Music as an Intervention for Deaf Pre-schoolers and their Families: A Channel for Communication

A study submitted in partial fulfilment of the requirements for the degree of Master of Arts of the University of Hertfordshire

Ginny Parker, BA (Hons), QTS, QToD

Mary Hare, Newbury

Partnered with University of Hertfordshire, Hatfield

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Abbreviations

IDS	Infant Directed Speech
NDCS	National Deaf Children's Society
NHS	National Health Service
NSS	Northumberland Sensory Support
UNHS	Universal Newborn Hearing Screening

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Abstract

The purpose of this multiple case study is to investigate the impact of a pre-school music group, provided as a group intervention for young deaf children and their families. Most prior research focuses on the use of music as a tool for rehabilitation post cochlear implant. In contrast, this project includes children with a range of hearing levels and at different stages of development and focuses specifically on the impact on caregiver-child interaction.

The research has used a mixed methodological approach, comprising of caregiver and professional interviews alongside video observations of parent child dyads engaged in a musical play activity. The results have demonstrated that a music group offers specific benefits as a vehicle to support positive caregiver-child interactions. These benefits appear to be due to the characteristics of using music as well as the intervention taking place in a group setting with other families of deaf children.

As such, the results of this study will add to the limited current literature on the use of music with the wider population of young deaf children and their families. It is intended that by adding to the evidence base, this study will be helpful in the implementation and development of the use of music as an additional intervention tool.

1. Introduction

This dissertation seeks to evaluate the impact of using music in a group setting as a context for early intervention for young deaf children and their families, with a particular focus on caregiver-child interaction.[1]

At present all the families that attend Northumberland Sensory Support (NSS) music provision have chosen to use primarily an auditory-oral mode of communication with their deaf child. Therefore, this is where the focus of this study lies. However, where relevant, reference to the signing mode of communication is made. It is worth noting Sass-Lehrer's (2011) proposition that families are increasingly pragmatic, choosing whatever approach works best in different situations and at different stages and that it is unnecessary to choose one approach over another. This pragmatic and flexible use of communication mode is the approach used in the NSS Music Group where sign is often used along with singing and music.

1.1. Rationale

Despite anecdotal evidence that music as an early intervention tool for deaf children is becoming more widespread and that it has many benefits, the existing literature demonstrates that there has been limited research in this area. In addition, as practitioners working in the field of early intervention for deaf children and their families, it is important to be engaging in and support evidence-based practice. Employing evidenced based practice leads to better

[1] This study uses the terms 'deaf' and 'hearing impaired' to cover all degrees of hearing loss in line with NDCS (National Deaf Children's Society) recommendations (NDCS, 2017). Where possible, this dissertation uses the terms 'caregivers' or 'families' with the aim of including fathers, extended family members and others such as legal guardians. However, if referring to articles or quotes from interviews that use other terminology such as 'carers' or 'mothers' then the terminology cited in the respective articles or interviews has been used.

outcomes for children but is also necessary when services are being required to justify their work and spending. Finally, this research is grounded in a personal conviction that music intervention for deaf pre-schoolers has the potential to have far-reaching benefits.

1.2. Context

Since the introduction of Universal Newborn Hearing Screening (UNHS) in 2006, there has been an ever-growing emphasis on the provision of high quality effective intervention which works with families to minimise the potential risks of a hearing impairment on subsequent development, especially in the areas of language and communication. The NSS Music Group is a part of the early intervention package offered to families with young deaf children.

The NSS Music Group is offered to all families in Northumberland who have a pre-school child with a sensory impairment, irrespective of the level of service input or other needs of the child. The group is offered as an additional intervention to families and therefore attendance or non-attendance does not impact on other input from the Sensory Support Service. The group has been running since 2012 and numbers of children attending have varied from between four and eight. Babies from as young as six weeks old have attended, up to the age of three years old. It is run weekly during term time by two teachers of the deaf, one being the researcher. Caregivers and children are encouraged to participate and there are a variety of signed songs, action songs, nursery rhymes, and music and movement activities. An important aspect of the group is the repetition of songs and music to build up familiarity while steadily introducing new material. For an example session plan see Appendix A.

The professionals and families involved in NSS Music Group are confident that the group has numerous benefits for the children and families who attend. The purpose of this study is to examine the provision in greater detail, both from a family and professional perspective, to identify the specific benefits and limitations of a music group such as this. This research focuses on the impact on caregiver child interaction as this is widely accepted as being one of the principle aims of effective early intervention for young deaf children and their

families (NHS Newborn Hearing Screening Programme, 2010, p.1, Joint Committee on Infant Hearing, 2007).

1.3. Chapter Outline

This dissertation begins by reviewing the current literature pertaining to early identification of deafness and its relationship to early intervention; the tenets of early interaction; the potential benefits of music to early interaction; and the use of music for early intervention with young deaf children and their families. Chapter 3 then explains the qualitative and quantitative methods used to carry out the different parts of the research into the impact of NSS Music Group. Chapter 4 outlines the results and uses them as a basis to explore themes relevant to the research question such as the development of communication and language, benefits of a group intervention and the use of music. Chapter 5 explores the results and the research in greater depth, contextualising the results within current literature and evaluating the research. Finally, the conclusion draws the findings together in order to justify the use of music as an intervention approach.

2. Literature Review

This literature review begins by contextualising early intervention for young deaf children and their families and its inextricable relationship with early identification. Both themes are considered in much of the current literature as pivotal to effectively meeting the needs of young deaf children and their families. Fostering effective interaction between a caregiver and child is recognised as a key aim of early identification and intervention due to its fundamental role in linguistic and communicative development. Thus, this review will examine the literature related to significant elements of early interaction.

The focus of the final part of the literature review shifts to the use of music. It will begin by examining literature related to music and the brain and the relationship between music, language and communication. Finally, I will review the literature regarding the relationship between music and deafness and its use with pre-school deaf children. The purpose of this review is to identify current themes in this area and potential gaps in the literature, and to form a basis from which to conduct this research.

2.1. Early Identification of Deafness and Early Intervention: A Symbiotic Relationship

Early identification of deafness and its relationship to early intervention is relevant to this study because the music group being used for the case study is an example of an early intervention strategy which is used within my service but also increasingly by other professionals working with families and deaf children. In addition, the NSS Music Group strives to be a family-centred intervention and there is a significant element of family-to family support which is why this review will look at both.

Following the inception of UNHS[2], early identification of childhood deafness is now the norm in England. As a result, the age of diagnosis of deafness has changed significantly to a position where the goal of UNHS is for screening to have been completed by 1 month of age. Following screening, the aim is for moderate to profound hearing loss to have been identified by 3 months of age and the family to be receiving intervention by the time the baby is six months old (NHS Newborn Hearing Screening Programme Standards 2016 to 2017).

However, early identification is not in itself an end goal of UNHS. What early identification allows is for early intervention and 'access to critical auditory brain centers during times of maximum neuroplasticity' (Cole and Flexor, 2010, p.2). The aim of effective early intervention for young deaf children and their families is to 'maximise linguistic and communicative competence' (Joint Committee on Infant Hearing, 2007, p. 898). Professionals in the field of deaf education including: Moeller et al (2013); the Joint Committee on Infant Hearing Position Statement (2007); and Quality Standards in the NHS Newborn Hearing Screening Programme (2010) have devised best practice guidelines that state that high quality, well-coordinated, family centred support and intervention are essential if deaf children are to fully reap the benefits of early identification; one without the other is not enough.

2.1.1. Early Intervention, Communication and Language

The principal aim of early detection of deafness and early intervention is to 'Enable high quality parent - child interaction for all newborn children through early identification of children at risk of poor interactions attributable to unidentified hearing problems.' (NHS Newborn Hearing Screening Programme, 2010, p.1). Therefore, maximising opportunities to develop linguistic and communicative competence (Joint Committee on Infant Hearing, 2007) and ameliorating potential delays in communication and language development

[2] The Newborn Hearing Screening Programme for England was introduced across the country in a phased process between 2002 and 2006 with full implementation achieved in March 2006.

(Spencer & Koester, 2016) must be a priority for professionals working with families and children who have been identified as having a hearing loss.

There is also an increased understanding that there are 'critical' or 'sensitive' periods in a young child's development when particular skills are most easily acquired (Spencer & Koester, 2016; Sass-Lehrer, 2011). Sass-Lehrer (2011) describes the first 3 years as the 'magic years' due to the implications of early experiences during this time for the acquisition of language and the impact on cognitive and emotional development. Specific research has looked at critical periods for language development (Lederberg & Spencer, 2005) indicating that providing quality language experiences, whether by using technology such as hearing aids or cochlear implants or from sign language, will support language development in the most efficient and effective manner.

2.1.2. Family-Centred Intervention

The Music Group is a family-centred intervention. It is open to all family members and frequently siblings, fathers, mothers and grandparents attend. Sass-Lehrer argues that 'the development of the young child can only be fully understood within a broad ecological context beginning with the family…' (2011, p. 69) and research increasingly emphasises the importance of the family as having the greatest impact on an infant's early development (Davis & Meltzer, 2007). Therefore, early intervention that is collaborative, has the child's family at the heart and is sensitive to each family's unique circumstances and cultural perspective is most likely to be successful and is considered a cornerstone of best practice (Moeller et al, 2013, Sass-Lehrer et al, 2016). Moreover, early intervention that provides support for the well-being of the whole family is most liable to see a positive impact on the overall development of the child (Calderon and Greenberg, 2011).

