



**University of  
Sheffield**

**Education 'In' and 'Through' Singing to Improve and Facilitate the  
Communication Skills of Autistic Children.**

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A thesis submitted in partial fulfilment of the requirements for the degree of  
Doctor of Philosophy

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## **Dedication**

To my husband Gabriel, my five-year-old daughter Katrina, my one-month-old son Ġużè and my parents Martin and Helen.

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## **Abstract**

### **Introduction/Background**

Autistic children can gain from education ‘in’ and ‘through’ music (Ockelford & Markou, 2012, p. 387). This exploratory study explored four research questions: 1) What approaches do teachers of singing consider to be effective in teaching singing to autistic students, including students who are MS (minimally speaking)? 2) What is the impact of teaching autistic students to sing as perceived by teachers of singing? 3) What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS (nonspeaking), MS, or LS (limited speaking)? 4) To explore how, while keeping the uniqueness of the child at the centre, I can use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS.

### **Methods**

In phase one, 35 singing teachers answered an online questionnaire. In the second phase, online interviews were conducted with 14 participants, including parents, music therapists, and speech-language pathologists. In the third phase, five autistic children and their caregivers participated in an ethnographic study; an ethnographic case series was written. Data was analysed using descriptive analytics and reflexive thematic analysis (Braun & Clarke, 2022).

### **Findings and Discussion**

The responses to the questionnaire indicated that a specific singing teaching approach for all autistic students does not exist. Singing teachers observed improvements in musical and other skills, including communication skills. The interviews suggested that singing can be explored as a tool to facilitate communication skills. The importance of goal adaptation and linking singing to communication goals was emphasised in the ethnographic case series. This qualitative, exploratory study showed that singing is perceived as a potential tool for fostering the development of communication skills in autistic students; however, further research using quantitative methods is needed to analyse the impact of singing instruction on autistic students.

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## List of Abbreviations

<b>AAC</b>	Augmentative and Alternative Communication
<b>AMMT</b>	Auditory Motor Mapping Training
<b>APA</b>	American Psychiatric Association
<b>ASC</b>	Autism Spectrum Conditions
<b>ASD</b>	Autism Spectrum Disorder
<b>CEFR</b>	Common European Framework of Reference for Languages
<b>CV</b>	Consonant-Vowel
<b>CVC</b>	Consonant-Vowel-Consonant
<b>DSM-III</b>	Diagnostic and Statistical Manual of Mental Disorders, Third Edition
<b>DSM-III-R</b>	Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised
<b>DSM-IV</b>	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
<b>DSM-V</b>	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
<b>DSM-V-TR</b>	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision
<b>EMG</b>	Electromyography
<b>ENT</b>	Ear Nose and Throat
<b>ICD-11</b>	International Classification of Diseases, Eleventh Revision
<b>IQ</b>	Intelligence Quotient
<b>LS</b>	Limited Speaking
<b>MBCT</b>	Melodic Based Communication Therapy

<b>MIT</b>	Melodic Intonation Therapy
<b>MMNm</b>	Musically Elicited Mismatch Negativity
<b>MRI</b>	Magnetic Resonance Imaging
<b>MS</b>	Minimally Speaking
<b>NS</b>	Nonspeaking
<b>OPERA</b>	Overlap Precision Emotion Repetition Attention
<b>PDD-NOS</b>	Pervasive Developmental Disorder Not Otherwise Specified
<b>PECS</b>	Picture Exchange Communication System
<b>PRISM Framework</b>	Processing Rhythm in Speech and Music Framework
<b>SENCO</b>	Special Educational Needs Coordinator
<b>V</b>	Vowel
<b>VC</b>	Vowel Consonant

## Declaration

I, Deborah Pullicino, confirm that the Thesis is my own work. I am aware of the University's Guidance on the Use of Unfair Means ([www.sheffield.ac.uk/ssid/unfair-means](http://www.sheffield.ac.uk/ssid/unfair-means)). This work has not been previously presented for an award at this, or any other, university.

## Introduction

It all started when I heard the singing voice of Paul, the autistic boy. His language was a medley of *Ave Maria*, *The Prayer*, *Air on the G String* and *Nella Fantasia* instead of English, Maltese, Spanish, Chinese, French, or German. As a practitioner-researcher focusing on teaching singing to autistic students, I was lost.

The autism spectrum condition is characterised by “Persistent deficits in social communication and social interaction across multiple contexts ... [and] Restricted, repetitive patterns of behavior, interests, or activities” (American Psychiatric Association [APA], 2022b, Autism Spectrum Disorder Section, F84.0, Criteria A and B). The rate of autistic individuals who remain minimally speaking is approximately 25% (Anderson et al., 2007). Since autistic children who are minimally speaking can sometimes sing (Wan et al., 2010a), previous research explored the use of various melodic patterns to facilitate communication skills (e.g., Paul et al., 2015; Sandiford et al., 2013; Wan et al., 2011). This provided a rationale for exploring how education ‘in’ and ‘through’ singing (Ockelford & Markou, 2012, p. 387) could improve and facilitate the communication skills of autistic children who are nonspeaking (NS), minimally speaking (MS), or limited speaking (LS) (Koegel et al., 2020). For the first phase of the study, the umbrella term ‘minimally speaking’, as defined by Kasari et al. (2013), referred to autistic individuals with “a very small repertoire of spoken or fixed phrases” (p. 480), with the number of spoken words varying from zero to 20 or 30. When designing the objectives of the study’s second phase, it was clear that the term ‘minimally speaking’ was too broad. Therefore, for the second and third phases, the terms ‘nonspeaking’ (NS), ‘minimally speaking’ (MS), or ‘limited speaking’ (LS), as defined by Koegel et al. (2020), were used.

My main reason for choosing the topic of autism spectrum conditions, singing education and communication skills is personal interest. I became interested in the topic after working with Paul, a child who could sing whole songs but could not address me to express his needs or feelings. The research project consisted of three main phases. The first phase was an online questionnaire for singing teachers with experience teaching autistic students. The online questionnaire was designed to answer two research questions. The first aim was to explore the approaches that singing teachers consider effective for teaching autistic students, including students who are MS. The second aim was to research the impact of singing teaching on autistic students, as observed by singing teachers, including benefits for other abilities such as speech and communication. The qualitative and quantitative data collected from the online questionnaire informed the study's second phase, a set of online interviews. Two of the interviews were carried out with parents of autistic children who are NS, MS, or LS. Eight interviews were carried out with professionals working with autistic children who are NS, MS, or LS, two speech-language pathologists, two music therapists, two occupational therapists and two singing teachers. Four interviews were conducted with early-years educators and foreign language teachers due to potential similarities in teaching communication skills to young neurotypical children, early-stage foreign language learners and autistic children who are NS, MS, or LS. The interviews aimed to explore practitioners' and parents' thoughts and observations on how singing can specifically target the facilitation of communication skills in autistic children who are NS, MS, or LS. The first two phases of the study contributed to the design of an ethnographic study focusing on education 'in' and 'through' singing for autistic children who are NS, MS, or LS. The ethnography aimed to explore how, while focusing on the uniqueness of each child, I, as a practitioner-researcher, could use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS.

The overall structure of the thesis takes the form of eight chapters. The first four chapters provide a literature review on autism spectrum conditions, singing education and communication, speech and language skills. The first literature review chapter explores the evolution of the concept of autism. The diagnostic features of autism spectrum conditions are discussed together with the specifier related to language impairment outlined in DSM-V-TR (APA, 2022b). The first literature review chapter is followed by a chapter concerned with the theoretical reasoning as to why singing can improve and facilitate the communication skills of autistic individuals. Chapter Three of the literature review begins by discussing the processing of music and music as an effective tool for brain plasticity. Singing training and neuroplasticity follow in the third thesis chapter, leading to an analysis of how singing training can be shaped to improve the communication skills of autistic individuals. The last literature review chapter, Chapter Four, presents how singing can be used to facilitate the communication skills of the targeted population in the study. Furthermore, Chapter Five is dedicated to the methodology of the first two phases of the study, the online questionnaire and online interviews. The research designs, analytic choices and processes of the study's first two phases are discussed. The sixth thesis chapter analyses the findings of the study's first two phases with a combined results and discussion format. The focus of Chapter Seven is the study's third phase, the ethnographic case series. The context, observations, and interpretations are written for each of the three case studies that form the ethnographic case series. A general discussion and conclusion are presented in the last thesis chapter.

The current study explored how autistic children can benefit from education 'in' and 'through' singing. The online questionnaire and the online interviews informed the ethnography. The ethnographic case series looked into how, if specific communication goals are targeted, singing teaching can be a potential tool for enhancing singing and musical skills

and facilitating the acquisition of communication skills. When researching effective approaches to teaching singing to autistic students, the online questionnaire data suggested that no specific approach can be used to encompass all neurotypical or autistic students. The educator's experience was highlighted as a significant factor in the teaching of singing to autistic children. Exploring singing teachers' observations on the impact of teaching autistic students to sing, it was noted that, in addition to improvements in singing and musical skills, autistic children who learn to sing might also benefit in other areas, such as speech, language, and communication. The online interviews explored the thoughts and observations of practitioners and parents on how singing teaching can specifically target the facilitation of communication skills of autistic children who are NS, MS, or LS. These interviews indicated the importance of treating communication not only as 'talking' but as an umbrella of various skills and as an ability which children can manifest in various ways. Singing was suggested as a very 'common sense' tool that can be explored to facilitate the communication skills of autistic children. Particular references were made to different methods which can be used during singing sessions to encourage the engagement of autistic students. A striking suggestion was the role parents could potentially play in the process of using singing to facilitate communication skills for autistic children. The ethnographic study suggested five-section singing teaching sessions aimed at improving and facilitating communication skills; the five-section singing teaching sessions can be easily applied in different singing teaching settings.

This research has raised many questions that require further investigation regarding how autistic children, especially those who are NS, MS, or LS, can benefit from singing as a therapy and as part of a music educational programme. The three-phase study highlighted the importance of prioritising the uniqueness of each autistic student. It explored the potential of

singing sessions not only to enhance musical skills but also to improve and facilitate communication skills. As a practitioner-researcher, I learnt that while centralising the individuality of every autistic student, I can target specific communication goals through singing.

## Chapter 1 – Autism Spectrum Conditions (ASC)

### 1.1 Introduction

This chapter begins by describing the evolution of the concept of autism. It goes on to describe the diagnostic features of autism spectrum conditions (ASC). The specifier found in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision* (DSM-V-TR) (APA, 2022b) ‘With or without accompanying language impairment’ is then explored in detail. The chapter concludes with a description of how autism is viewed in each step of this research project; autism is viewed as a neurodiversity.

### 1.2 Evolution of the Concept of Autism

Children’s descriptions of what we now refer to as autism spectrum conditions (ASC) trace their origins to the 1700s and 1800s (Rosen et al., 2021). Around 1910, the Swiss psychiatrist Eugen Bleuler used the term ‘autism’ for the first time (Verhoeff, 2013). In 1943, Leo Kanner reported his observations about a group of eleven children between two and eight years old and in 1944, Hans Asperger described four boys aged seven to eleven (Da Silva & Lebrun, 2023). The concepts described by Kanner and Asperger were vital early contributions that led to the present understanding of ASC (Rosen et al., 2021). Moreover, the studies published in 1972 by Kolvin and Rutter demonstrated differences between autism and schizophrenia, including differences in characteristics and family history (Da Silva & Lebrun, 2023) and in 1980, in the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.; DSM–III; APA, 1980), ‘infantile autism’ was no longer placed under the psychosis category (Da Silva & Lebrun, 2023). In the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.; DSM–III-R; APA, 1987), the term ‘infantile autism’ was changed to ‘autistic disorder’ and

in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; DSM–IV; APA, 1994) Asperger’s disorder was included as a separate diagnostic category (Rosen et al., 2021).

The *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM–V; APA, 2013) placed the new category ‘autism spectrum disorder’ under the diagnostic category ‘neurodevelopmental disorders’ (Guerrera et al., 2024). The new category, ‘autism spectrum disorder,’ included autistic spectrum conditions, Asperger’s disorder and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) (Verhoeff, 2013). Severity levels, specifiers of frequently non-ASC co-occurring conditions, such as language and intellectual difficulties and a reference to sensory sensitivities could be found in DSM-V (Rosen et al., 2021). No major changes were implemented in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed., text rev.; DSM–V-TR; APA, 2022b), except that in DSM-V-TR all social communication sub-characteristics should be met for a person to be diagnosed with ASC (Da Silva & Lebrun, 2023). During the time of the current study, the DSM-V-TR (APA, 2022b) and the *International Classification of Diseases* (11th revision; ICD-11; World Health Organisation, 2019) are the two classification manuals most used (Joon et al., 2021). Throughout the three phases of the data collection of this research project, the last two editions of the *Diagnostic and Statistical Manual of Mental Disorders*, in other words, *DSM-V* (APA, 2013) and *DSM-V-TR* (APA, 2022b), were the classification manuals used.

### **1.3 Diagnostic Features of Autism Spectrum Conditions**

According to the DSM-V-TR (APA, 2022b):

The essential features of autism spectrum disorder are persistent impairment in reciprocal social communication and social interaction (Criterion A), and restricted, repetitive patterns of behavior, interests, or activities (Criterion B). These symptoms are present from early childhood and limit or impair everyday functioning (Criteria C and D). The stage at which functional impairment becomes

obvious will vary according to characteristics of the individual and his or her environment.

(Autism spectrum disorder, F84.0)

Table 1.1, DSM-V-TR (APA, 2022b) specifies three severity levels for autism spectrum conditions.

**Table 1.1** *Severity levels for autism spectrum disorder (examples of level of support needs)*

Severity level	Social communication	Restricted, repetitive behaviors
Level 3 "Requiring very substantial support"	Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interactions, and minimal response to social overtures from others. For example, a person with few words of intelligible speech who rarely initiates interaction and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches.	Inflexibility of behavior, extreme difficulty coping with change, or other restricted/repetitive behaviors markedly interfere with functioning in all spheres. Great distress/difficulty changing focus or action.
Level 2 "Requiring substantial support"	Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions; and reduced or abnormal responses to social overtures from others. For example, a person who speaks simple sentences, whose interaction is limited to narrow special interests, and who has markedly odd nonverbal communication.	Inflexibility of behavior, difficulty coping with change, or other restricted/repetitive behaviors appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress and/or difficulty changing focus or action.
Level 1 "Requiring support"	Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions, and clear examples of atypical or unsuccessful responses to social overtures of others. May appear to have decreased interest in social interactions. For example, a person who is able to speak in full sentences and engages in communication but whose to-and-fro conversation with others fails, and whose attempts to make friends are odd and typically unsuccessful.	Inflexibility of behavior causes significant interference with functioning in one or more contexts. Difficulty switching between activities. Problems of organization and planning hamper independence.

*Note.* From American Psychiatric Association. (2022a). 'Severity levels for autism spectrum disorder (examples of level of support needs)' [Table]. In *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>

DSM-V-TR (APA, 2022b) explains that ASC, which is diagnosed more in males than in females, can be evident before one year of age. However, its symptoms are typically noted between 12 to 24 months of age. If symptoms are less evident, they can also be recognised after 24 months. In DSM-V-TR, accompanying language difficulties are one of the specifiers, which may or may not be present. Descriptions for this specifier include a lack of intelligible speech, the presence of single words only, the use of phrase speech, full sentences and fluent speech. In addition, when a person is diagnosed, receptive and expressive language skills are separately described, as better expressive language skills may be demonstrated in ASC. Correspondingly, individuals with ASC may have difficulties

in social-emotional reciprocity. Thus, social interaction may be absent or very limited. Difficulties in imitating the behaviour of others, labelling instead of commenting and responding to social cues are examples of difficulties in social-emotional reciprocity. Difficulties in nonverbal communicative behaviours linked to social interaction may also be present. Examples include lack of eye contact, impaired joint attention and difficulties in facial expressions (APA, 2022b).

The first phase of this research project, a survey, was aimed at singing teachers with teaching experience with autistic individuals of all severity levels and language abilities. The second phase of the study, which was a set of interviews with parents of autistic children and practitioners, focused on children of any severity level who are nonspeaking (NS), minimally speaking (MS), or limited speaking (LS) (refer to the descriptions in Koegel et al., 2020). The ethnography, which was the last phase of this three-phase study, was carried out with five autistic children who are NS, MS, or LS and who fit the descriptions of Level 2 or 3 (refer to Table 1.1). In the three phases of the study, the link between singing teaching and social-emotional reciprocity and nonverbal communicative behaviours associated with social interaction was explored.

#### **1.4 Specifier ‘With or Without Accompanying Language Impairment’**

DSM-V-TR (APA, 2022b) explains that language difficulty may or may not be present in ASC; specifiers indicate particular condition characteristics in DSM-V-TR. Twenty-five to 35% of the individuals diagnosed with ASC remain minimally speaking (Anderson et al., 2007; Norrelgen et al., 2015; Tager-Flusberg & Kasari, 2013). Tager-Flusberg and Kasari (2013) argue that “there is little consistency in the definition of this group” (p. 469), and Posar and Visconti (2022) further add that a commonly used exact

definition for this group does not exist. In fact, the clinical population in question, which is understudied (Bal et al., 2016), was labelled by Tager-Flusberg and Kasari (2013) as “the neglected end of the spectrum” (p. 476). For the first phase of the study, ‘Teaching singing to students on the autism spectrum: A survey’, the definition suggested by Kasari et al. (2013) was used. It was explained that in the survey, ‘minimally verbal’ referred to autistic individuals with “a very small repertoire of spoken or fixed phrases” (p. 480), with the number of spoken words varying from zero to 20 or 30.

The collected survey data suggested that under the broad definition of ‘minimally verbal’ given by Kasari et al. (2013), singing abilities may vary a lot. A singing teacher with experience with autistic students, Level 3, reported “a reaction to a rhythm” (online questionnaire, question 31). Another questionnaire respondent described the singing of a song in front of a whole year group assembly by a boy who many of the school staff and students “had not heard him speak before” (online questionnaire, question 31). Refer to Chapter Six for the findings and discussion of the study's first phase. Therefore, informed by the collected survey data, for the second phase of the study, the definitions ‘pre-speaking’, ‘nonspeaking’, ‘minimally speaking’ and ‘limited speaking’ as suggested in Koegel et al. (2020) were utilised to aim for more precise descriptions of the speaking abilities of the children referred to in the study. Koegel et al. distinguish between the terms ‘pre-speaking’, ‘nonspeaking’, ‘minimally speaking’ and ‘limited speaking’ (pp. 2968–2969). Children under 18 months who do not express any words are defined as pre-speaking since they are very young to be described as nonspeaking. According to Koegel et al., the term ‘nonspeaking’ can be used for children over 18 months with no verbal, expressive, intelligible words or approximations. A phonetic repertoire may be present in this group of children. The term ‘minimally speaking’ is suggested for children who use significantly fewer words than the

typical number of words used at their age. The term 'limited speaking' is suggested to include children whose verbal abilities are better than those described as 'minimally speaking', but still significantly below the expected level of a child of the same age. Generative language abilities and communicative function are also to be considered; for example, Koegel et al. explain that if communication is only used for requests, a child is to be considered 'limited speaking'. A more detailed description of the four groups can be found in Koegel et al. (pp. 2968–2969).

Standardised tests may not give a clear picture of the communicative abilities of autistic individuals who are NS, MS, or LS. On the other hand, methods which can be used to indicate the communicative abilities of the person include but are not limited to parent or teacher reports, detailed descriptions of the communicative profile of each participant in a study and language and speech samples (Koegel et al., 2020). To promote a description based on the communication abilities of the child in contrast to an approximate number of words used by a child, Naples et al. (2023) propose a Low Verbal Investigatory Survey for autism. This brief parent-report consists of 36 items to assess the communication abilities of autistic children who are minimally speaking. This survey includes questions about the receptive communication skills and the phonetic repertoire of the children, such as "Does your child follow multi-step directions?" (p. 1399) and "How many consonant sounds does your child make?" (p. 1399). Questions about babbling, echolalia and recognising printed letters and/or numbers are also included. During all the phases of the study, but especially during the third phase of the study, the ethnography, it was essential to focus on the communication abilities of the autistic children, not on the number of words each participant could say. Furthermore, since autism spectrum conditions mainly present difficulties in social communication, children can demonstrate various communicative abilities in different social contexts. Throughout all

the study phases, it was taken into account that an autistic individual can move through the four terms suggested in Koegel et al. (2020) in different contexts and/or through the study.

### **1.5 Non-judgmental and Respectful Language**

Neurodiversity views autism “as part of the natural spectrum of human diversity” (Monk et al., 2022, p. 791). When autism is viewed as neurodiversity, in contrast to a number of impairments, service providers, similarly to when providing a service to other individuals, can focus on growth instead of concentrating only on care (Pickard, 2019). Bearing this in mind, this research project was designed with the view of autism as a neurodiversity; after collecting data about singing education and autism spectrum conditions in the first two phases, an ethnography was carried out for the third phase. The ethnography created a space for the growth of each particular participant by allowing specifically tailored goals targeting the communicational and singing development of each person. The ethnography aimed not only to strongly refrain from ‘curing’ an impairment to fit what is seen as ‘normal’, but also to understand, respect, appreciate and act according to the uniqueness of every participant. As Cornago (2021) emphasises, “[e]ach person with autism is distinct, let us not compare them” (p.16).

A crucial aspect of autism as a neurodiversity is non-judgmental and respectful language. Specific autistic individuals support identity-first language (‘autistic person’), while others support person-first language (‘person with autism’) (Vivanti, 2020). Provided that the term ‘person on the autism spectrum’ is usually endorsed by both supporters of identity-first and language-first terminology (Dwyer et al., 2022), it was used throughout the data collection process. Similar to several research papers (e.g., Koegel et al., 2020; Posar & Visconti, 2022; Tager-Flusberg & Kasari, 2013), in the three phases of the study, terms consisting of the

word 'verbal', such as 'minimally verbal', were used. Throughout the data collection of this research project, a preference for identity-first language, for the term 'speaking' instead of 'verbal' and for the term 'autism spectrum conditions' instead of 'autism spectrum disorder' was observed; this terminology was therefore used throughout the writing of the dissertation chapters. Terminology in quotations from other sources has not been changed to present quotations in their original form; the same applies to titles of or quotations from the three phases of this study. The change in terminology was also not applied to occurrences linked to the evolution of the concept of autism. In addition, participants who participated in the three phases of the study used diverse terminology for various reasons.

Dunn (2019) explains that autism is a neurodiversity, not a number of deficits that "should be cured" (p.13). This research project analyses how singing education can promote the growth of an autistic person, especially communication growth and the development of the singing voice and not how singing education can cure a number of 'impairments'. It should also be clarified that this project's approach is an educational approach, not a therapeutic one. The sessions carried out during the study's third phase, the ethnography, focused on offering an educational space, not a therapeutic one.

## **1.6 Conclusion**

The first chapter of the literature review briefly described how the concept of autism evolved. The diagnostic features of autism and the specifier related to language impairment found in DSM-V-TR (APA, 2022b) were then discussed. An exploration of the view of autism in this research project, in other words, as neurodiversity, concluded this chapter. Having discussed concepts about autism and the importance of autism as a neurodiversity, the

second chapter of this literature review will address the theoretical reasoning behind singing to promote and enhance communicational growth in autistic children.

## **Chapter 2 – Theoretical Reasoning Behind the Potential of Singing to Improve and Facilitate the Communication Skills in Autistic Children**

### **2.1 Introduction**

Autistic individuals, including individuals who are NS, MS or LS, can benefit from “education *in and through* music” (Ockelford & Markou, 2012, p. 387). As will be explored in the third and fourth chapters of this literature review, when viewing autism as a neurodiversity to focus on aims promoting growth, education ‘in’ singing might ‘improve’ communication skills in autistic children and education ‘through’ singing might ‘facilitate’ communication skills. This chapter discusses the theoretical reasoning behind why singing education can be a potential medium for improving and facilitating communication skills. It starts by presenting singing as an innate ability, an ability which can also be found in autistic individuals. The chapter suggests why singing might be an easier way to combine syllables than speech and explains the relationship between language acquisition and sung sequences. At the end of this chapter, oral-motor skills and imitation in relation to singing and autism are explored.

