones of musical development for disabled and non-disabled children alike occur in the early years, when expert guidance is, therefore, particularly important. This issue aside, it is possible to build up a picture of what may currently be happening in the cases of those youngsters with septo-optic dysplasia who were reported to have acquired some skills in playing instruments, evidently with little or no formal support.

We have already noted (in Chapter 4) that, as part of their reportedly high levels of interest in everyday sounds and music, some children with little or no sight appear to be especially attracted to sound-making objects including musical toys and 'everyday' instruments with which they are likely to come into frequent contact: hand-held percussion, electronic keyboards, whistles, recorders and the like. We may suppose that, at first, just like any other plaything, the children manipulate these, exploring in particular their sound-making qualities – intended and unintended! As one mother wrote concerning her five-year-old daughter (who apparently adores music of all types): 'She will ask to get instruments out and play with them', though apparently without producing anything of particular musical interest. The researchers' observations in the field suggest that a further stage is 'playing at making music', where children are aware that the instrument they are exploring is for music-making, but, as yet lacking the ability to reproduce tunes that they know, they play imaginatively, making up snatches of music. At first, these appear to be determined predominantly by physical patterns of movement rather than being

sound-led. Such patterns of movement may but need not be remembered and repeated, though there is in any case no guarantee that the child's efforts will sound the same on different occasions since, on the keyboard (for example) similar actions can produce different effects according to the combinations of notes that are struck. For example, as one mother writes of her seven-and-a-half-year-old daughter:

She will play a little melody on the piano and make up her own words to go along with it. She will ask [us] to come and listen but she has never been heard to repeat the same song twice.

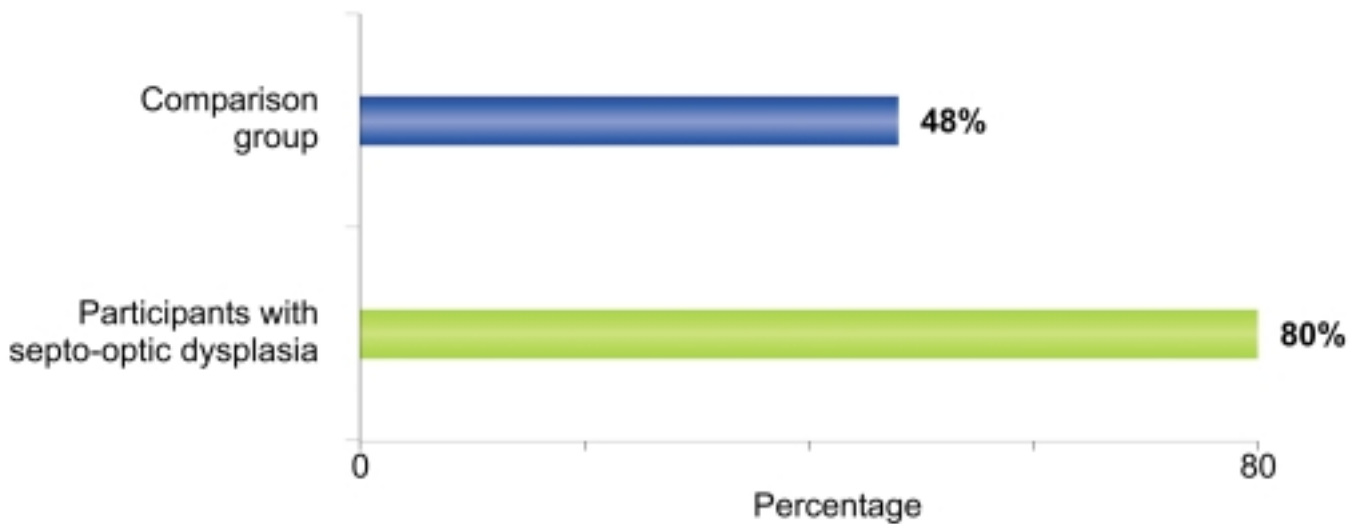
Similarly, another parent observes that her six-year-old daughter 'taps out her own tunes on anything that will make a noise and make up songs to accompany it'.

Some children take a further step: with persistence (we may surmise), they come to connect particular patterns of movement with the sounds that they generate (see Note 41). This enables them both to reproduce their own material consistently on an instrument and to recreate melodies and other musical fragments with which they have become familiar from frequent exposure (such as nursery rhymes, television theme tunes, mobile phone ring tones and the like). That is, they develop the capacity to 'play by ear'. For example, one parent notes that her three-year-old daughter 'has always enjoyed playing our keyboard and is able to copy rhythms and repeat her own tunes consistently'. Another remarks that her seven-year-old daughter

seems to be able to hear a melody and to emulate it in a very short time . . . She has just started with formal instruction on the piano with the *Primer* series but would rather skip the books and just play it the way she hears it.

Her music therapist wonders whether she has AP, and there is little doubt that, for those learning to play by ear, this ability (which may evolve alongside the development of instrumental skills) confers enormous advantages. For example, one six-and-a-half-year-old girl who, her mother reports, after only a few months of playing, 'is already naming chords, all keys, [and] can name any key music is being played in', also 'learns songs quickly'.

There are no reports of learning to play by ear among the comparison group, who (it appears) tended to start learning an instrument at a later stage than those with septo-optic dysplasia and, unlike their blind and partially-sighted counterparts, typically through formal tuition.<sup>34</sup> Hence the route to starting to learn an instrument, according to the survey data, is quite distinct for each group. A key factor may be the degree to which



**Figure 12**  
Self-motivated to  
make music?

self-motivation is present: in answer to the question ‘Is [your child] self-motivated to play or only when it is suggested?’ [question 24], 80 per cent of those with septo-optic dysplasia ( $n = 15$ ) as opposed to 48 per cent of the comparison group ( $n = 23$ ) replied in the affirmative (Figure 12), a difference which is statistically significant ( $P \leq 0.05$ ).