Rush and Sheldon (2011), discuss the coaching method of early childhood intervention and describe how many practitioners use intervention strategies that focus directly on the child. However, they suggest that parent mediated intervention, which emphasises parent responsiveness, is much more effective in influencing outcomes than that which focuses only on the child. This concurs

with Cole and Flexor's (2007) assertion that it is imperative that caregivers as well as professionals 'understand the features of optimal, growth-promoting interactions' (p. 250). This evidence underpins the action research element of my research project which aims to collaborate with parents, discussing the use of specific strategies used within the music group and the skills that they develop.

2.1.3. Family-to-Family Support

Social support is seen as providing a buffer from the potential stress of parenting a deaf child as well as also providing protection from stress from other sources that may be experienced in everyday family life (Thomson et al, 2011). Gutman et al (2009) found that there was a positive correlation between the size of social networks and maternal mental health, and that those mothers with more extensive social networks had more positive interactions with their infants than those with less extensive networks. However, it could be argued that it is not only the size of the network that matters but the quality; that is support networks that include fellow caregivers in similar situations may be of particular value. Hintermair (2004, 2006) suggests that when working with families, professionals should attempt to reinforce children's and families' resources and strengths. Hintermair highlights the importance of 'natural networks' of support and the role of the professional in assisting in expanding and restructuring these networks to include other parents of deaf children to optimise the families' social resources. The Global Coalition of Parents of Children who are Deaf or Hard of Hearing state in their 2010 Position Statement that;

> On reflection of the early intervention years, a majority of families cite contact with other parents of children with hearing loss as the most helpful support they received after learning their baby was deaf or hard of hearing. Direct parent-to-parent support ranks as one of the strongest measures of family support.

2.2.Early Interaction

A principle goal of the early identification of deafness and subsequent intervention is to enable high quality early interactions between infants and their caregivers because it is known that these early exchanges with significant responsive adults form the basis for future communication and language development (Sharma and Cockrill, 2014). This is important as this study intends to explore the use of a music group as an intervention and its impact on caregiver- child interactions. This section will examine some of the significant elements of early interaction identified in the literature.

2.2.1. Caregiver and Child Attachment

Before looking at specific elements that constitute early interaction, it is important to emphasise how early interaction is underpinned by a strong, positive caregiver-child relationship. There is an enduring interest in the concept of attachment. This is because secure attachment is believed to influence many facets of child development such as social and emotional skills, the ability to form positive relationships with others (Weichold & Sharma, 2013) and early language development (Thomson, 2011). Neuroscientists also now believe that secure attachment can influence many other neurological pathways and the development of the infant brain (Shonkoff & Garner, 2012, Suskind, 2015).

2.2.2. Turn-taking, Imitation and Joint Attention

Turn-taking begins with the earliest interactions and is a crucial element of communication, language development and social exchanges (Spencer & Koester, 2016). Beginning with touch, eye gaze and facial expressions, turn-taking then evolves to include vocalisations and eventually words and then conversations.

Imitation is another element of early interaction which is often instinctive. Imitation occurs when adults copy and therefore reinforce an infant's gestures or vocalisations. It conveys the message that the infant has been noticed and responded to (Spencer & Koester, 2016).

Joint attention refers to caregivers' and children's coordinated attention to each other and to a third object or event (Lieberman et al, 2014). It can be referred to as 'triadic' in nature as all 3 elements are present and interlinked (Harris, 2010). It is achieved when one individual alerts another to an object by means of eye-gazing, pointing or other verbal or nonverbal indications (Sharma et al, 2014). Coordinated joint attention typically begins at around 12 months of age and allows toddlers and adults to communicate and share meanings which in time will develop into intentional communication and shared language (Lederberg & Beal-Alvarez, 2011). Research has shown that being in joint attention helps babies to learn language. Collinson (2017), in her scoping review on the best and most recent evidence on deaf children's early language and communication, discusses the importance of joint attention and how parents' responsiveness to the child's focus of attention has been found to predict language growth.

An adult following a child's lead is closely linked to joint attention and is another important element of early interaction. Fundamentally, a child is more likely to attend to what an adult is saying or doing if it relates to the child's interest or focus (Collinson, 2017). Talking to children about objects and events that have caught their attention is especially important for the development of language. Responding to children in this way reinforces their motivation to communicate also known as contingent communication. This is of particular importance to this study, not only because of its close link with language development, but also because following a child's lead is an important element incorporated into NSS Music Group sessions.

2.2.3. Infant-directed Communication and Multisensory Elements of Early Interaction

Infant directed speech (IDS), sometimes known as 'motherese', is the way adults often adjust the pitch, tonality and rhythm of their speech and vocalisations when interacting with an infant (Spencer & Koester, 2016). Adult vocalisations directed at an infant often adopt musical properties such as wider pitch range, longer pauses and highly modulated intonation contours (Thurman & Welch, 2000, Welch, 2006 cited in Rocca 2015). This helps the infant 'tune

in' to speech that is directed at them and helps to hold their attention, therefore facilitating speech perception and language development (Collinson, 2017). Research into deaf parents raising deaf children illustrates how parents who are deaf and using sign as their mode of communication also adapt their communicative interactions to match their child's visual access to language, using facial expressions, body language and gesture to attract and hold their infant's attention (Meadow-Orlans et al, 2004).

An infant experiences the world through all his or her senses. There is a close link between sound and sight in early interactions. Visual attention is attracted by sounds from as soon as a baby is born (Spencer & Koester, 2016 p. 198). Whether a baby is deaf or hearing caregivers will often integrate touch and movement with visual and sound input in early interactions, especially when using music and singing in communication.

2.3. Music

As my research focuses on the use of a music group as an intervention for deaf pre-school children and their families, specifically its impact on caregiver-child interaction, this section of will examine the evidence to support the potential benefits of using music as an early intervention strategy. The literature around music and brain development, deafness, communication and language and how they are interlinked will then be reviewed. Finally, examining current literature specifically regarding the impact of music on interaction and its uses with deaf pre-school children.

2.3.1. Music and the Brain

There is an increasing body of evidence to suggest that music and musical activities can benefit the listening and learning brain (Francois and Schon, 2011 in Rocca, 2015, Moreno and Bidelman, 2014). Moreno and Bidelman suggest that music training not only provides robust, long-lasting benefits to auditory function but also to a much wider range of non-auditory aspects of cognitive function such as working memory and intelligence. Since Moreno and Bidelman's research, Habibi et al (2016) have published findings based on a five-year research project involving children receiving music instruction. They

found that music lessons appear to accelerate brain development in young children, particularly in the areas of the brain responsible for processing sound, language development, speech perception and reading skills. Their findings add to a growing body of evidence (Sacks, 2006; Patel, 2010; Wilkins et al, 2014) that music affects and develops more than just auditory areas of the brain.

2.3.2. Music, Language and Communication

Brandt and his colleagues (2012) argue that 'language and music are deeply entangled in early life and develop along parallel tracks' (p.1) and therefore musical hearing and ability is essential to language acquisition. Kotilahti et al (2010) demonstrated that in newborn babies there were similar neural responses to music as to IDS. This relates to Dame Evelyn Glennie's observations that 'speech is a form of music which overflows with inflection, phrasing, dynamics, rhythm, punctuation, tempo, expression and emotion.' (Glennie, p.8 in Salmon, 2008).

As well as close links with language, music especially when shared, has correlations with social development (Hallam, 2010, Gerry, 2012). Indeed, as Professor Lauren Stewart explains, (The Guardian, 2017) from an evolutionary perspective, amongst many theories as to why humans have such a strong affinity with music, the theory of social bonding is an important one. This theory suggests that making music together makes us feel connected to other people and therefore makes us function better as a group. Kirschner & Tomasello (2010) found that 4-year-old children who took part in a musical game later played together in a more cooperative manner than children who played a non-musical game. With even younger children and thinking about shared musical activities between a caregiver and child, Cirelli et al (2014) reported that 14-month-old infants who were gently bounced to music in-synchrony by an adult who was facing them were more likely to display prosocial behaviours following the activity. This contrasted with the same experiment being carried out where the movements were out of synchrony thus suggesting that interpersonal motor synchrony may be one component of musical engagement which encourages social bonds and potentially promotes altruistic behaviour.

2.3.3. Music and Deafness

Misconceptions abound regarding music and deafness (Schraer-Joiner, 2014). One of the premises of these misconceptions is that deaf people cannot perceive sound (Marschark, 2009). In reality, most deaf people have some residual hearing and research shows that deaf children, whether aided or unaided, can experience and enjoy music (Schraer-Joiner, 2014).[3] Moreover, organisations such as Music and the Deaf have worked extensively to challenge misconceptions and develop provision and expectations of what deaf people can achieve with music (McWatt & Hunt, 2016). Also, high profile deaf musicians such as Dame Evelyn Glennie, the profoundly deaf percussionist, have contributed to changing perceptions of deafness and music.

Fulford et al (2011) conceptualise two ways that deaf musicians describe their perception of music. The first being 'auditory attending' which is using residual hearing and/or hearing technology to perceive sound and the second being 'non-auditory attending' which relies on other characteristics of sound such as vibrations. However, Dame Evelyn Glennie describes how we all experience music using all our senses and how she personally must 'open up every fibre' of her being 'to be a giver and receiver of sound' (Glennie in Salmon, 2008, p8).