### **2.2 Singing is an Innate Ability**

Repetition and memorisation promoted by a melody can make singing more involuntary than speech (Stadler Elmer, 2020). A notable example of this is the experience of earworms, in other words, “persistent musical and verbal retrieval episodes” (Halpern & Bartlett, 2011, p. 425). As argued by Stadler Elmer (2020), this involuntary process involved in singing may contribute to the development of singing in the first years of human life. By presenting two early examples of singing in the very first months of life, Stadler Elmer (2012a) suggests that children can sing simple tunes before they acquire the skills to form two-syllable words. She presented the situations that Stern (1914, as cited in Stadler Elmer, 2012a) and

Papoušek and Papoušek (1981, as cited in Stadler Elmer, 2012a) reported. Early in 1914, William Stern (Stern, 1914, as cited in Stadler Elmer, 2012a) described his 1-year 10-month-old son singing melodies such as *Hopp, hopp, Pferdchen lauf Galopp* using a correct rhythm and a correct relation between one note and another. Unstable tonality was reported, and the child did not sing the words. On a similar note, Papoušek and Papoušek (1981, as cited in Stadler Elmer, 2012a) wrote that when given turns by her father, their 1-year 1-month daughter Tanja could “anticipate the next part of the song or repeat the last contour in an appropriate rhythm bringing it to the correct fundamental note” (Papoušek & Papoušek, 1981, as quoted in Stadler Elmer, 2012a, p. 11). A similar case study by Stadler Elmer (2012b) also presents a 14-month-old boy creating a very short melody. After the boy’s carer points to an object in a picture book and says, “da” in German, the boy repeats the syllable and then explores the sound by creating a short melody in E Minor. Observations include the ability to vary pitch between syllables, the repetition of syllables in singing, variations of duration and accentuation of syllables and a minimal expiratory capacity. Similarly, in a study which analysed speech and singing responses of eight preschool children during play or child-adult interactions, children who were still acquiring vocal control were observed to exhibit intermediate vocalisations (Mang, 2000). Intermediate vocalisations are vocalisations that are between speaking and singing.

Furthermore, studies focusing on the singing of preschool children suggest that, as argued by Wan et al. (2010b), the musical expression of singing is “as natural as speaking” (p.287). Although singing ability can be further improved by vocal training, the emergence of singing does not depend on training (Wan et al., 2010b). Singing is “an innate capacity that allows adapting the vocalization to the surrounding music and language” (Stadler Elmer, 2012b, p. 61). An innate singing ability can also be observed in certain autistic individuals (e.g.,

Heaton et al., 2008; Stanutz et al., 2014). Warnock (2019) observes that, “[c]hildren with an autistic spectrum condition, as with all children beyond the age of six to eight months, seem to have the ability to anticipate and predict forthcoming notes in a melody” (p. 277).

### **2.3 The Innate Singing Ability in Autistic Individuals**

Early in 1943, Kanner noted particular musical interests of autistic individuals (Kanner, 1943, as cited in Wan et al., 2010a). Stanutz et al. (2014) analysed short- and long-term pitch and melody memory in 25 mainly musically untrained autistic children aged 7-13. Typically developing children of matched age and intelligence quotient (IQ) were recruited as controls. The children were asked to distinguish single tones on two different tasks and to recall two-bar melodies after one week. Superior memory skills for music were reported both in the short-term and long-term memory in autistic participants. These results suggest that since abilities related to music and singing may be superior in certain autistic individuals, singing may be a potential tool to be delved into as a way to improve and facilitate communication skills in autism. Provided that the autistic participants in this study were mainly high-functioning autistic participants or were diagnosed with PDD-NOS, the generalisability of the study’s findings is subject to limitations. The study is limited by the absence of autistic participants who are not high-functioning. Additionally, the study lacks a detailed description of the verbal abilities of participants. Particular music abilities of autistic individuals were also reported by Heaton (2003) and Heaton et al. (2008).

Heaton (2003) carried out two experiments with 14 autistic children aged seven to 15 years. A matched control group was included. In experiment one, pitch memory and labelling were examined, and in experiment two, the identification of labelled missing tones from a musical chord was analysed. Heaton (2003) carried out another experiment with 15 children

aged seven to 14. The verbal IQ scores of all the autistic children were within the normal range, except for those of two children; the two children had a verbal IQ of 56. A matched control group was also included in the experiment. The disembedding of unlabelled tones from musical chords was analysed. In the case of pre-exposed and labelled pitch representations, autistic children demonstrated better pitch memory and labelling. The same ability was not observed when the pre-exposure of pitch representations was reduced. This suggests that the musical ability of autistic children might be much stronger when they are familiar with a specific set of musical notes. The findings of Heaton's (2003) study are essential to consider in this research project when analysing effective approaches in using singing to facilitate communication skills of autistic children. A question raised by the findings of Heaton's study is what type of songs could best facilitate communication skills in the third phase of the study, the ethnography. Ultimately, more research can determine if familiar songs can be more beneficial than unfamiliar songs when using songs with autistic children to target specific speech, language, or communication skills.

Heaton et al. (2008) tested pitch discrimination and pitch memory not only with participants described in the study as "intellectually high-functioning" (p. 205) but also with participants described as "intellectually low-functioning" (p. 205)<sup>1</sup>. Of 33 participants, 12 were "intellectually low-functioning" (Heaton et al., 2008, p. 205) and their ages ranged from 11 to 19 years. A comparison group was also included in this study. Certain participants who demonstrated exceptional pitch-processing skills demonstrated a wide discrepancy between verbal and nonverbal subtest scores, had poor vocabulary and also exhibited significant language impairments. In the view of this research project, these findings indicate that singing

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<sup>1</sup> Acknowledging neurodiversity, the exact terminology by which participants were distinguished in Heaton et al. is quoted here only to provide an accurate picture of the study that was carried out.

training might offer various benefits not only to autistic children but also to those who are NS, MS, or LS.

Stanutz et al. (2014) suggest that the absolute pitch ability in certain autistic individuals may contribute to a better memory of vowel sounds than consonant sounds. Experiments that analysed the use of absolute and relative pitch cues in statistical learning tasks with 8-month-old infants and adults (Saffran & Griepentrog, 2001) suggest that infants' preference for absolute pitch cues diminishes as they age. Furthermore, studies such as those carried out by Bouchon et al. (2015) and Kitamura and Notley (2009) demonstrate the attention infants give to vowels compared to consonants. Typical infant early vocalisations are made up of a series of vowels which are prolonged (Stadler Elmer, 2020), and infant-directed speech, which adults use to draw the attention of infants, is also full of long vowels which do not vary a lot (Falk & Tsang, 2020). Stanutz et al. (2014) suggest that, unlike typically developing infants, whose preference for absolute pitch cues diminishes when they grow up (Saffran & Griepentrog, 2001), autistic children may "retain a level of AP [absolute pitch] ability, [and] their preference and memory for the pitched (vowel) sounds of words may interfere with their memory of speech (consonants) sounds" (p. 146). Kuhl et al. (2005) support the idea that autistic children may encounter difficulties in discriminating between consonants. Järvinen-Pasley and Heaton (2007) also argue that autistic children may find it easier to memorise pitches of vowel sounds. Stanutz et al. conclude that melodies and songs can promote better memory of vowel sounds than consonant sounds. A certain level of absolute pitch ability or preference may contribute to a preference for vowel sounds over consonant sounds in typically developing infants and autistic children. This may be a possible reason why a song that, according to Stadler Elmer (2020), is made up of a string of vowels that are prolonged, or parts of a song, can be present when language is impaired or is still developing. The previous suggestions indicate the need

for detailed studies into how singing can benefit autistic children whose communication skills, speech and language are not yet developed or are at their early stages of development.

Similar to typically developing children who demonstrate the ability to sing simple tunes despite lacking the ability to form two-syllable words (Stadler Elmer, 2012a), certain autistic children, whose language ability is minimally developed or non-developed, can also sing (Pullicino, 2021; Reece, 2015; Wan et al., 2010a). In both cases, words in songs may only be processed phonetically, without any awareness of the meaning of the words sung (Reece, 2015). Ockelford (2013) suggests that autism may create an exceptional early cognitive environment; sounds may be processed mainly in terms of their auditory qualities and not their functional meaning. Describing the singing abilities of her autistic daughter, an interviewed mother in Pullicino (2021) explained that her daughter “used to be able to sing when her language was still impaired ... she had the ability to sing the words” (p. 44). An online questionnaire aimed at parents, teachers, carers and music therapists who worked or cared for autistic individuals (n=320) indicated that approximately nine out of 10 who used one or two-word sentences demonstrated singing ability (Reece, 2015). Furthermore, more than a quarter of the children described as “non-verbal” (Reece, 2015, p.126) were able to sing, and 15% were reported to sing for three hours or more. However, Reece (2015) reported that only 12% of these children used words learnt from songs in their everyday activities. For this research study, this finding raises intriguing questions regarding methods which can be explored to encourage the use of words learnt in songs in everyday contexts. In a semi-structured interview, a teacher in a special education setting described the singing of an autistic pupil who used around 30 to 40 words functionally.

... one of my, one of my little girls from the year before last...she...a couple of them actually learned a whole song, by rote, you know, she had very few, probably like 30 to 40 words that she would use functionally...to ask for things, but in, you know, she knew

every word to every pop song we learned together, to the point where she'd sing it all the way through. (Reece, 2015, p. 89)

As discussed, singing is an innate ability in individuals, including autistic individuals. In some instances, it may also be superior in autistic people. Therefore, this research project was interested in exploring how autistic children, especially children who are NS, MS, or LS, can develop and improve their communication skills through singing.

#### **2.4 Singing as an Easier Way to Combine Syllables Than Speech**

Stadler Elmer (2020) describes the syllable as a unit found in both speech and song; a syllable is a vowel (V) or a vowel and consonant combination, such as a consonant and a vowel (CV) or a vowel and a consonant (VC) and a consonant, a vowel and a consonant (CVC). Stadler Elmer (2020) presents the syllable formed in canonical babbling as the basic singing unit. Canonical babbling combines two or more consonant-vowel syllables (CV), e.g., *bababa* (Nathani et al., 2006). The study focusing on the transition between speaking and singing of a 14-month-old child by Stadler Elmer (2012b) suggests that in their early years, children find it easier to experiment with the combination of syllables in a song than to produce words consisting of a combination of syllables. Stadler Elmer (2020) argues that “infants and toddlers find it much easier to adopt their vocalization to the rules of singing than to those of speaking [...] Forming words with syllables is much more demanding and thus later in development than creating melodies with them” (p. 37). The reason Stadler Elmer (2020) gives for this is the difference between the shape and organisation of syllables in singing and speaking. She explains that speaking requires the combination of syllables in words and sentences. On the other hand, repetitions, variations and lack of linguistic semantics of syllables joined to form a melody are possible in singing. Stadler Elmer's explanation further supports the idea that

autistic children who are NS, MS, or LS may find the elements presented in songs easier to lead them to a specific communication goal than other mediums.

An insightful study, based on long-term video documentation, is that of an autistic girl who is NS. She sings songs with sounds but lacks words. El Mogharbel et al. (2003) explain that the girl's vocalisations are mainly consonant-vowel (CV). The researchers write that:

[T]he motivation for her vocal activity is the performing of music. Not being restrained by linguistic matters such as sound-meaning-relationship, the nonverbal girl is free to employ phonetic sounds in a way that enhances or at least does not hinder her musical performance. (p. 52)

El Mogharbel et al. argue that vowels dominate the girl's singing because of their rich, resonant sounds. They add that a simple syllable structure also contributes to an open oral tract. The two questions that are raised by this study and that influence the present one are:

1. Like every other individual, how can this girl be taught singing to explore her singing talent and improve her singing ability?
2. The researchers explain that musical criteria influence the girl's phonetic preferences and can be distinguished from speech-related sound structures. How can the structures already present in the girl's singing be used as a bridge to facilitate speech?

## **2.5 Language Acquisition and Sung Sequences**

The first phases of language acquisition involve segmenting speech into words (Jusczyk & Aslin, 1995). Schön et al. (2008) explain this challenge by referring to foreign language learning. When learning a foreign language, we face the challenge of identifying word boundaries from what appears to be "an uninterrupted stream of meaningless sounds" (Schön et al., 2008, p. 796). Schön et al. (2008) compared language learning based on speech sequences with that based on sung sequences. The study consisted of three experiments. In the first experiment, 26 native French participants were asked to discriminate words from

part-words after listening to seven minutes of a continuous speech stream; participants did not succeed in this discrimination. In the second experiment, distinct musical tones were associated with syllables. When syllables were produced by a synthesiser instead of spoken, participants could discriminate words from part words. The last experiments also involved the singing of syllable sequences, but while the syllable-pitch mapping in the second experiment was constant, in the third, it was variable. Constant syllable-pitch mapping involves the association of each syllable always with the same pitch and using the same pitches for each specific word. The level of performance in the third experiment was lower than in experiment two but higher than in experiment one. Findings indicate that attention and/or boundary enhancement affect learning in sung sequences. The study also demonstrates the effect of the superposition of linguistic and melodic transitional probabilities, in other words, the constant syllable-pitch mapping inferencing the likelihood of the appearance of syllables and tones following preceding or succeeding syllables and tones. Overall, the three experiments carried out by Schön et al. (2008) suggest that when figuring out word boundaries from a stream of syllables, the “motivational and structuring properties” (Schön et al., 2008, p. 982) present in sung sequences, facilitate linguistic processing. These findings corroborate other researchers’ observations who analysed the effects of sung sequences in cases where language is still developing or not fully developed (e.g., Bryant & Barrett, 2007; Thiessen et al., 2005).

Motherese or infant-directed speech, which is characterised by high pitch, elementary grammar, slow tempo and melodic contours (Saint-Georges et al., 2013), is commonly used by adults to catch the attention of infants and toddlers. Bryant and Barrett (2007) reported that Shuar subjects (South American hunter-horticulturalists) recognised utterances of different intentions recorded by English-speaking mothers significantly better in infant-directed speech than adult-directed speech. Shuar subjects all had Shuar as their first and primary language

and were all taught Spanish. In Thiessen et al. (2005), 20 infants between 6.5 and 7.5 months heard nonsense sentences spoken in infant-directed speech, and another 20 infants listened to the sentences in adult-directed speech. While exposure to infant-directed speech led to distinguishing words from syllable sequences, adult-directed speech did not. This study suggested that infant-directed speech, characterised by melodic contours, facilitates the use of statistical information present in speech; infant-directed speech facilitates word segmentation.

Schön et al. (2008) outline that simple and repetitive structures can be found in children's songs. A recent theoretical review by Mottron et al. (2021) proposes that exposure to structured materials such as YouTube nursery rhymes can serve as a trigger to help improve language in autism. Studies such as those by Bulf et al. (2011) and Kirkham et al. (2002) also suggest that statistical learning is not limited to auditory input; other modalities include visual input. Mottron et al. further hint that for the population in question, "language needs to be presented in a more isomorphic manner and with a higher level of structural recurrence" (p. 9).

Droucker et al. (2013) indicated that, similarly to infant siblings of typically developing children, infant siblings of autistic children preferred infant-directed to adult-directed speech. At six, eight, 12 and 18 months, infants heard four speech passages, consisting of two infant-directed and two adult-directed speech. Although the sample in this study is small, since the population involved is very particular, the study suggests that sung sequences can also promote joint attention in infants at risk for ASC. Joint attention, which plays a crucial role in symbolic thought and language acquisition, can be described as the ability of two individuals to focus on the same thing to interact with one another (Montagut-Asunción et al., 2022).

Autistic children typically demonstrate difficulties in joint attention (Murray et al., 2008). Difficulties in joint attention are among the first indications of autism (Charman, 2003).

The observations about infant-directed speech suggest how singing might help improve communication skills in autistic children who are NS, MS, or LS. It raises intriguing questions regarding how features of infant-directed speech can promote receptive communication in ASC.

## **2.6 Oral-Motor Skills and Singing**

In specific cases of autism, speech difficulties may accompany social communication and social interaction difficulties (Belmonte et al., 2013; Broome et al., 2017; Chaware et al., 2021; Wolk & Brennan, 2013). Individuals can exhibit articulation errors, phonological errors, errors in prosody and motor-speech disorders, which include dysarthria and childhood apraxia of speech (Chaware et al., 2021). Gernsbacher et al. (2008) highlighted a significant variation in oral-motor skills of autistic children described as “highly fluent” and “minimally fluent” (p. 48)<sup>2</sup>. Twenty autistic children described as “minimally fluent” and another 20 autistic children described as “highly fluent” were recruited. An oral-motor assessment was carried out in the children’s home. Requests and demonstrations were made to observe specific oral-motor skills, including opening the mouth and elevating the tongue. The researchers observed that, on average, the group described as “minimally fluent” had greater difficulties performing specific oral-motor skills than the group described as “highly fluent”. While problems in joint attention and carrying out instructions may have affected the presented results, similar

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<sup>2</sup> Acknowledging neurodiversity, the exact terminology used by Gernsbacher et al. (2008) to describe the participants in their study was quoted only to give a clear description of the study as much as possible.

differences in oral-motor skills were reported in Gernsbacher et al. by caregivers of autistic children described as “highly fluent” and “minimally fluent”.

Additionally, autistic children with oral-motor skills and speech difficulties will have difficulties in talking and singing. However, when singing exercises specifically target particular oral-motor skills, songs can offer a context of repetition (Patel, 2014), promotion of joint attention (Schön et al., 2008) and a structure in which syllables can be combined with melodies and joined together without the need of being given a specific semantic meaning (Stadler Elmer, 2020). In singing, melody and rhythm offer a discreet foundation for syllable one, joined with syllable two and syllable two, joined with syllable three, and so on. Singing is a task that promotes the connection between one syllable and another, one word with another and one phrase with another; this is all done by the sometimes nearly invisible glue between one unit and another, made possible with the melody and rhythm of a song. Wan et al. (2010b) also suggest that “[s]inging, or the act of producing musical sounds with the voice has the potential to treat speech abnormalities because it directly stimulates the musculature associated with respiration, phonation, articulation and resonance” (p. 288). Warnock (2019) further adds that songs may “encourage a child to attempt their first phonetic sounds” (p. 277).

## **2.7 Singing and Imitation**

Hamilton et al. (2007) suggest that “an understanding of imitation behaviour in autism must begin with the recognition that imitation is not a unitary cognitive component and is not dependent upon a unitary mirror neuron system in the human brain” (p. 1866). Hamilton et al. carried out a study with 25 autistic children and 31 typically developing children of a mean verbal mental age of four years and three months. Intact ability to mimic hand action was

observed in autistic children. Hamilton et al. suggest that autistic children exhibit impairments in tasks that are not linked with the hand-goal mirror neuron system.

Moreover, Rogers et al. (2003) reported that autistic children experience difficulties in facial imitation tasks. In McIntosh et al. (2006), while viewing images of happy and angry expressions, the cheek and brow muscle region activity of autistic adolescents and adults, as well as of controls, was monitored with electromyography (EMG). Although voluntary mimicry of emotional facial expressions was reported in both groups, automatic mimicry was not observed in autistic individuals. Provided that the study carried out by Hamilton et al. (2007) was conducted with a group of autistic children who had a mean chronological age of eight years one month and a mean verbal mental age of four years three months, a limitation of this study is that it might lack an insight into autistic individuals who are NS, MS, or LS.

In the system review about the mirror neuron system in autism, Hamilton (2013) argues that dyspraxia and other motor control difficulties, which in some instances can accompany social communication and social interaction difficulties in autism, may be a result of difficulties in action chaining observed in studies focusing on motor control and action understanding. Chua et al. (2022) explore the difficulties in action chaining experienced by particular autistic individuals. Interestingly, when in Tarbox et al. (2009), the chaining procedure was used to teach echoics such as “Monday”, success was reported with two autistic children aged five and seven years; for example, “Monday” was divided into the components “mun” and “day”. Before the beginning of the study, the five-year-old boy could say single-syllable utterances, and the seven-year-old boy could imitate around six sounds. This study would have had wider applicability if more autistic children with different communication profiles were recruited. Mostofsky et al. (2006) argue against developmental dyspraxia in autistic individuals being only limited to imitation impairments. They explain that

developmental dyspraxia in the population concerned may result from challenges related to the “*acquisition/learning* of sensory representations of movement and/or the motor sequence programs necessary to execute them” (p. 324).

Adapted singing may offer a safe context for improving imitation skills, especially sound and facial imitation skills. It might also offer a repetitive, motivational context in which learning movement sensory representations may be easier.

## **2.8 Conclusion**

This chapter explored the theoretical reasons behind singing as a potential way to improve and facilitate communication skills in autistic children. When viewing autism as a neurodiversity, music education may support the communicative growth of an autistic individual. The next chapter will explore how music training, specifically singing training, can potentially contribute to developing the singing voice and improving communication skills.

## **Chapter 3 – Education ‘In’ Singing to Improve Communication Skills**

### **3.1 Introduction**

The previous chapter of this literature review presented the theoretical reasoning behind education ‘in’ and ‘through’ singing to potentially ‘improve’ and ‘facilitate’ communication skills in autistic children, especially children who are NS, MS, or LS. This chapter focuses on the potential that music education, particularly singing training, might have to ‘improve’ the communication skills of the population in question. A section about the processing of music opens the chapter and is followed by an exploration of why music can be an effective tool for brain plasticity. The chapter goes on to discuss singing training and neuroplasticity and concludes with an analysis of how singing training might be shaped to ‘improve’ and ‘facilitate’ the communication skills of autistic children.

### **3.2 The Processing of Music**

Music processing is “a ‘whole-brain’ phenomenon” (Warren, 2008, p. 32). Similar to processing any visual, auditory, or somatosensory information, the primary and secondary regions in the cerebral cortex are involved. However, activity in other brain regions is also present during music processing. The frontal lobe, the parietal lobe, the temporo-occipital regions, the cerebellum and the extended emotional network are all crucial in the processing of music (Altenmüller & Schlaug, 2012). Change and adaptation are capabilities of the human mind. Musical activity and learning can be an effective tool for brain plasticity (Bengtsson et al., 2005; Habib & Besson, 2009; Gaser & Schlaug, 2003; Hutchinson et al., 2003; Hyde et al., 2009; Wan & Schlaug, 2010). As a matter of fact, music-induced brain plasticity is more pronounced in individuals with years of musical experience and early-trained musicians (Münste et al., 2002). The effects of musical training on brain plasticity are also instrument-

specific (Pantev et al., 2001). Research suggests that music-induced brain plasticity can be structural plasticity or functional plasticity (Jäncke, 2009). Structural plasticity involves the change of the brain's neuronal connections. Functional plasticity promotes altering and adapting neurons' functional properties in cases of neuron malfunction or damaged neurons.

Since music processing is a whole brain process which can promote change and adaptation in the human mind, this three-phase study explores the impact of autistic children on learning music. Provided that structural and functional music-induced brain plasticity is instrument-specific, the study focuses on the benefits of singing teaching to other abilities, including speech and communication.

### **3.3 Music as an Effective Tool for Brain Plasticity**

Music learning is increasingly being proposed as an effective tool to promote structural and functional brain plasticity (e.g., Bangert & Schlaug (2006); Gaser & Schlaug (2003); Lappe et al. (2008); Schneider et al. (2002)). Anatomical differences in the brain area associated with speech production, language comprehension and language processing, known as Broca's area, were observed in a group of 26 right-handed male musicians, all members of a symphony orchestra (Sluming et al., 2002). The same anatomical differences in Broca's area were not noted in the control group, made up of 26 non-musicians. These findings provide support for music-induced brain plasticity. However, participants in Sluming et al. (2002) were professional musicians. On the contrary, the present study does not focus on professional singers. It includes individuals with no musical knowledge; for example, singing sessions for certain individuals in the study can target the improvement of joint attention when an educator sings a musical phrase.

In contrast to the participants in the study by Sluming et al. (2002), the participants in Hyde et al. (2009) were not professional musicians. The participants were children who had no prior formal musical training. Not all individuals who take musical lessons become professional musicians, so studies that analyse brain plasticity in the early stages of musical training are imperative. In Hyde et al. (2009), 15 children with a mean age of 6.32 years had private keyboard lessons for half an hour a week, for 15 months. The 16 children in the control group, with a mean age of 5.90 years, did not receive instrumental musical training. MRI (Magnetic Resonance Imaging) scanning indicated structural brain changes in musically relevant brain regions of the children who had received musical training. Changed anatomical features included changes in the cortical motor system, the auditory system and the corpus callosum.

The work published by Hyde et al. (2009) is supported by that of Lappe et al. (2008). While in Hyde et al., a group received musical training and another group received no musical training at all, in Lappe et al., one group was given sensorimotor-auditory training and the other was only provided with auditory training. Magnetoencephalography is a neuroimaging technique used to record the magnetic activity from neurons, while musically elicited mismatch negativity (MMNm) is used to reflect musical expertise in people electrophysiologically. Lappe et al. (2008) demonstrated plastic reorganisational changes in the auditory cortex in non-musicians trained to play a musical sequence on the piano for two weeks. Recordings by MMNm from magnetoencephalographic measurements did not exhibit the same plastic reorganisational changes in the control group, which was instructed to listen to the music played by the members of the other group. This study compares brain plasticity resulting only from auditory training and that resulting from sensorimotor-auditory training. The relevance of the studies by Hyde et al. and Lappe et al. to the present study is that music-

induced brain plasticity is not limited to musicians with years of experience. In addition, for the present study, the findings of Lappe et al. suggest that autistic children, through engagement, could enhance other abilities, such as speech and communication. This can be achieved if they practise from week to week to learn to sing a phoneme, a word, a phrase, a sentence, a verse, or a song rather than only participating in activities that involve listening to songs.

