

MERYC2017



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Researching the musical engagement of young children with Retinopathy of Prematurity

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Abstract

There is evidence that children with Retinopathy of Prematurity (RoP) are more likely than their fully-sighted peers to show a strong interest in music, to develop rare abilities (such as 'absolute pitch'), and to teach themselves skills such as playing an instrument by ear at an early age (Ockelford and Matawa, 2010). However, beyond the anecdotal accounts of parents and teachers (for example Ockelford, 2008, 2013) little is known about the nature of the music-developmental trajectories that children with RoP take in the early years. The research reported here takes the first step towards addressing this gap in our knowledge by observing and assessing the musical development of four children with RoP (with varying degrees of visual impairment: Stages 3, 4, and 5) over a period of two years.

Data are gathered through regular visits by a music therapist who interacts musically with the children, and through videoed musical 'diaries' assembled by parents. The children are assessed using the Sounds of Intent in the Early Years music-developmental framework (Voyajolu and Ockelford, 2016), which offers quantitative and qualitative means of analysis. Parent interviews are also taken to provide further information on the children's musical interests and experiences at home. Initial analysis of the data suggests that one of the children displays levels of musical development that are broadly typical for their age, two of the children's general developmental delay is reflected in their musical development and one child is showing early signs of being able to play the keyboard 'by ear' suggesting an unusual musical precocity.

Keywords

Retinopathy of Prematurity. Music therapy. Musical development. Premature infants

Introduction

In the UK, approximately 54,000 infants are born prematurely each year. Of these, around two thirds are likely to develop learning difficulties and 60% have some degree of visual impairment, (although not all will need treatment). Six per cent will have severe visual impairment due to retinopathy of prematurity (Bliss, Statistics section, n.d.). Retinopathy of prematurity (RoP) can occur in babies that are born early, particularly at less than 32 weeks, or in those who have a low birth weight or where babies have needed oxygen treatment. When babies are born too early, their retinal blood vessels may not fully develop. Abnormal blood vessels can cause scar tissue, meaning the

retina detaches. This damage is known as Retinopathy of Prematurity (RoP) (Royal National Institute of Blind People (RNIB), 2015).

Research with blind children born prematurely suggests that almost half will develop exceptional music-processing skills such as 'absolute pitch' within the first 24–36 months of life. This includes those with moderate or severe learning difficulties (Ockelford and Matawa, 2010). Other studies have also suggested a prevalence of absolute pitch in blind individuals, including children (Hamilton, Pascual-Leone & Schlaug, 2004; Welch, 1988). Wan, Wood, Reutens, & Wilson (2010) found that early-diagnosed blindness (occurring at birth and shortly afterwards) was correlated with advanced auditory perception.

Many children with visual impairment who were born premature demonstrate more than exceptional auditory processing skill. A great interest in listening to and creating sound and music during childhood, with the self-motivation to learn an instrument 'by ear' has also been documented (Baker, 2014; Ockelford & Matawa, 2010). Non-musical benefits for early years children with visual impairment have also been explored. For example, Metell (2015) investigated the role of music within communication and social development and found positive outcomes in terms of children's bonding and interaction with parents

The current project aims to build on the research by Ockelford and Matawa (2010) to further understand the musical engagement and development of children with RoP through longitudinal case studies over a period of two years.

Method

Design

A longitudinal case study design with an emphasis on naturalistic observation was used to understand how each child's musical engagement has developed over time. The use of longitudinal research has been noted as an effective method when studying developmental change (Menard, 2002), in particular to provide a glimpse into children's ever changing daily experiences (Green & Hill, 2006). Observing children in their natural environment has also been suggested to provide valuable insight into children's development (Greene & Hogan, 2006). Dunn (2006) writes of the importance of observation in terms of understanding children's behaviour within their relationships and states: 'If we are to document the salient influences on children's development, we need to know not only how they respond to standardized experimental procedures or situations, but what happened to children in their family and school lives' (p. 87).