Research suggests that rhythm, tempo and dynamics are the elements of music best perceived and enjoyed by deaf children (Fawkes, 2006; Nakata, 2006; Chen-Hafteck and Schraer-Joiner, 2011). Fawkes suggests that rhythm is the most powerful of these because it can stand on its own. Yenari (2010) and Schraer-Joiner (2011) propose that deaf children can often perceive beat and

[3] Despite the advances in hearing technology it is important to recognise that hearing aids and cochlear implants do not replace normal hearing and their use will affect music perception. Digital hearing aids are able to control things such as the ratio of sound to noise in the environment but there continues to be issues regarding frequency and dynamic range. In addition, cochlear implants are not designed to transmit pitch and timbre which are both important features of music (Bergeson, 2017).

rhythm as well as if not better than their hearing peers although they also suggest that hearing children often have better pitch recognition.

The Executive Summary of Music to Young Ears, Engaging Deaf Children with Music report (Hanson, 2013), states that music and deafness is an under researched area of music provision. In my own review of the literature, I have found that it is an area of growing interest. However, the majority of recent research is focused on the use of music as a form of rehabilitation or auditory training following cochlear implantation (Chen et al, 2010; Gfeller, 2007; Gfeller, 2011; Rocca, 2012; Rocca, 2015; Yucel et al 2009). Whilst this research is important it does not encompass the wide range of deaf children who could be engaging with music from children with different types and degrees of hearing loss or those whose families chose signing as their principal mode of communication. In addition, by focussing on rehabilitation post-implant these research projects do not always cover the wide range of potential benefits of engaging with music such as the development of social skills, parent-child interaction of the development of executive functioning skills. It is also worth noting that Paul Whittaker (in Salmon, 2008), who founded the influential organisation Music and the Deaf, highlights the dangers of always using music as a means to an end and he suggests that deaf children should be given the opportunity to explore, understand and above all enjoy music.

2.3.4. Music as an Intervention for Young Deaf Children

Bergeson-Dana (2017) has been a recent advocate for the use of music as an intervention for pre-school deaf children. She suggests that not only should professionals and families engage in music with young deaf children because it is fun but also because it has the potential to close the achievement gap between deaf children and their peers. She discusses how active participation in musical activities impacts on a range of other cognitive skills such as speech perception, language development, executive function and social development as well as honing auditory and visual perception and motor skills.

I have not focused on a number of articles written in recent years concerning the use of music with pre-school children as a form of rehabilitation following

cochlear implantation[4] as the remit for my study includes a wider range of children with different types and degrees of hearing loss[5]. However, some of these studies discuss wider issues regarding the use of music with pre-school deaf children which are relevant to my research. For example, Gfeller et al (2011) discusses the importance of playing instruments, how movement can be used to promote communication and the importance of singing due to its similarities to speech but with greater inflection. Rocca (2015) discusses the positive aspect of music as providing an age-appropriate intervention for babies and infants as well as empowering parents. In her study, parental feedback on participating in the music programme was very positive and parents described carrying over ideas from the sessions into everyday routines. Parents also reported increased vocalisations, attention and anticipation of the activities in their infants. Professional observations noted increased joint attention during the sessions and parents were observed as being more relaxed with their child, with more back and forth communication and face-to-face interaction. Yucel et al (2009) also reported closer parent-child relationships as an additional benefit to their family orientated musical training project.

[4] It is worth noting that following implantation children will need a period of acclimatization to adjust to acoustic stimulation as for most children their auditory system will have had little or no stimulation prior to implant (Gfeller et al, 2011). This is relevant because music and singing can play a part in this acclimatization and also because this is something to be aware of and sensitive to if newly implanted children attend a music group. The appropriateness of music as a context for rehabilitation also explains the recent research and interest in this area.

[5] It is also important to be aware that cochlear implants are well suited to transmitting the beat or rhythm of music but technically they are less well suited to transmitting timbre and pitch (Gfeller et al, 2011). This is relevant in terms of awareness and the potential of music as a tool to improve and develop pitch perception.

Chen-Hafteck & Schraer-Joiner (2011) have conducted one of the few studies into the use of music with pre-school deaf children that is not limited to children with cochlear implants and which also specifically looked at music in a group setting. Their study, whilst small, compared musical experiences of five deaf children (hearing loss ranging from 35-95 dB) and four hearing children, aged 3-4. They observed responses to a range of musical activities and looked at measures of flow. Flow being when the challenge and skill level for an activity are both high and there is a state of optimal enjoyment which produces an ideal learning environment. 'Flow indicators' been used previously in studies as a way of measuring musical engagement. Videotaped evidence of weekly 30-minute music sessions were analysed using flow indicators. Their analysis indicated that both groups of children: were capable of engaging in musical activities; demonstrated musical knowledge in structure, musical styles, beat and rhythm; expressed their need to communicate through music; showed that their quality of flow experience was dependent upon individual characteristics; and demonstrated that their flow experience was affected by the types of musical activities. The researchers concluded that musical activities can be pleasurable for deaf children even if their perception of music is different from children with typical hearing. However, there is a need for a variety of activities that can encourage development of various skills and aspects of flow experience. Those working with young deaf children in this way need to be tuned into individual children's learning styles and needs (Chen-Hafteck & Schraer-Joiner, 2011). This corresponds with one of the key findings in Music to Young Ears, Engaging Deaf Children with Music (Hanson, 2013) which is that

> [...] early years practitioners must understand and be sensitive to the perspectives and individual circumstances of each deaf child. This awareness has to inform their professional practice, whether they are musically trained or not, to ensure that deaf children get the maximum impact from their experience with music. (Hanson, 2013, pp.6)

These are all factors to consider in both the implementation and research to be carried out into the use of a music group as an intervention for young deaf children and their families.

2.4. Literature Review Conclusion

The literature review carried out for this research project has highlighted some key issues. Firstly, there is extensive literature to support the importance of effective early intervention following the diagnosis of a hearing loss in a young child. In addition, a key aim of such intervention is to promote high quality interactions between caregivers and their infants as research indicates that these early communicative exchanges form the building blocks for later language and communication development. Intervention that is family-centred and promotes family to family support is crucial to its success.

Regarding the specific use of music as an intervention for pre-school children and their families there are several emerging themes. Firstly, recent research suggests that there are potential benefits to the use of music that are wider reaching than developing auditory pathways. It suggests potential benefits to language development, executive function and social skills amongst others. There is an increasing body of evidence which indicates the benefits of using music as a rehabilitation tool following cochlear implantation. However, as yet there appears to be limited research into the of music as an intervention in a group setting, or for children with varying degrees of hearing loss. In addition, there is very limited literature on broader benefits to the use of music as an intervention with young deaf children and their families such as the development of social skills and the benefits to caregiver and child interaction.

3. Methods

3.1. Introduction

A range of data collection methods have been used in order to explore the impact on pre-school deaf children and their families of attending a weekly music group with a particular focus on the potential benefits to caregiver-child interactions.

The research used a pre-existing music group as its focus. The study consisted of video observations of caregiver-child dyads engaging in a two-minute musical play activity. The interaction taking place in the videos was analysed by using an observational schedule. In addition, questionnaires and interviews with caregivers and professionals were carried out to create an in-depth narrative.

3.2. Approach

A mixed methodological approach has been used in this research project. Creswell (2013) suggests that greater insight into a research question can be gained by combining research approaches rather than by one alone. Video analysis of caregiver-child interaction during a short musical activity gave some quantitative data. Interviews with caregivers and professionals has provided substantial qualitative data. These two data sets have been combined to create a detailed picture of the impact of NSS Music Group on early parent-child interaction. Rocca (2015) collected data from parental questionnaires regarding the impact of a music intervention for young children pre- and post-cochlear implant and a multiple case study approach was used by Chen-Hafteck and Schraer-Joiner (2014) in their research into the engagement with music of young children with varied hearing abilities. They also analysed video data from group music sessions to determine children's engagement with musical activities.

The exploratory nature of the study allowed for investigation and research into the potential outcomes and effects of music intervention for deaf pre-school children and their families. Critics of the case study approach suggest that it is difficult to cross-check information and that there are risks of selectivity in terms

of reporting and therefore distortion in the results (Bell, 2014). There is also debate as to what degree findings from a case study can be generalised and therefore applied to other situations. However, the advantage of a case study is that it allows for one specific aspect of a situation to be studied in depth (Bell, 2014). Shields (2007) argues in defence of qualitative case studies;

> The strength of qualitative approaches is that they account for and include difference--ideologically, epistemologically, methodologically--and most importantly, humanly. They do not attempt to eliminate what cannot be discounted. They do not attempt to simplify what cannot be simplified. Thus, it is precisely because case study includes paradoxes and acknowledges that there are no simple answers, that it can and should qualify as the gold standard. (p. 12).

Flyvbjerg (2006) argues that context-based knowledge is more valuable than generalised knowledge and he argues that researcher bias is no more prevalent in case studies than in other forms of research.

In addition, this was also an action research study as the research was practitioner led with the aim of improving and modifying the work NSS Music Group already do. As well as conducting an observation of caregiver-child interaction and carrying out semi-structured interviews with caregivers, the practitioners also had an explicit focus on promoting caregiver-child interaction during a six-week intervention period. This was done by introducing one of the activities each week with a short explanation to caregivers relating to the relevance of the activity, what specific skills the activity helps to develop and why these are beneficial to caregiver-child interaction. At the end of the session there was time to discuss the skill and incorporate suggestions from caregivers into subsequent sessions. Bell (2014) has described this form of action research as aiming to inform best practice and enhancing performance.