Furthermore, stimuli activating dopaminergic neurons can improve learning and memory performance (Ferreri & Rodriguez-Fornells, 2017). Since the natural reward of pleasurable music leads to dopamine release (Salimpoor et al., 2011), music activities are powerful stimuli for neuroplasticity. Learning and memory formation lead to structural and functional neuroplasticity (Groussard et al., 2010). In Ferreri and Rodriguez-Fornells (2017), 30 university students, all non-professional musicians, listened to unfamiliar instrumental classical excerpts three times and gave reward-related subjective ratings. Better recognition and recollection of excerpts were reported as more rewarding. Although the results indicate that music-related rewards could improve long-term memory, one must note the absence of a control group in this study. Seen in the context of the present study, the findings of Ferreri and Rodriguez-Fornells can lead to the hypothesis that if autistic children, who can have a special preference towards certain songs, are taught to sing preferred songs or taught certain communication goals through songs that they like, an improvement in long-term memory can be observed.

Apart from the potential of music training to enhance general brain plasticity (Habib & Besson, 2009), music training can affect other learning domains. Previous studies have explored transfer effects between music and non-music abilities. Transfer effects examined

include those between music training and general intelligence (Schellenberg, 2004), auditory discrimination (Forgeard et al., 2008), literacy skills (Gordon et al., 2015) and verbal memory (Taylor & Dewhurst, 2017). Unfortunately, as highlighted by Habib and Besson (2009), studies which reported positive transfer effects between music and non-music abilities often failed to take into account specific factors, such as the general cognitive ability of the people in the experimental group and those in the control group (e.g., Taylor & Dewhurst, 2017). The three phases of the present study explore the transfer effects between singing and other non-music abilities. However, similar to the described studies, possible confirmation bias resulting from the researchers' and research participants' beliefs about the benefits of music activities is a limitation that cannot be ignored.

### **3.4 Singing Training and Neuroplasticity**

This research project focuses on one specific instrument: the human voice. The instrument used by a person singing any set of musical notes, irrespective of whether the notes form a simple nursery rhyme or an aria, is the body of the individual carrying out the musical task (Barefield, 2012). The brain areas involved in singing are the cerebral cortex, the basal ganglia, the limbic system, the homunculus and the brainstem. The voluntary fine-motor control vocalisation system is a hierarchically organised brain system, with the primary motor cortex at the highest level (Cohen et al., 2020). Wan et al. (2010b) argue that the auditory-motor feedback loop that singing engages in the brain, is more powerful than other forms of music-making. In addition, in contrast to instrumental music making, in singing, it is the vocal motor system which is involved, not the peripheral motor system (Kleber et al., 2010). Since "sound is produced and amplified entirely within the body" (Kleber et al., 2010, p. 1144), movement does not rely on any visual control.

In a chapter discussing the effects of opera singing training on the nervous system, Brigo et al. (2023) explain that neuroimaging and neurophysiological studies carried out with opera singers indicate that years of opera singing training result in several changes. These involve “regional neuronal networks engaged in motor control of vocal activity and multi-modal sensory integration, including auditory and sensorimotor regions and the insula” (p. 74). While the explanation of Brigo et al. involves neuroplasticity changes resulting from years of singing training, the study conducted by Sihvonen et al. (2024) analysed structural neuroplasticity effects of a four-month singing intervention on patients with poststroke aphasia. Similar to the current research project, apart from involving singing training, the participants in this study are not professional musicians with numerous years of singing training, and they also have communication difficulties. In Sihvonen et al., the singing intervention suggested structural changes in left frontal language areas and bilateral language pathways. Data collected included high-resolution T1 images and MRI data. When interpreting the findings of this study, one must note the presence of a control group; this presence gives more strength to the findings. The singing intervention consisted of group training and self-training at home. Apart from adapted group-level Melodic Intonation Therapy (MIT), the sessions also included group-based singing. Similar to the present study, in Sihvonen et al., singing was employed in two different ways. It was used to facilitate specific communication skills (group-level MIT) and singing tasks normally associated with a singing session. Group-based singing included breathing exercises, vocal exercises and singing songs. It is essential to highlight that the researchers explained beforehand that songs were chosen and adapted according to the needs of the participants. In the ethnography of the present study, the singing sessions also consisted of two different sections; the sections were similar to those described in Sihvonen et al. In the present study, keeping in mind that every child is unique, songs were

specifically chosen and adapted for each participant. As most research about music-induced brain plasticity examines neuroplasticity resulting from the learning of a specific musical instrument (Zarate, 2013), as suggested by Altenmüller and Schlaug (2012), more studies on the effect of singing training on particular brain systems, would help us establish a greater degree of accuracy in this matter.

The OPERA hypothesis (Patel, 2011) suggests why musical training can benefit speech processing. According to this hypothesis, the five conditions that must be met for speech processing adaptive plasticity to result from musical training are 1) Overlap, 2) Precision, 3) Emotion, 4) Repetition and 5) Attention. ‘Overlap’ refers to basic acoustic features shared by speech and music being processed by overlapping brain networks. ‘Precision’ suggests that music places higher demands on shared brain networks than speech. Positive emotions and rewards are frequently linked to music. Further on, focused attention required during musical training is associated with the promotion of neuroplasticity. Musical tasks that engage the networks involved are repeated many times. Patel argues that “simply giving an individual music lessons may not result in any benefits for speech processing” (p. 12) and “music activities aimed at benefiting speech processing should be purposely shaped to optimize the effects of musical training” (p. 12). Analysing the difference between the performance of pitched and unpitched musicians on tone identification and word learning tasks, Choi et al. (2023) support the precision element presented in the OPERA hypothesis; however, they add that the instrument that a musician plays significantly contributes to music-to-language transfer. Unfortunately, the pitched musicians in Choi et al. were piano, cello, guitar, violin, flute, clarinet, or organ players. Singers were not included in the study. A similar study may be conducted with musicians playing pitched instruments, others playing unpitched instruments and professional singers.

In his paper on the expanded OPERA hypothesis, Patel (2014) focuses only on instrumental music training. Singing is not included in the discussed musical training. He explains that this was done because his focus was on cross-domain plasticity, as effects on plasticity due to singing training may result from within-domain plasticity. He further adds that future studies may examine if song-based training can be more effective than nonverbal musical training in promoting brain plasticity linked to speech. In his paper, he presents a very clear picture of the relationship between singing and communication skills. His description clearly explains the reasons why singing was chosen as the musical instrument studied during this research project:

Song, by definition, combines elements from speech (phonemes, syllables) and music (e.g., melodies built from musical scales and beat-based rhythms). ... Indeed, songs have several features which make them well-suited to drawing attention to the sound structure of language, and thus for implicitly training speech processing. For example, songs are typically slower than ordinary speech (in terms of syllables/sec), giving the brain more time to process the spectrotemporal details of syllables. Furthermore, songs often involve repetition of word sequences (e.g., refrains), predictable rhythms, and frequent rhymes, all of which help emphasize the sound structure of words over and beyond their semantic meaning. In other words, four distinct factors in song (rate, repetition, rhythm, and rhyme) act to highlight the sound structure of language. (Patel, 2014, p. 99)

The five musical training elements proposed in the OPERA hypothesis, which may result in speech processing adaptive plasticity (Patel, 2011; Patel, 2014), inspired the following research questions:

- 1) What approaches do teachers of singing consider to be effective in teaching singing to autistic students, including students who are MS?
- 2) What is the impact of teaching autistic students to sing as perceived by teachers of singing?
- 3) What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS?

- 4) To explore how, while keeping the uniqueness of the child at the centre, I can use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS.

The principle presented in the OPERA hypothesis (Patel, 2011; Patel, 2014) is that not every method of music training can benefit communication skills. Patel (2014) also discusses whether verbal musical training can benefit plasticity in speech-processing networking more than nonverbal musical training. This led to the exploration of how pediatric vocal pedagogy could be “purposely shaped to optimize the effects of musical training” (Patel, 2011, p. 12) on the communication skills of autistic children, especially autistic children who are NS, MS, or LS. It is important to note that this study involves no comparisons between the effects of verbal and nonverbal musical training on the communication skills of autistic children; the study focuses only on singing-based training. Nevertheless, comparisons between the impact of verbal and nonverbal musical training on the communication skills of autistic children, especially children who are NS, MS, or LS would be a fruitful area for further work.

### **3.5 The Shaping of the Singing Training**

This research project explores the effect of singing training on the communication skills of autistic children who are NS, MS, or LS. The first part of the study, the survey, considered autistic individuals of all ages and communication abilities to get a whole picture; however, the second and third phases focused on children who are NS, MS, or LS. Given this scenario, works about beginners’ pediatric vocal pedagogy were relevant to this study. The two works about pediatric vocal pedagogy written by Williams (2019) and Lentini (2020) contained practical session structures. These were studied to consider singing potential in phase two, the interviews, and to plan the singing training during the last phase, the ethnography.

Williams (2019) suggests a set of steps that can form a singing session for children. The steps are 1) exercises to wake up and balance the body; 2) breathing exercises; 3) exercises to release the throat; 4) exercises to warm up the larynx; 5) exercises to explore resonance; 6) exercises to clarify articulation; and 7) repertoire. Williams also suggests a series of steps that children can follow when practising at home; these steps are similar to Williams' suggested session structure. The steps are 1) preparing the mind; 2) exploring a balanced posture; 3) breathing exercises; 4) exercises to warm up the larynx; 5) technical exercises; 6) familiar repertoire; 7) new repertoire; and 8) warm-down.

Complementing the work of Williams (2019), Lentini (2020) presents "The Discover, Learn and Grow Curriculum" (p. 57). Its first section, "Discover Your Voice" (p. 57), is for singers who are starting out, the second part, "Learn Your Voice" (p.70), for students who already have some musical experience and the last part, "Grow Your Voice" (p. 82), for the child advanced singer. Each one of the three parts of the curriculum includes five different steps: 1) mind-body awareness, 2) breath and posture, 3) musicianship training, 4) vocalisation practice and 5) repertoire building.

Moreover, although aspects from both Williams (2019) and Lentini (2020) were considered in the shaping of the singing training carried out during the third phase of this research project, the ethnography, the training was mainly based on the first part of the singing curriculum presented by Lentini (2020), "Discover Your Voice" (p. 57). This was done because the five-step structure proposed in the first part of Lentini's curriculum could be more easily shaped for children ranging from NS to LS communication abilities. In addition, Lentini's structure included 'musicianship' as one of the five steps of the training framework. This study wanted to explore how musicianship could be developed with the children in question, as, like

every other child, these children have the right to enjoy music not only as a means but also as a subject in itself. The shaping in Table 3.1 was applied during the ethnography sessions so that, as emphasised by Patel (2011), the training maximises the benefits to the communication skills of autistic children who are NS, MS, or LS. Each step was linked to specific goals for each child, depending on the child’s uniqueness. When developing and carrying out singing goals, as advised by Jeffery (2023), necessary compromises were taken to ensure that neurodiversity is continuously recognised and respected. For example, instead of targeting complex breathing skills related to singing, the focus was placed on ensuring relaxed in-breath and controlled out-breath as much as possible.

**Table 3.1** *The shaping of the singing training*

Sections of the session
Mind and body warm-ups
Posture
Breathing
Musicianship
Vocalising
Repertoire: Songs to facilitate communication skills
Repertoire: Songs to improve communication skills

*Note.* This shaping is based on the “Discover Your Voice” curriculum section by Lentini (2020).

### 3.6 Conclusion

The beginning of this chapter delved into music processing and the effectiveness of music as a tool for structural and functional brain plasticity. What followed was an exploration of neuroplasticity and singing training. The ending of this chapter, which analysed how singing training might be shaped to ‘improve’ and ‘facilitate’ communication skills of autistic children who are NS, MS, or LS, paves the way for the next chapter. The next chapter delves into how

education 'through' singing might have the possibility to 'facilitate' communication skills of autistic children.

## **Chapter 4 – Education ‘Through’ Singing to Facilitate Communication Skills**

### **4.1 Introduction**

The previous chapter looked into the potential of education ‘in’ singing to improve the communication skills of autistic children. This chapter will probe into the potential of education ‘through’ singing to facilitate communication, language and speech skills of autistic individuals, especially those who are NS, MS, or LS. The chapter will begin by presenting previous studies that used songs and singing to facilitate communication skills in individuals with language and speech production difficulties, including individuals with acquired neurogenic communication disorders and individuals with developmental difficulties. This section is followed by one that deals with using songs and singing to facilitate communication skills in foreign language teaching and early childhood education. Studies focusing on using singing as a tool to facilitate the communication skills of autistic individuals are presented in the last section of this chapter.

### **4.2 The Use of Songs and Singing to Facilitate Communication Skills in Individuals With Language and Speech Production Difficulties**

Singing can effectively improve communication skills in individuals with language and speech production difficulties (Falk et al., 2020). Studies were carried out involving people with developmental difficulties to analyse how singing can be used as a means to facilitate communication skills (Van Tellingen et al., 2022). A study conducted by Falk et al. (2016) with eight adolescents who stutter and eight typically fluent adolescents suggests that singing may alter the coordination of laryngeal-oral timing in individuals who stutter. Participants were instructed to say and sing a disyllabic word five times during this study.

Using a single-case experimental design, Lagasse (2012) examined the effect of Melodic Intonation Therapy (MIT) on the functional speech production of two children with developmental apraxia of speech. While participants were engaged in the procedure, some improvements in speech were indicated. However, no significant results were obtained in the testing measures. Combining MIT with another motor intervention method called the 'Touch-Cue Method', Martikainen and Korpilahti (2011) conducted a single-case study with a four-year-old girl who demonstrated speech characteristics associated with childhood apraxia of speech. Following MIT for six weeks, the girl decreased speech sound errors, and her sequencing abilities improved.

Studies such as those conducted by Falk et al. (2016), Martikainen and Korpilahti (2011) and Lagasse (2012) indicate that singing can be an effective tool to facilitate communication skills in individuals with developmental difficulties. However, future studies may analyse how the benefits of singing in communication skills can be enhanced by implementing approaches suitable for children and adolescents of different ages.

The processing rhythm in speech and music (PRISM) framework (Fiveash et al., 2021) presents three mechanisms that can be found in both speech and music. These three elements are precise auditory processing; the synchronisation and entrainment of neural oscillations to external stimuli; and connections between auditory and motor cortices present during music and speech rhythm perception and production. This framework suggests that music rhythmic training might effectively enhance speech and language processing in developmental speech and language disorders. Fiveash et al. (2023) tested the effect of regular and irregular rhythmic primes on sentence repetition. The study was carried out with 15 children with developmental language disorder and 18 age-matched typically developing children, who acted as a control group. By instructing the children to hear rhythmic primes

followed by sentences and then repeat the sentences aloud, the study suggested that regular rhythmic patterns could improve sentence repetition performance compared to irregular rhythmic patterns.

Furthermore, the works of Fiveash et al. (2021) and Fiveash et al. (2023) provide support for the use of music, especially music rhythm, to facilitate language skills in populations with difficulties in speech and language skills and also to scaffold language skills in children with typical communication skills development. Proposing music as a promising tool in speech and language therapy, these studies would have certainly benefited from suggestions of how music, especially music rhythm, can be used when preverbal skills are still not developed or when language is at its very early stages of development. For example, it would be interesting to discuss how the rhythmic training carried out in the studies to enhance complex syntax performance may be adapted to address specific preverbal skills, especially joint attention skills.

Apart from this, studies were also carried out to analyse the potential of singing to improve functional communication skills in individuals with acquired neurogenic communication disorders such as aphasia and dysarthria. The effects of vocal exercises and singing on functional speech intelligibility and speech rate of participants with acquired dysarthria were examined in a multiple case study design by Tamplin (2008). Each participant participated in 24 individual music therapy sessions, which included rhythmic and melodic articulation exercises and vocal intonation therapy. Improvements in speech intelligibility were significant, but those in speech rate were not.

Melodic Intonation Therapy (MIT), which was later adapted to be used with autistic children by Wan et al. (2011), uses melody and rhythm to improve the communication abilities of patients with aphasia (Norton et al., 2009; Popescu et al., 2022; Schlaug et al., 2010). Haro-

Martínez et al. (2019) analysed the effects of MIT on post-stroke nonfluent aphasia. The randomised pilot study included two groups of patients. A group started the therapy during the first three months of the study, followed by three months without therapy, while the second group served as a control in the first three months of the study and started therapy between three and six months of the start of the study. Twelve sessions of 30 minutes each were conducted over six weeks. In this study, the Spanish-adapted version of the MIT protocol (Haro-Martínez et al., 2017) was used. This version consisted of three levels with 20 items each. Images and hand tapping were used to reinforce the items. Phrases that are commonly used in the patients' environment were targeted. The study suggested that MIT could effectively improve communication skills in post-stroke nonfluent aphasia patients.

Singing can also improve functional communication skills in people with Parkinson's disease (Barnish & Barran, 2020; Wan et al., 2010b). Twenty patients with Parkinson's disease who participated in 20 hours of speech therapy and 26 hours of choral singing demonstrated significant improvements in maximum inspiratory and expiratory pressure and the maximum duration of sustained vowel phonation (Di Benedetto et al., 2009). Speech therapy sessions were a preparation for choral sessions. The interdisciplinary singing-based therapeutic intervention 'ParkinSong' with 75 people with Parkinson's disease included "high-effort vocal and respiratory tasks, speech exercises, group singing and social communication opportunities" (Tamplin et al., 2019, p. 453). Interestingly, the controlled trial results suggest that this intervention may positively affect respiratory function and loudness in people with Parkinson's disease. Higgins and Richardson (2019) conducted an 11-week choral singing intervention with participants with Parkinson's disease to analyse possible improvements in speech intelligibility. Improvements in speech communication were detected.

The previously described studies in this section indicated songs and singing as possible tools for facilitating the communication skills of individuals with language and speech production difficulties. The findings of these studies support the idea that singing might be beneficial for autistic individuals who are also diagnosed with the specifier of an accompanying language impairment.

#### **4.3 The Use of Songs and Singing to Facilitate Communication Skills in Early Childhood Education and Foreign Language Learning**

An individual on the autism spectrum might perceive the lyrics of a song as a string of musical sounds, not as a set of words with a semantic meaning (Reece, 2015). Ockelford argues that “a feature of auditory perception prominent in some people on the autism spectrum is shared by *all of us* in the first few months of life” (Ockelford, 2013, p. 228); the first few months of life involve the very early steps of language learning. Infants in their early phases of language learning encounter difficulties in word segmentation (Thiessen et al., 2005), that is, in eliciting a word from a series of words that sound only as a string of sounds combined together without any semantic meaning. Similar difficulties in word segmentation are encountered by people in the first stages of learning a foreign language (Schön et al., 2008). Since certain autistic individuals, infants and individuals who are in the early stages of learning a foreign language might perceive a set of words as a sound instead of as a set of words with semantic meaning, similarities might exist in the facilitation of speech, language and communication skills of these three different groups. Facilitating communication skills in these groups involves the facilitation of speech, language and communication skills to individuals who, for various reasons and at different levels, are struggling to join one syllable with another and identify the information-carrying words in a string of sounds. In all groups,

the level of struggle depends on the individual's language abilities. Jeffery (2023) suggests that "singing can be easier to *process* than speech ... because singing, like infant-directed speech, can emphasise aspects of speech and voice, making it easier to perceive speech sounds, words and phrases" (p. 193). The next paragraphs will examine the use of singing to facilitate language, speech and communication skills in foreign language teaching and early childhood education.

In Good et al. (2015), Spanish-speaking Ecuadorian children learnt an English passage as a song or oral poem. Children who learnt the passage as a song demonstrated better results in recalling the passage, pronouncing vowel sounds and translating terms from English to Spanish. Long-term recall was also better in children who learnt the passage as a song. Similarly, the potential of the singing tool in foreign language learning is suggested by Ludke et al. (2014). After 15 minutes, adult participants assigned to the singing condition demonstrated better performance in recalling and producing foreign language phrases (Hungarian) than those in the speaking or rhythmic speaking conditions. Baills et al. (2021) analysed the effect of listening to songs and singing on vocabulary learning in the early stages of foreign language learning. Chinese students were trained to learn 14 words in French under four different conditions. Twenty-five students were in the rhythmic speech-listening group, and another 25 were in the song-listening group. Twenty-eight students listened to a song, and 30 participants listened to and sang the song. Overall, the study indicated that while listening to songs and singing was beneficial in improving the pronunciation of the words, it did not facilitate the recalling of meaning. It would have been interesting if, in the studies carried out by Good et al. (2015), Ludke et al. (2014) and Baills et al. (2021), more emphasis had been given to different methods of using songs to specifically facilitate the learning of the meaning of words and phrases. For the current study, learning meaning is crucial as certain

autistic individuals may find it easy to repeat a set of words but might experience difficulty in linking meaning to words. An example is that of an autistic child singing a whole song without knowing the meaning of the words sung. This is also typical in early years when a child might sing an entire song without knowing the meaning of its words.

In Lawson-Adams et al. (2022), 56 preschool children (mean age of 57.57 months) participated in a within-subjects design study. Words were taught under three different conditions. The first condition was teaching words with picture cards only, and the second condition was teaching words using a song sung with a melody. The last condition included a rhythmically spoken song, but the melody was not sung. The control condition included words that were not taught to the preschool children. The depth of word knowledge was significantly greater when songs were sung or spoken rhythmically than when only picture cards were used. No variation was observed in receptive language learning between the conditions of singing and when only using picture cards. A study conducted by Lebedeva and Kuhl (2010) with 20 infants between 10 and 11 months demonstrated that infants' detection of phonetic changes was more reliable within sung strings than in spoken strings. However, this result contradicts a study of 17 Spanish preschool children (two to three years) learning English as a foreign language (Albaladejo Albaladejo et al., 2018). Fifteen target words were presented under three conditions: 1) a story, 2) a song and 3) a story and a song. The study suggested that the song condition was the least effective condition. Taken together, the results reported by Lawson-Adams et al. (2022), Lebedeva and Kuhl (2010), and Albaladejo Albaladejo et al. (2018) suggest that additional research is needed to better understand how singing can be used in early childhood education to promote the acquisition of various communication skills.

#### **4.4 The Use of Songs and Singing to Promote Social Interaction and to Facilitate Receptive and Expressive Communication Skills in Autistic Individuals**

Melodic patterns presented in short melodies, familiar songs, precomposed songs or infant-directed speech were used in a number of studies carried out with autistic individuals to facilitate improvements in various abilities. For instance, in social interaction (e.g., Oldfield et al., 2019; Nugent, 2019), receptive communication skills (e.g., Simpson et al., 2013; Simpson et al., 2015) and expressive communication skills (e.g., Lim, 2010; Lim & Draper, 2011; Lim et al., 2022; Reece, 2015; Sandiford et al., 2013; Wan et al., 2011). This section starts with the use of songs for the development and enhancement of social interaction because, as Cornago (2021) argues, “[i]nteraction is the base of communication” (p. 14).

##### **4.4.1 The Development and Enhancement of Social Interaction**

Warwick (2019) describes a girl who “lived in a world of her own” (p. 17). The girl, who was NS, refused to engage in music therapy improvisation. She preferred to gaze out of the window throughout the session. Certain autistic children experience difficulties with developing and maintaining the interaction that occurs when two or more people share an experience. When problems in social-emotional reciprocity are present, music and singing might serve as a bridge before speech and language goals are the focus of any intervention or session.

Moreover, Oldfield et al. (2019) present the case of a four-year-old boy, Harry, who was NS and had difficulties with sitting tolerance and concentration. During five months, he attended 50 individual music therapy sessions thrice weekly. In his first sessions, he was described as a boy who could not engage in musical activities and used to climb on furniture and instruments while constantly moving around the room. Specific instruments, clapping, vocalising and movement games were used to work on the early development of focus and

engagement. During later sessions, vocal dialogues were reported to be very effective with this client:

At first, Harry made short babbling sounds but soon the phrases became longer and often included melodic lines. The vocal dialogues incorporated imitative responses of Harry's sounds which aimed to reinforce his sense of identity and self-awareness. He seemed to be delighted when Laura copied and mirrored his sounds, and he responded with more singing. As he was encouraged to use his voice, he started exploring different facets of it and he incorporated a wider range of sounds, pitch and volume into his vocal repertoire. (Oldfield et al., 2019, p. 45)

Oldfield et al. (2019) reported the presence of words and word approximations towards the last music therapy sessions. The child also felt confident participating in familiar songs with his therapist and created a number song. These improvements indicate the effectiveness that music and singing can have on the development of focus, engagement, social interaction and vocalisation skills of an autistic child. The child's mother commented, "He talks through that [singing] and that's amazing." (p. 46). This comment portrays singing as a means through which certain children can communicate when social interaction difficulties are present. It would have been interesting if detailed explanations of how the 50 sessions were carried out during the five months of music therapy were included in this case study.

Another case study in Oldfield et al. (2019) is that of Simon, who communicated only using a few words before his 20 individual music therapy sessions. The early sessions of this boy were characterised by consistent running around the room. The music therapist was continuously on alert to prevent the boy from any harm. The reduction of distractions in the room was necessary. Clear activity beginnings and endings and establishing a familiar structure during sessions aided the child's concentration. Strategies used by the music therapist included improvised songs, nursery rhymes and instrumental accompaniments.