Yet despite the reportedly higher incidence of self-motivation to make music among the children with septo-optic dysplasia, and their typically earlier start in developing instrumental skills, it seems that none of those who featured in the survey had advanced any further than those who were fully sighted. As noted earlier in this chapter, almost all participants were described as ‘beginners’ with a few at an ‘intermediate’ level. And while 12 (38 per cent) of the comparison group were starting to get to grips with musical notation, none of those with septo-optic dysplasia was said to have been introduced to music in large print or braille. All in all, then, the music-developmental advantage that some children with septo-optic dysplasia appear to have enjoyed in their early years seems subsequently to have been lost. For example, the mother of one young man (now almost 23 years old) described how he ‘could play the [piano and organ] well at four years old but never followed up, so lost a lot of his skills’. Certainly, the young people of whom the researchers are aware beyond the current research group who have succeeded in developing advanced performance skills (such as Rex Lewis-Clack) have had a great deal of support and encouragement in fostering their talents from an early age. Hence it would appear to be vitally important for parents to seek specialist advice at the earliest opportunity if their child shows any signs of particular musical interests or abilities. This applies to whatever form these interests or abilities may take – through unusually sustained or intense listening, for example, or in starting to make music vocally or on an instrument.



### Photos 7 and 8

Ben (six) is particularly interested in technology and likes to work things out for himself

Finally, it is worth noting that certain of the parents' comments point up other important differences in the approaches that are adopted to their children's music-making, which seem to depend on the presence (or absence) of disability. For example, there are four accounts of fully-sighted children taking music examinations compared with none of those who are blind or partially sighted. Admittedly, the differing age profiles of the two groups may again have played a part here, though it is unlikely this is the whole story. Once more, the researchers speculate whether attitudes to disability may have been a factor. Yet, within the UK, for example, the national examination boards who run the 'Grade' examination schemes variously make provision for candidates who are visually impaired, have autistic spectrum disorder, special physical needs or learning difficulties. Examinations are open to people of all ages. The reference to 'Suzuki' tuition – only among the comparison group – is telling too, if not somewhat ironic, since this method is widely recognised as being particularly appropriate for children who are blind or partially sighted (cf. Note 36). It may be that the opportunities for wider socialisation that music can offer (for example, through the Suzuki summer school mentioned above) are yet to be taken up by those with septo-optic dysplasia who would potentially benefit.

## 8 Conclusion and recommendations

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*Focus on Music* explores the musical interests and abilities of children with septo-optic dysplasia, largely through the ears and eyes of their parents – though this information is supplemented with some direct observation by the research team. The detailed data that are presented here are a testament to these parents’ dedication to their children, and their insights shine through many of the comments that are made. Clearly, the conclusions that are drawn must be regarded as preliminary. Nonetheless, there is strong evidence that children’s level of vision is likely to be of greater significance in the development of their musical interests and abilities than whether they do or do not have septo-optic dysplasia. Hence the findings set out in this report may be of interest not only to those caring for and working with young people with this syndrome, but to carers, teachers, therapists and others involved with the wider population of blind and partially-sighted children. Also, further research is indicated to ascertain whether the results reported here would be replicated in the context of other eye conditions and syndromes.

*Focus on Music* strongly suggests that educational and therapeutic music provision for children with septo-optic dysplasia could in many cases be much improved. And since it is highly unlikely that this insufficiency is specific to the syndrome, it raises the question of whether blind and partially-sighted children (including those with additional disabilities) are, as a group, suffering discrimination in terms of the music services they are offered. The accounts of parents strongly suggest that, despite the unusually high levels of musical interest and ability that their children apparently display, those with septo-optic dysplasia have fewer opportunities to access specialist therapy or tuition than their fully-sighted peers and are far less likely to have their achievements publicly recognised. Of course, there are notable exceptions, and these should be given due acknowledgement. But in general terms, it appears that many of those offering music services still have some way to go in seeing beyond a child’s visual or learning difficulties to the latent musicality that this study suggests will be lying beneath.

The research team makes the following recommendations.<sup>35</sup>



- That this report be disseminated to those people with septo-optic dysplasia for whom it may be of interest, to the parents of children with the syndrome, the professionals who work with them (including medical practitioners, early years workers, teachers, therapists, social workers and educational psychologists), and to those responsible for planning, funding and delivering music services; and that the report be made available more widely to those involved in the education or care of blind and partially-sighted children.
- That those devising and delivering educational programmes, particularly in the early years (and across a wider age range of those with learning difficulties), should ensure that due account is taken of visually impaired children's likely interest in sound and the important role that music may play in their day-to-day experiences and wider development.
- That children and young people with septo-optic dysplasia should have access to appropriate music education (that may include specialist instrumental and vocal tuition) that meets their needs and enables them to fulfil their potential. Such input may well start from an early age (earlier than many music teachers typically begin to offer lessons),<sup>36</sup> when many of the foundations of auditory development in the domain of music are being laid.<sup>37</sup>
- That music services should work to ensure equality of access for all children with disabilities to specialist instrumental and vocal tuition, including those in the early years; and that appropriate government agencies should monitor the take up of such services by children with special educational needs nationally, to identify and celebrate good practice and to discourage discrimination.<sup>38</sup>
- That parents, teachers and therapists should keep in mind the possibility of exceptional musical development (including AP) among those with septo-optic dysplasia, and seek expert guidance as necessary on how best to foster particular abilities in the context of disability.
- That music examination boards should be vigilant in ensuring that the materials and approaches to assessment that they develop do not unwittingly discriminate against those with disabilities, and that, through a prevailing philosophy of inclusion, they actively promote widening participation.
- That, at national level, music therapy and music education organisations should work to promote greater clarity in the distinct though related nature and function of the two disciplines, and to raise awareness of the importance of both music education and music therapy for children with special educational needs.
- That music therapy organisations should lobby at national, regional and local level to ensure access to music therapy for all children with disabilities for whom it would be beneficial.