3.3. Data Collection

A range of data collection methods were used with the aim of looking at the use of music as an early intervention strategy for deaf children from a variety of perspectives. By integrating methodologies, the study aim was to provide a comprehensive narrative that provides depth rather than breadth.

3.3.1. Collection of Quantitative Data

The quantitative element of the data was gained by carrying out an observational video assessment using a caregiver-child interaction schedule during the study. The schedule was specifically designed for the purposes of this study having looked at a range of other available tools. Bell (2014) discusses the frustration of researchers that, despite the wealth of tried and tested methods employed previously by others, there is very rarely one that is quite right for a particular task. The advantage of this data is that it provides some objective evidence of impact. However, one of the disadvantages is that it may be impossible to exclude a range of other influencing factors such as the mood or energy levels of the child or the adult at the time or external factors such as involvement in nursery or other groups. The impact of external factors is mitigated to some extent by the parental questionnaires which aim to look at differences in circumstances such as attendance at Nursery.

Various tools to measure caregiver-child interaction were considered, though none of which were found to fully fit the purpose of the study. There are a range of tools that assess early interaction that are not specifically designed for deaf children which were not appropriate for this study. One tool that was investigated further was Video Interactive Guidance (VIG). VIG is an intervention tool rather than an assessment tool although video evidence and analysis are used as part of the programme. It is used across sectors such as health, education and social care with the aim of enhancing communication within relationships (AVIG UK). There is a growing body of research into its use and effectiveness, including a recent research project into its use with prelingual deaf children and their parents (Lam-Cassettari et al, 2015), reporting enhanced interactions and parental self-esteem following the intervention. However, with

its focus on intervention rather than assessment its usefulness was limited. That said, the effectiveness of watching interactions back alongside a caregiver and focussing on positive aspects of aspects of communication and attempting to increase those is an element that was incorporated into this research.

Looking more specifically at tools designed to be used with deaf children and their families the most useful was TAIT video analysis. TAIT video analysis was developed to monitor the development of early communication skills of children with hearing aids and has since been used extensively in the assessment of children with cochlear implants. The assessment is based on in-depth analysis of video recordings of a child interacting with a known adult in a controlled setting. It charts individual progress, but it has also been found to predict later performance in speech perception and intelligibility (Archbold & Tait, 2012). Another important aspect of TAIT analysis, from the perspective of study design is that this technique has been shown to have very high reliability among different observers (Tait et al, 2001, Tait et al, 2007) and to correlate with other measures (Archbold & Tait, 2012). However, TAIT video analysis has been designed specifically for pre-verbal children and therefore the recommendations are that it is used with children under 24 months of age or children with complex needs. In this study the research cohort were all over 3 years old and already verbal.

Another tool designed to be used with deaf children and their families is Baby Beats Notes Tracking Tool. It has been designed to use alongside the Baby Beats (Advanced Bionics) early intervention musical rehabilitation resource. Baby Beats has been designed to 'Improve early parent interaction, early listening behaviour, early communication skills and social and emotional development pre-and post-implant' (Rocca, 2015, p.33). Baby Beats Notes tracks listening skills such as sound awareness, localization, discrimination, identification, auditory memory, sequencing and auditory comprehension. It also tracks a range of early communication skills such as communicative intent, turn-taking, vocalisation and understanding and using language. While useful in its relevance to deaf children and their families and the use of music as an intervention it was not wholly appropriate for this study as it is specifically

designed to be used in conjunction with the Baby Beats programme. Although elements of Baby Beats are incorporated into music sessions, a wide range of other musical activities are also used and the group does not only include implanted children.

Furthermore, a disadvantage of many of the assessments mentioned above is a focus on what the baby or child is doing rather than investigating what both the caregiver and child do within the interaction. James et al (2013) argue how this is at odds with current understanding of centrality of parental responsiveness in the scaffolding of early speech and language development in the child. They assert that: 'During assessment of the quality of parent–child interactions, it is important to consider the bidirectional influence that both members of the dyad exert on one another.' (James et al, 2013, p.668). Bearing this in mind, a further document that I have examined is the Monitoring Protocol for Deaf Babies and Children, Level 2 (2006) materials, specifically Section 4: Parent- child interaction tables. These tables list strategies that adults can use to support their child's communicative development in line with the Monitoring Protocol stages of development. Whilst not an assessment tool, these materials highlight the importance of the adult input and response in developing interaction.

Having considered all the stated limitations of available measures, elements of them were used to design an observational schedule that was appropriate for this study (See Appendix B). Both caregiver and child elements of interaction were included. Only positive aspects of interaction were included, following the VIG approach, rather than highlighting negative aspects. The schedule was used to analyse a 2-minute videoed caregiver-child interaction. The interaction took place in the families' homes at a time that suited them and involved some exploration of a range of musical instruments. Following the recording, the researcher watched the video back with the family, jointly identifying positive elements of the interaction.

3.3.2. Collection of Qualitative Data

The qualitative data was collected by conducting semi-structured interviews (see Appendix D) with the caregivers of the deaf children attending NSS Music Group and participating in the study. Semi-structured interviews were also conducted with 3 different professionals. The caregiver interviews were carried out in the families' homes at a time that was convenient to them and the professional interviews were all conducted in their places of work. The interviews were conducted by the researcher who is known to all the families and professionals. This implies that interviewees were potentially comfortable talking to the researcher but that answers to questions could be influenced by the established relationships. The advantage of the qualitative data is that it can complement the quantitative data, hopefully providing depth and detail. The disadvantage is that it can be time consuming and could be influenced by the researcher-interviewee relationship. The caregiver interview was piloted with a former parent from the group and was carried out at the same time as the questionnaire to limit the time required of families.

Following on from eight questionnaire questions (given to caregivers) the semi-structured interview consisted of nine guiding questions which were explored further as necessary. This allowed for the same core questions to be asked of all participants while allowing for some exploration of issues as they arose. The interviews were recorded and transcribed later for data analysis.

3.4. Participants

The participants comprise of four pre-school children and their families. The numbers and the families were determined by those who were attending the NSS Music Group at the time of the study in September 2017. Implications for the study are that the number of participants are small and the participants were determined by those attending the group rather than a specific selection criterion and as a result statistical analysis is not possible.

The criteria for eligibility for the study was families who attend NSS Music Group with a child who has a hearing loss. The Music Group is offered to all of the families who have a pre-school child with a sensory impairment and

numbers of children attending have varied from between four and eight. Currently there are eighteen pre-school children on our Hearing Impairment register.

From the families that attend NSS Music Group, permission was sought from those that wished to participate. When the group reconvened in September 2017 families were provided with a short information leaflet explaining the purposes and aims of the study as well as an explanation about what taking part would entail. The potential benefits to the group but also for other deaf children were discussed, especially if the study can be used to inform professionals and other families of its findings.

Ethical approval for the research was obtained from the University of Hertfordshire and written informed consent was obtained from the participants (Appendix I) prior to the initiation of data collection.

3.5. Data Analysis

Interviews were transcribed and then thematic network analysis (Attride-Stirling, 2001) was used. This involved exploring the data, considering and coding it to identify themes from the information gathered. The advantage of this method of analysis is that it is data led, however it has the potential to be time consuming and it is not always straightforward to identify common themes due to an abundance of diverse data.

For the quantitative data the numbers involved in this study were too small to be viable for statistical analysis. However, the gathered data has been presented visually in a bar graph and any patterns, relationships or connections have been described. By combining the analysis of qualitative and quantitative data from a variety of sources the strength of both have been utilised to create a detailed narrative which may mitigate to some degree the issue of small participant numbers.

3.6. Reflexivity

I work as a teacher of the deaf and jointly run a weekly music session for pre-school sensory impaired children and their families. I have been involved with the Music Group for the past four years. Conducting this research required a high level of reflexivity and self-awareness as it entailed examining an area of work in which I am already involved and invested in with participants with whom I have pre-existing working relationships with.

The research needed to be handled sensitively and carefully as it attempted to be a collaborative process between myself, colleagues and the young children and their families. By the nature of studying pre-school children the study involved working with parents who may still have been coming to terms with their child's deafness. During semi-structured interviews sensitive issues could have arisen from the discussions. These needed to be handled with care and consideration. It was also important that all participants had clear information about the research, the methodologies, the purpose and the overall findings. One of the study's aims was that families not only felt part of the study but also had some ownership of it.

To ensure the rigor of this study I sought consent and approval prior to commencing from the NSS manager as well as the dissertation supervisor and the University of Hertfordshire through the Ethics Committee process. Rigorous critical appraisal was also sought from colleagues, peers and the research team at Mary Hare regarding the study's methods, approaches and findings. In addition, I identified and acknowledged confounding factors and variables which affected the results and attempted to maintain a high level of reflexivity, self-awareness and criticality throughout the study, acknowledging personal potential bias and investment in the study as well as the possible influence on findings due my own established relationship with participants.

At all times data protection and confidentiality were of paramount importance. All data gathered was kept securely on password protected devices. As soon as recordings had been transcribed and analysed they were deleted. All other data was anonymised using a key for identification only accessible by the

researcher. All verbal discussions and written research was anonymised, participants and identifying data has been minimised and only used if essential with parental permission sought before its use. In the results section, pseudonyms have been used to identify the participants as the data needed to be anonymised but using letters or numbers appeared impersonal and interrupted the flow of the narrative.