A description of the engagement and attention skills of Simon and Harry were described in the present study to indicate that with children who have a limited sitting tolerance, and who cannot follow a set of simple instructions, certain interventions targeting specific words or phrases, like those proposed by Wan et al. (2011) and Sandiford et al. (2013), can be impossible to be carried out. Simon's mother commented, "He's open for new things now" (Oldfield et al., 2019, p. 49). This comment suggests music and singing as a possible tool to promote social interaction in cases similar to those of Simon and Harry. When social interaction slowly starts to be present, a child may open himself to the sounds around him and the use of sounds in various contexts. Music and singing might be an effective tool to aid the very first steps of communication development, which are extremely difficult for certain autistic children to master. This reflection is further explained by Simon's mother.

Before was like, he was always on his own, then we catch a moment when he's, you know, when he's with us but now it's different: He's always with us, then sometimes he's forgetting about us and he is on his own. It's amazing. (Oldfield et al., 2019, p. 50)

Cornago (2021) further adds that her son, an autistic child, said his first words while doing movement activities like bouncing on a ball and dancing.

Oldfield et al. (2019) argue that progress is very difficult to analyse when quantitative data collection methods are used in cases like those of Harry and Simon. They emphasise that "it is important to look at the whole picture and consider different types of data and information" (p. 54). This suggestion is relevant to the present research study as the data collection methods chosen, especially the ethnography carried out during the last phase, tried to capture a whole picture. This was decided since the collection of a series of quantitative data is very difficult to be gathered in such cases and might also miss crucial details of the wider context.

Additionally, two other case studies that propose music and singing as a potential key to social interaction development are presented in Nugent (2019). The cases of Ewan and Peter, both five-year-old boys, demonstrate that the presence of family members in certain or all therapy sessions might contribute to the further development of a child's social interaction. In Ewan's case study, it is described that during the final therapy session, the music therapist "chose to step back and let Mum facilitate interactivity with Ewan" (p. 189). This significant decision by the music therapist indicates a positive step towards the generalisation of what the boy achieved during the sessions.

In Nugent's (2019) case studies, there is a particular reference to using familiar songs and nursery rhymes to facilitate early steps in social interaction. Nugent used the phrase "appealed to" (p. 187) to describe the engagement achieved by means of songs built on a very simple structure. Nugent also explains the positive effect that the nursery rhymes *Row, Row, Row Your Boat*, *Hickory Dickory Dock*, and the adaptation of *Six Bottles on the Wall* had to enable the "opening [of] a pathway for Peter and me to connect in one of his favourite activities" (p. 190). Nugent further explains that by changing certain words of the familiar song *Six Bottles on the Wall*, Peter was encouraged to "adapt to a small change in a well-known activity" (p. 190). Given a chance to fill in words left out in familiar nursery rhymes, Peter was observed to improve eye contact and to succeed in vocalising words and phrases of the songs. Peter is described as moving from an "observer to an active participant" (p. 191).

The two case studies presented by Nugent (2019) suggest room for further studies regarding how the involvement of family members during music sessions focused on enhancing communication skills may be explored to aid the growth of communication skills of autistic children, especially those who are NS, MS, or LS. This involvement is also seen in the

Interactive Music Therapy method, in which improvised music not only targets non-musical objectives but also contributes to enhancing the parent-child relationship (Nugent, 2019). Similarly, Musical Interaction Therapy (Wimpory & Gwilym, 2019), which uses strategies such as action rhymes, imitation, familiar and spontaneous songs and vocalising, focuses on the “interactive play between a child with an autistic spectrum condition and their familiar carer” (p. 106). In Musical Interaction Therapy, a crucial goal is establishing preverbal interaction, including developing turn-taking skills and facial expressions. Wimpory and Gwilym (2019) explain that including a familiar adult during therapy sessions results in the child developing a positive communication relationship with the adult. They also add that parents and teaching assistants are encouraged to include Musical Interaction Therapy strategies in their daily routines so that therapy is not limited to the time dedicated to the therapy session.

The case studies in Nugent (2019) also provide tentative suggestions that using familiar songs, especially nursery rhymes, may present a number of advantages when working with autistic children who are NS, MS, or LS. Warwick (2019) expresses the opinion that there might be cases in which the use of pre-composed songs, especially songs that the individuals are familiar with, is more suitable for building the very early pillars of a relationship than improvised songs. Along a similar wavelength, Jones (2015) explains that strategies like musical conversations, singing and vocalising offer a child with selective mutism “a space to feel heard” (p. 220). The case report by Wakamatsu (2022) also describes how the engagement in singing repertoire of an autistic girl with selective mutism promoted social interaction. Observing the variations that different types of songs have on the step-by-step building of a relationship (Nugent, 2019; Warwick, 2019), it would be fruitful for future studies to analyse these disparities between improvised or familiar songs on autistic children and selective mutism.

Works like those written by Oldfield et al. (2019) and Nugent (2019) demonstrate the benefits that music and singing may have on social interaction. Other studies include those carried out by Finnigan and Starr (2010), Paul et al. (2015) and Pater et al. (2023). After discussing the possible effect of singing on social-emotional reciprocity, the next sections will focus on facilitating receptive and expressive communication skills through the singing tool.

#### **4.4.2 The Facilitation of Receptive and Expressive Communication Skills**

##### **4.4.2.1 Receptive labelling**

Focusing on receptive communication skills, Simpson and Keen (2010) used a very popular song with children, *Old MacDonald Had a Farm*, to teach three autistic boys aged three to four years to choose the animal graphic symbol named in the song. Although the small sample study suggests that the song facilitated the receptive labelling of specific animals taught, little generalisation to other contexts has been reported. When laminated symbols of taught animals were used instead of the intervention PowerPoint presentation, which included animal symbols and the song *Old MacDonald Had a Farm*, the generalisation of correct labelling was minimal. Simpson and Keen argue that this lack of generalisation indicates that in similar music interventions, generalisation strategies should be given specific attention to providing “multiple exposures across different contexts and communication partners” (p. 175). This suggests that there is abundant room for further progress in determining how generalisation can be facilitated using methods similar to those used in this study. The current study explores the generalisation of learnt content to other contexts.

##### **4.4.2.2 A string of words and a melody**

While Simpson and Keen (2010) focused on the facilitation of receptive communication skills, the last phase of a three-phase research study carried out by Reece (2015) focused on the facilitation of expressive communication skills. Reece’s study was a comparative intervention with 24 autistic students (3-16 years) and 32 neurotypical children

(5-11 years). When describing the linguistic abilities of the autistic participants, Reece explained that the head teachers of the chosen schools were instructed to select the autistic students “functioning at the one- or two-word level ... [but] some children participated who had more advanced linguistic abilities” (p. 151). Three children’s songs were composed explicitly for this study, which included content from the children’s series *Thomas the Tank Engine*. Reece highlights that the pieces were specifically composed for this study to eliminate familiarity issues. The language used in the pieces, which were recorded at 120 beats per minute, included simple words referring to concrete things and the present tense was used throughout (e.g., “I can tell you what I can see. I can see the engines, one, two, three.” (p. 156)). A poster of a scene from the children’s series was paired with each piece of music to facilitate the pupils’ attention and was used during the recall phase. The participants participated in one session a week for six weeks. The recall of a) words and music, b) words only and c) music only was tested.

Findings from Reece (2015) suggest that music had a better effect on recall in autistic students with limited linguistic ability than on those with higher linguistic abilities. In addition, the findings indicate that children with limited language ability performed better in the words-and-music condition than in the words-only scenario. These results reflect those of Lim (2012), who used the ‘Developmental speech and language training through music’ technique to target words and phrases from originally composed songs. Reece (2015) argues that a possible explanation for a better recall performance in the words-and-music condition than in the words-only condition of autistic students with limited language abilities can be that for these children “melody and words are integrated in memory” (p. 250). Reece adds that as the abilities in music and language improve, autistic individuals may be more capable of processing the words and music of a song separately.

According to Reece (2015), the findings of the comparative intervention indicate that in both short-term and long-term recall, the participants experienced more difficulty recalling the melody of a piece than remembering the rhythm. On the other hand, in phase one of the same study, in a semi-structured interview, a teacher working in a special education setting reported that a pupil who had around 30 to 40 functional words could learn a whole song (p. 89) and she could sing pop songs “all the way through” (p. 89). No reference was made to difficulty remembering the melody of songs in comparison to the rhythm of songs. This observation raises three questions. The first question is: What caused this difficulty recalling the melody for autistic participants in phase three of Reece’s study? The second question concerns whether this difficulty impacted word recall when words were combined with music. Another question considers how the difficulty of recalling the melody reported by Reece in the comparative intervention can be minimised or eliminated. To answer the previous questions, the study would have benefited from the inclusion of songs with which the children are very familiar, like the song *Old MacDonald Had a Farm* used by Simpson and Keen (2010). Comparison between familiar and unfamiliar songs would have been beneficial.

#### **4.4.2.3 Auditory motor mapping training**

Like Reece (2015), Wan et al. (2011) focused on facilitating expressive communication skills. Auditory motor mapping training (AMMT), an adapted version of MIT, which is a technique used with patients with aphasia to restore speech, was used by Wan et al. (2011) with six autistic children who had no intelligible words before treatment. Each child had five 45-minute weekly sessions for eight months, which added up to 40 sessions. Three baseline assessments were performed before the beginning of treatment, and seven probe assessments were performed during the treatment period. Further on, two probe assessments were conducted as follow-ups, four weeks and eight weeks after the end of the

treatment. During each therapy session, the AMMT protocol was followed. The protocol involved five steps: (1) The therapist sings the words on two pitches while tapping the drums fixed at the same pitches, C4 (261.626 Hz) and Eb (311.127 Hz). (2) The therapist and the child sing the phrase in unison. (3) The therapist and the child start the phrase together, but the therapist fades out halfway through to let the child sing the rest. (4) The child is encouraged to repeat the words intoned by the therapist immediately. (5) The child sings the word without assistance. During the sessions, 15 bi-syllabic words or phrases consisting of objects, actions and social words or phrases relevant to the child's day-to-day activities were targeted. Examples include "mommy", "more please", and "all done" (p. 3). Another set of 15 words was not practised during the sessions but was used during probe assessments. All sessions were videotaped. When speech production was measured, approximate CV (consonant-vowel) combinations were counted as reasonable speech productions as long as the vowel was correct and the consonant produced was a consonant approximation. Progress was best during the first 15 sessions. Statistically significant changes were reported in the ability of the children to produce words and phrases, even with the second set of words and phrases that were not practised during the sessions.

The age range of the children in Wan et al. (2011) was five to eight years. Therefore, this rules out the possibility of improvements due to delayed speech development because, as Sandiford et al. (2013) explained, "below the age of 5 ... normal language acquisition is still expected" (p. 1299). Inclusion criteria included a sitting tolerance of more than 15 minutes and the ability to follow one-step commands without needing prompts. The sitting tolerance criteria can make this intervention unsuitable for a number of autistic children because sitting tolerance for 15 minutes or more can be very difficult for certain children, especially those on

Level 3 of the spectrum. The same applies to the inclusion criteria of being able to follow a one-step command, as due to joint attention issues, the population in question may find it extremely difficult to follow a simple one-step command; this is especially challenging during early years when speech and language interventions can be very beneficial. One of the reasons Wan et al. gave for including motor activity by means of tuned drum tapping was to engage the children's interest. Autistic children whose attention is still single-channelled can experience difficulties intoning words and playing the drums simultaneously. Wimpory and Gwilym (2019) argue that "playing an instrument, or using any object ... distracted the child, not only from looking at a person but also from being highly engaged ... This is especially true for pre-school children with autistic spectrum conditions" (p. 120).

Moreover, in Gernsbacher et al. (2008), certain autistic children, especially those who were minimally fluent, demonstrated difficulties in oral-motor skills when compared to typically developing children. In light of the study by Gernsbacher et al., the inclusion criteria for an ability to imitate simple oral-motor movements can also result in this treatment being unsuitable for particular autistic children. This argument may be a possible explanation for the findings reported in Yan et al. (2021). In the study by Yan et al., when the potential of AMMT to facilitate speech was tested with tone language-speaking autistic children, specifically with Mandarin-speaking children described as 'nonverbal' and 'low-verbal' (p. 4664), better results were observed in 'low-verbal' participants than in 'nonverbal' participants<sup>3</sup>.

Of the six children who participated in Wan et al. (2011), the percentage of correctly produced target words was less than 30% for five children. The percentage of one child was 71%, and the percentage of another was 8%. At baseline, the child whose percentage was 71%

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<sup>3</sup> Acknowledging neurodiversity, the exact terminology by which participants were distinguished in Yan et al. is quoted here only to provide an accurate picture of the study that was carried out.

could produce volitional vocal output such as “ba” and “coo”, while the child whose percentage was 8% could whisper and produce volitional vocal output such as “k” and “b”. While the reported sounds of the first child are made up of a consonant and a vowel sound, those of the second child are not.

Although AMMT is very easy to implement in daily educational settings, as only two tuned drums are required (Wan et al., 2011), it might not cater for all autistic children who are NS, MS, or LS. As described in Mody and Belliveau (2013), an autistic child can have a vast vocabulary that is not used in context. The protocol of AMMT indicates that the technique is aimed mainly at those with no intelligible words, not at those who demonstrate difficulties with communicative intent; in other words, they can say a word but not use it in context.

#### ***4.4.2.4 Melodic Based Communication Therapy***

Another study focusing on expressive communication skills is that of Sandiford et al. (2013). Twelve five-to-seven-year-old participants had no functional speech and could say 10 words or fewer. The randomised control study included a group assigned to melodic based communication therapy (MBCT) and another group assigned to traditional speech therapy. Treatment consisted of four 45-minute sessions per week for five weeks. During the sessions, a set of 25 words was targeted, followed by a combination of two words from the same set in case all 25 words were learnt. Each word had a particular melody. The first step of the MBCT procedure involves the child listening to a recording of the word set to a specific melody while seeing the stimulus presented. The steps which follow involve familiarisation with the rhythm of the melody by means of clapping. After singing is added to clapping, the child is led to the word’s independent singing. Thus, the last step requires the child to say the word independently. In Sandiford et al., a detailed procedure can be found. Although the procedure

is very well defined, it might be challenging to follow the proposed lengthy, rigid procedure with autistic children who are NS, MS, or LS and also demonstrate deficits in joint attention.

There was no significant difference between the number of verbal attempts and the number of correct words of the two groups in the study. However, more imitation attempts were noted in the group following MBCT, and parents of children in this group reported an increase in the use of taught and untaught words in context. The positive effects of generalisation of skills through music were suggested in this study. Although generalisation is analysed in both Sandiford et al. (2013) and Wan et al. (2011), no specific reference to carryover techniques was made in these studies.

The intensity level of the study conducted by Sandiford et al. (2013) was very high, as the children attended a 45-minute session four days per week. Considering that autistic children might have other therapies, researchers could analyse how the benefits of MBCT can still be present in fewer sessions per week.

Although clinicians have suggested that oral-motor speech disorders may be present in some of the autistic children who remain NS, MS, or LS (Chenausky et al., 2019; Shriberg et al., 2011), this study excluded autistic children who were MS and also diagnosed with dysarthria. Therefore, the effects of MBCT may be effective only for a specific group of autistic children who are NS, MS, or LS, not for all children who are NS, MS, or LS.

Studies focusing on facilitating receptive and expressive communication skills, such as those carried out by Simpson and Keen (2010) and Wan et al. (2011), suggest singing and songs as a possible method of facilitating communication skills in autistic individuals. More collaboration between professionals working with autistic individuals may be fruitful in promoting intervention goals which cater more to the specific needs of each individual. After analysing the studies discussed in the section about receptive and expressive communication

skills, a need for more child-led interventions, especially when keeping in mind that autism is a neurodiversity, must be highlighted.

#### **4.5 Conclusion**

This chapter focused on the potential use of songs and singing to facilitate communication skills in autistic children, including children who are NS, MS, or LS. The chapter began with a brief description of singing to facilitate communication skills in individuals with language and speech production difficulties. A section on the use of singing in early childhood education and foreign language learning followed. The last part of the chapter explored the use of songs and singing to promote social interaction and facilitate receptive and expressive communication skills in autistic children.

The study was conducted at a time when a growing awareness of the importance and societal value of music therapy and specialised music education for neurodivergent individuals was clearly evident. As society develops a deeper understanding of neurodiversity, music therapy and specialised music education are highlighting a shift from viewing difference as a deficit to recognising it as a form of diversity, as clearly illustrated in works such as Dunn et al. (2019), Ockelford (2013), and Sounds of Intent (n.d.-a). For example, the Sounds of Intent framework (n.d.-a) clearly demonstrates how music education can be taught to acknowledge students' diversity; this framework was crucial for me when I designed the goals of the singing sessions in the third phase of this study. When the practices of music therapy and specialised music education are considered through the lens of the expanding field of medical humanities (e.g., Rao et al., 2025; Sampy, 2025), the benefits of empowerment and self-expression for individuals across the neurodiversity spectrum are emphasised. The three-phase exploratory

research study contributes to the evolving and emerging field of music therapy and specialised education for neurodivergent individuals.

## Chapter 5 - Methodology of the Online Questionnaire and the Online Interviews

### 5.1 Introduction

In this methodology chapter, I describe and explain the methods used in the first two phases of the research study; the study's first phase was an online questionnaire, and the second phase was a set of semi-structured online interviews. The title 'methodology' is used for this chapter because, following Braun and Clarke's (2022) suggestion, the chapter is not "a practically oriented *descriptive summary*" (p. 121) but "a more theoretically-oriented and reflexive *discussion of what, why and how*" (p. 121) the research was carried out. In this chapter, I use language that "keeps the researcher *visible*" (Braun & Clarke, 2022, p. 128) to indicate my active role in producing the research design and analysis. The first section of the chapter focuses on the research design. Following the presentation of four key elements considered when designing the project, the survey approach is discussed because it was used for the first two phases. The explanation of the online questionnaire's design and the online interviews ends the chapter's first section. In the chapter's second section, I describe the analytic choices and processes of the first two phases of the study.

### 5.2 Research Design

#### 5.2.1 Four Key Elements Considered When Designing the Project

Braun and Clarke (2022) list 10 points crucial for the design of a research project (p. 26-28). I considered all points thoroughly when designing this three-phase research project; however, four of the outlined points were particularly important for this study. First, when designing the aims, the theoretical framework and the methodology, I aimed for a coherent design. The coherent design was targeted to gather a set of data which could provide answers to the project's research questions. Secondly, I gave particular weight to the design of the

research questions. The four research questions were not all developed at the beginning of the project. During the design of phase one, I had an overall aim: to explore how singing education could possibly affect the development and enhancement of singing, speech and communication skills of autistic children who are MS. As part of the reflexive thematic analysis, the research questions kept evolving and narrowing throughout the study's phases. For example, while 'minimally speaking' was used at the beginning of the study, throughout the project, it was decided that the terms 'nonspeaking', 'minimally speaking' and 'limited speaking' (Koegel et al., 2020) would be more appropriate for the study's specifications. The evolution of the research questions was especially crucial since phase one of the study informed phase two and the last phase.

The third element I emphasised in the research design was conducting research as an empirical activity. Before the data analysis, I systematically prepared all the collected data and transcribed all audio data (Braun & Clarke, 2022). The fourth element was "ethical thinking" (Braun & Clarke, 2022, p. 28). I specifically used the term "ethical thinking" instead of "ethics" because, for this particular project, the distinction between "ethics" and "ethical thinking" given by Braun and Clarke (2022, p. 28) was very relevant. Given the sensitive nature of the study, this thinking was "integral to all elements of research practice, before, during and after analysis" (Braun & Clarke, 2022, p. 28). The consideration of the four elements described led to the start of the first two phases of the study, for which I chose the survey approach.

## ***5.2.2 The Survey Approach***

### ***5.2.2.1 The purpose of the survey approach***

I used the survey approach for the study's first two phases. This approach includes a number of different methods which can be used to collect data to answer a research question or a set of research questions (Denscombe, 2017; Kelley et al., 2003). Different methods of a

survey strategy include but are not limited to online surveys (e.g., Evans & Mathur, 2005), fully qualitative surveys (e.g., Braun et al., 2021), interviews (Denscombe, 2017) and postal questionnaires (Kelley et al., 2003). Denscombe (2017) explains that since surveying encourages the researcher “to look” (p. 11) at a picture to acquire information about various situations, it leads to empirical research. The survey approach is suitable to capture a situation “[a]t a specific point in time” (Denscombe, 2017, p. 12) and it offers a “wide and inclusive coverage” (Denscombe, 2017, p. 12) of the situation being researched. The approach does not involve manipulation of variables or control of conditions, and apart from its use in descriptive studies, it can also be an effective approach to exploring specific situations (Kelley et al., 2003). Knowledge, attitudes and behaviour of a group of subjects can all be analysed (Rubinfeld, 2004). Descriptive statistics, cross-tabulation, statistical analysis, data visualisation and thematic analysis are examples of different data analysis methods which can be used to analyse data collected by different methods of the survey approach. Choosing particular methods of a survey approach depends on the research question or questions and also on the nature of the research project (Kelley et al., 2003). I carried out an online questionnaire for the first study phase to answer the following two research questions:

- What approaches do teachers of singing consider to be effective in teaching singing to autistic students, including students who are MS?
- What is the impact of teaching autistic students to sing as perceived by teachers of singing?

Informed by the findings of the study’s first phase, I designed the following research question and conducted a set of online interviews to answer it.

- What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS?

#### ***5.2.2.2 The survey approach in the current area of study***

The survey approach is a commonly used strategy in the study areas of autism, music, and speech, language and communication. Reece (2015) studied the effect of music on language for autistic children. His work consisted of three phases. In the first two phases, the survey approach was used. Phase one was a set of semi-structured interviews with teachers, music therapists, carers and parents and a questionnaire was designed for the second phase. In Gadberry (2011), an electronic survey was created to study music therapists' use of aided augmentative and alternative communication when working with autistic clients. An online survey was also designed by Kern et al. (2013) to analyse music therapy practices and trends with autistic clients. In Edwards et al. (2016), semi-structured interviews were carried out with parents of autistic children to study the qualities that parents consider important in a therapist who works with their child. The use of the survey approach in the previous studies is similar to the survey strategy used in the first two phases of the current study.

#### ***5.2.2.3 Steps of the survey approach***

The design of a survey approach method involves a number of steps. Kelley et al. (2003) explain that when choosing the survey approach, the first step is to identify the research question or questions. After choosing the research method, e.g., an online interview, careful research tool design should follow; piloting and the development of a cover letter are essential during this step. Sampling handling is what follows. The last steps are data collection, data analysis and reporting. Throughout the whole process, research should be carried out in an ethical manner. I followed these steps throughout this research study's first and second phases, as indicated in Table 5.1. I gained ethical approval for the study's first two phases and

maintained ethical standards throughout the entire research process, as described in Table 5.1.

**Table 5.1** *Steps of the survey approach followed in Phase 1 and Phase 2 of the study*

Phase 1	Phase 2
I identified two research questions.	I identified one research question.
I chose a research method: an online questionnaire.	I chose a research method: online interviews.
I designed the questions for the online questionnaire. I carried out the piloting and wrote an information letter and consent form.	I designed the questions for the online interviews. I carried out the piloting and wrote an information letter and consent form.
I selected the group that data was going to be collected from: singing teachers based in the United Kingdom or Malta who taught or were teaching autistic students at the time of the study.	I selected the group that data was going to be collected from: two parents of autistic children who are NS, MS, or LS; professionals who work with autistic children who are NS, MS, or LS; two early-years educators; and two foreign language teachers teaching students at early stages.
Data collection: The online survey was open for four weeks.	Data collection: I carried out the online interviews.
Data analysis: I used descriptive analysis to analyse quantitative questions and reflexive thematic analysis (Braun & Clarke, 2022) to analyse qualitative questions. I combined insights from both data types.	Data analysis: I used reflexive thematic analysis (Braun & Clarke, 2022) to analyse the collected data.
Reporting: I reported and discussed the findings.	Reporting: I reported and discussed the findings.

Rubinfeld (2004) discusses that developing the right set of questions contributes to instrument bias minimising in the survey approach. When developing questions, the required types of questions should be chosen to provide answers to the research question or questions of the study. In phase one, I designed questions to provide a general overview of the approaches that singing teachers consider effective when teaching singing to autistic students.

Questions also targeted the impact of singing learning on the population in question as perceived by teachers of singing. In the second phase, the questions were focused on exploring the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS. In the survey approach, different types of questions are open-ended, fixed-response, multiple-choice, rating scale and ranking (Rubenfeld, 2004, p. 1183). Questions included in the survey instruments designed for the first two phases of the study were open-ended questions, dichotomous questions, which are closed-ended questions offering two typically opposite answers and multiple-choice questions (refer to Table 5.2).