- That further research should be undertaken into the musical interests and abilities of blind and partially-sighted children, including those with additional disabilities, to understand better how different medical conditions and differing levels of functional vision may impact on auditory development.



# Appendix I *Case study*

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## Introduction

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This is an account and analysis of an interactive music session that a young girl – ‘Kay’ – had with one of the researchers (Adam Ockelford – ‘AO’) which was intended to assess her musical development. At the time, Kay was rising five. She had septo-optic dysplasia and was totally blind. The specifically musical elements of the interaction are discussed in some detail here since they offer a unique insight into the workings of an intriguing and apparently exceptional musical mind. Moreover, they indicate how precocious musicality can evolve with little or no direct intervention on the part of parents, teachers and therapists, and the implications of this are considered for groups of children (such as those with visual impairment) among whom the possibility of taking an exceptional music-developmental path *Focus on Music* highlights.

Kay’s assessment was triggered by reports from her class teacher that she particularly enjoyed singing and that, as far as the teacher could judge, her efforts appeared to be unusually advanced for a child of her age. Although the results of any previous developmental assessments that Kay may have had were not available, in general terms, she appeared to be functioning at a level that one would expect for a child of her age. She was evidently something of a character: strong willed, but with a great sense of humour. It was known that Kay had a small keyboard at home, with which she apparently liked to play for substantial periods of time. She had never received any music tuition.

## The interactive music session

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Given her interest in song, AO began by asking Kay if she would like to sing something, and without further ado, she set off unaccompanied with an up-tempo version of ‘Supercalifragilisticexpialidocious’ from *Mary Poppins*.<sup>39</sup> Kay’s singing was characterised by a raucous enthusiasm. However, notwithstanding the limitations of her vocal technique (which

meant that her intonation was not always perfect), her rendition had a secure tonal centre (the key of D), which was established before the piano accompaniment came in. Kay evidently relished making music with someone else, and she was happy to repeat the song with great gusto at an even faster tempo.

Here, then, was a natural young performer, who, quite uninhibited, loved to make music and could communicate forcefully through sound. The fact that her rendition began recognisably in the key of D major<sup>40</sup> and remained stably in that key (despite the immaturity of her vocal production) indicated that Kay was likely to have AP. In addition, she showed a strong sense of rhythm that was flexible to accommodate different tempi. In terms of memory, she evidently had at least one (complete) song in her repertoire, so it seemed reasonable to assume that there would be others too. However, a number of issues remained unresolved. For example, was Kay able to create her own music through improvisation? And if so, at what level was she capable of assimilating and developing given material and fashioning this into a recognisable structure within a coherent stylistic framework? How effectively was she able to process harmony (that is, hearing the accompaniment as well as the melody)? And had her mental model of musical structure yet been mapped onto the physical patterns of movement required to play an instrument by ear (in particular, the keyboard)?<sup>41</sup>

AO sought answers to the first two of these questions by suggesting that Kay should make up a new song – perhaps about her pet dogs (Jack and Elisha).<sup>42</sup> Four chords (F major, D minor, G minor, C major) were presented on the piano with a gentle swing rhythm and a blues feel that became more apparent as the piece progressed, and a simple vocal melody was added to set the scene. After only two iterations of the sequence, Kay took over and made up a song that lasted for one-and-a-half minutes. As the accompanist, AO's initial impression of the unfolding extemporisation was of a performance of startling moment-to-moment expressivity within a continuously evolving but coherent musical structure. Behind it, evidently, lay an active musical mind capable of creating new material intuitively, quickly and confidently within a familiar style.

# I Have a Dog

♩ = 97 *With a gentle swing*

AO: I have a dog ... What's his name? ... and his name is  
K: 'Jack'

The first system of the musical score consists of three staves. The top staff is the vocal line in treble clef, starting with a quarter rest followed by a dotted quarter note, then an eighth note pair, and a quarter note. The middle and bottom staves are the piano accompaniment, with the right hand in treble clef and the left hand in bass clef. The piano part features a steady eighth-note bass line and chords in the right hand.

3

Jack. Jack loves his name. K: He

The second system continues the musical score. The vocal line has a quarter rest, a quarter note, another quarter rest, and then a dotted quarter note followed by an eighth note pair. The piano accompaniment continues with the same rhythmic pattern as the first system.

5

on - ly drinks his wa - ter, and no Eu - ka - nu - ba.

The third system concludes the musical score. The vocal line features a series of eighth notes and quarter notes. The piano accompaniment includes a key signature change to one sharp (F#) in the right hand, while the left hand remains in the original key signature.

7

What can I do with him? I

9

must get to school, 'cos I'll called E - li - (hee) - sha.

11

- E -

13

li - sha likes her own bis - cuits.

15

She has got three ————— bowls:

17

one for her bis - cuits,

17

one for her wa - ter, and

19

one for her meat.

21

She's much bet - ter than Jack as well.

25

She is fly - ing her, and like to her. I

Musical score for measures 25-26. The vocal line (treble clef) contains the lyrics "She is fly - ing her, and like to her. I". The piano accompaniment (grand staff) features a bass line with dotted rhythms and a treble line with chords and melodic fragments.

27

like to wig - gle her hair a - bout.

Musical score for measures 27-28. The vocal line (treble clef) contains the lyrics "like to wig - gle her hair a - bout.". The piano accompaniment (grand staff) features a bass line with dotted rhythms and a treble line with chords and melodic fragments.