4. Results

4.1. Introduction

The results of this research comprise of two elements. Firstly, the results of video observations of caregiver-child dyads engaging in a two-minute musical play activity. The interaction taking place in the videos was analysed by using an observational schedule (see Appendix B) and then they have been plotted on a column chart (Figure 1) so that they can be viewed easily and compared. The second element of the results consists of themes identified from the caregiver and professional interviews carried out as part of the study. These results will be analysed in conjunction with interview data under the headings of the key themes established.

4.2. Results of Video Observations

Videos were made of 4 caregiver-child dyads engaged in a two-minute musical play activity. The videos took place in the participants' own homes, and the set up and equipment used were the same in each case.

The interaction taking place in the videos was analysed using an observational schedule (see Appendix B) which had been designed specifically for this project. The behaviours that were identified through the video observations were: joint attention, synchronised interaction, turn-taking, imitation, child facial/ gestural turn, child vocal turn, caregiver facial/ gestural turn, caregiver vocal turn, adult follows the child's lead, and adult pauses for child turn. These behaviours were all chosen as features identified from the literature as behaviours that promote positive early interaction (Spencer and Koester, 2016).

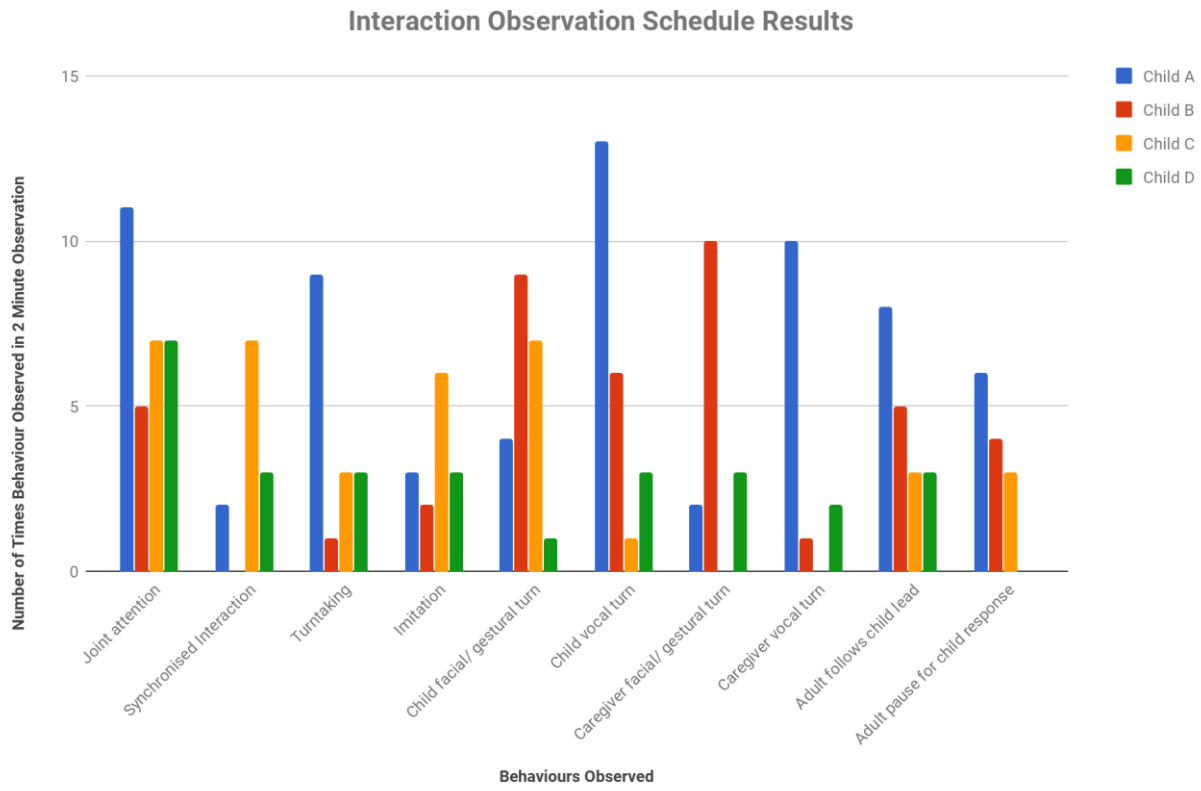

Figure 1: Interaction Observation Schedule Results

As a result of using a specifically designed observation schedule, there is no evidence of observer reliability or correlation with other measures. Notwithstanding the small number of observations made, several reflections can be made by looking at the data. For example, in these cases, more occurrences of joint attention appear to lead to more examples of turn taking within interactions. This corroborates Spencer & Koester's (2016) assertion that a child is more likely to attend to what an adult is saying or doing if it relates to the child's interest or focus. In these examples, there appears to be a relationship between the adult following the child's lead, the adult pausing for a child's response and a greater number of child vocal turns. Furthermore, in all 4 cases the number of child vocal turns are greater than the number of adult vocal turns. This could support Nittrouer's (2010) findings that caregivers of deaf children are less likely to respond verbally to their child's communicative attempts. However, it could also be that the adults were using strategies such as pausing

or demonstrating joint attention by eye gaze to encourage the child's vocalisations or that adults were more aware and self-conscious being videoed than the children which may have inhibited their own vocalisations.

Further reflections on this data will be made in conjunction with the participant information table (see Appendix F) and the interview data in the results of thematic analysis discussion below.

4.3. Results of Thematic Analysis of Parent and Professional Interviews

Although originally designed as guidelines to be used within the discipline of psychology, the six-step method for thematic analysis of qualitative data described by Braun and Clarke (2006) has since been used across a wide range of disciplines (Braun and Clarke, 2013) and therefore was a useful framework for this study. Following the first step, the interviews were recorded and then transcribed. The transcription process allows for immersion, engagement and familiarisation with the findings. Following transcription, preliminary codes were identified. The codes consist of interesting or meaningful features within the data such as discussion regarding the Music Group as preparation for nursery or the development of social skills. Although this is a small case study and seven interviews are being analysed, the codes were many and varied. The next step involved collating codes to form overarching themes. Four broad themes were identified with related sub-themes and these have been used as a tool to analyse the collated data. The four themes that emerged were: The Development of Communication and Language through the Music Group; The Specific Benefits of a Group Intervention; The Specific Benefits of Music as a Context for Intervention; and Potential Challenges.

Next, the identified themes and subthemes will be explored by using a selection of quotes from the interviews video observations alongside data from the video observations as a springboard for analysis.

4.4. Analysis of Results

4.4.1. The Development of Communication and Language Through the Music Group

> I think it brings Abbie on, because there are a lot of things we do in singing, the likes of 'Where is teddy?', when we hide the teddy, when she started speaking, I found that one in particular got her to ask questions. (Abbie's caregiver)

As can be seen from the Participant Information Table (see Appendix F), Abbie was born profoundly deaf and has been coming to NSS Music Group since she was six months old. The quote above and the data from the video observation, which demonstrates a high number of positive interaction behaviours from both the caregiver and the child, indicate that the Music Group has had a positive impact on Abbie's communication and language development. This is one example where Abbie has been exposed to language and the structure of a question through singing that she has then transferred into her own speech at a later stage. The singing of familiar songs in a weekly group allows for significant repetition of grammatical structures and vocabulary in a meaningful context. In addition, by using singing this utilises aspects of IDS as discussed in the Literature Review which holds the infant's attention when engaged in early listening. All the caregivers gave examples of perceived impact of the Music Group on aspects of their child's communication and language. This suggests that the Music Group contributes to the Joint Committee on Infant Hearing's (2007) recommendation that the role of early intervention is to maximise opportunities to develop linguistic and communicative competence.

Developing Caregiver-Child Interaction

> [...] the relationship between the parent and carer and child because they are doing activities with joint attention, the whole sharing of being somewhere in a group with others, [...] Doing the synchrony of movement activities... really creates a massive bond between them. (Emma)

This quote highlights how the Music Group promotes some of the important aspects of early interaction discussed by Spencer & Koester (2016) such as being engaged in joint attention and the integration of touch and movement in early interactions. Other aspects of early interaction that were mentioned by

parents and professionals in the interviews were turn taking, listening and attention. Emma discussed the importance of the child taking the lead. However, an additional key factor that arises both from this quote and the interview with Fiona is the emphasis on the caregiver-child bond which derives benefit from the Music Group.

4.4.2. The Specific Benefits of a Group Intervention

As the study has progressed one of the salient features from the interviews and the analysis of the responses is that many of the benefits derived from attending the Music Group are because of the intervention taking place in a group setting. This ranges from family-to-family support, the children having deaf peers from a young age, the development of social skills and preparation for nursery. Of significant interest is how a group setting may lend itself to a coaching style of intervention; that is, an approach to intervention which is collaborative, in partnership with carers and which aims to maximise the impact of early intervention.