**Table 5.2** *Examples of questions included in the first two phases of the study*

Question type	Example question
Open-ended questions	Question 6 – Online interviews  What are your observations about singing and visuals?
Dichotomous questions	Question 17 – Online questionnaire  Do you have singing teaching experience with students on the autism spectrum who are/were minimally verbal? In the absence of a shared definition of ‘minimally verbal’, for the purpose of this study, as defined by Kasari et al. (2013), ‘minimally verbal’ refers to students with “a very small repertoire of spoken or fixed phrases” (p. 480); the number of spoken words vary from 0 to 20 or 30. <i>Mark only one oval.</i> <input type="radio"/> Yes (Skip to question 18) <input type="radio"/> No (Skip to question 21)
Multiple-choice questions	Question 2 – Online questionnaire  How long have you been working as a singing teacher? <i>Mark only one oval. If required exclude extended periods of absence.</i> <input type="radio"/> 1-3 years

	<input type="radio"/> 4-6 years <input type="radio"/> 7-10 years <input type="radio"/> 11-15 years <input type="radio"/> 16-20 years <input type="radio"/> More than 20 years
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Avoidance of “double-barreled” questions, “halo effect”, “loaded” questions, double-negative, no comparator, jargon and complex vocabulary also minimises bias resulting from the survey instrument (Rubinfeld, 2004, p. 1184); when designing the questions of the questionnaire and the interviews, I aimed to avoid the aforementioned type of questions. During the pilot study of the two survey instruments, I further edited “loaded” questions and eliminated complex vocabulary (Refer to Table 5.3).

**Table 5.3** *Avoidance of “loaded” questions and complex vocabulary*

<p>Question 18 – Online questionnaire</p> <p>Original question:  How many students with ASC have you taught in your singing teaching career in one-to-one or in group sessions?  <i>Mark only one oval.</i></p> <p><input type="radio"/> 1-2  <input type="radio"/> 3-4  <input type="radio"/> 5-6  <input type="radio"/> 7-8  <input type="radio"/> 9-10  <input type="radio"/> More than 10</p> <p>After the pilot study, I reworded the question to:  How many students on the autism spectrum who are/were minimally verbal have you taught? In the absence of a shared definition of ‘minimally verbal’, for the purpose of this study, as defined by Kasari et al. (2013), ‘minimally verbal’ refers to students with “a very small repertoire of spoken or fixed phrases” (p. 480); the number of spoken words vary from 0 to 20 or 30.</p>
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*Mark only one oval.*

- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- More than 10

The definition of the term 'minimally verbal' was added after the pilot study to avoid including terminology which might not be clear to the participants. The phrase 'in one-to-one or in group sessions' was also eliminated to aim for a more concise question.

Question 1 – Online interviews

Original question: What is your experience about songs and singing and the facilitation of the communication skills of the children in question?

After the pilot study, I reworded the question to:

*What is your experience with songs, singing and communication skills?*

The word 'facilitation' and the phrase 'of the children in question' were eliminated to aim for clarity.

After discussing the use of the survey approach in the first and second phases of the study, I will provide a detailed discussion of how I carried out the methods of online written questionnaires and online interviews, both methods of the survey approach.

### **5.2.3 The Design of Phase 1: The Online Questionnaire**

In the first phase of the current study, I designed a mixed-method online questionnaire as an instrument for survey research. Written questionnaires are a method pertaining to the survey approach; they can be quantitative, fully qualitative, or mixed methods (Braun et al.,

2021). When questionnaires are conducted online, strengths include advantages related to speed and cost (Van Selm & Jankowski, 2006), while weaknesses include issues with privacy and low response rates (Evans & Mathur, 2005).

#### **5.2.3.1 The online questionnaire: The fifteen steps**

Discussing online survey methodology, Evans and Mathur (2018) suggest fifteen crucial steps:

- 1) To set survey goals prior to deciding on survey methodology.
- 2) To decide the survey mode of delivery.
- 3) To plan the sampling method.
- 4) To decide who will design the survey.
- 5) To disclose the purpose of the survey and the use of the data that will be collected.
- 6) To design user-friendly and objective questions.
- 7) To decide upon an appropriate survey length.
- 8) To design the survey in a way to encourage completion of it.
- 9) To pre-test the survey.
- 10) To plan who will administer the survey and analyse the data.
- 11) To set necessary timeframes.
- 12) To plan how to preserve raw data.
- 13) To use appropriate data analytics.
- 14) To outline study limitations and give future suggestions.
- 15) To use the findings to contribute to existing knowledge gaps.

I followed the fifteen steps outlined by Evans and Mathur (2018) throughout the first phase of this research study, a phase in which an online questionnaire was carried out.

1) I set two main survey goals.

I decided that the survey approach was going to be used to study approaches that teachers of singing consider effective in teaching singing to autistic students, including students who are MS. The impact of teaching autistic students to sing as perceived by teachers of singing was also targeted.

2) I chose the online written questionnaire method.

The aim of the study's first phase was to give an overview of the situation regarding the teaching of singing to autistic students in the United Kingdom and Malta at the specific period of the study. I chose the United Kingdom and Malta for two main reasons. The first reason was that I, the main researcher, had personal connections with singing teachers from both locations. The second reason was that I wanted to study the state of singing instruction for autistic students, specifically in the United Kingdom and Malta, during the study period. When aiming for a coherent study design, I paid particular attention to the relation between chosen theories of reality, theories of knowledge, methodology and methods (refer to the Section *The Description of Analytic Choices and Processes* later in this chapter).

3) I chose the sampling method.

Convenience sampling was the sampling method that I chose. The survey was targeted at singing teachers based in the United Kingdom or Malta who taught or, at the time of the study, were teaching autistic students. Students could include, but were not limited to, autistic persons who were minimally speaking; this decision was taken to acquire a general overview of the situation in the study. Students could be of any age and could have other comorbidities with autism spectrum conditions. Both teachers carrying out individual sessions and those conducting group sessions could participate in the study. I designed the survey explicitly for

singing teachers or musical theatre singing teachers, and not for general music teachers teaching singing in schools as part of their curriculum. Singing teachers and musical theatre singing teachers were the targeted participants because the survey wanted to explore the teaching of singing to autistic students, not the teaching of general musical education or specific instruments. I sent the survey link to existing contacts. Contacts were colleagues, friends and other singing teachers I became acquainted with from conferences, concerts and networking. I also shared the survey link on social media, including Facebook pages and groups of interest to singing teachers based in the United Kingdom or Malta. Before confirming the target population for the survey, I sent emails about the proposed survey to a number of schools and colleges. Also, I briefly described the proposed survey on different social media platforms. The steps described were carried out because the research team was fully aware that the number of singing teachers who have experience with autistic students, especially autistic students who are NS, MS, or LS, is minimal. The survey was open to teachers teaching autistic students of any age; this could help increase the number of survey responses and acquire a better general picture of the situation. The aim was to collect around 50 survey responses.

- 4) The research team determined the research team person responsible for the survey design.

I, the main researcher, was responsible for designing the questions and determining the survey's layout. The whole process was supervised by the main supervisor, Professor Judy Clegg, a Professor of Speech and Language Therapy in the School of Allied Health Professions, Nursing and Midwifery at the University of Sheffield, and by the second supervisor, Professor Stephanie E. Pitts, a Professor of Music Education at the University of Sheffield.

- 5) The communication of the survey purpose and the use of the collected data.

Each time the survey link was shared on social media or when it was sent by email, I included a note covering the following points:

- The name of the researcher, the name of the University, the name of the University division and the name of the University course
- The two main aims of phase one of the study
- The inclusion criteria of the study population
- The length of the questionnaire in minutes
- A reference to the information sheet which preceded the online questionnaire (Refer to Appendix C for the information sheet)
- The link to the survey
- A reference to the consent form (Refer to Appendix C for the consent form)
- An invitation to share the link with any other potential participants
- The closing date of the survey
- A note of appreciation for taking part in the study

6) I designed the questions of the questionnaire.

The name of the online survey was 'Teaching Singing to Students on the Autism Spectrum: A Survey'. I created the mixed-method questionnaire using Google Forms and included open-ended, dichotomous and multiple-choice questions. All questions were in English, as targeted participants in Malta could also speak English. The self-administered survey consisted of 33 questions divided into three sections. Section A focused on the singing educator completing the study and was made up of four questions. The second section, which consisted of nine questions, asked about the teaching of singing in general. The last section was made up of 20 questions about the teaching of singing to autistic students. The questions of the questionnaire can be found in Appendix C.

7) I decided on the survey length.

Provided that short surveys are linked to a higher response rate (Crawford et al., 2001; Kaplowitz et al., 2012), I designed the survey to take around 10 minutes to complete. Throughout the design of the questions, especially during the pilot study, I changed a number of questions from open-ended to closed-ended, particularly multiple-choice, to ensure that each respondent spent only around 10 minutes answering all the questions. I did this to ensure that the busy schedule of each participant was respected.

8) I designed the survey to maximise completion rates.

The early drafts of the survey consisted of two sections. The beginning section focused on who would answer the survey, and the second section focused specifically on teaching singing to autistic students. Throughout the design process, I decided to add a mid-section about the teaching of singing in general. I added a mid-section to gradually encourage the participants to reflect on how they teach singing to autistic students. For teachers who have minimal experience with autistic students, a whole survey on the teaching of singing to the population in question might be very difficult to complete. Since the number of singing teachers with experience with autistic students, especially with students who are NS, MS, or LS, is very limited, every experience was valuable for this study.

9) I carried out a pilot study.

I piloted the survey with three singing teachers who had experience with autistic students. I collected data through writing since participants were going to communicate their responses in writing during the full-scale survey (Ruel et al., 2016). I sent an email to four singing teachers whose contacts I already had because they were colleagues, friends, or other singing teachers I know from networking. I invited these four teachers to pilot the questionnaire. Further on, I explained to these teachers that if they accepted the invitation,

they would be encouraged to read and point out unclear questions or points. Any other difficulties encountered while reading the questions were also crucial to highlight. The email emphasised that they could ignore the email if they preferred not to accept the invitation. I informed the four teachers that they would be emailed the survey questions if they accepted the invitation. Feedback about the questions was received from three teachers. A detailed report of the feedback received and the changes carried out can be found in Appendix A. Following the feedback given during the pilot study, I added a number of questions to the survey. As a result, in Appendix A, the number allocated to each question varied from the survey emailed to the pilot study participants to the published one. Therefore, to avoid confusion, the number assigned to the questions emailed to the pilot study participants and labelled in Appendix A as 'Original question' is not written. After analysing and making the changes suggested during the pilot study, I reviewed the questions multiple times and edited other details. Changes included more straightforward multiple-choice options and more examples added to clarify specific terms.

10) The research team decided who was going to administer the survey and analyse the data.

I, the main researcher, was responsible for publishing the self-administered survey which was open for four weeks. I was also the person responsible for analysing the data.

11) I set the necessary timeframes.

I published the online survey on the 26<sup>th</sup> of September, 2022. I accompanied the publishing date and the survey's closing date by the survey link. After four weeks of data collection, I started the data analysis. The data analysis and the writing of the findings of the study's first phase informed the second phase of the study, which was a set of interviews.

12) I planned the preservation of raw data.

I wrote a data management plan. The plan involved describing the data and explaining the data collection, management and sharing. I used Excel files to analyse data during the project, stored digital data safely on the University Google Drive, and protected it with passwords. I did not collect paper documents. The information sheet at the beginning of the online questionnaire covered all planned data uses. Only the research team had access to the survey data throughout the study. I shared the required data with the supervisors through shared access to files on the University's Google Drive. Beyond the end of the study, only anonymised and analysed data will be stored; this data will be stored at the University of Sheffield repository Online Research Data for a minimum of 10 years.

13) I used appropriate data analytics.

The data analysis of the mixed-method online questionnaire consisted of four main steps. The first step involved separating the data types (refer to Table 5.4). This was followed by the summary and interpretation of the quantitative data (refer to Appendix D), in which I used descriptive analysis. The next step was the reflexive thematic analysis of open-ended questions (Braun & Clarke, 2022) (refer to Chapter Six). At the end of the analysis, I integrated and discussed the collected and analysed quantitative and qualitative data findings (refer to the second part of this chapter for a detailed account of analytic choices and processes).

**Table 5.4** *Quantitative and qualitative data*

Data type	Number of questions	Type of questions
Quantitative data	28	Multiple-choice questions Dichotomous questions

Qualitative data	4	Open-ended questions
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14) I outlined study limitations and gave future suggestions.

Following data analysis and the write-up of results, I listed the study limitations and gave suggestions for future research (refer to Chapters Six and Eight).

15) I used the findings to contribute to existing knowledge gaps.

The findings informed the design of phases two and three of the current research study. The data collected in the online questionnaire gave a general picture of the approaches that singing teachers consider effective when teaching singing to autistic students. It also explored the impact of singing learning as perceived by teachers of singing. The collected data raised a question about the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS. I explored this research question in the second phase of this research study.

### **5.2.3.2 The online questionnaire: Ethical thinking**

I applied ethical considerations during the survey design, data collection, analysis and reporting of results (Oldendick, 2012). The actions implemented included the design of objective questions, obtaining willing and informed consent, the protection of the privacy of the information, and accurately presenting the results. I submitted an ethics application form specifically for the study's first phase. Later, I submitted two other ethics application forms to seek approval for the other two study phases. The questionnaire study was accepted by the Ethics Board of the University of Sheffield (Appendix B). I offered no financial or in-kind payments to the participants.

Furthermore, an information sheet and an agreement to consent can be found at the beginning of the published questionnaire (Appendix C). After being instructed to read the information sheet, the respondents were invited to complete the consent form, which was divided into three sections, each section including one or more consent tick boxes. The first section of the consent form focused on what was involved in participating in the survey. The second section specified using the information collected during and after the research project. The last section was about providing information that researchers could use. At the end of the consent form, respondents were invited to answer 'Yes' or 'No' to the question, "Having read the above information, I consent to take part in the study. Please indicate your consent before moving on to the questions in the survey." It was explained to the respondents that forms in which they selected 'No' to this question but then completed the survey would be securely reviewed and destroyed. The survey was completely anonymous. I did not collect identification information or names through the questionnaire, and kept all data collected strictly confidential.

At the end of the online questionnaire, participants were invited to contact me if they were willing to participate in other study phases; it was up to them to decide whether to contact me or not. In cases where participants emailed me, I kept their email addresses securely and did not share them outside the research team. Survey responses were not linked to any email address since the survey was completely anonymous.

There was no potential for physical and/or psychological harm or distress to the participants, and I included no distressing or sensitive questions in the online questionnaire. Since incidental discoveries of potential harm to students attending or who used to attend singing sessions carried out by the survey participants could be uncovered in the open-text

survey responses, like harmful attitudes or behaviours toward vulnerable students, when applying for ethics approval, I clearly explained the course of action if such issues were to be identified. I explained that the issues would first be discussed with the research team. If need be, the Research Ethics and Integrity Manager of the University of Sheffield should be informed and asked for professional advice.

In the information sheet, I gave the participants my contact information and that of the two supervisors overseeing the research project. The information sheet also outlined the procedure for reporting incidents and concerns. In addition, I instructed the participants to contact me to raise complaints or concerns about the research. Concerns related to potential exploitation, abuse or harm resulting from involvement in the study were to be reported to the study's Designated Safeguarding Contact. I also informed the participants that they could contact the Research Ethics and Integrity Manager of the University of Sheffield if they felt that their complaint was not handled satisfactorily.

#### ***5.2.4 The Design of Phase 2: The Online Interviews***

Informed by the findings of the online questionnaire, I carried out a set of online interviews for the second phase of the study. Online interviews are comparable to online questionnaires, as both use a survey strategy method. Different types of interviews include telephone, face-to-face and online interviews. Interviews “allow a two-way interaction between researcher and respondent” (Kelley et al., 2003, p. 262). Salmons (2010) describes interview research as “[a] [w]indow [i]nto the [l]ived [e]xperience” (p. 1). In contrast to other research methods, such as a written quantitative questionnaire, qualitative interviews allow the researcher to interact directly with the participant (Salmons, 2016). Similar to the considerations related to the methodology of online questionnaires outlined in Evans and Mathur (2018), Salmons (2014) presents a conceptual framework addressing online

interviews. Each of the eight categories in the framework offers a set of questions that can be considered when designing online interviews. The first category focuses on the purpose and design of the study. Then, Salmons discusses the choice of online data collection method and the researcher's position. The fourth category focuses on deciding the style of the interview. Interview technology and setting are considered in the fifth category. The last three categories focus on visual methods, the handling of sampling and recruiting, and ethical thinking. As described below, during the second phase of the research study, I followed the eight categories discussed by Salmons (2014).

1) I aimed for the creation of a coherent design.

I chose in-depth interviews for the second phase of the study. I was the interviewer and the interviewees were two parents of autistic children who were NS, MS, or LS; one nursery teacher and one preschool teacher; two teachers teaching children a foreign language at a basic level (Common European Framework of Reference for Languages (CEFR) Level A1-A2 (Council of Europe, 2021)); two singing teachers; two music therapists; two occupational therapists; and two speech-language pathologists. The aim was also to interview a music psychologist and an educational psychologist; however, no interested candidates with relevant experience were found to participate in the research. The singing teachers, music therapists, occupational therapists and speech-language pathologists all had experience with autistic children who are NS, MS, or LS; these professionals could have experience with autistic children who have other comorbidities and, therefore, refer to them during the interviews. However, only parents of autistic children with no comorbidities were interviewed. When designing the study, the plan was to interview only participants based in the UK or Malta. The first reason for this was that I had personal connections with potential participants, and the

second reason was that I wanted to study how the teaching of singing can specifically target the facilitation of communication skills of autistic children who are NS, MS, or LS in Malta and in the UK. It is important to underline that the first phase of the study, the online questionnaire, was completed by singing teachers based in Malta or the UK. As in the first phase of the study, in the second phase, the singing teachers could not be general music teachers in schools. Teachers teaching musical theatre singing could participate. Despite planning to interview singing teachers with experience teaching autistic children who are NS, MS, or LS, based in Malta or the UK, I did not find participants with relevant experience. Therefore, an ethics amendment was submitted to interview singing teachers with relevant experience who could be based in any location, not only in Malta or the UK.

The findings of phase one of the study informed the choice of the interview participants. Phase one indicated that only 35% of the singing teachers who completed the online questionnaire had taught more than 10 autistic students, and only 32% had experience with students who are minimally speaking. The findings of phase one suggested that knowledge from various professionals could be crucial for creating effective singing teaching methods, especially since available training for singing teachers who teach autistic students is minimal. A nursery and a preschool educator were interviewed because of their experience teaching children whose language is still in its early or developing stages. In addition, the experience of teachers teaching a foreign language at a basic level (CEFR Level A1-A2) was crucial because these teachers experience teaching students to develop a language at an elementary level. Caregivers of autistic children who are NS, MS, or LS were invited to participate because they could give a clear picture of the children in their comfortable environment, and, in many cases, the caregivers of children can be the people who know the children best. Phase one indicated that the term 'minimally speaking' does not provide an

accurate portrayal of all the different communication abilities that autistic children can have. Therefore, the terms 'nonspeaking', 'minimally speaking' and 'limited speaking' were used in the second phase, as defined by Koegel et al. (2020).

The framework of the interviews was set by the research question of the study's second phase: What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS? When aiming for a coherent design, I focused on the clear alignment between chosen theories of reality, theories of knowledge, methodology and methods (refer to the Section *The Description of Analytic Choices and Processes* later in this chapter).

2) I chose the method of online interviews to carry out the study's second phase, which was to investigate a real-world phenomenon.

I carried out interviews online because, given the different commitments of the participants, online interviews were more convenient than meeting face-to-face. In addition, participants were geographically dispersed. I carried out the interviews on Google Meet, and each interview was video-recorded and saved on the University's Google Drive. All questions were in English because all participants felt comfortable speaking in English. Each interview was targeted to take around 15 to 20 minutes; however, certain participants answered certain questions in more detail and, as a result, some interviews took longer.

I asked every participant to complete a short questionnaire on Google Forms so that the required demographic information could be obtained. I created three forms that included questions to acquire the necessary background information about the interviewees (refer to Appendix G, Appendix H and Appendix I). When I reported the demographic information about the interviewees in this chapter, I did not include certain information to protect the

identity of the participants (refer to Table 5.5, Table 5.6 and Table 5.7). The questions in these surveys were developed to fill in gaps identified in the data collected in the study's first phase, such as the link between singing abilities and different communication skills of autistic children who are identified as 'minimally speaking'. One of the questionnaires was for parents of autistic children who are NS, MS, or LS. The other questionnaire was targeted at educators teaching typically developing children, that is, for the nursery educator, the preschool educator, and the foreign language teachers teaching a foreign language at a basic level (CEFR Level A1-A2 (Council of Europe, 2001)). The questionnaire for all the other professionals was designed for specialists who have experience with autistic children who are NS, MS, or LS.

**Table 5.5** *Demographic information about interviewed parents*

	Parent 1	Parent 2
Musical background of the parent	From a young age, the parent had a particular connection to music	No musical background
Gender of child	Female	Male
Age of child	Six	Fourteen
Diagnosis of child	Autism	Autism
Level of autism according to DSM-V-TR (APA, 2022b)	Level 2	Level 3
Verbal ability of the child according to the descriptions given by Koegel et al. (2020)	Limited speaking: Children whose verbal abilities are better than those of the children who are described as minimally speaking, but still significantly below the expected level of a child of the same age	Nonspeaking: Children over 18 months with no verbal expressive, intelligible words or approximations
The preferred musical genres of the child	All types of music	Children's songs

**Table 5.6** *Demographic information about interviewed educators teaching typically developing children*

	Early-Years Educator 1	Early-Years Educator 2	Foreign Language Teacher 1	Foreign Language Teacher 2
Profession	Teacher	Childcare educator	Teacher	Teacher
Area of specialisation	Early-years learning and care	Childcare	2 foreign languages	2 foreign languages
Number of years of experience	11 years	1-2 years	10 years	11 years
An approximate number of children the participant worked with	144 children	8 children	1000 students	50 students per academic year
Age of students	From 2 years 9 months up to 5 years	1 to 2 years	11-15 years	10-16 years
Musical background	No musical background apart from attending workshops, singing in a school choir (10-11 years old) and being a parent to a guitarist. Enjoys lullabies and singing along with karaoke.	Family of musicians. Music is important for this participant.	Very limited	Does not play an instrument. Appreciates music and attends concerts.

**Table 5.7** Demographic information about interviewed professionals with experience with autistic children, including autistic children who are NS, MS, or LS

	Speech- Language Pathologist 1	Speech- Language Pathologist 2	Occupational Therapist 1	Occupational Therapist 2	Singing Teacher 1	Singing Teacher 2	Music Therapist 1	Music Therapist 2
Profession	Speech- language pathologist	Speech- language pathologist	Occupational therapist	Occupational therapist	Singing teacher	Voice Artist- Faculty	Music psychotherapist	Music therapist
Area of specialisation	Early intervention	Paediatric (generic)	Paediatric	Paediatric	Paediatric (mainly 5 to 18 years old)	Voice	Young children (2 to 11 years) and Autism	Music therapy
Number of years of experience	4 years	14 years	23 years	10 years	15 years +	15 years	2 ½ years	2 years
Level of autism of the children that the interviewee worked with according to DSM-V-TR (APA, 2022b)	Level 1 Level 2 Level 3	Level 1 Level 2 Level 3	Level 1 Level 2 Level 3	Level 1 Level 2 Level 3	Level 1 Level 2	Level 1 Level 2 Level 3	Level 1 Level 2	Level 1 Level 2 Level 3
Verbal ability of the child	NS MS	NS MS	NS MS	NS MS	MS LS	MS	NS MS	NS MS

that the interviewee worked with, according to the descriptions given by Koegel et al. (2020)	LS	LS	LS	LS			LS	LS
Approximate number of autistic children who are NS, MS, or LS that the interviewee worked with	Over 30	A lot of children (did not give an approximate number)	Over 100	Hundreds	2	1	20	40
Ages groups of autistic children who are NS, MS, or LS that the interviewee worked with	1-5 years old 6-10 years old 11-15 years old	1-5 years old 6-10 years old	1-5 years old 6-10 years old	1-5 years old 6-10 years old 11-15 years old	6-10 years old 11-15 years old	11-15 years old	1-5 years old 6-10 years old 11-15 years old	6-10 years old 11-15 years old

Musical background of the interviewee	Use of music during sessions	Limited musical background; use of routine songs and nursery rhymes during sessions	No musical background	No particular musical background, but plays simple guitar and loves to sing	A Bachelor's Degree in Vocal Performance (Classical); specialises in musical theatre and classical	A Bachelor's Degree; Master's Degree in Vocal Pedagogy; experience as a singer, coach, conductor, vocal coach and private lesson teacher	A singer; Teaching degree in music	Studied classical violin, piano and flute; sung in choirs as a child; first degree in music; Master's in music therapy
Other relevant information					Also worked as a speech-language pathologist with autistic children who are NS, MS, or LS		Worked in education for over 20 years	

### 3) I thought about what position I would take as a researcher

From the beginning of the study's second phase, I was aware that my motivations to carry out the set of online interviews were my connections to the phenomenon, since my work connected me to autistic singers keen on singing and their caregivers. Another motivation was to contribute to building on already available literature on the study area. During phase two, I saw a connection between myself as a researcher and the "miner researcher", described by Salmons (2014) as a researcher "who digs out facts and feelings from research subjects" (p. 8). My position as a researcher led me to choose online interviews as a data collection method. I could connect with people with specific experiences, who could be geographically dispersed, and ask them questions to learn about their experiences, which were valuable for my research question.