Observations for this project have been taken by a music therapist who visited each child and their family at home four times a year. During visits the music therapist interacted musically with the children, their parents and

siblings when present. The children's musical activity was captured through video, with the aim of observing and subsequently gauging the musical engagement and development of each child. Families were encouraged to use music with their children in between visits and capture moments of musical engagement through video, whether with their immediate family, including parents, siblings, grandparents, or family friends.

Video observations of the children were collected by parents with the use of the EthOS app (ethnographic observation system), which allows video, audio and photographic data to be taken with a smart phone or tablet and sent directly to a secure cloud database. The music therapist collected video on a designated project tablet using the EthOS app as well, allowing all video to be stored and analysed in a central and secure database.

Participants

Four families were recruited in year one by liaising with charitable organisations that work with families of children who are born prematurely, through e-flyers and online media, and through contacts with hospitals and medical professionals. One family dropped out of the study in the first year, with two new families being recruited in the second year. Data have therefore been collected on six children overall. However, in this paper, data from four of the children from year one will be discussed.

Of these four children, one child was born at 23 weeks' gestation with stage 4-5 RoP, one at 24 weeks' gestation with stage 3 RoP, one at 24 weeks' gestation with stage 4 RoP, and at 27 weeks' gestation with APROP (Aggressive Posterior RoP). At the start of the project in 2015 two of the children were 24 months of age and two of the children were 36 months.

Analysis

Observations

The Sounds of Intent in the Early Years (Sol EY) framework of musical development has been used to analyse observations and map the children's musical engagement over time (Ockelford & Voyajolu, 2016; Voyajolu & Ockelford, 2016). In summary, the Sol-EY framework sets out six levels of musical development and three domains of musical engagement. The domains include reactive (listening and responding to sound and music), proactive (making sound and music alone) and interactive (making sound and music with others). Of the six levels of musical development, the four which usually occur in the early years are summarised as:

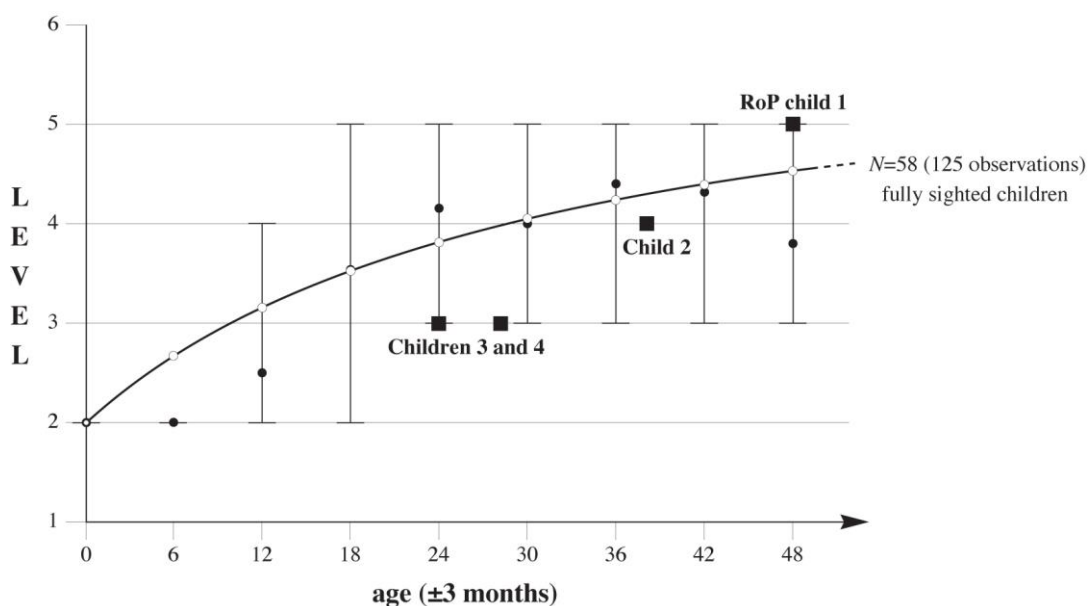
- an emerging awareness of sound and music and the diversity that is possible, and a developing awareness of a sense of agency in producing sounds
- recognising and creating patterns in sound through repetition and regularity, imitating others and enjoying being imitated
- understanding and creating groups of sound that form musical 'chunks' or melodic motifs and

- responding to and creating whole pieces that gradually become more 'in tune' and 'in time', in accordance with the child's cultural background.