29

She likes ... Liked ... Ah

Musical score for measures 29-30. The vocal line (treble clef) contains the lyrics "She likes ... Liked ... Ah". The piano accompaniment (grand staff) features a bass line with dotted rhythms and a treble line with chords and melodic fragments, including a triplet in the right hand.

31

She ————— My best girl

Musical score for measures 31-32. The vocal line features a melodic phrase starting with a quarter rest, followed by a quarter note G4, a quarter note A4, and a quarter note B4. The piano accompaniment consists of a bass line with quarter notes and a treble line with a half note and two triplet eighth notes.

33

— dog of the world and

Musical score for measures 33-34. The vocal line continues with a quarter note C5, a quarter note B4, a quarter note A4, and a quarter note G4. The piano accompaniment features a more active treble line with eighth and sixteenth notes, and a bass line with quarter notes.

35

she ————— 's.

Musical score for measures 35-36. The vocal line has a long note with a fermata. The piano accompaniment includes a treble line with a triplet of eighth notes and a bass line with a long note and a fermata.



## Analysis

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Beyond these contemporaneous reactions, however, the taped record of the session makes it possible to transcribe and analyse Kay's efforts systematically in relation to a number of criteria, which in turn enable us to profile aspects of her musical (and wider) development (see 'Kay's improvised song'). These criteria are developed from a theory of how music intuitively 'makes sense' and can convey meaning (Ockelford 2005a, b). According to the theory, musical coherence is based on a sense of derivation, whereby any given aspect of musical sound – whether a particular pitch, melody, note-length, rhythm, harmony or key – is felt to *imitate* another (something which, it is thought, typically occurs non-consciously). Each of these aspects of sound has the potential to induce a range of emotional responses, and the sense of derivation that exists between them enables a kind of abstract aesthetic narrative to be built up in the course of listening to a piece – rather like hearing a story that is devoid of concrete meaning. It is important to acknowledge that, in the case of Kay's song, words were present too, and while these are not the main focus of the discussion here, relevant points will be noted in the context of the musical issues that are identified.

The criteria for analysing Kay's improvisation relate to the three potential sources of material that she had to draw on: the unfolding melody (as initiated by AO), the piano accompaniment and other pieces in similar style.

### The unfolding melody

With regard to the melody itself, the principal question addressed here concerns its cogency: in short, does it make musical sense? For this to be so, at least one salient feature from each musical event must intuitively be felt to be derived from another or others.<sup>43</sup> Analysis, to be published in due course,<sup>44</sup> shows that this is indeed the case: here it is sufficient to observe that successive notes do not pass by as isolated entities, but sound logically connected to each other through similarities in pitch or rhythm which bind them together in the mind to form short melodic 'chunks'. These chunks are themselves linked to one another through various forms of similarity and sameness. On the basis of this evidence, it is reasonable to assert that Kay has grasped many of the principles of how music (in the given style) is structured and that she can use these to create new tunes that make sense to listeners. It appears that Kay developed this capacity with no formal intervention on the part of others – purely through being exposed to a range of music and through expressing herself by singing. Of course, this is not in itself exceptional; almost all young children make up songs that are coherent by copying

and extending what they hear.<sup>45</sup> It is in the *nature* of the structural techniques that Kay employs that we can glean more about her developing musicality.

Take, for example, the first phrase of Kay's improvised song, which is almost wholly made up of 12 repeated Fs – a pitch structure of the simplest kind. This could be interpreted as a device for Kay to 'buy time' while she decides which way to take the melody. However, the Fs appear to grow organically from the preceding material, deriving from two sources: the pitches echoing the initial repetitions of the melody, while the rhythm adopts the dotted-quaver/semiquaver pattern first heard in the second half of bar 2. So Kay takes two distinct elements from the opening phrases of the melody (supplied by AO) and fuses them in her continuation, a form of musical development typical of many styles that simultaneously offers coherence and variety. Kay's forceful delivery of the repeated pitches adds to the sense that she is asserting her place in the partnership that is about to unfold: both musically and socially, building a foundation for the action to come.

This kicks off immediately: in the very next phrase (bar 7), there is a sense of release as the melody springs up from the constraints of Kay's opening repetitions using a new syncopated rhythm. Despite the feeling of things moving off in a new direction, though, both rhythm and pitch once more derive logically from what has gone before: the 'dotted' motive again being pressed into service and two similar ascending melodic intervals (from F to A, and A to C) deployed to straddle the two phrases. This method of connecting chunks – rather like using a musical 'ladder' to link different ideas – is one that Kay adopts a number of times (for example, between bars 16/17 and 22/23). Her other favoured approach is to take a pitch at or near the end of a phrase and use it to start the next (see, for example, the links in bar 8, 18/19 and 20).

These two ways of connecting musical chunks are characteristic of many musical styles (Ockelford 2004). Just as the great majority of people absorb the syntactical rules of their native language without conscious effort (just by listening and trying things out for themselves), thereby acquiring the ability to create original but coherent and comprehensible linguistic utterances, so Kay evidently is able to do the same in the domain of music. Her intuitive awareness of certain of the elements of *musical* syntax within familiar styles enables her to formulate new *musical* statements that make sense to other listeners.

However, there is another way of linking segments of music – the repetition (or variation) of chunks *as a whole*. Arguably this is the most widespread of all music-structural techniques, yet one which Kay does not use. The nearest she gets to it is in bars 17–24, when a pattern of three descending pitches is successively transposed and varied.<sup>46</sup> Why is this method not utilised more? It may be a consequence of the

improvised nature of the exercise Kay was undertaking, in which building a coherent structure depends on remembering material that has just been made up at the same time as continuing with the creative process (which may well interfere with the memories that have recently been formed). By intuitively adopting the approach of having each successive chunk pick up where the previous one left off, Kay makes fewer demands on memory and gives herself greater freedom to follow her musical or verbal whim of the moment. A corollary of this free-flowing approach is that there is no particular pattern to the links between chunks in Kay's song: while the moment-to-moment connections on the musical surface are convincing enough, there is no hierarchical arrangement of the segments – no deeper structural repetition or development. The climax, which occurs at the end of the improvisation, is signalled by a change of register and effected through a high, sustained keynote (sung 'fortissimo'), rather than occurring through a feeling of structural inevitability.