### 4) I chose the e-interview style

To 'mine' participants' experiences, I prepared semi-structured e-interviews because having a standard set of open-ended questions for all participants was essential. However, I also wanted to ask the participants further questions depending on their particular responses to the questions.

Eight questions were designed for all the participants. The study's first phase informed the open-ended questions explicitly developed to gather data on the interview topics from different perspectives. The following eight topics are the topics of the interview questions:

- a) The effect of songs on communication skills.
- b) Musical genres and the development of communication skills.
- c) Effective methods to encourage singing.

- d) Impact of songs on joint attention.
- e) Relationship between singing and movement activities.
- f) Relationship between singing and visuals.
- g) Songs and daily routine.
- h) The use of sounds and words learnt in songs in a daily context.

I piloted the interview questions with two music therapists working with autistic children, including children who are NS, MS, or LS. I decided to pilot the interview questions with music therapists because they have valuable experience in the use of songs with autistic children. Two online meetings on Google Meet were carried out, and notes were taken during both meetings. The questions were modified in line with the received feedback (refer to Table 5.8). Changes mainly consisted of rewording certain questions to aim for clarity and conciseness (refer to Appendix E).

**Table 5.8** *The eight interview questions after the two pilot studies*

Question number	Question
1	What is your experience with songs, singing and communication skills?
2	What are your observations about different musical genres and the facilitation of communication skills?
3	What is your experience with methods that can be used to present songs to encourage singing?
4	What are your observations about the effect of songs and singing on attention? Explain what you are referring to when you use the term 'attention' in your answer.
5	What are your observations about singing, sitting and movement activities?
6	What are your observations about singing and visuals?

7	What is your experience with methods that can be used to include songs and singing in the daily routine?
8	What are your observations about the singing of songs and the language used in daily life?

5) I decided which interview setting best fit the purpose of the second phase of my study

I decided to communicate visually with the interview participants and conducted each interview in a private online milieu. All interactions took place synchronously. I chose this setting for the e-interviews because, given the nature of the research topic and the interview questions, I wanted to create a private setting with each participant, where participants would feel safe sharing experiences while knowing that all data would remain strictly anonymous. I decided to communicate visually with each participant because I knew that if the interviewee and I could see each other during the interview, the experience would be more intimate. This sense of familiarity was crucial to the research question of the second phase of the study because the research question focused on a phenomenon that might have different meanings and be linked to various personal experiences for each individual.

6) I chose purposive sampling to recruit participants

I used purposive sampling to recruit participants via personal and professional connections. Since the participants for the study's second phase were required to possess specific experiences, identifying participants who directly fit the study was a lengthy process. Potential participants were informed about the study by means of an email, an SMS, or a text message on Messenger or WhatsApp. I gave potential participants initial information about the study and explained that the 15 to 20-minute interview would be conducted on Google Meet and would be video recorded. I instructed all participants to ignore the text message or

the email if they were not interested in participating in the study, and explained that participation was voluntary. To recruit participants, I also shared a brief description of the study on social media, including Facebook pages and groups of interest to the targeted participants. Further on, I also contacted relevant associations and Facebook groups via email or text to share my invitation with their members. Regarding the recruitment of singing teachers, at the end of the online questionnaire, singing teachers interested in participating in other phases of the study were instructed to contact me. I contacted the participants who had contacted me, but no participants were interested in participating in phase two. Participants who responded to the invitation email explained that they did not feel that they had relevant experience for phase two of the study.

#### 7) Ethical thinking was crucial for me during the entire process of the study's second phase

I applied ethical considerations during all the phases of the study's second phase. I submitted an ethics application form specifically for the online interviews. Later, I submitted another ethics application form to seek approval for the last phase of the study. The online interview study was accepted by the Ethics Board of the University of Sheffield (Appendix F). Informed consent was obtained from all the participants. Before the interview, the information sheet, the agreement to consent, and a short questionnaire focusing on demographic information (Appendix G, Appendix H and Appendix I) were sent to the participants. After reading the information sheet, participants were invited to complete the consent form which was divided into three sections, each including one or more consent tick boxes. The first section of the consent form focused on what it involved to take part in the interview. The second section specified how collected information would be used during and after the project. The third section was about providing information that could be used by the

researchers. At the end of the form, the participants were invited to answer 'Yes' or 'No' to the question, "Having read the above information, I consent to take part in the study. Please indicate your consent before moving on to the short survey." It was explained to the participants that forms where participants selected 'No' to this question but then completed the short survey would be securely reviewed and destroyed. I offered no financial or in-kind payments to the participants.

The interviews posed no potential for physical harm to the participants. However, it was possible that the interviewees, especially the caregivers of autistic children, became distressed. Bearing this in mind, I excluded questions that were distressing or sensitive in nature from the short questionnaire and the online interviews. In addition, before the start of each interview, I explained to all participants that if the interviewee became emotionally troubled, the options to stop for a few minutes or to end the interview were possible.

I was aware that incidental discoveries of potential harm to children cared for by participants could be uncovered during the interviews, such as harmful attitudes or behaviours toward vulnerable children. Therefore, before the start of the study, it was decided that if such issues were identified, I would discuss the issues with my two supervisors or, if need be, seek professional advice from the University Research Ethics and Integrity Manager.

Moreover, all participants were given my contact information and that of the two supervisors overseeing the project. The information sheet shared the procedure for reporting incidents and concerns with the participants. I was the person that the participants were instructed to contact to raise complaints or concerns about the research. Concerns related to potential exploitation, abuse or harm resulting from involvement in the study were to be reported to the study's Designated Safeguarding Contact. If participants felt that their

complaint was not handled satisfactorily, they could also contact the Research Ethics and Integrity Manager of the University of Sheffield.

I processed all the personal data for the study's second phase, and the University of Sheffield acted as Data Controller. All collected data was kept strictly confidential. I was responsible for managing storage and backups. At the beginning of phase two, as approved in the ethics application form, I started to analyse the data collected from the short questionnaire using NVivo. However, throughout the process, I realised that I preferred to analyse the data manually, so I did not use NVivo. Digital data was safely stored on the University Google Drive and was protected by passwords. No paper documents were collected. I stored the video-recorded interviews on the University's Google Drive and used transcription in Google Meet. Participants were invited to consent so that their interview recordings could be transcribed using Google Meet; I explained to the participants that if they did not consent, I would transcribe the interview manually.

All identifying information in the transcripts was changed or replaced by generic descriptions in square brackets. The transcripts were carefully checked to remove all secondary identifiers. For example, certain names of nursery rhymes or traditional songs were removed to protect the identity of the participants. The interviews were transcribed verbatim. To avoid confusing the reader, I edited a few instances for clarity. For example, "so she she change some words to on the nurs- but still she keeps the rhythm" was changed to, "so she changes some words to on the nurs- but still she keeps the rhythm" (Online interviews, Parent 1). The information sheet clarified that in all write-ups of the findings and subsequent publications, all data would be anonymised so that it would not be identifiable and that beyond the end of the study, only anonymised and analysed data would be stored.

## 8) The process of data collection

To prepare for the interview data collection, I wrote an interview protocol to plan for the four interview stages: the opening, the asking of questions, the closing phase, and the follow-up (Salmons, 2014). For the opening of the interviews, I kept in mind a number of points. 1) To thank the participants for their participation. 2) To remind the participants that their participation is voluntary and that they could stop at any time during the interview. 3) To remind the participants of the approximate duration of the interview. 4) To get consent again from the participants to record the interview to facilitate the transcription process. 5) To inform the participants that the interview will consist of eight questions. Similar to my past experiences when carrying out interviews, participants were reminded that if they preferred not to answer specific questions, they were free to do so, and they could also stop at any time during the interviews. In case of technical difficulties, the participants' preferences, convenience and ease were prioritised. For example, during an interview, there was a technical difficulty with transcription in Google Meet. To be sure not to lengthen the duration of the interview and cause inconvenience to the participant, the interview was started at the planned time, and the transcription option was not used for that specific interview. The eight written questions were used as a guide throughout the semi-structured interviews. When closing the interviews, I asked the participants if they wanted to add other points apart from those discussed during the interview. I also thanked the interviewees and explained that their experiences were extremely valuable to the study. After the interviews, I took permission from the interviewees to contact them in case any difficulties arose during the analysis of the collected interview data.

### 5.3 The Description of Analytic Choices and Processes

The first section of the chapter discussed the design of the first and second phases of the study. This section focuses on the rationale and process of the descriptive analysis used in the online questionnaire and the reflexive thematic analysis used in both the online questionnaire and interviews.

The perspectives on knowledge taken in the first two phases of the study were those of critical realism and contextualism. As a practitioner-researcher, I am aware of my immersion in the same world I am studying (Braun & Clarke, 2022; Pilgrim, 2014), and that the subjects I study can never be detached from their specific contexts (Tebes, 2005). Reflecting on these perspectives on knowledge, I decided to use descriptive analysis combined with reflexive thematic analysis to analyse the data collected in the first phase of the study.

During the first phase of my study, I wanted to explore what approaches teachers of singing consider to be effective in teaching singing to autistic students, including students who are MS, and the impact of singing teaching as perceived by teachers of singing. Descriptive analysis was crucial to give me the first understanding of the phenomenon I wanted to analyse; this analysis led me to develop the research questions I wanted to study in the second and third phases of the study (Loeb et al., 2017). Recognising the importance of subjectivity and reflexivity in the phenomenon I wanted to observe, I decided to situate my study in a Big Q framework (Braun & Clarke, 2022). Braun and Clarke (2022) describe the Big Theory position of a qualitative paradigm as “An only-ever partially knowable world, where meaning and interpretation are always situated practices” (p. 6). Given the nature of my research questions and knowing that the Big Q framework is the foundation of reflexive thematic analysis (Braun & Clarke, 2022), I chose reflexive thematic analysis to try to make sense of the collected data

during the three phases of the study. Seeing variations of reflexive thematic analysis as a spectrum, I took a more inductive and experiential approach than a deductive and critical one when carrying out reflexive thematic analysis. The collected data mainly guided theme development, and when analysing the data, I aimed to delve into the participants' perspectives. The meaning was explored as a combination of semantic and latent approaches (Braun & Clarke, 2022). The use of descriptive analysis in phase one of the study, and the use of reflexive thematic analysis in the first two phases leading to the ethnography, gave me the chance to explore through reflexivity the sensitive phenomenon of how singing teaching can facilitate and improve the communication skills of autistic children who are NS, MS, or LS. Throughout the study, I kept in mind the importance of personal, functional and disciplinary reflexivity (Wilkinson, 1988) while always acknowledging that the autistic students I was observing could never be studied in isolation from their environment.

When starting my reflexive analytic journey, I decided to apply the descriptive analysis process described in Loeb et al. (2017) to explore what approaches teachers of singing consider to be effective in teaching singing to autistic students and the impact of singing teaching as perceived by teachers of singing. The phenomenon I first identified was not at all clear at the beginning. I had a lot of questions about autism, singing teaching, language, speech and communication skills. I was seeing the phenomenon as a never-ending wall covered with many questions. I realised that since there were so many questions to answer about the identified phenomenon, different study phases would be appropriate. To decide which type of data collection method would be most beneficial for the study's first phase, I tried to find out the best concepts of the phenomenon that could give me an indication of what exists in the real world. Correspondingly, the two aspects I identified were the approaches teachers of singing consider effective for teaching singing to autistic students and

the impact of singing instruction as perceived by teachers of singing. To get the first impressions of the selected concepts, I developed a mixed-method online questionnaire for singing teachers with experience in teaching autistic students based in the UK or Malta. The questionnaire consisted of 28 quantitative questions and four qualitative questions. When I collected all the questionnaire data, I started searching for patterns that could give me the first key concepts of the phenomenon I wanted to study. Tables and figures were used to analyse, summarise and present the collected quantitative data. The descriptive analysis steps described in Loeb et al. (2017) were revisited many times to portray a picture explaining singing teaching and autism in the UK and Malta.

Descriptive analysis was not the only method that was utilised to analyse the collected data from the mixed-method online questionnaire. Reflexive thematic analysis, as described in Braun and Clarke (2022), was used as a guide to analyse the collected qualitative data and link it with patterns identified from the collected quantitative data. The six phases described by Braun and Clarke were only used as guidelines but were not followed linearly and strictly since, as Braun and Clarke explain, every analytic experience is unique. Since the participants completed the questionnaire independently, I required time to familiarise myself with the collected data. I revisited this phase many times as I felt the need to familiarise with the data or specific aspects of the collected data. Coding data at the semantic and latent levels, I ended up with many code labels. I slowly developed the first candidate themes by working with all the code labels. Theme development was a very long and thorough process. I kept returning to the dataset and continuously refining the candidate themes. During the theme refining process, I decided that the themes which best described the questionnaire data in relation to my knowledge and insights as a practitioner-researcher were two themes linked to the first research question of the questionnaire and another two themes connected to the second

questionnaire research question. The themes were: 1) no cookie-cutter approach; 2) the significance of experience; 3) singing may get better; 4) it is not only singing that may get better. It is important to underline that during the writing-up phase, I kept rethinking and refining the names of the developed themes.

Additionally, the writing process did not start at the final write-up phase. Writing was a continuous reflective process before and during the data collection and analysis. I wrote familiarisation notes and reflective journals. Reflective journals were a crucial part of my research journey as they were “a repository for documenting and storing thoughts for subsequent reflection, interrogation and meaning-making” (Braun and Clarke, 2022, p. 19). I must admit that the most difficult process I found throughout the reflective analysis phases was choosing extracts. Varying from the illustrative use, the analytic use and the blending of both illustrative and analytic usages of data extracts, it was difficult to decide which extracts, despite being important, could be left out of the final write-up. When deciding which extracts to include in the final write-up, I tried to choose those that best evidenced my analytic arguments.

The reflective thematic analysis phases I carried out when analysing the questionnaire data were very similar to those I conducted to analyse phase two’s collected interview data. Data familiarisation required much less time during phase two than phase one of the study because I was the interviewer who interviewed all the participants. When coding the interview data, I found it challenging to find a practical and efficient method since I had fourteen interviews, with some interviews being rather long. Initially, I tried writing labels on electronic versions of transcript documents. This method did not work for me. Then, I printed all the transcripts and coded all the data using different colours, numbers and letters. Using

colours, numbers and letters to distinguish and link different code labels helped me generate candidate themes. Similar to when developing themes in the first phase of the study, the theme development phase of phase two was a very long process. I kept on changing and refining themes, even when doing the final write-up. Reflexive journals were an essential aspect during the collection and analysis of the interview data. After each interview, I used to reflect on my practice as an interviewer and on the interview's effect on me. Sharing the same realities with many interviewees, I frequently needed time to reflect on what the participants were sharing with me. The following extract is part of a reflective journal entry I wrote after an interview with a parent of an autistic child.

*First of all, my identity is that of a mother. During the interview, I started getting goosebumps. I could feel that this mother was trying to do all she could to help her child communicate. When I asked her about using songs in daily life, she underlined that although she was sure that songs could help her child communicate more, she felt helpless. She had no idea how to use songs to help her son use words in daily contexts. She was crying for help before days passed by, and her son grew up without acquiring the necessary communication skills. I have a daughter. How could I tell her how much I felt similar to her when my daughter had problems I could not help her solve? I could not stop thinking about this mother after the interview.*

The study's second phase has one main research question, which was informed by the findings of phase one. Exploring the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS, I developed three themes. The three themes were: 1) communication as an orchestra, not as a solo instrumentalist named 'talking'; 2) the art of drawing them in; 3) singing as a 'common sense' tool. The analytic journey of the first two phases of the study equipped me with a lot of tools, which I found helpful in the last phase of the study. Additionally, it was a journey that encouraged me to analyse how, through ethnography, I could explore the use of singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS.

## **5.4 Conclusion**

In Chapter Five, I have described in detail the research design of the first two phases of the study. I have also explained the analytic choices and processes of phases one and two. The next chapter deals with what Braun and Clarke (2022) describe as the “analytic story” (p. 128) of the study’s first two phases; Chapter Six uses an integrated approach that combines the findings and discussion of the online questionnaire and the online interviews.

## Chapter 6 - Analysis of the Online Questionnaire and Interviews

### 6.1 Introduction

This chapter analyses the integrated quantitative and qualitative findings of the first phase of the study and the qualitative findings of the second phase of the study. The study's first phase was a mixed-method online questionnaire for singing teachers with experience teaching autistic students. The second phase, which built on the findings of the questionnaire, was a set of online interviews. The interviews were with professionals who work with autistic students, early-years educators, foreign language teachers, and parents of autistic children. Descriptive analytics was used to analyse the quantitative questions of the mixed-method online questionnaire, and reflexive thematic analysis (Braun & Clarke, 2022) was used to analyse the qualitative questionnaire questions and the interviews. The interpretation of the results of the quantitative questionnaire questions will be discussed in this chapter; however, a detailed answer to each quantitative question can be found in Appendix D. The opening of this chapter lists the themes developed from the data collected during the first two phases of the study. The second section of the chapter presents an analysis of the questionnaire data; this chapter section includes only extracts from the collected questionnaire data. Lastly, the chapter concludes with an analysis of the interviews; this chapter section includes only extracts from the interviews collected data. As Braun and Clarke (2022) suggest, this analysis chapter combines the results and discussion sections. Given the numerous connections between the results and the existing research, this integrated approach was chosen to avoid repetition.

## 6.2 The Themes Developed During the First Two Phases of the Study

This section of this chapter gives an overview of the analysis that will be presented in the next two sections. Phase one had two research questions, and phase two had one (refer to Table 6.1). Data collected from the first phase informed the design of the research questions of the second phase, and data collected from the first two phases informed the aim and design of the ethnographic case series (refer to Chapter Seven). Table 6.1 lists the themes developed from the collected data in relation to the research questions of each specific phase.

**Table 6.1** *The themes developed during the first two phases of the study*

Phase	Research question or aim	Developed themes
Phase 1 The online questionnaire	Research question 1: What approaches do teachers of singing consider to be effective in teaching singing to autistic students, including students who are MS?	Theme 1: No cookie-cutter approach  Theme 2: The significance of experience
	Research question 2: What is the impact of teaching autistic students to sing as perceived by teachers of singing?	Theme 3: Singing may get better  Theme 4: It is not only singing that may get better
Phase 2 The online interviews	Research question 3: What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS?	Theme 5: Communication as an orchestra, not as a solo instrumentalist named 'talking'  Theme 6: The art of drawing them in  Theme 7: Singing as a 'common sense' tool

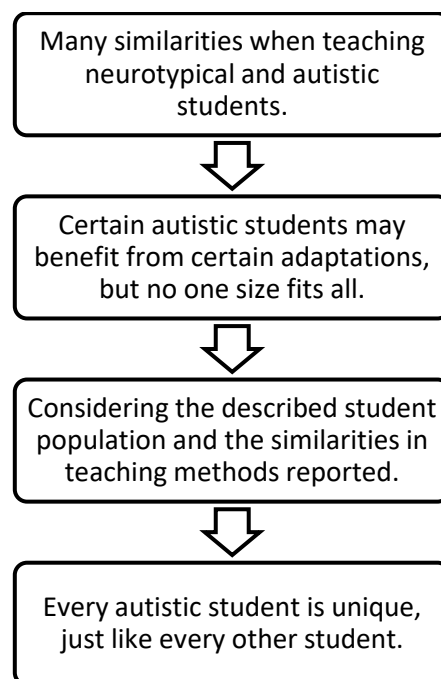
The following seven arrow diagrams are presented to briefly outline each developed theme's scope and flow (refer to Figures 6.1 – 6.7).

Phase 1: Online questionnaire

Research question 1: What approaches do teachers of singing consider to be effective in teaching singing to autistic students, including students who are MS?

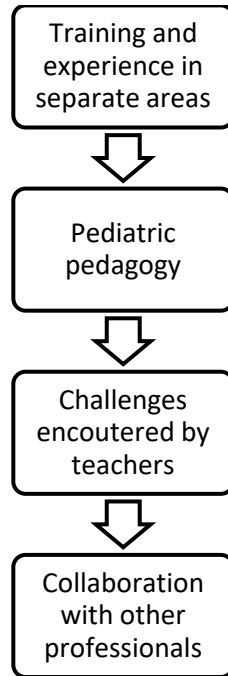
Theme 1: No cookie-cutter approach

**Figure 6.1** *No cookie-cutter approach*



Theme 2: The significance of experience

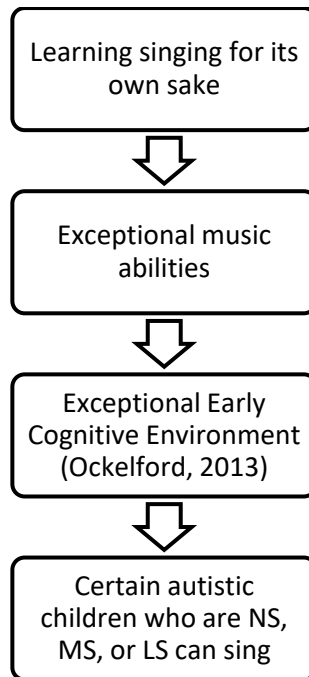
**Figure 6.2** *The significance of experience*



Research question 2: What is the impact of teaching autistic students to sing as perceived by teachers of singing?

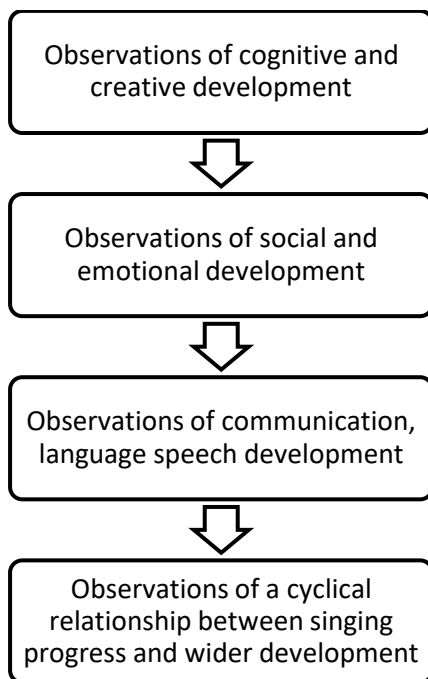
Theme 3: Singing may get better

**Figure 6.3** *Singing may get better*



Theme 4: It is not only singing that may get better

**Figure 6.4** *It is not only singing that may get better*

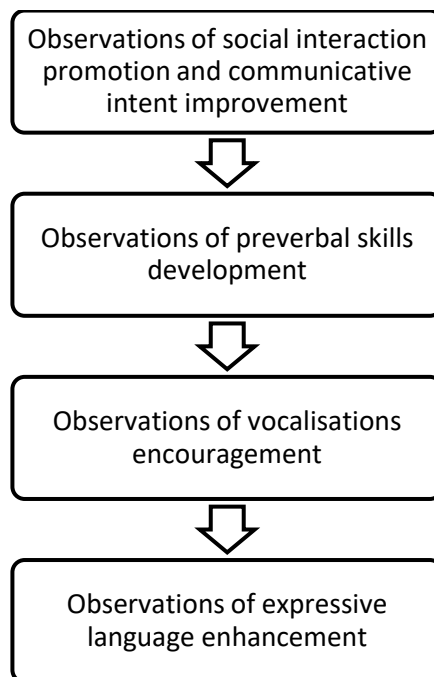


Phase 2: Online interviews

Research question 3: What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS?

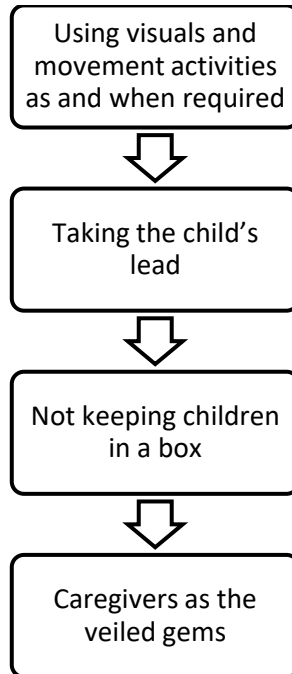
Theme 5: Communication as an orchestra, not as a solo instrumentalist named 'talking'

**Figure 6.5** *Communication as an orchestra, not as a solo instrumentalist named 'talking'*



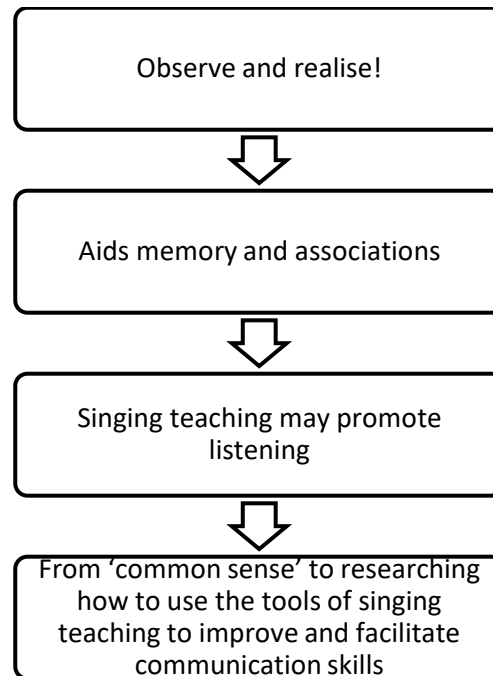
Theme 6: The art of drawing them in

**Figure 6.6** *The art of drawing them in*



## Theme 7: Singing as a 'common sense' tool

**Figure 6.7** *Singing as a 'common sense' tool*



### 6.3 Online Questionnaire Analysis

This section presents the themes developed from the collected online questionnaire data with singing teachers who have experience with autistic students. The themes of *no cookie-cutter approach* and *the significance of experience* are related to the first research question of the online questionnaire: *'What approaches do teachers of singing consider to be effective in teaching singing to autistic students, including students who are MS?'*. Concerning the research question: *'What is the impact of teaching autistic students to sing as perceived by teachers of singing?'*, the themes created were that *singing may get better* and that *it is not only singing that may get better*. This analysis integrates the answers to the qualitative

questionnaire questions (online questionnaire questions 4, 9, 31 and 32) with those given to the quantitative questions, which were the rest of the online questionnaire's questions.