Family-to-Family Support

> You get to share your experiences of what you've been through with them - because obviously not many people know what it's like to have a deaf child - none of the parents at school. (Ben's caregiver)

The results from the interviews strongly correlate with the work of Hintermair (2006). This concerns the importance of networks of support for parents and how professionals, in this case through the facilitation of the Music Group, can assist in strengthening and restructuring these networks to include other parents of deaf children. All the caregivers discussed the value of spending time with other families with deaf children and, as the quote above intimates, the importance of sharing experiences with other people in similar situations. This is also in line with The Global Coalition of Parents of Children who are Deaf or Hard of Hearing Position Statement (2010) which declares that most families cite other families as being the most valuable source of support following a diagnosis of deafness. By saying that none of the other parents at school know

what it is like to have a deaf child, Ben's caregiver alludes to the issue that deafness is 'low incidence'. Therefore, it is likely that families will not know other families with deaf children within their initial 'natural networks'. Therefore, the Music Group offers the opportunity to create, strengthen and expand networks of support. This theme was also discussed in all the professional interviews. Fiona, who has extensive experience working in the Early Years but limited experience of deafness, having observed one music session commented that:

> Parents would get a lot of reassurance about their child and the path their child is going down and any issues that are involved with a hearing impairment above and beyond the normal things you'd talk about as a parent. (Fiona)

Developing Social Skills and Having a Deaf Peer Group

> [The Music Group] helps them to interact with the other children and [...] to take turns. As I say, Ben was really shy and I really think music has helped him come out of his shell a lot. (Ben's caregiver)

> She can see other children with hearing aids so that in the future she will know that she is not the only one, she's not different. (Katya's caregiver)

Interaction with peers arose as an important benefit of the Music Group in all of the interviews. Fiona discussed the children's ability to interact with each other as being key to the children's self-confidence. The Position Statement from the Joint Committee on Infant Hearing (2007) states that the goal of early intervention is to promote language development, which in turn affects other areas, such as socio-emotional development. Therefore, it could be argued that the Music Group, by developing early language and communication skills and providing opportunities for deaf children to socialise and have a deaf peer group, provides a very effective context for positive early intervention.

Closely linked to the development of social skills is the idea that the Music Group prepares pre-school children for Nursery. This is another element that arose in all of the interviews. For example, participants discussed practising

skills such as listening or turn taking in a group, following instructions and the separation of children and caregivers during the family sign part of the session.

Music Group as a Partnership Approach to Early Intervention

> It's such a good idea [to make it explicit why we do some of the activities] because if you are pointing things out it gives them [parents] understanding of why we do things - not just you should do this because we say it is good. Giving some information and education about why you are doing something - it is important knowledge and you are empowering them [parents] and boosting their confidence as well. (Emma)

During the period of the research project, explicit links were made during the sessions, to the benefits of particular activities and the skills that were being developed. As can be seen from the participant table Emma runs the Music Group with the researcher. Therefore, there is significant potential for inherent bias. However, Emma's comments and viewpoint support Rush and Sheldon's (2011) argument that this approach of a shift towards parent mediated intervention is more effective than intervention that exclusively focuses on the child. It is also in line with Cole and Flexor's (2007) suggestion that it is imperative that caregivers as well as professionals understand the elements of optimal interactions that promote growth and development.

Another issue that arose from the professional interviews was how beneficial a group setting can be as a forum for working in partnership with parents in comparison to working solely with families in the home.

> Parents often feel a bit under the spotlight when they are on their own. Whereas in this sort of situation they can sit back and watch what is happening. They can dip in and out, they can do as much or as little as they want and how they feel comfortable. Whereas one to one they probably feel pressured. It doesn't feel like it's aimed at you in a group setting. (Gill)

4.4.3. The Specific Benefits of Music as a Context for Intervention

> Music has a massive value, especially with younger children [...] With younger ones because of the rhythm, it helps with language development, repetition, even vocabulary and it makes it fun too. [...] It has a multitude of advantages. (Emma)

In her quote Emma picks up on the value of rhythm in music which is one of the qualities that music shares with infant-directed speech and is of importance because of its ability to gain and hold an infant's attention. Emma also mentions music's potential to impact on language development and vocabulary learning which concurs with Bergeson-Dana's findings (2017). Implicit in this, is that the skills that are used and built on in a music session such as active listening, imitation, turn taking etc. are those which form the basis of early communication and language development (Spencer and Koester, 2016).

A further important point from the quote is the idea that music is fun. There was little specific mention of the benefits of music in most of the caregiver interviews. However, there were numerous references to enjoyment and fun which it could be argued is a specific result of using music as a vehicle for intervention. This correlates with Rocca's (2015) findings that parents in her study gave positive feedback to the use of music, finding it motivating. She also found that the use of quick, fun musical activities encouraged parents to carry them over into their everyday routines. This point will be explored further in the discussion section.

> Well the best I think she loves the music teachers, and the music instruments and then the children. It's completely different from nursery, it's different group so she really enjoys to come every week. [...] She is singing all the time! And actually from that point when we started to go we've been singing all the time {...} we sing every day at home! (Katya's caregiver)

> I just thought there was a good balance of activities and a variety [...] to keep their interest and they were obviously very engaged and having great fun which is key. And the adults were enjoying the session too and they were gaining a lot out of seeing their children interacting and how enthusiastic their children were in the session. (Fiona)

4.4.4. Challenges

> It was hard for her [Mum] getting both kids there in a taxi by herself [...] but I think she persevered because it was helping Ben. (Ben's caregiver)

> I wasn't too sure or too brave to talk or to ask questions. I was just sitting and observing. [...] because all the people are so lovely and the atmosphere is so familiar so I just stop to be shy! (Katya's caregiver)

All the participants were asked about potential barriers to attending the Music Group. Both the quotes above come from families who attend the group regularly and illustrate an identified potential barrier which could have prevented them from coming to the group. However, in both cases, the caregivers identified a degree of persistence in overcoming the difficulty. Danny's caregiver, who has not attended regularly, identified the timing of the group as problematic and this was not something she could foresee overcoming despite suggestions and adaptations.

Professionals also identified the role of confidence in coming to a group such as the Music Group.

> Singing itself, some people have that as a barrier. People can be reluctant to join in with singing or they might not have had a good experience of it at school. (Fiona)

> If a parent feels possibly anxious or has issues around the diagnosis of deafness they might not feel like they can throw themselves into a group like that. So, I think that can be a time when parents feel like they can't face up to that. (Gill)

This last quote emphasises the emotional aspect of parenting a deaf child and the important role of acceptance and acknowledgement in being able to access services.

4.5. Conclusion

The results for this study have been produced by carrying out thematic analysis of data gathered from video observations of caregiver-child interactions and transcribed interviews with caregivers and professionals. The data and resulting codes extrapolated from this study were many and wide-ranging. As a result, the themes and subthemes identified have led to some rich and detailed data that has been explored further in the discussion section. The key themes that emerged were related to the development of communication and language

through the Music Group, the specific benefits of a group intervention and the specific benefits of using music as an intervention and potential barriers to engaging and participating in a Music Group. These results illustrated caregiver and professional experiential perspectives regarding the impact of using music in a group setting as a context for early intervention for young deaf children and their families.

5. Discussion

Throughout this project it has been stated that the principle aim of early identification of deafness is to provide early intervention. This enables high quality interactions between the caregiver and child thus minimising the potential impact of deafness on the development of communication and language. The intent of this research has been to evaluate the Music Group's impact on caregiver-child interactions and therefore its effectiveness as an early intervention strategy.

This section gives an outline of these results aiming to contextualise them in relation to existing literature. Then, the research carried out for this particular project is evaluated by examining its strengths and weaknesses. Finally, suggestions for future research which have arisen from this dissertation are considered.

5.1. Results and Relationship to Existing Literature

The results of this research project will be discussed in turn with the aim of examining to what extent the findings contribute to, complement or challenge the existing literature.

5.1.1. Developing Language and Communication

From a caregiver and professional experiential perspective, this study has indicated a belief that attending NSS Music Group facilitates the development of communication and language. There are a number of possible interlinked reasons for this impact.

Firstly, as discussed in the professional interviews, the Music Group is an ideal forum for developing positive early interaction skills due to the nature of many of the musical activities. These skills include: joint attention, imitating, turn taking, and following the child's lead. These skills are the building blocks for the development of speech and language. Joint attention is of particular relevance as there is a growing body of evidence that suggests that caregiver responsiveness to the child's focus of attention predicts language growth

(Collinson, 2017). Furthermore, evidence from multiple studies also indicates that hearing parents of deaf children may need additional support and advice to help them establish effective strategies to facilitate joint attention and raise the awareness of following their child's lead and the importance of responsive two-way interactions (Collinson, 2017). These are all elements that NSS Music Group attempts to address and were discussed in the interviews. In addition, from the video observation data the most prevalent examples of joint attention, following the child's lead and child vocal turns in the caregiver-child dyad were those that had been coming to NSS Music Group for the longest period of time.

Secondly, the singing aspect of NSS Music Group contributes to the development of language. As discussed in the professional interviews singing includes increased pitch range, longer pauses and lots of repetition; sharing many features with IDS. IDS is thought to stimulate infants' attention to speech and therefore facilitate speech perception and language development (Collinson, 2017, Bergeson, 2017).

Thirdly, all of the caregivers interviewed discussed how their children request, repeat and adapt songs and activities from the Music Group at home. This indicates firstly that the impact is not only during the time the children are attending the group but that it filters into everyday life and also that caregivers and their children can develop, enjoy and lead these interactions. This suggests that the intervention becomes parent led and implemented which is thought to have significant impact on children's expressive and receptive vocabulary and other language skills (Collinson, 2017). In addition, interventions which increases parents' understanding of their own importance in their child's development equipping them with knowledge, skills and strategies has been found to be the most effective (Collinson, 2017) and this was a key aim of the action research element of this study.