### **The impact of the piano accompaniment**

The second issue identified above concerns the nature of the relationship between Kay's improvisation and AO's accompaniment. The theory that musical structure stems from the derivation of material through imitation can be used again to analyse the processes that are at work here. Specifically, such analysis can be used to shed light on the nature of Kay's interaction with another person in a musical context. This has two elements. First, to what extent is her material *directly derived* from what is provided, and to what extent is it original?<sup>47</sup> And second, to what extent is her material *influenced* by what is provided (that is, 'indirectly derived'), and to what extent does it chart its own course? Using the analytical techniques developed by Ockelford (2005a), both these issues can be subject to statistical analysis. That is, a measure can be obtained of just how strong the connections are, and therefore of Kay's openness or resistance to other contemporaneous musical influences. However, in order to be meaningful, such figures would need to be interpreted in the context of comparative quantitative data, which are not currently available. Hence, here we will restrict ourselves to qualitative observations and suggest what these may signify for Kay.

Kay derives surprisingly little material directly from that which is provided. Following her opening gesture, in which the repeated Fs and rhythmic fragments are adopted from the introduction, no other phrase as a whole grows from the material improvised by AO. In the domain of pitch, there are connections between individual notes of varying degrees of strength. For example, the A that initiates Kay's second phrase (in bar 7) weakly echoes the A in the previous bars of the accompaniment (5 and 6), and the A that opens her fourth phrase (at the end of bar 12)

appears to pick up from the As in the right hand piano part that directly precede. However, it is only towards the end of the improvisation, from bar 30 (when Kay is apparently running out of steam), that stronger connections are found – notably the repeated A flats and Fs that Kay takes from the accompaniment. Rhythmically, the ‘dotted note’ motive is pervasive, and, following her opening phrase, it is much a part of Kay’s material as the accompanist’s. Other rhythmical elements too are exchanged between the partners: the ‘dragging’ rhythm first heard in the piano in bar 12, for example, reappears in the vocal melody in bar 15 and then again in the piano in bar 24.<sup>48</sup>

In terms of *influence*, however, the position is rather different. Kay’s efforts generally fit well with the repeated sequence of four chords, and even where, initially, her melodic intent seems to have overridden the harmony (for example, at the end of the first phrase, in the second half of bar 6, where the repeated Fs continue over the C major chord, and similarly at the end of bar 10), her subsequent continuations makes sense of these things in retrospect. The repeated Fs in bar 6 serve as a springboard for the next phrase, for example, while the F at the end of bar 10 is sustained to reach over into the F major harmony that starts the next sequence. However, within this general pattern of conformance, Kay’s creativity keeps bursting through. Consider, for example, the second chord in the sequence, which in the original, comprises a simple D minor harmony (made up of the notes D, F and A). In the course of her improvisation, Kay overlays this at different times with D, F, G, A, B flat and C, using a range of melodic devices (such as ‘passing notes’ – notes that connect harmony notes). And while her phrase lengths indicate her evident cognisance of the four-bar underlying structure, they are not bound by it, ranging from two beats in length to nine. Here, the influence of her improvised words appears to be particularly important.

What do these observations tell us about Kay’s musical abilities and propensities? It is evident that, within a familiar style, she can grasp a simple repeating harmonic structure and create material that not only conforms with that which is provided but extends it: Kay quickly makes the song her own. Her conformance to the given harmonic pattern exists despite the fact that she seldom directly imitates material provided by the piano. This lack of obvious thematic connection between voice and accompaniment may have been brought about by the considerable musical skill and experience that are needed to attend to someone else’s contribution and remember it at the same time as creating material oneself. However, Kay does sometimes leave the piano to play on its own (notably in bars 11 and 12), partly to regroup her own thinking, no doubt, though nonetheless affording a feeling of ‘give and take’ in the manner of a mature musical dialogue. That said, Kay appears most

likely to take advantage of the material available in the accompaniment when she is least sure of herself (in bars 30–33). This period of uncertainty does not last for long, though, and shortly afterwards Kay becomes her most assertive in determining the timing and nature of the final cadence, which culminates in a high F, unheard in the piece up to this point, which contributes to its effectiveness in signalling the end of proceedings.

### **The influence of other pieces in similar style**

The third and final issue to be addressed is the extent to which Kay uses material from other pieces in her improvisation. For this to occur implies that the music improvised by AO (and Kay herself) triggers specific memories of other pieces as well as features common to many ('stylistic influences') that are subsequently pressed into service. Direct borrowing from other compositions or performances is not a requirement for musical coherence (although it is encountered widely in traditional jazz – see Berliner (1994)), and it is not an approach that Kay adopts.<sup>49</sup> The utilisation of more general features is far more important in the construction of musically meaningful pieces, however, and Kay's improvisation does indeed fit comfortably within the stylistic envelope of the Western musical vernacular of the late 20th century, in terms both of the tonal and the temporal frameworks that are used. More than this, though, Kay utilises a range of melodic devices that indicate a certain musical sophistication, including passing notes (in bars 15 and 16), 'appoggiaturas' (accented non-harmony notes – see bar 25), as well as elements specific to the blues style, in particular the flattened third, first introduced by her in bar 10.<sup>50</sup>

### **Summary of findings**

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To summarise: there are currently no comparative data available to indicate objectively just how typical or exceptional Kay's improvisation is in relation to what one might reasonably expect from a child of her age. It is hoped that future research will make good this omission and enable informed judgements to be made in this case and others. Suffice it to say here that in terms of her ability to construct a mature musical narrative that is at once both expressive and coherent, drawing upon a range of stylistically appropriate music-syntactical techniques, Kay's improvisation appears to show an exceptional level of musical development.<sup>51</sup> The fact that certain common approaches to the logical connection of material are not used and the concomitant absence of a deeper structure may be specific to this improvisation or could indicate where future avenues of

learning (and teaching) may lie. However, the enduring message for researchers and teachers alike is the capacity of the mind to absorb and intuitively utilise advanced musical strategies with no formal tuition at all.<sup>52</sup>

### **What does this case study tell us?**

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What does this case study tell us about the musical development of blind and partially-sighted children with septo-optic dysplasia and the educational and therapeutic music provision that may potentially be appropriate for them (and, indeed, for young people more generally)?