### **6.3.1 Theme 1: No Cookie-Cutter Approach**

The qualitative and quantitative data collected in the online questionnaire indicated contradictory meanings about practical approaches used to teach singing to autistic students, resulting in the *no cookie-cutter approach* theme. This theme focuses on the tension that was suggested in the collected data, the contradiction that teaching singing to autistic students is very similar to teaching singing to neurotypical students. However, at the same time, there may be differences because, like every other individual, neurotypical or neurodivergent, every student is unique. The title of the theme was inspired by the following extract, which was taken from an experience shared by a questionnaire participant.

There is no cookie-cutter approach that works for all autistic students. They are all individuals so a fresh approach is required for each. Taking the time to develop trust with the student means that results are often excellent as generally they would only want to do singing lessons if they love music. (Online questionnaire, question 32)

A common view amongst questionnaire respondents was that there are many similarities between teaching singing to neurotypical and autistic students. It was suggested that the cookie-cutter approach seems to be an illusion, not only if one pretends to use it when teaching autistic students, but also if one tries to apply such an approach with neurotypical students.

As a teacher working mostly one to one, I have the luxury of being able to cater for the individual needs of all of my pupils so I am used to changing and adapting in the moment. This seems to work for pupils on the autistic spectrum - but it also works for everyone else! (Online questionnaire, question 32)

I like to get to know all of my students (neurotypical and neurodiverse) and tailor my approach accordingly. (Online questionnaire, question 31)

Viewing singing as an innate ability for both neurotypical individuals (Stadler Elmer, 2020; Stadler Elmer, 2012a) and autistic individuals (Warnock, 2019), which can later be further developed through specific singing training (Wan et al., 2010b), amongst the questionnaire participants echoed the view that regardless of being a neurotypical or neurodivergent student, every student attends singing sessions to cultivate their love for the innate ability of singing.

I don't see it much differently than seeing results in a neurotypical student- everyone comes wanting to learn to sing better. (Online questionnaire, question 31)

I find teaching my autistic student no different to my normal students. She tries just as hard and takes part in all the same opportunities we offer as all other students. (Online questionnaire, question 31)

Apart from surfacing in the qualitative interview questions, the view of numerous similarities between the teaching of singing to neurotypical and autistic students also surfaced in specific quantitative questionnaire questions. This included the questionnaire's questions focusing on the frequency and length of sessions, the steps and methods of the sessions, the genres of songs sung during sessions, the way the progress of students is measured, and the collaboration with other professionals when teaching students. For example, when reporting the frequency and length of singing sessions, a 30-minute session once a week was most common for both general singing sessions (76%) and sessions with autistic students (62%). The comparison of the following comments added to the question about the frequency and length of the sessions further suggests the concept of similarities between the teaching of neurotypical (online questionnaire, question 7) and autistic students (online questionnaire, question 21).

It varies depending on pupil or group. (Online questionnaire, question 7)

Depends on the situation. (Online questionnaire, question 7)

As and when required. (Online questionnaire, question 21)

It all depends on the situation. (Online questionnaire, question 21)

Correspondingly, a similar picture was portrayed when teachers reported musical theatre songs (97% in general singing sessions; 85% in sessions with autistic students) as the most popular genre of songs taught.

When instructed to comment on the colour, setup, lighting, décor and size of the rooms where sessions occur (online questionnaire, question 9), many respondents described a typical setup associated with a studio or a music classroom. However, a participant described a somewhat different setting:

It was home-like. Outside there were swings, places to roller skate and grass. (Online questionnaire, question 9).

The phrase 'home-like' hints that the participant might have felt that such a setup, in contrast to a typical studio or music classroom setup, can encourage certain autistic students to feel more comfortable during their sessions.

Focusing on the adaptation of physical and social environments when teaching autistic students (online questionnaire, question 23), nearly all respondents underlined that the

development of connection and trust is of utmost importance in building a relationship with the students (n=33; 97%). This overall sentiment, which could be felt throughout the questionnaire, was that this type of development is not only beneficial for autistic students but equally crucial for neurotypical learners. Movement during sessions (n=31; 91%) was followed by the simplification of instructions (n=30; 88%). However, the tension created along the theme keeps on surfacing, as while these adaptations are reported along with other adaptations, such as the prevention of routine disruptions (n=27; 79%) and the change of expectations (n=24; 71%), the following comment was added by a participant:

Changes depend on the student. (Online questionnaire, question 23)

This comment returns the emphasis to the 'no-cookie-cutter approach'. Although certain autistic students may benefit from specific adaptations, there is no adaptation or set of adaptations that can be applied to teaching all autistic students. This is precisely the same as when the overwhelming majority of participants indicated that practically no technique or adaptation can work with each and every neurotypical student.

Discussing generalisability in reflexive thematic analysis, Braun and Clarke (2022) argue in favour of the reflection "on the ways in which the characteristics of our participant group/dataset, and the context and setting of our research, may have shaped or inflected our 'results'" (p. 146). Along a similar wavelength, a singing teacher who participated in the online questionnaire wrote:

My student is at the higher functioning end, so minimal adjustments needed as I always follow a predictable structure. My student has demonstrated excellent performance skills. I have noticed she needs clearer instructions for home practice and my lesson notes system helps with this. (Online questionnaire, question 31)

The perspective endorsed by many questionnaire participants should be put into context. 100% of the participants had experienced teaching Level 1 autistic students, while only 24% had experience with Level 3 autistic students. While 35% taught more than 10 autistic students, only 9% taught more than 10 autistic students who were minimally speaking. In addition, while 32% experienced teaching autistic students who were minimally speaking, only 18% of the participants taught autistic students whose language was non-functional. This profile of the participants might have contributed to the perception that there are a few differences in teaching singing to neurotypical and autistic students. To analyse this possibility, the research question of the study's second phase specifically targeted autistic students who are NS, MS, or LS, not autistic students in general, as targeted in the two research questions of the first phase of the study. This was decided after comparing extracts similar to the previous data extract (Online questionnaire, question 31) with extracts capturing the following idea:

Especially on an Autism Level 3 - a reaction to a rhythm and a point of focus due to music is where the satisfaction stems from. (Online questionnaire, question 31)

The tension which was built throughout this theme led the way to further analysis in the project about how singing sessions can be developed not only for autistic students but specifically for autistic students who are NS, MS, or LS. This distinction is echoed and strongly catered for in the Sounds of Intent framework (Sounds of Intent, n.d.-a; Sounds of Intent, n.d.-b; Sounds of Intent, n.d.-c), which has specific levels and domains to make sure that every individual can benefit from what music education can offer, regardless of the different needs

and abilities of each individual. The first level of this framework is “learning to hear”, followed by the levels “sounds interesting” and “copy me copy you”. The fourth level is “bits of pieces”, the fifth is “whole songs”, and the last is “the wider world of music” (Sounds of Intent, n.d.-b). The framework progresses through various levels, from initial hearing stages to advanced performance potential.

Moreover, the differing opinions that teaching singing to autistic students can be similar yet may sometimes be different from teaching to neurotypical students lead to the commonly underlined belief amongst the questionnaire participants that every autistic student is unique, unique like every other neurotypical student. Students’ uniqueness requires a holistic approach, which meets the students where they are and accompanies them through an adequate and safe journey. Williams (2019) explains that:

Singers need kind, empathetic nurturing during their training and throughout their performing life. They need permission to fail: making mistakes and learning from them takes courage, and it can only take place if the pupil feels safe to do so. ... The teacher can create space for the singer to grow, suggesting goals without shattering dreams. (p. xxxiii)

When asked to describe how the progress of neurotypical students is measured (online questionnaire, question 12), 32 respondents (94%) chose an increased sense of enjoyment. For 34 respondents (100%), achieving personal singing goals was paramount. In the same vein, when answering the same question about autistic students (online questionnaire, question 26), an increased sense of enjoyment was chosen by all respondents (n=34; 100%), and the achievement of personal singing goals was highlighted by 31 respondents (91%). These results suggest that when respecting the uniqueness and individuality of each particular student, irrelevant to being a neurotypical or an autistic student, a way is paved to support all students according to their starting points and continuing progress. As one participant put it:

Often, I find it is the lesson the students can be themselves and shine in a way they can't elsewhere. (Online questionnaire, question 31)

Emphasising the potential that singing teachers have to create a personalised and supportive 'world' for students, another respondent writes that:

The satisfaction comes in the accessible space that is being created that you know that the world is not yet catered completely for. (Online questionnaire, question 31)

### **6.3.2 Theme 2: The Significance of Experience**

Analysing the questionnaire data to answer the research question related to effective approaches associated with the teaching of singing to autistic students, the code 'experience' kept surfacing in association with various responses. Responses indicated that experience contributed to every single approach adopted in teaching singing to neurotypical and neurodivergent students. Experience, derived from each individual's training, seemed to leave its imprint on the teaching methods used with students, forming relationships with students and collaborating with other professionals.

Training leading to different qualifications equips singing teachers with the necessary tools to explore the singing teaching field and further develop their expertise. The qualifications of the questionnaire respondents were typically related to music, education, singing, vocal pedagogy, theatre studies, musical theatre studies, vocal health, performance, music theory, musical instruments and dancing (online questionnaire, question 4). Qualifications linked to neurodivergent conditions, including autism spectrum conditions, were not commonly reported. The following extracts are examples of the qualifications which could be related in some way or another to neurodivergent conditions or autism:

MSc (Teaching and learning/SEND), Assorted CPD courses on ... SEND

TQUK Level 2 Qualification in Understanding Autism

(Online questionnaire, question 4)

Examining the extracts above, it can be underlined that the qualifications reported by the participants are not specifically focused on how to teach singing to neurodivergent students, including autistic students. Qualifications reported typically focus on specific, separate areas, such as singing, autism, or vocal pedagogy. Training focusing on the Sounds of Intent framework (Sounds of Intent, n.d.-a; Sounds of Intent, n.d.-b; Sounds of Intent, n.d.-c) was reported by only one participant. Four participants reported teaching experiences related to autism or Special Educational Needs and Disabilities (SEND). This qualification profile of the questionnaire participants suggests that the approaches described in the questionnaire are mainly approaches resulting from experiences that are not grounded in specific training on how singing can be taught to autistic students, including students who are NS, MS, or LS.

Nearly half of the questionnaire participants (n=16; 47%) reported teaching more than 300 students during their careers. On the other hand, only 35% of the respondents (n=12) taught more than 10 autistic students. The qualification profile of the participants might be one of the contributing factors resulting in such a difference between the number of neurotypical and autistic students who attend singing sessions to develop their singing skills. Lack of training targeting how to teach singing to autistic students might hold back singing teachers from further developing their experiences with autistic students. This can result in fewer autistic students deciding to enhance their singing skills through vocal training. When these findings are analysed along with those published by Stanutz et al. (2014) and Heaton et al. (2008), which suggested particular musical abilities in autistic individuals, many questions about possible singing teaching training arise. Reece (2015) reported that autistic children described as “non-verbal” (p. 126), in certain cases, could also sing. However, 23 respondents

(68%) reported no experience with autistic students who are minimally speaking, and only 32% (n=11) reported experience with this population (online questionnaire, question 17). During the first phase of the study, the questionnaire, the term 'minimally speaking' referred to students with "a very small repertoire of spoken or fixed phrases" (Kasari et al., 2013, p. 480).

Participants described an array of methods used when teaching autistic students. Voice-to-voice was reported by 94% (n=32) and recorded backing tracks by 91% (n=31) (online questionnaire, question 25). A striking finding is that while the methods of recorded backing tracks (n=33; 97%) and voice-to-voice (n=31; 91%) were also frequently used in the teaching of singing to neurotypical students (online questionnaire, question 11), a noticeable difference could be observed in the use of traditional notation and solfege. Traditional notation refers to the musical symbols, including the staff and notes, providing a universal language for musicians. Following this, solfege is the use of syllables to sing pitches. With autistic students, traditional notation was reported by 62% (n=21) and neurotypical students by 88% (n=30). Similarly, with autistic students, solfege was reported by 32% (n=11) and neurotypical students by 47% (n=16). This observation suggests that singing teachers might use traditional notation and solfege more with neurotypical students than with autistic students. An intriguing question is, what will the use of traditional notation and solfege with the concerned population achieve, if singing teachers are specifically trained to teach singing to autistic students, focusing on different levels of autism and different communicative abilities? It would be thought-provoking to analyse how teaching solfege during singing sessions can encourage the development of the communicative skills of autistic children who are NS or MS. El Mogharbel et al. (2003) describe an autistic girl whose music motivates her to produce phonetic sounds. There is abundant room to analyse how trained singing teachers, or speech-

language pathologists, can use solfege to develop the vocalisations of children with the same communicative profile as this girl. Will solfege aid this girl in further developing her consonant-vowel (CV) vocalisations?

Furthermore, when discussing young children and the approaches described by the questionnaire participants, the participants' teaching experience with neurotypical and autistic children must be considered. Three participants (9%) taught autistic children aged one to five years old, and 17 (50%) taught six to ten-year-olds (online questionnaire, question 15). When participants were asked to report the ages of autistic children who were minimally speaking, according to the definition given by Kasari et al. (2013), only one participant (3%) reported experience with one to five-year-old children (online questionnaire, question 19). Seven respondents (21%) had experience teaching students aged six to 10 years. Stadler Elmer (2020) suggests that infants and toddlers may find using syllables in melodies more straightforward than using the required syllables to create specific words. This highlights the potential that early singing activities and training can have for the neurotypical population and autistic children. The findings of the current study about the number of autistic children, including those who are minimally speaking, as defined by Kasari et al. (2013), do not seem to complement the argument of Stadler Elmer (2020). Although singing has a lot of potential to aid communicative skills in the early years of a child and subsequently in the childhood years, the present study suggests that autistic children do not frequently undertake singing activities.

Thirty participants (88%) reported teaching neurotypical children between six and 10 years old, compared to the reported number of autistic children within the same age bracket who were taught singing (21%). This contradiction in the results might indicate that if singing teachers are more familiar with singing pediatric pedagogy, like the pedagogies discussed by

Williams (2019) and Lentini (2020), their approaches during singing sessions may result in more autistic children developing their singing skills through singing training. This is because teaching singing, especially certain singing techniques, is challenging for young children. In some instances, it might be even more challenging to teach singing to autistic children, including those who are NS, MS, or LS. In addition, Lentini emphasises the important role of the caregivers during and between singing sessions. Increasing the involvement of parents might be another approach that results in more autistic children taking singing sessions. Such an approach may also promote a singing home environment from which the autistic child can benefit. Prior studies have noted the importance of sing-like speech for neurotypical children (Thiessen et al., 2005) and infants at risk for ASC (Droucker et al., 2013). The development of a home singing culture might also increase sing-like speech (Thiessen et al., 2005), a type of speech which might promote more joint attention in autistic children. If the joint attention of an autistic child improves, other communication skills may gradually improve as well.

Satisfying experiences were echoed among the questionnaire participants when the implementation of specific approaches catering to individual students' needs was reported. This was expressed in the following extract:

It is challenging but rewarding. That's really all I can say. (Online questionnaire, question 31)

As hinted in the extract, similar to when teaching singing to neurotypical students, teaching autistic students is not free from challenges. Issues reported indicate that the more challenges a teacher manages to overcome, the better the teacher is equipped to teach a particular student. Similar to when teaching neurotypical students, a way to face challenges is to accept where the students are and examine the next steps in which they require guidance.

Challenges vary according to each person. The satisfaction is always gratifying. Baby steps and a lot of patience and love are needed. (Online questionnaire, question 31)

Questionnaire participants expressed various challenges that they encounter when teaching singing to autistic students. Ockelford (2013) suggests that professionals working with autistic children might face challenges because autistic children might relate to the world around them in different ways than other children do.

It can be frustrating when working with students facing these challenges as often tried and tested strategies and resources may not work. It is a lot of extra time and effort to create resources, upskill myself and gain the necessary knowledge of the students' needs so that lessons can be personalised. However, it is deeply satisfying when a breakthrough is made and you can see progress in a student. (Online questionnaire, question 31)

Although the energy required for teaching singing to students on the autism spectrum is significantly different in both quality and quantity, by far my lessons with this group of people are the most rewarding. (Online questionnaire, question 31)

Ockelford (2013) gives a unique approach to how challenges like those reported above can be faced and transformed into satisfying experiences. He suggests that one ought to “unpack the difference (or differences), and the behaviours should be explicable, and therefore potentially able to serve as resources for teachers and therapists to use in supporting children on their unique developmental journeys” (p. 14).

In the collected questionnaire data, there were suggestions that challenges might vary depending on the level of autism and communicative abilities of the student.

I enjoy the challenge and intellectual stimulation but this may be because I have predominantly worked with those who are high functioning. (Online questionnaire, question 31)

It is somewhat surprising that although data suggested that challenges might in some way or another be related to the specific profile of the autistic student, a minimal difference was

observed between teachers working with other professionals, such as other educators and speech-language pathologists, when teaching neurotypical and autistic students. When teaching neurotypical or autistic students, nearly one-third of the participants (n=10; 29%) reported that they do not collaborate with other professionals. When teaching singing to autistic students, teachers reported collaborating mostly with educators (n=21; 62%) and speech-language pathologists (n=6; 18%) of the students. In revisiting the title of the current theme, 'the significance of experience', working with other professionals can promote the sharing of different experiences from people who have engaged in various training experiences. Collaboration with other professionals can also encourage different perspectives on how specific challenges encountered by singing teachers can be tackled. This is certainly an important issue for future research. Researchers can examine why singing teachers sometimes work alone instead of teaming up with other professionals when teaching singing to autistic students. Understanding this situation better, researchers may also analyse how professionals, like speech-language pathologists and occupational therapists, might accompany singing teachers throughout their teaching journeys with autistic students, especially those who are NS, MS, or LS.

### **6.3.3 Theme 3: *Singing May Get Better***

The online questionnaire was developed to inform the second and third phases of the current study. In addition to exploring the approaches that singing teachers consider effective when teaching autistic students, the second aim of the questionnaire was to investigate the impact of singing training on autistic students as observed by singing teachers. By analysing the collected data, the first theme developed regarding the second research question was 'singing may get better'. It is important to emphasise that the purpose of this theme is not to make a definitive statement about singing improvement; rather, it reflects the perceptions of

singing teachers, since no objective measures were included in this exploratory research to assess singing progress.

The simple title 'singing may get better' was particularly chosen for this theme to represent a very straightforward idea: if a person receives singing training, there is the potential that the singing of this person improves.

Hard at first to understand what best works for the student but overall managed to gain some basic skills in reading music especially. (Online questionnaire, question 31)

I can most certainly hear an improvement in pitching and see a much more relaxed, physical stance when singing. (Online questionnaire, question 31)

Working with different professionals, I can say that the words 'autism' and 'music' are frequently associated solely with the phrase 'music therapy'. Many individuals might have the idea that music therapy is the only or main musical activity for autistic individuals. Music therapy has a lot to offer to autistic individuals (Dunn et al., 2019). As Dunn et al. (2019) suggest by the title they chose for their work, music therapy can accompany an autistic person "across the lifespan". Nonetheless, as the extracts above indicate, for autistic individuals, music education can never replace music therapy and vice versa; the two disciplines are similar but have different aims. Aligning with the questionnaire participants, Ockelford (2000) emphasises that students with learning difficulties can engage in music-related educational sessions and programmes to develop their musical skills. Ockelford et al. (2002) explain that "while the *content* of therapeutic and educational sessions for clients or pupils/students with severe or profound learning difficulties is likely to be similar, the *aims* should be different" (p. 178).

Additionally, as the Sounds of Intent framework (Sounds of Intent, n.d.-a; Sounds of Intent, n.d.-b; Sounds of Intent, n.d.-c) clearly demonstrates, different individuals will reach different levels in musical skills. Comparing this to neurotypical students, not every student reaches the level of a professional musician. This fact does not result in music therapy being seen as the only option for neurotypical individuals. Neurotypical students do not all reach a professional level because of various reasons. Commitment, musical abilities, learning difficulties and preferences for different hobbies are a few of the reasons that can be mentioned. All the reasons stated are similar to why an autistic music student might not reach a professional music level. When analysed thoroughly, the examples given of why a neurotypical person might not reach a professional music level can be traced in the following extracts:

It's the best job ever, but progress is measured over years, not weeks. (Online questionnaire, question 31)

If any person, especially someone on the autism spectrum, does not enjoy singing, then it becomes an exercise in futility. It is best to try build a rapport and work slowly, without pushing too much. Pushing and insisting will only frustrate the student and the teacher so care needs to be taken of what's best for the student and not for what anyone else expects the student to do. (Online questionnaire, question 31)

Similar to the difficulties faced by neurotypical students, the above difficulties outlined by the questionnaire participants might be faced by an autistic student developing singing skills during singing sessions. While admitting that autistic students, like every other student, can encounter difficulties during a singing training journey, participants indicated that a singing session with an autistic student (online questionnaire, question 22) could still be similar or very similar to that with a neurotypical student (online questionnaire, question 8).

Both when teaching singing to neurotypical students and to autistic students, teachers include vocal warm-up exercises (n=33; 97%), breathing exercises (n=28; 82%), skill-building exercises (n=29; 85%) and application of singing technique to repertoire (n=29; 85%). As indicated in the following extract, when attending singing sessions, an autistic student, like every neurotypical student, may benefit from the development and enhancement of singing skills:

More autistic children and adults could benefit from singing! (Online questionnaire, question 32)

Interestingly, certain autistic children demonstrate exceptional innate musical abilities. The relationship between autism and particular musical abilities has been reported in prior studies, such as those carried out by Heaton et al. (2008), Heaton (2003), Stanutz et al. (2014) and Warnock (2019). This observation dates back to 1943 when Kanner (1943, as cited in Wan et al., 2010a) pointed out the outstanding musical interests of certain autistic individuals. These observations in previous literature were also suggested in the questionnaire.

They generally have a gift or high interest in music that parents want to explore further. (Online questionnaire, question 31)

Not only did my autistic students thrive with music, they excelled. I had one especially amazing experience with a student who I spent one-on-one time with - I gave him a guitar to try. He had never played before and was exceptional at it. He soon joined the rock band and was killing it with his peers. (Online questionnaire, question 32)

The boy whose ability to play the guitar is exceptional and different from the musical development we are usually accustomed to, reminds me of a boy who inspired me to start my never-ending learning journey about singing and autism. The communication abilities of this boy were limited. He used to take my hands on the piano and say the name of a musical piece,

for example, “Beethoven Sonata No. 21 in C Major” or “Mozart Symphony No. 40 in G Minor K. 550”. I am writing the names of the musical pieces as direct speech because that was how he used to refer to the pieces he wanted to sing or play on the piano. Then, he hums the melody of the piece and sometimes plays it with his right hand on the piano. Another autistic girl I previously taught, who was MS, used to sing songs she liked from beginning to end; her lyrics were always perfect. These episodes are very similar to those of a very young boy, as described by Ockelford (2013). A one-year-old boy listened to the organ playing for around 15 minutes. At one year and a half, he played a series of nursery rhymes in C Major. At two years of age, the boy had the ability to play tunes using the key that he had heard them in. From relative pitch at one year and a half, he acquired the absolute pitch ability at two years of age. This autistic boy was blind and had severe learning difficulties.

Ockelford (2013) explains that for certain autistic children, the “experience of music is likely to be very different from that of the majority: more vivid, more intense, more exciting, more exhausting” (p. 226). Describing why short musical snippets might be played repeatedly by autistic individuals, he writes that in contrast to a neurotypical child, “to a child with finely tuned auditory perception, there are in fact many different things to attend to in even a few seconds of music, and many relationships between sounds to fathom” (pp. 240-241).