5.1.2. The Specific Benefits of a Group Intervention

Through the process of closely attending to the interview data through the transcription process, the importance of the Music Group as a group intervention became ever more evident. One key theme that was discussed in

every family and professional interview was the value of family-to-family support. This is underpinned by best practice guidelines (Moeller et al, 2013). NSS Music Group provides a ‘natural’ context for families to meet in a relaxed environment which helps to fulfil Hintermair’s (2006) suggestion that it is the role of the professional to assist in expanding families’ networks, especially to include other families with deaf children and reduce social isolation.

A further theme that emerged specifically from this study is how a group intervention can be an effective setting to work in partnership with caregivers to discuss and develop early interaction. One of the professionals interviewed described at length how parents can learn not only from professionals but from each other. In addition, she discussed the possibility that for some families visits to the home and working alone with the professional and their child can sometimes be intimidating. Potentially, NSS Music Group offers a non-threatening forum for discussion and collaborative learning to take place which boosts caregiver’s feelings of confidence and self-efficacy. As recent literature suggests (Collinson, 2017), self-efficacy is not a fixed trait; it is something that can be supported and developed. Thus, effective early intervention should aim to enhance the confidence of children’s caregivers as those with higher self-efficacy are more likely to put their knowledge and skills into action.

Finally, a further benefit discussed in all the interviews was the perceived positives of a group setting for children in terms of developing their social skills, having a deaf peer group and in preparation for Nursery. There is a close link between language development and social competence and therefore early intervention needs to target social skills and development as well as language development (Hoffman et al, 2014). NSS Music Group is an effective context for this due to the focus on listening, attending, participating, turn taking and interaction and specific elements linked to the use of music which benefits social interactions which will be discussed further in the next section.

5.1.3. The Specific Benefits of Music as a Context for Intervention

This section will discuss how music may differ from other group interventions which could be used as a context for developing caregiver-child interactions. Firstly, using music and songs with deaf children is age appropriate and appealing to many children and their caregivers. From the interviews a major theme that came to light was the enjoyment factor. All of the participants described NSS Music Group as something that was fun and enjoyable. Despite being highly subjective and difficult to quantify, it could be argued that enjoyment is a thread that runs through many of the identified themes such as parent child bonding, positive interactions, learning through play and everyday routines and the development of social skills. It could also be argued that NSS Music Group is enjoyable because of the use of music and singing which concurs with Rocca's (2014) findings into the use of Baby Beats. Enjoyment was also highlighted in Yenari's (2010) paper where she discusses children's motivation to sing and that a combination of content, humour, surprise elements, movement, the presence of peers and increased familiarity with songs leads to increased motivation. Enjoyment is important in its own right (Whittaker in Salmon, 2008) and if an intervention is to be successful then caregivers and children have to attend and participate and that this is more likely to be the case if the intervention is enjoyable.

Using music as a vehicle for intervention has particular features which are beneficial to caregiver-child interaction and the development of communication skills (Bergeson-Dana, 2017). In the interviews undertaken for this research project participants discussed: rhythm, repetition, turn taking, joint attention and movement as positive elements that arise from using music and the similarities between singing and IDS have also been discussed in the literature review.

In addition, the video observation data for this study indicated that music sometimes serves as a mode of communication. This correlates with Chen-Hafteck and Schraer-Joiner's (2011) findings that the deaf children in their study demonstrated a need and interest in communicating with others despite limited speech and language skills. Playing musical instruments allows for copying, turn taking and joint attention. In addition, as poignantly described in one of the

caregiver interviews, singing is something that some children are able to do before they can produce something in speech.

5.1.4. Challenges

Alongside the demonstrable benefits of using a Music Group as an intervention with young deaf children and their families it is important to acknowledge the evident challenges with this approach. As discussed in the Results section, families and professionals identified practical barriers to attending the Music Group such as location, transport and timing. In addition, other obstacles such as shyness, confidence or a lack of acceptance of their child's deafness were also identified as potential barriers.

Moreover, whilst acknowledging and being aware that each deaf child is unique, and their experiences of music will all be different, this will also be the case for caregivers. A group intervention and/or the use of music and singing will not suit every deaf child or their family. All of which emphasises the need for early intervention to be collaborative and sensitive to each family's unique circumstances and cultural perspective (Moeller et al, 2013, Sass-Lehrer et al, 2016) both as a unit but also as individuals.

5.2. Evaluation of Research and Wider Implications

This research project has employed a mixed methodological approach to explore the potential impact of NSS Music Group as an intervention strategy. The number of participants was very small and involves families who already attend the group which suggests that they already perceive the group to be beneficial. Whilst the parameters of the study was limited and did not allow for statistical analysis of the quantitative data, the data gathered was 'rich' and 'thick' rather than 'shallow' and 'broad' (Braun & Clarke, 2013, p4). The video analysis data and caregiver and professional interview data set in the context of action research provided a detailed case study of NSS Music Group. By using a variety of data sources and methods the study could be described as using triangulation to strengthen the findings. However, the metaphor of a jigsaw puzzle (Ussher, 1999; 43 in Braun & Clarke 2013) may be a better way to describe how in this study the different elements have been put together to see

a broader, more complex picture rather than to discover one ‘truth’ or ‘result’. The advantage of this approach is a greater understanding of the group as an intervention and how it can impact on caregiver and child interaction from a variety of viewpoints and using more than one method of data collection. A potential disadvantage is that the research is highly context specific and the knowledge gained may not always be easily applicable to other situations.

However, there are some salient themes which have arisen which could contribute to the wider knowledge base and general understanding of effective early intervention for deaf pre-school children and their families. These range from: the effectiveness of a group context for collaborative working between professionals and families; the importance of family to family support; the benefits of music as an intervention for promoting and developing early interaction and the positive aspects of a group intervention for both the children and the caregivers.

It is also important to recognise the both the personal perspective and influence of the researcher on the results. This does not undermine the research but is a consideration when analysing and interpreting the results.

5.3. Future Research

I have focussed on the themes related most closely to the research question. Several other themes emerged which were of interest but that have not been explored further on this occasion but would be of interest for further research. Firstly, the use of sign within the group along with the singing and music as well as the family sign group which runs as part of the Music Group provision. All of the families discussed this as something of benefit and used outside of the group regardless of the child’s level of hearing loss. Another theme that emerged was the impact of music on the development of other skills such as executive function skills and play skills as discussed by Bergeson-Dana (2017).

Larger scale comparative studies would be beneficial to compare the impact of a music group to a playgroup or book/ story based intervention or to compare

the impact of a general music group compared to a music group run specifically for hearing impaired children.

6. Conclusion

This study has evaluated the impact of using music in a group setting, as a context for early intervention for young deaf children and their families, with a focus on caregiver-child interaction. I have employed a mixed methodological approach which has provided a rich, detailed account of the benefits and challenges of using a music group as an intervention tool. Whilst acknowledging the limitations of this research, namely the low participant numbers, the self-selected nature of the participants and the potential researcher bias, I remain confident that there are a number of conclusions which can legitimately be drawn which have wider implications for Sensory Support Services aiming to meet the needs of young deaf children and their families.

This study has demonstrated that a music group can be a useful context for developing early interaction, language and communication. Music in a group setting is a sociable, shared activity which is often multisensory and beneficial to caregiver and child bonding. A close caregiver-child bond underpins all interactions and communication and is therefore crucial to ensuring positive language development. I have demonstrated that music and singing in a group setting promote specific early interaction behaviours such as joint attention, turn taking and imitation as well as developing language and communication. Singing has been shown to be closely linked to IDS which gains and holds young children's attention and therefore helps to develop speech perception as well as early language. In addition, this study has highlighted how music is age appropriate, fun and enjoyable which is an important aspect when considering family engagement in early intervention.

Moreover, this study demonstrates strong evidence that providing intervention in a group setting offers several advantages. One being the opportunity for family-to-family support which is crucial to family wellbeing when coping with the challenges of having a deaf child. A group setting also provides a deaf peer group for the children, promotes the development of social skills and prepares children for Nursery. Furthermore, a music group provides a forum for collaborative intervention which is family centred and promotes self-efficacy

where approaches to developing early interaction, communication and language can be discussed. This allows for intervention which becomes parent-led which is known to be most effective.

However, it is important to acknowledge that this type of intervention would not suit every child or every family or indeed every service. This final point highlights the need for all Early Intervention to be flexible, responsive and appropriate for each context.

The title of this study proposes that music can be a channel for communication. A definition of the word channel is ‘a medium of communication; an agency for conveying information’ (Oxford English Reference Dictionary, 2002). This research has proven that music, especially in a group setting, does both of these things. In addition, I suggest that as professionals working in the field of early intervention our role can be described in a similar way; as a channel for communication. We strive to share information which flows in many directions. Thus, facilitating interaction and communication between caregivers and their young children but also between families. My research has provided evidence that a music group for deaf pre-school children and their families is an ideal forum for this. As a consequence of this research we will continue to run and promote NSS Music Group with a focus on increasing caregiver self-efficacy in early interaction with their young children. In addition, I would like to disseminate my findings and encourage other services to consider the implementation of a music group as an early intervention approach.