- First, it is evident that exceptional musical abilities can develop very early (in the first few years of life), and with no direct intervention on the part of others.
- Second, Kay's improvisation tells us that the essential elements of musical understanding, many of which are typically conceptualised and codified in the process of music education, can develop and thrive at a purely intuitive level.<sup>53</sup>
- Third, Kay's example shows us that the capacity to create pieces and to perform them – above all, to communicate persuasively through the medium of music – does not need to be taught.
- Fourth, it is apparent that with sufficient self-motivation, some young children, even totally blind infants, with no visual model to guide them, can teach themselves to play instruments (such as the keyboard) by ear. That is *not* to say, though, that formal intervention should not play a part in such children's musical development: on the contrary, the research team believes passionately that it should. Although severe visual impairment need be no impediment to auditory development (Miller and Ockelford 2005), without appropriate guidance, it may well present a major obstacle to acquiring a secure instrumental technique.

In Kay's case, although she has achieved a great deal by dint of her own efforts, there is a much more that remains to be done, and she would undoubtedly benefit from working with a teacher willing to engage with her musical interests, able to guide her technical development and with the capacity to extend her musical horizons. For sure, Kay's strong personality and the fact that she is used to learning on her own mean that such a teacher would need to approach things flexibly, with a menu of options available, and a constant willingness to learn from Kay. But her musical fulfilment depends to a large extent on the intervention of an insightful adult with a clear sense of what her future may hold.

# Appendix 2 *Excerpts from the questionnaire*

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## FOCUS on Music Parents' Questionnaire [Excerpts]

### 5 Medical diagnosis

- a) Please summarise for us the medical diagnosis you have for your child:

[NB text boxes are larger in the original questionnaire]

- b) When was this diagnosis given? (DD/MM/YYYY)

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### 6 Vision

- a) Please tell us about your child's vision (tick only one box please). Does she/he have:

no vision? \_\_\_\_\_

some light but no pattern perception? \_\_\_\_\_

some light/shape/movement perception? \_\_\_\_\_

partial sight? \_\_\_\_\_

- b) Please summarise the results of any visual assessments you have for your child:

--

7 Is your child particularly interested in:

- |  | Not at all               | A little                 | A lot                    |
|--|--------------------------|--------------------------|--------------------------|
| d) everyday sounds? (eg, vacuum cleaners, car engines) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Please specify:

10 Does your child have a particular interest in **music**?

- | Not at all               | A little                 | A lot                    |
|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

11 Do you believe music is or has been important to your child?

- |   | Not at all               | A little                 | A lot                    |
|---|--------------------------|--------------------------|--------------------------|
| a) as a source of stimulation?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) as a source of comfort?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) to promote communication?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) to promote socialisation?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) to promote understanding?<br>(eg, through songs with numbers,<br>counting, days of the week) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) to mark out events in the daily<br>routine?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) other?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Please specify:

12 Does your child have a favourite piece or pieces or type of music?

- | Yes                      | No                       | Not sure                 |
|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

13 If your answer to 12 was 'yes', please tell us about it/them (otherwise go to question 14).



14 Is music important at particular times, or with particular activities, in particular places or with particular people?

Yes      No      Not sure  
           

If your answer was 'yes', please explain:

15 Does your child have music therapy sessions?

Yes      No  
     

If 'yes', please tell us about them:

16 How would you describe your child's musical ability?  
(tick only one box please)

- a) Not as developed as you would expect for a child or her/his age \_\_\_\_\_
- b) About what you would expect for a child or her/his age \_\_\_\_\_
- c) More developed than you would expect for a child or her/his age \_\_\_\_\_
- d) Exceptionally highly developed \_\_\_\_\_

17 Does she or he play an instrument?

Yes      No

18 If 'yes', which instrument(s) does she/he play?

	Beginner	Intermediate	Advanced
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please tell us about her/his playing, and give examples:

19 Does she/he read music?

Yes  No

20 Does she/he learn 'by ear'?

Yes  No

21 Does she/he have a special talent for singing?

Yes  No

If 'yes', please tell us about it:

22 Does she/he have instrumental/voice lessons?

Yes  No

23 About how many hours a day on average does she/he play or sing?

0-1  1-2  2-3  More than 3

24 Is she or he self-motivated to play, or only when it is suggested?

Self-motivated  At the suggestion of others

25 Does your child have perfect (ie, 'absolute') pitch?

Yes      No      Don't know  
           

If 'yes', please tell us what she/he can do (eg, *name notes, play notes back on a keyboard*):

26 Does your child make up his or her own music?

Yes      No  
     

If 'yes', please tell us about it:

## Appendix 3 **Useful organisations and contact details**

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**The AMBER Trust** supports blind and partially-sighted people – particularly those with additional disabilities – in the field of music. The Trust recently raised funds for the construction of the ‘Soundscape’ Centre, a performing arts centre for people with visual impairment and learning difficulties, which forms part of RNIB’s Redhill College in Surrey and was opened in 2002. The Trust also supports individuals in the purchase of musical instruments, gives grants for tuition and sponsors research. For more information about the Trust see <http://www.ambertrust.org/> and contact the Trust at [info@ambertrust.org](mailto:info@ambertrust.org)