Level one of the framework is a reference to the developmental level that occurs before hearing starts to work and level six refers to musical maturity, which usually occurs in adolescence. Figure 1 illustrates the Sol EY framework model, depicted as a set of concentric circles starting with level one at the innermost circle, opening outwards towards level 6.

A total of 233 observations of four children have been collected and analysed over the first sixteen months of the project. As the project is still in its second year, further observations are being collected by both the researchers and parents and are yet to be analysed. However, the preliminary analysis shows that one child is demonstrating a level of musical development ahead of that typically demonstrated by full-sighted children. For example, he has shown early signs of being able to play the keyboard 'by ear' despite having a general developmental delay. One child remains at much the same level of musical development as would be expected of her fully-sighted peers of the same age, and two of the children's general developmental delay is reflected in their musical development. Figure 2 shows a comparison between the four children in the current study and the musical engagement of a cohort of fully-sighted children, also analysed using the Sol-EY framework (Ockelford & Voyajolu, 2016; Voyajolu & Ockelford, 2016)

Figure 1. The Sounds of Intent in the Early Years framework of musical development



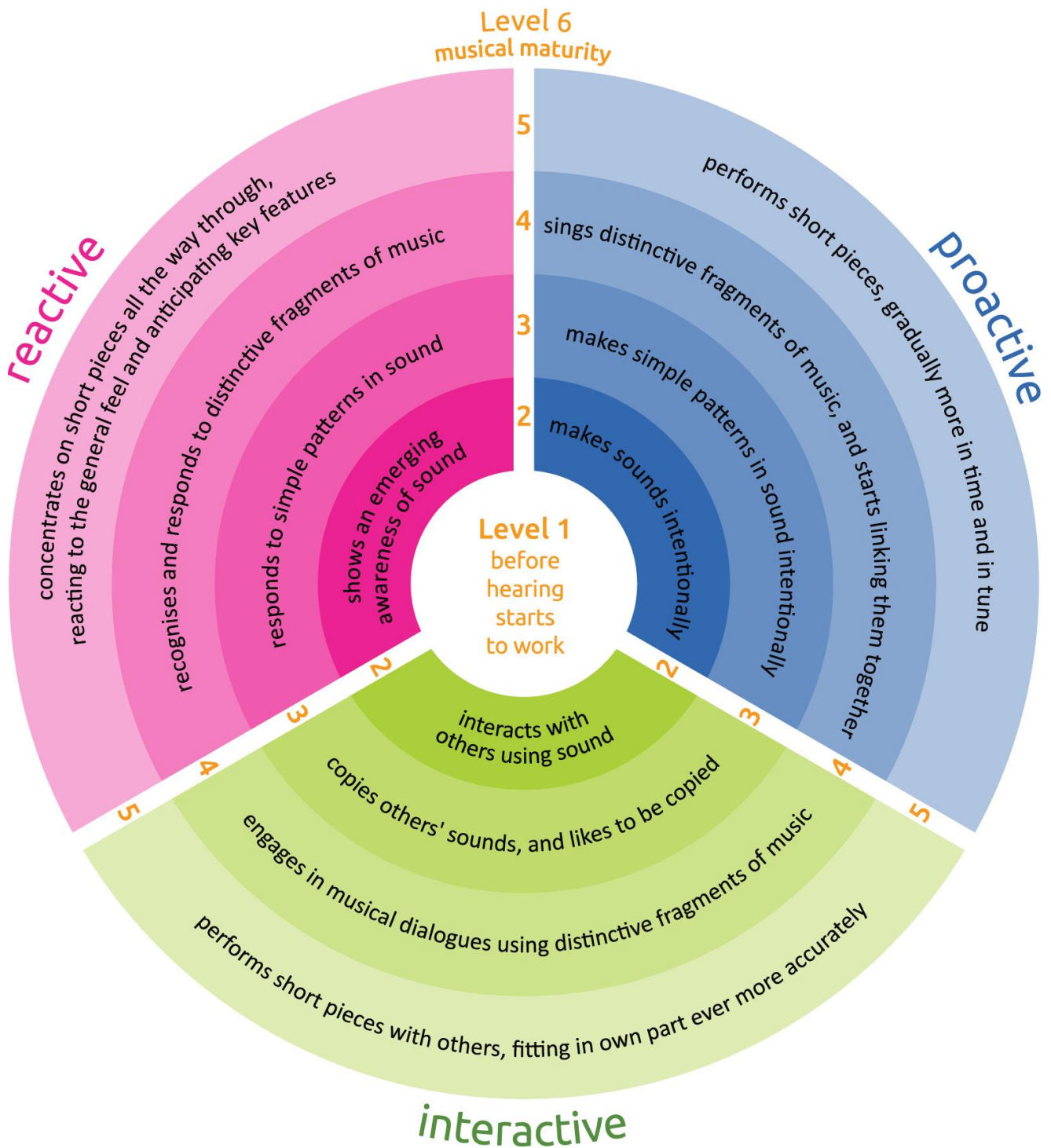


Figure 2. Comparison of neurotypical and blind children's musical development

Parent Interviews

As well as observational evidence, during the four visits the music therapist held semi-structured interviews with parents to gain further insight into the child's musical preferences, interests, and usual activities, as well as the

parent's experience of the project. Interview questions were based on the questionnaire used in Ockelford and Matawa's 2010 study on the musicality of children with RoP. Interviews were audio recorded and are being analysed qualitatively alongside observations. Initial parent comments are included here.

On the child's engagement with sound and music

"Every morning she comes down and the guitar is the first thing she asks for."

"We have never seen him so engaged for such a long-time. Usually he loses interest in activities after a few minutes. It's amazing to see how much he enjoys it."

"She is not interested in TV whatsoever. But she is [in] the portable DVD player. She'll ask for her music to be played... If we're at home it will be in the kitchen on the radio every morning. Otherwise if we're out and about she'll have her portable one... It's a comfort for her I feel. Because again, when we're out or she's tired or in unfamiliar surroundings she'll always opt to go to the push chair and then she'll say 'Can I have my CD player?'"