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Appendix A: Example Music Session

Intro: Hello song We're Going to Sing
Baby Beats Music and Movement Sequence
Action Songs Train (1) - Chatting & Singing Where is Teddy? - Chatting & Singing See saw (15) Baby spider...
Signing Songs Horsey, horsey If you are happy and you know it… Baa baa black sheep
Parachute Shake & shake Waves on the sea, fish & shark Rain is falling Over the parachute
Lycra Forwards and backward Hide your toes Humpty Dumpty
Other Bubbles X is sleeping Big drum and stones
Instruments You shake and you shake and you stop (scrape, tap, ring etc.) Twinkle twinkle with triangles Roll the cabasa If you are happy and you know it bang the drum (slow, fast, quiet etc.) Guess the instrument Xylophone ladder
Books Tanka Tanka
Finishing Songs Mulberry bush, Elephant & Mouse, train whistle
Snack Time/ Play & Family Sign

Appendix B: Observing Interaction Schedule

Child/ Adult dyad:

Date:

Context: 2-minute videoed interaction between the child and a caregiver in child's home environment. A box of instruments and pictures of instruments provided as stimulus for play.		
Behaviour	Tally/ Timing	Comment
Joint attention (adult/ child) TIME		
Synchronised interaction		
Turn taking		
Imitation		
Child facial/ gestural turn (autonomous?)		
Child vocal turn (autonomous?)		
Caregiver vocal turn (contingent?)		
Caregiver facial/ gestural turn (contingent?)		
Adult follows child's lead		
Child follows adult lead		
Adult pauses for response		
Child pauses for response		
Other observations:		

Appendix C: Northumberland Sensory Support (NSS) Music Group: Parental Questionnaire

Thank you for taking the time to complete this questionnaire. All responses will be confidential and anonymous.

Questions about your child:

- How old is your child? (In years and months)
- What is your child's hearing loss type and level?
- How old was your child when their hearing loss was diagnosed?
- What is your child's preferred communication mode: (e.g. speech, signing, a combination etc.)
- What hearing equipment does your child use?
- Who does your child live with? (Please give the ages and relationships to your child)
- Does your child attend a nursery setting and if so for how many sessions? (1 morning/ afternoon = 1 x session)
- Does your child attend other organised activities and if so how often? (e.g. another Music Group, playgroup, library group etc.)

Appendix D: Interview Schedule

- How long have you and your child been attending NSS Music Group?
- Why do you attend NSS Music Group?
- What does **your child** like about attending NSS Music Group?
- What do **you** like about attending NSS Music Group?
- Have there been any benefits to your relationship with your child linked to attending NSS Music Group? (E.g. turn taking abilities, behaviour, listening skills, concentration etc.)
- Has it been useful to discuss the skills we are developing? If so, in what way?
- Do you use any of the songs or activities from NSS Music Group at home?
- What are the benefits of being part of a group when you attend NSS Music Group?
- Have there been any barriers to you attending NSS Music Group? And if so how have you overcome them?
- How could we improve NSS Music Group? Your ideas would be gratefully received!
- Any other comments:

Appendix F: Participant Information (Children and Families)

Child	**Age**	**Type and level of deafness**	**Age at diagnosis**	**Hearing Equipment**	**Communication Mode**	**Household**	**Nursery**	Other organised activities	Length of time attending NSS Music Group
Abbie	3;05	Sensorineural, profound	2 weeks old	Cochlear implant, Roger Radio Aid	A combination	2 x legal guardians	5 x mornings a week	none	2 years and 11 months
Katya	3;03	Sensorineural, severe to profound	4 weeks old	2 x hearing aids, Roger Radio Aid	Speech	2 x parents, 1 sister (15)	4 x afternoons a week	none	2 years
Ben	3;06	Sensorineural severe to profound	4 weeks old	1 x hearing aid, Roger Radio Aid	Speech	2 x parents, 1 twin sister	5 x mornings a week	none	1 year
Danny	3;03	Mixed, moderate	6 weeks old	2 x Sky V hearing aids, Roger Radio Aid	Speech	2 x parents (1 works away during the week)	5 x mornings a week	none	3 occasions over the last 2 years

Appendix G: Participant Information (Professionals)

Professional	Profession	Experience
Emma	Teacher of the deaf	Many years' experience in Early Years Education in a mainstream context. Recently qualified Teacher of the deaf. Jointly runs Pre-school Music Group with researcher for the past 2 years.
Fiona	Early Years Professional	Many years' experience in Early Years Education. Recently had 2 deaf children in an Under Two provision. Interested in deafness and pre-school work. Observed one Music Group session.
Gill	Teacher of the deaf	Many years' experience as a Teacher of the Deaf, some with pre-school children. Coordinates Family Sign which follows Music Group. Has observed two Music Group sessions.

Appendix H: Ethics Approval Notification

University of Hertfordshire UH

SOCIAL SCIENCES, ARTS AND HUMANITIES ECDA

ETHICS APPROVAL NOTIFICATION

TO Ginny Parker

CC Jane Peters and Dr Imran Mulla

FROM Dr Timothy H Parke, Social Sciences, Arts and Humanities ECDA Chairman

DATE 13/10/17

Protocol number: EDU/PGT/CP/03275

Title of study: Music as Intervention for Deaf Preschoolers and their Families: A Channel for Communication

Your application for ethics approval has been accepted and approved by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

This approval is valid:

From: 13/10/17

To: 31/12/17

Additional workers: no additional workers named

Please note:

If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and your completed consent paperwork to this ECDA once your study is complete. You are also required to complete and submit an EC7 Protocol Monitoring Form if you are a member of staff.

Approval applies specifically to the research study/methodology and timings as detailed in your Form EC1A. Should you amend any aspect of your research, or wish to apply for an extension to your study, you will need your supervisor's approval (if you are a student) and must complete and submit form EC2. In cases where the amendments to the original study are deemed to be substantial, a new Form EC1A may need to be completed prior to the study being undertaken.

Should adverse circumstances arise during this study such as physical reaction/harm, mental/emotional harm, intrusion of privacy or breach of confidentiality this must be reported to the approving Committee immediately. Failure to report adverse circumstance/s would be considered misconduct.

Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Students must include this Approval Notification with their submission.

Appendix I: Participant Information

UNIVERSITY OF HERTFORDSHIRE

ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS
('ETHICS COMMITTEE')

FORM EC6: PARTICIPANT INFORMATION SHEET

1 **Title of study** Music as Intervention for Deaf Pre-schoolers and their Families: A Channel for Communication

2 **Introduction** You are being invited to take part in a study. Before you decide whether to do so, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask us anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide whether or not you wish to take part. The University's regulations governing the conduct of studies involving human participants can be accessed via this link: http://sitem.herts.ac.uk/secreg/upr/RE01.htm**.** Thank you for reading this.

3 **What is the purpose of this study?**

To explore the benefits to preschool deaf children and their families of attending a weekly Music Group which is run as part of a Sensory Support Provision. The research will use a pre-existing Music Group but will focus on a 6 week block. There will be a range of baseline and follow-up assessments used as well as video evidence to track and evaluate impact. In addition questionnaires and interviews with parents and key workers will be carried out to create narrative. The research will focus on the benefits to parent/ carer and child communication

4 **Do I have to take part?**

It is completely up to you whether or not you decide to take part in this study. If you do decide to take part you will be given this information sheet to keep and be asked to

sign a consent form. Agreeing to join the study does not mean that you have to complete it. You are free to withdraw at any stage without giving a reason. A decision to withdraw at any time, or a decision not to take part at all, will not affect any treatment/care that you may receive (should this be relevant).

5 **Are there any age or other restrictions that may prevent me from participating?** *No*

6 **How long will my part in the study take?** If you decide to take part in this study, you will be involved in it from September to December, 2018.

7 **What will happen to me if I take part?**

- *To sign a consent form*
- *To have a short musical activity recorded*
- *To jointly carry out some tracking of your child's musical and communicative development*
- *To take part in a recorded interview*

8 **What are the possible disadvantages, risks or side effects of taking part?**

It will take some of your time although I will try to keep that to a minimum and the majority of research will take place during the Music Group session.

9 **What are the possible benefits of taking part?**

- Contributing to an evidence base supporting the use of music with deaf babies and children as an intervention strategy to promote early communication
- I hope that there will be a positive impact for you and your family. Through discussion I hope that we can jointly may deepen our understanding of some of the components of early communication and how music can potentially address some of those factors.

10 **How will my taking part in this study be kept confidential?**

Consent forms will be stored at the Sensory Support Office in locked drawers. Any information that is used will be coded so that it will not have your name on it. When the study is completed in May 2018 the consent forms will be destroyed.

11 **Audio-visual material**

I am intending to create audio-visual material through the use of video and by recording interviews. Data will be anonymised and stored in accordance with the data protection procedures. All materials will be kept on a computer with a security password or within a locked cupboard. Recordings will not be shared with anyone else.

12 **What will happen to the data collected within this study?**

12.1 The data collected will be stored electronically, in a password-protected environment, for 9 months, after which time it will be destroyed under secure conditions.

12.3 The data will be anonymised prior to storage.

13 **Will the data be required for use in further studies?**

13.1 The data will not be used in any further studies;

14 **Who has reviewed this study?** This study has been reviewed by:

14.2 The University of Hertfordshire Social Sciences, Arts and Humanities Ethics Committee with Delegated Authority. The UH protocol number is: **EDU/PGT/CP/03275**

15 **Factors that might put others at risk** Please note that if, during the study, any medical conditions or non-medical circumstances such as unlawful activity become apparent that might or had put others at risk, the University may refer the matter to the appropriate authorities.

16 **Who can I contact if I have any questions?**

If you would like further information or would like to discuss any details personally, please get in touch with me, in writing, by phone or by email: Ginny Parker, Northumberland Sensory Support, Riverside Centre, Ashington, NE63 0YD, Ginny.Parker@northumberlnd.gov.uk, 07900 225874

Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar.

Thank you very much for reading this information and giving consideration to taking part in this study.