**FOCUS Families** provides information, education and support to those affected by septo-optic dysplasia or optic nerve hypoplasia. The group can be contacted at <http://focusfamilies.org/>

**RNIB Music Advisory Service** provides information, advice and support to blind and partially-sighted people – children and adults – in the UK, and offers training and consultancy to the professionals who work with them. The RNIB Music Adviser, Sally Zimmermann, can be contacted on +44(0)20 7388 1266 or at [sally.zimmermann@rnib.org.uk](mailto:sally.zimmermann@rnib.org.uk) or at the  
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**SEMPRE** (the Society for Education, Music and Psychology Research) provides an international forum to encourage the exchange of ideas and to disseminate research findings in both music education and music psychology. The Society maintains a broad membership that reflects the considerable range of interests it represents. Membership includes free copies of the journal *Psychology of Music*, reduced fees for attendance at conferences, and entitlement to apply for a range of financial awards that

are intended to foster new research and assist the work of new researchers. For more information and contact details see <http://www.sempre.org.uk/>

**Soundabout** was set up in Oxfordshire in 1997 with a mission to foster the development and enhance the quality of life of children and young people with severe disabilities by enabling them to participate in and enjoy interactive music-making. Soundabout's main focus is on working in the classroom side-by-side with teachers and teaching assistants who often underestimate their own musicality, offering them simple techniques which facilitate musical expression and participation among their pupils. Soundabout is unique in that it is specifically designed for the most profoundly disabled children and young people, a client group almost entirely overlooked in the world of music education. For more information and contact details see <http://www.soundabout.freeserve.co.uk/>

**Suzuki Association** Information on the **Suzuki Association of the Americas** can be found at <http://www.suzukiassociation.org/>

For information and contact details of the **European Suzuki Association** see <http://www.europeansuzuki.org/>

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# Notes

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1. 'For Our Children's Unique Sight' – a support network of families whose children have septo-optic dysplasia/optic nerve hypoplasia. Contact details are to be found in Appendix 3.
2. Throughout this report, the term 'participants' refers to the children and young people about whom their parents and others (the 'respondents') provided data.
3. No significant differences were found between the responses from the UK (22 out of a total of 32 or 69 per cent) and the USA (10 or 31 per cent).
4. In some cases, depending on the number of responses to particular questions, it is statistically appropriate to assume that these findings pertain to wider populations. Where this is so, the probability of the finding occurring by chance (calculated in each case through chi-square analysis) is indicated to give a sense of how robust it is. For a fuller explanation, see Note 16 below. The supporting data and calculations are available from Adam Ockelford (contact details in Appendix 3).
5. One was said to be taught the piano by her music therapist.
6. It is worth noting too that, although 34 per cent of those who were blind and partially sighted were said to have a 'special talent for singing', none had received specialist vocal tuition or support.
7. The term 'additional needs' is used in this paper to refer to *educational* needs rather than the range of healthcare consequences that septo-optic dysplasia can have.
8. For further information available on the web see <http://election.cbsnews.com/stories/2003/09/25/60minutes/main575161.shtml> (accessed 24 September 2005).
9. Seven children were visited at home or school by Adam Ockelford or Sally Zimmermann (Music Adviser at the RNIB) or both.
10. The parents of a comparison group, volunteers whose children lived in south London or Wales and who were matched as far as possible for age and sex, but with no known disabilities or serious health issues, also completed the questionnaire for the purposes of comparison.

11. To unpick this issue would require comparison with a further group of blind and partially-sighted children who were matched for levels of vision, age and sex with the participants who had septo-optic dysplasia – a suggested future avenue of research (see Chapter 8).
12. This report focuses on musical interests and abilities; no significant correlations were found between these and the other areas of development and personality that were examined. However, should findings pertaining to such data that are of significance in their own right become evident through future analysis, these will, of course, be made publicly available.
13. The items from the questionnaire that pertain to this report are listed in Appendix 2. Cross-references are made in the text that follows.
14. In keeping with RNIB's policy of accessible information, all data presented in this report in graphical form are also described in words or figures (as part of the narrative or in tables).
15. The 'mean' age is the average derived by adding together the ages of the participants and dividing the total by the number of them. The 'standard deviation' is a measure of how spread out the ages were from the mean.
16. A mathematical procedure that estimates the confidence that researchers can have that the differences observed between samples (for example, the 32 participants with septo-optic dysplasia and the 32 children in the comparison group) arise not by chance, and are therefore likely to be characteristic of the populations as a whole. The degree of confidence is expressed as the probability ('*P*') with which the results could have occurred randomly. The usual threshold for considering a finding to be 'significant' is when the probability is less than or equal to 1 in 20, expressed as ' $P \leq 0.05$ '. So, for example, when  $P \leq 0.01$ , this means that we can be at least 99 per cent confident that the differences found between one group and another did not occur by chance and are likely to be more widely representative.
17. An expectation that may also have influenced parents' judgements as to the importance of sound in their children's lives. However, these judgements were often supported by detailed comments and further borne out by the observations of researchers on visits.
18. Thirteen in the case of the comparison group (41 per cent) – not a significantly different number from the participants with septo-optic dysplasia.
19. The parents' views and expectations of their children are, of course, crucial in their own right, and merit further study.
20. Conversely, it may be that some of the 18 per cent of parents who gauged their child's level of musical development to be at a lower level than they would have expected were being unduly cautious on



account of the higher-than-usual expectations that knowledge of acclaimed 'musical savants' had induced.