"Hearing is very switched on. But generally, if we're out and about, it's people's voices. If it's somebody that she hasn't heard before she'll say 'Who's that? What's that? Who are they? She's very interested in the outside world.'"

On the use of music with their child

"We had a few toy musical instruments lying around the house but I would have had no idea what to do with them. I'm so unmusical and the project has given me the confidence to use my own voice and to make sure I take her along to music groups and concerts now she's a bit older. Having the real instruments from you has been really good, as you can tell how they have a better sound, particularly with her having no sight."

"I think I would have done some singing but didn't realise the benefits and how it could help with his speech. Having the visits has been a good motivator as I've learnt that what I'm doing with him is really helpful"

We are finding similar evidence to Ockelford and Matawa's 2010 study that children who are blind are highly engaged in listening to everyday sounds and music. Therefore, one of the key factors in the project rationale has been to encourage parents to use music confidently at home and to nurture their child's engagement.

Conclusion

The data collected thus far provides a first look at the musical lives of these four children with Retinopathy of Prematurity. We see that even within this small sample, one child is showing signs of musical skill beyond that that would be typically expected in fully-sighted children of the same age, despite having a developmental delay. We have also seen, in relation to earlier studies of children who are visually impaired (Baker, 2014; Adam

Ockelford & Matawa, 2010), a high level of engagement with sound and music, which we hope has been harnessed and encouraged by the visits, and most importantly, as a consequence by the children's families.

As observational data of the children continue to be collected, future analysis will focus on their musical development over time in relation to the children's age and in comparison to their sighted peers.

Furthermore, the research team, with feedback from families, is developing a resource of musical activities based the Sol-EY framework for children with sight loss. The resource includes a set of cards, which will be paired with a website to include video and audio examples of each activity as well as downloadable versions of the cards, songs and activity suggestions

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