21. See, for example, Annie Takeuchi and Stewart Hulse (1993) 'Absolute pitch', *Psychological Bulletin*, 113 (2), 345–61.
22. For example, Welch (1988) found that 22 out of 34 blind children in special schools had AP (65 per cent) and Ockelford (1988) found that 19 out of 50 children who were born blind or who had lost their sight shortly thereafter had AP (38 per cent). For comparison, Roy Hamilton, Alvaro Pascual-Leone and Gottfried Schlaug (2004) report that 57 per cent of blind musicians within a sample of 21 have AP.
23. See, for example, Hamilton, Pascual-Leone and Schlaug (2004).
24. Siamak Baharloo, Paul Johnston, Susan Service, Jane Gitschier and Nelson Fremier (1998).
25. Darold Treffert (2000: 390–1).
26. One boy with septo-optic dysplasia and Asperger's syndrome was reported to be obsessed with anything to do with Rod Stewart.

S knows every Rod Stewart song ever made even though he is only seven years old. He has been to two Rod Stewart concerts already. He collects all CDs, cassettes, records and eight-track tapes. He cannot yet read yet he can name every song from every album by number. . . . Not only will he tell you what song it is, but what version – i.e., the slow one or the fast one, whether it was from a live concert, if it started different, etc. He hears things from each song that we do not hear at all. Every drum beat or other sound. S can sing each song exactly as Rod Stewart does, i.e., the different accents, or if he yells or tells a joke in between, etc., etc. S is from America but will take on Rod's British accent when singing Rod's songs. This obsession takes up nearly all of S's waking time and has done for the last four years.

However, while S clearly has some of the characteristics of musical savants (a good ear and an excellent memory for auditory information), his obsession with a particular artist has led him to learn large amounts of information *about* the music, rather than driven him to exceptional performance. As his respondent says: 'S has shown no interest in any instruments (other than air-guitar) I like Rod Stewart.'

27. Such as the acquisition of language, for example, which one of the researchers had hypothesised may occur later in children with AP.
28. Hence these preliminary findings in a specific domain accord with and appear to extend John Sloboda's much more comprehensive research that has indicated that the level of performance expertise acquired is directly related to the amount of formal practice of that

skill undertaken by the individual concerned (see Sloboda (2005)). The data here suggest that the *informal* practice of a skill (where the child is not consciously seeking self-improvement through what are typically externally determined or agreed goals) can be effective in skill acquisition too.

29. A further two were said to play *with* instruments (the keyboard and the drums).
30. At the level of performance described, the 'piano' and 'organ' are taken to be equivalent to the 'keyboard', and 'drums' equivalent to 'percussion'.
31. The 22-year-old man described below.
32. Discounting the music therapy sessions in which teaching apparently occurred.
33. A notable exception being those involved in the 'Suzuki' approach – see Note 36.
34. From the data available, it is not clear how the decision to start lessons was made.
35. While these recommendations are made primarily in relation to children with septo-optic dysplasia in the UK, the team is also of the view that comparable activity should take place in the USA and elsewhere.
36. The notion of starting formal engagement with music early is one of the cornerstones of the 'Suzuki' approach, which has proved successful for blind and partially-sighted children, including those with additional disabilities (contact details in Appendix 3).
37. To this end, it is recommended that parents be appropriately advised and supported by the local agencies and individuals who work with them. Additionally, RNIB's Music Advisory Service (see Appendix 3) offers specialist advice and support across the UK.
38. Cf. Hallam and Rogers (2003), who found that non-white and poorer pupils were less likely to benefit from local education authorities' music services than others.
39. The session was videotaped for future reference.
40. Kay was unaware of this or any other formal musical concepts or specialised terminology.
41. Later in the session, Kay played the melody of 'Supercalifragilisticexpialidocious' on the piano, making a number of errors which were immediately corrected, her ear clearly guiding the movements of her hands and fingers. The issue of learning to play through aural means will not be taken further here, but is considered at some length in Ockelford (1996: 46–57).
42. These and other names have been changed to preserve anonymity.
43. That is not to say that, in order to be coherent, Kay's improvisation should consist only of repetition. Through 'perceptual binding' (the

cognitive glue through which the different properties of an object cohere in the mind to form the notion of a single thing – see, for example, Snyder (2000: 7) ) and ‘gestalt perception’ (through which discrete events are reckoned to form larger wholes – see, for instance, Deutsch (1999) ) sounds, or groups of sounds, may differ from each other in some respects while being the same in others. Hence (as we shall see), similarity and diversity work in parallel in the creation of musical material that is at once original though coherent.

44. Ockelford (2006), ‘Using a music-theoretical approach to explore the impact of disability on musical development: a case study’.
45. See, for example, Moog (1976: 128–33); Hargreaves (1985: 60ff).
46. Most of the phrases are of a similar length, probably determined by what Kay could comfortably sing in one breath.
47. Clearly, originality also relates to the extent of the derivation of material from other pieces of music, and this is considered below.
48. The extent to which AO derives material from Kay (for example in bars 28 and 35) will be the subject of a separate investigation which seeks to gauge the balance of influence between the two parties, and where the locus of control lies at any given point.
49. AO does, however, quoting ‘Dream, Dream, Dream’ by the Everly Brothers in bars 20–23.
50. Although this is partly anticipated by AO in bars 5 and 6.
51. The extent to which her verbal improvisation is typical, both in its own right and in relation to the music, are the potential subjects of future research.
52. As music-analytical techniques such as those used here are further developed, it is interesting to postulate the extent to which the analysis of purely musical elements in improvisation may shed light on aspects of broader personality and human relationships. Clearly, such techniques may be of considerable value to music therapists and educationists seeking to evaluate the effect and effectiveness of their interactions with children with special needs.
53. Kay also shows us that, contrary to certain thinking, it is not necessary to know to the names of notes to possess AP. For a discussion of a range of issues related to our current understanding of AP, see Deutsch *et al.* (2004).

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