Furthermore, Ockelford suggests that certain autistic individuals may process all everyday sounds as musical sounds instead of sounds with a specific function. For example, the sound of a microwave is processed in musical terms, not as a sound with a particular meaning in everyday life. As the figure *The supposed impact of ‘Exceptional Early Cognitive Environments’ caused by autism on musical and wider development* (Ockelford, 2013, p. 242) indicates, this Exceptional Early Cognitive Environment may result in difficulties associated

with language processing and understanding the function of various sounds around us. Autistic individuals may also demonstrate a preference for auditory detail and patterns.

Ockelford (2013) argues that since the autistic brain may process everyday sounds differently from a neurotypical brain, problems with sensory processing may arise. While a neurotypical boy may have the ability to focus on his mother's instructions, an autistic boy might not be able to ignore the sound of the microwave and the horn of the car to focus solely on his mother's words. The autistic boy might process all the mentioned three sounds in musical terms, lacking the ability to link each sound with its functional significance. A link between what Ockelford (2013) refers to as Exceptional Early Cognitive Environment and the following questionnaire extracts can be observed:

Sometimes standing still can be problematic and focusing on a specific area of a room. (Online questionnaire, question 28)

The main difficulties I find are sensory and so I always address these first so that we find a comfortable way to sit or stand or move around whilst we sing. (Online questionnaire, question 28)

When asked about difficulties encountered when teaching singing to autistic students, participants reported that attention problems are the most common (n=28; 82%). Difficulties following instructions (n=20; 59%), problems with sitting tolerance or staying in an assigned area (n=19; 56%) and sensory issues (n=17; 50%) were also pointed out (online questionnaire, question 28). The difficulties described could all be seen as a result of what Ockelford calls an Exceptional Early Cognitive Environment. The difficulties expressed by the participants in the questionnaire are in line with those observed in earlier works, such as in Jeffery (2023). Jeffery (2023) argues that poor sensory integration causes movement and difficulties in social

interaction. Southon and Boltin (2018) write about the impact that sensory processing difficulties have on the daily tasks carried out by children. Oldfield et al. (2019) describe how, during a music therapy session, the four-year-old autistic boy Harry “was constantly moving and pacing around the room and he did not show any prolonged interest or engagement in a musical activity. He discarded instruments quickly and often got distracted by his desire to climb on furniture and instruments” (p. 44).

Ockelford (2013) manages to provide a new lens of how to understand the relationship between Exceptional Early Cognitive Environment, exceptional musical abilities, absolute pitch and sensory processing difficulties:

From observing many children on the autism spectrum over the years, I am of the view that earworms are relatively commonplace, particularly among those with AP, for whom, I suspect, they form potent elements in the youngsters’ streams of consciousness. Evidence for this includes the frequency with which children repeatedly hum, whistle or sing snippets of tunes, presumably as an expression of what they can hear in their heads, often with fingers placed firmly in the ears, to block out possible external distractions. (p. 227)

Correspondingly, Reece (2015) writes about ‘non-verbal’ children who could sing (p. 248). Similar observations of autistic children who were NS, MS, or LS and could sing were made by Wan et al. (2010a) and Pullicino (2021). The questionnaire extracts which follow support the observations made by Reece (2015), Wan et al. (2010a) and Pullicino (2021).

He used to spend science lessons under the table but he learned how to use music to feel safe and improve his mood. Perhaps most impressively, he gained enough confidence to sing a song in front of his whole year group in assembly. Staff and pupils were astonished. Many of them had not heard him speak before and had no idea he could sing. (Online questionnaire, question 31)

A boy with limited communication, always wears an orange t-shirt, attends a specialist school. He’s gentle and prefers to sing falsetto. (Online questionnaire, question 31)

The findings agree with Reece (2015), on the basis that singing ability in autistic children who are “non-verbal” (p. 248) can clearly demonstrate Exceptional Early Cognitive Environment in practice. In the extracts above and the situations described by Reece, children may be processing sounds only as musical terms, not as sounds with specific functional meanings.

Reece (2015) writes:

It is doubtful that the children understood the words they sang, and it may be that they were processing the words as a series of abstract sounds, i.e. as music. It is almost as though, for the children, the words function as another strand in the musical texture – like a series of changing timbres. (p. 248)

This argument had plenty to offer to the present study. It led to the questioning in the study’s second and third phases of how Exceptional Early Cognitive Environment, and the exceptional musical abilities that can be present in autism, may be potential tools to improve and facilitate communication skills in autistic children using education ‘in’ and ‘through’ singing.

#### **6.3.4 Theme 4: *It Is Not Only Singing That May Get Better***

An objective of the online questionnaire was to explore how singing teachers perceive the broader developmental effects of singing teaching on autistic students. The theme of *singing may get better* focused on the effects of singing training on the musical skills of autistic students; the theme of *it is not only singing that may get better* builds on the theme *singing may get better*. It discusses how, in addition to an effect on singing skills, according to teachers’ observations, singing training might also impact the broader development of autistic students. It is important to emphasise that the purpose of the theme ‘it is not only singing that may get better’ is not to make a definitive statement about any relationship between singing and improvements in communication skills or other areas of cognition and behaviour. Rather, the theme reflects the perceptions of singing teachers, as no objective measures related to the broader developmental effects of singing were studied in this exploratory research. The

potential transfer effects between music and non-music abilities were explored in studies such as those conducted by Schellenberg (2004) and Gordon et al. (2015). The following two extracts written by the questionnaire participants hint at the possibility of an effect of singing training on the enhancement of cognitive and creative development.

Their exploration of music helps pupils to deepen their understanding of communication through sound and I have worked with children and adults whose expressive communication has grown and developed through music. (Online questionnaire, question 31)

[Singing tuition for autistic students] Boosts confidence and helps creativity too, helps them to express themselves through other talents they might not know they had. (Online questionnaire, question 30)

An interesting suggestion expressed in the previous extracts is that singing sessions might affect how autistic individuals or those around them think about their potential. If individuals or those around them believe that something can be achieved, reaching the target might become more manageable. For example, an autistic boy might not demonstrate his full potential while participating in mathematics or language classes. This will result in those responsible for his academic development believing that the boy's cognitive and creative abilities have specific limitations. As soon as this boy is seen in a different situation, singing a song instead of sitting during a lesson without talking to anyone, teachers and other individuals might challenge their perspective about the same student. This can also happen to the parents of autistic children.

It might be difficult for parents of autistic children to find opportunities that offer a smooth, empowering passage for the step-by-step development or enhancement of cognitive and creative skills. The findings of the first phase suggest that for specific autistic individuals,

singing training might be one of the possible smooth, empowering channels. Singing sessions might also serve such a purpose because, as hinted in one of the previous extracts, parents and professionals working with autistic individuals might adopt specific methods or techniques used during singing sessions in their daily routine with autistic individuals. These observations indicate abundant room for further studies to determine how certain methods and strategies used with autistic students during singing sessions can be adapted to be best utilised by parents or professionals.

The previous two extracts both suggest that singing training may also affect the general wellbeing of an autistic student, precisely having an effect on social and emotional development. The relationship between music training or engagement in music activities and improvement in the wellbeing of individuals has been widely researched. Daykin et al. (2020) write that “evidence suggests that, overall, singing is positively correlated with wellbeing outcomes in a wide range of population groups, and that participants in singing groups generally report positive experiences” (p. 38). The relationship between engagement in singing training and a positive effect on wellbeing was echoed in many questionnaire responses, as indicated in the following extracts. In addition, when reporting observed benefits of singing tuition on autistic students, 91% (n=31) indicated building of social relationships, 85% (n=29) underlined better wellbeing, 76% (n=26) reported improvement in emotional skills and 62% (n=21) observed a development in social reciprocity (online questionnaire, question 30).

From the two students I had taught who had mild autism and the other Asperger’s syndrome, I felt that both of them truly blossomed especially since they kept it up for quite a long time... I have taught them both one-to-one as well as in groups over several years and I saw them not only get better musically but also they developed some great friendships too. (Online questionnaire, question 31)

Being able to see a student's improvement in confidence and being able to include in more performances is very satisfying and the relationship they have toward expressing themselves through singing. (Online questionnaire, question 31)

Jeffery (2023) argues that it is crucial to "support a learner's continuing enjoyment of music and help them reap the benefits of music as a tool for wellbeing" (p. 219). She suggests that if a student is in a state of "flow" (p. 219), an optimal state for learning described by Csikszentmihalyi (1990, as cited in Jeffery, 2023), the five OPERA conditions of overlap, precision, emotion, repetition and attention required for musical training to impact speech processing adaptive plasticity (Patel, 2011) are more likely to be met. Jeffery (2023) explains:

In flow, learners will apply their skills with engagement and light but focused attention. The state of flow is rewarding and will lead to repetition. To achieve a flow state, the task must be challenging enough to maintain focus and attention but not so tough that the task becomes stressful. (pp. 219-220)

The notions of engagement, attention, reward, repetition and challenge referred to in the quotation by which Jeffery links flow to the OPERA conditions required for the transfer of music domain skills to language-related skills could all be hinted at in the following extract written by a participant who completed the online questionnaire:

I teach a boy, age 11 and have done for 3 years. He has various ticks and anxieties but loses them all when he sings. It is one of my favourite lessons in the week because he just loves it and we have so much fun and laughter. ... He has now joined the school choir, which he would never have done a couple of years ago. His parents, other teachers and I are so proud of him and all he has achieved. (Online questionnaire, question 31)

The observations of singing teachers suggest that improvements in cognitive, creative, social, and emotional development may promote communication, speech, and language development, and vice versa. In the questionnaire, frequent references were made to the effect of singing training on communication skills in general. Starting with the critical function

of preverbal skills in communication development, a participant described the following situation:

I recently had one student hold eye contact with me and smile after singing a song through particularly 'well'. It is a moment I will never forget. (Online questionnaire, question 31)

When asked about the effect of singing training on preverbal skills, 71% (n=24) reported an improvement in attention, 65% (n=22) an improvement in eye contact and 65% (n=22) an advance in imitation (online questionnaire, question 29).

In the online questionnaire, in addition to the observation of singing training on preverbal skills, a reference to the possible benefits singing can have on speech was also noted. The following extracts present the opportunity that singing gives every individual, including autistic students who might be NS, MS, or LS, to discover their voice by exploring and making different sounds.

Playing with the voice, making various vocal effects. (Online questionnaire, question 29)

A specific reference was also made to the potential impact of singing on expressive communication skills:

Their [autistic students'] exploration of music helps pupils to deepen their understanding of communication through sound and I have worked with children and adults whose expressive communication has grown and developed through music. (Online questionnaire, question 31)

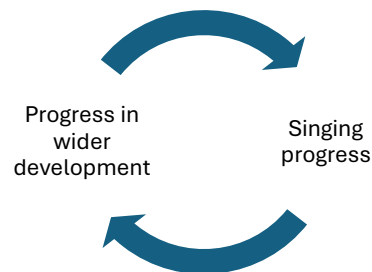
The previous three extracts and the noted improvements in listening skills (n=29; 85%), communicative intent (n=28; 82%), expressive communication skills (n=27; 79%) and receptive communication skills (n=26; 76%) (online questionnaire, question 30) all broadly

support the suggestion made in previous studies (e.g. Jeffery, 2023; Patel, 2011; Sihvonen et al., 2024). That being, that singing might be a potential tool to target improvements in communication, speech, and language development.

Further on, analysing the results of the questionnaire's questions related to the effect of singing training on communication, speech and language development, it should be noted that the reported results were observed when the main goals of the singing sessions were not related to communication skills development, but to singing and musical skills development. For example, while teaching a song or a scale, improvement in the communicative intent of an autistic boy was gradually noted. Since, as suggested by Patel (2014), there is the possibility that musical training is particularly aimed at improving communication skills, the question which followed naturally in the current study was: *What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS?* This informed the development of the research aims of the second and third phases of the study. During the development of the research questions for the second and third phases, the questionnaire findings on the observed effects of singing sessions on communication, speech, and language development were interpreted with caution. This was done because other activities or training that students participated in, apart from singing sessions, might also have influenced the improvement of communication skills reported.

Connecting the questionnaire findings on the observed effect of singing training on the broader development of autistic students to my daily experiences, I think there may be a possible cyclical relationship between singing progress and the enhancement of wider development (see Figure 6.8).

**Figure 6.8** *A possible cyclical relationship between the singing progress and the enhancement of wider development*



This cyclical relationship can be hinted at in the following questionnaire extracts:

When singing becomes their special interest then many issues take care of themselves. (Online questionnaire, question 29)

The empowerment of the student is improved when they achieve something – I've seen students literally beam when they have nailed something challenging they have been working on. (Online questionnaire, question 30)

Observed during my work with autistic students and suggested in the previous two extracts, there might be a possibility that singing improves cognitive, creative, social, emotional and communication development. I observe that as a student improves in broader development, singing skills may further progress, leading to possible improvements in skills related to broader development. I believe that if carefully built and maintained, this cyclic relationship between the enhancement of singing skills and wider development could benefit autistic students.

The themes developed for the study's first phase proposed exploring practitioners' and parents' perceptions of how singing can facilitate the communication skills of autistic children

who are NS, MS, or LS. Online interviews with parents of autistic children who are NS, MS, or LS and practitioners were carried out during the study's second phase.

#### **6.4 Online Interviews Analysis**

Reflexive thematic analysis was used to analyse the qualitative data collected from the online questionnaires carried out with parents of autistic children who are NS, MS, or LS and with different professionals. The specialists interviewed were two speech-language pathologists, two occupational therapists, two music therapists and two singing teachers with experience with autistic children who are NS, MS, or LS. Two early-years educators and two foreign language teachers were also interviewed because of the possible similarities when working with autistic children who are NS, MS, or LS, and very young children who are still developing their communication skills and students who are learning a foreign language at the beginning stages. The interviews aimed to answer the research question: What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS? The three themes developed are 1) communication as an orchestra, not as a solo instrumentalist named 'talking', 2) the art of drawing them in and 3) singing as a 'common sense' tool.

##### ***6.4.1 Theme 5: Communication as an Orchestra, Not a Solo Instrumentalist Named 'Talking'***

Imagine an orchestra. There is the violin sounding its colourful strings. The trumpet is making a statement. The oboe is proud of the bright, expressive notes that it is managing to draw. The viola is walking around throwing warm and rich colours. Every instrument is vital in an orchestra, but no one instrument can make the sound of an orchestra. The conductor facilitates the relationship between each instrument so that every instrument is given its importance. When it comes to the orchestra of communication, unfortunately, the solo

instrument named 'talking' is often mistakenly seen as the solo instrument producing the orchestral sound named 'communication'. The pressure placed by many institutions and people, including parents, on autistic children that the only essential communication method is 'talking' could be felt throughout the online interviews. The following extract suggests the frustration felt by a music therapist working with autistic children who are NS, MS, or LS when constantly observing a lack of understanding regarding communication skills and autistic children who are NS, MS, or LS.

What's really interesting is that I work in a lot of schools. So and I think I mentioned this before schools are very driven by getting children to conform to communicate in a way that's not perhaps relevant to them. But is relevant to the wider world. So often they say, "Can you come in and help develop their language skills their communication skills" erm and it's about understanding what communication skills means for the people that I'm working with because for teachers it's usually talking erm but for me, it can be anything from eye movements, looking towards me, erm moving towards an instrument. It can be making a vocalisation. It might even be that they are verbally and they're vocally stimulating, it can be whatever, it's a means of communicating. So, I think it's my experiences is that my expectations of what communication skills can be very different to the establishments I work with. (Online interviews, Music Therapist 1)

Recognising that communication involves much more than just talking, the collected data from the interviews suggest that singing can be a conductor which facilitates the development and enhancement of various communication skills of autistic children who are NS, MS, or LS. A singing teacher explained that in itself, learning to sing is learning to communicate with others.

But I think that erm any any one person who does singing or sings has so much more access to their language and to their erm ability to communicate cos part of a singing lesson is you're learning to communicate in a way that erm that is authentic ... So I think that erm if I were to observe anything it would be that singing has this kind of full functioning erm ability to make accessible things that are harder for others and erm and I think it's a powerful tool, I do. (Online interviews, Singing Teacher 2)

As the previous extract implies, apart from being a way of communication, singing teaching might also serve as a powerful tool when focusing on communication skills. The DSM-V-TR (APA, 2022b) explains that the features of autistic spectrum conditions include “persistent impairment in reciprocal social communication and social interaction” (Autism spectrum disorder, F84.0).

The interview data suggests that singing might be beneficial when targeting social interaction. A speech therapist describes his experience when using songs with autistic children who are NS, MS, or LS:

I use lots of routine songs ... I start a song, it's a repetitive song and then I stop and there would be some interaction. At first the interaction would be, maybe they look at you, maybe they make a hand gesture. (Online interviews, Speech-Language Pathologist 2)

Describing her autistic daughter playing *Pat a Cake* with her brother or grandparents, a mother explained:

For example, when the grandparents or her brother invite her to play such a song, erm she at first ... stares eye contact and then accepts it and when they start singing it, she continues to keep eye contact ((she claps and moves hands forward)) while clapping and touching other's hands. (Online interviews, Parent 1)

The idea of the potential of songs to encourage the joining in of autistic children with the outer world was also expressed by a singing teacher who is also a speech-language pathologist:

Erm in the area of speech therapy I have actually found that erm a lot of my some of the nonverbal kids erm responded really positively to singing ((Interviewer: Okay.)) and some of them ((inaudible)) very limited verbal skills. Erm it was something they they could sort of learn and they would they would join in and have that joined experience with you when you would sing to them. Erm so with some of the kids that really loved to hear singing or to hear music, I would use it as a communication therapy tool, so erm when kids are trying when they're trying to help erm establish communication

between erm the students you want them to understand, you know, I give something to you and you give something back, like that idea of a conversation. (Online interviews, Singing Teacher 1)

The above extract presents songs as a tool to help autistic children understand what it involves to interact with others. The singing teacher explained it using the effective words, “I give something to you and you give something back, like that idea of a conversation”. Since songs are repetitive and some of them, like nursery rhymes, might be familiar to many children, they can make it easier for autistic children to start exploring their first steps of social interaction.

It was echoed in the interviews that children might associate a song they frequently hear with something it is usually linked to. For example, if a mother sings a song before dinner to an autistic child who is NS, the child might someday hum the song to communicate his needs. Apart from being a potential tool that might help autistic children to interact with others, songs may also offer an opportunity for autistic children to communicate their intent of requesting something. As the following extract demonstrates, in the beginning, the intent to request something may not be expressed by humming or singing a song but by other communication methods, such as a gesture to sing more. This can slowly lead to children humming the song themselves to request something, as described in the following extracts.

... one of the parents I have worked with before, she used to sing goodnight to her two-year-old, three-year-old who was nonverbal. And she would sort of like sing this goodnight song as they started to go to the room for bed. Erm and he actually, as he got a little bit older, he started to sort of hum along to sing along the tune at that time. ((Interviewer: Wow!)) Erm so it sort of became a signal ... (Online interviews, Singing Teacher 1)

It could happen like in everyday life. Children could start associating, for example, I don't know, we make the song of the *Hungry caterpillar* before food, so they could make associations. (Online interviews, Speech-Language Pathologist 2)

Although the development of each child is unique, it might be common for autistic children to find it easier first to socially interact with their primary caregivers, including their parents or a therapist they frequently work with. Songs may be helpful in these first steps of social interaction.

The nursery rhymes help me build that relationship with the client erm even if they give me just an eye gaze and then look away, but they, the songs, the music, they just know that it's something different. (Online interviews, Speech-Language Pathologist 1)

... maybe that one of the crocodile, [an expression expressing surprise] what's the name of the nursery rhyme? I forgot. Erm ((sings)) row row row your boat, gently down the stream ((singing stops)). So I take out a boat, I pretend, we pretend, I just put like three chairs behind each other and we pretend we're on a boat. ((Interviewer: Okay.)) And me, myself, or the daddy, or the mummy, is the crocodile. (Online interviews, Speech-Language Pathologist 1)

Interaction with primary caregivers may slowly lead autistic children to feel comfortable using songs to interact with other important people, such as their peers or teachers. A speech-language pathologist describes a three-year-old autistic child initiating an interaction with a friend.

He went to a friend, a boy and he started singing, let me remember, the *If You're Happy and You Know It* and he started to hum, he used humming, he couldn't use words. But he started humming ((she hums the tune of *If You're Happy and You Know It*)). But that was interaction, that was his way of interacting with his peer ... (Online interviews, Speech-Language Pathologist 1)

The previous participants' suggestions about singing as a potential tool to promote social interaction and communicative intent support the work of Oldfield et al. (2019). Oldfield et al.

describe the difficulties that Harry, a four-year-old autistic boy who was NS, faced regarding engagement in musical activities. After a number of music therapy sessions, the boy was reported to respond gradually through melodic lines.

Moreover, developing and enhancing preverbal skills is vital in children's communication development. Works such as those of Wimpory and Gwilym (2019) describe music strategies, including songs, to establish preverbal interaction of autistic children in Musical Interaction Therapy. In the same vein, Simpson and Keen (2010) used the song *Old MacDonald Had a Farm* with three autistic boys to promote the improvement of receptive communication skills. Consistent with the literature, the online interviews also suggested songs as a potential tool for developing and enhancing the preverbal skills of autistic children.

... mostly I use the songs erm and also in the younger ones to initiate erm gestures like clapping, pointing, et cetera. (Online interviews, Occupational Therapist 2)

Further to songs being a potential tool for preverbal development, the interview participants suggested that songs are a practical yet underexplored tool that many professionals and parents have yet to discover and use.

But by that I am giving different opportunities in just, not even a minute, because a nursery rhyme, it can only take a couple of seconds to sing it, ((Interviewer: Yes.)) but during that time I'm giving the opportunity for him to hear what I'm saying, so he is following commands and instructions, erm he is seeing, so *The Wheels on the Bus* he's seeing the wheels, the people, the door opening and closing, the driver shouting, the mummy saying, "Shh!", daddy saying, "I love you!". So those are all erm greetings, so by that I am also giving the opportunity for social skills, that is greetings bye, hello and by that I'm using also my hand, gestures and key word signing. (Online interviews, Speech-Language Pathologist 1)

Autistic children might encounter attention-related difficulties (Murray et al., 2008; Charman, 2003). Parents and professionals working with autistic children may face problems

related to early child attention, joint attention, maintained attention, single-channelled attention and multi-channelled attention. As a crucial preverbal skill, the term 'attention' often surfaced in the interview data. Participants reported songs and singing as an aid, which can be used both to target attention improvement specifically or to improve attention of autistic children indirectly. The following extract exemplifies how songs encourage different demonstrations of attention; for specific individuals, the attention referred to in the extract below may not be so evident.

But attention is much more than that. It's about you know your physical responses, verbal responses that can be eye movement, dilation of the pupils, it can be body arm body movements, it could be attack to a beat, it could be a movement like one of the physical stims that they do, one of their physical stims might be in time to the song that you're singing. So, you know, it's about that attention erm some of mine were clapping in time, beat along to songs on instruments, remembering the words remembering which one, showing showing that. That's because I have some children who turn their backs. They don't actually turn to face. ((Interviewer: Okay.)) Yeah, but they will rock in time to the music so I know that they're with me. I don't need anything more from them because they are actually there and I can be singing a familiar song and they find it comforting and you can tell because they move in linear movements. (Online interviews, Music therapist 1)

At the clinic, I frequently hear phrases from parents like, "he has zero attention" or "he never looks at me when I call out his name". Slowly, after starting to know the child's preference, I start to include very short phrases from songs that the child is familiar with in the session. I notice that the more the melodies are known to the child, the easier it will be to gradually start developing a connection with the child.

A parent of an autistic child who is MS described a situation of her child when he was very young, listening to nursery rhymes and performing actions linked to the rhyme.

... the short like nursery rhymes erm on YouTube, I used to to play for them on the television ... when he was little ((Interviewer: Okay)) erm dancing in front of the television erm and clapping and turn around, depends on what the song was saying,

you know, to do. He was just following the instructions and he was, he was only very little when he used to do this ... (Online interviews, Parent 2)

The observation of this parent has a lot to offer to future researchers. The child was not forced to do this task; he enjoyed the activity. He was doing the actions of his own volition. What can this observation suggest for schools teaching autistic children or for parents who need to communicate instructions to their children? How can this tool be used in the daily routine? Knowing the importance of the stages of play, such as exploratory, nonfunctional, functional and symbolic play, for both neurotypical and autistic children, songs might be tools which easily promote improvement in play skills. As seen in the second extract which follows, similar to the observation about the autistic boy following instructions of his own will in the previous extract, sometimes children choose the tools of songs and singing on their own.

... a nursery rhyme about sleeping, so I prepare a baby, a blanket and they can use it. But like that we are practising symbolic play. (Online interviews, Speech-Language Pathologist 1)

... but it is also a way how they, how they play and I think that is something really beautiful to observe ... they also use it as a way how to play together, like *Row Row the Boat*, we're all rowing together. It is not just me, it is, we're singing it together. (Online interviews, Early-years educator 1)

Furthermore, certain studies suggest that autistic children might find motor and sound imitation challenging (e.g. Hamilton, 2013; McIntosh et al., 2006; Rogers et al., 2003). A speech-language pathologist reported the use of songs to facilitate motor and sound imitation:

Erm, so with nursery rhymes I am tackling attention, I'm tackling imitation, both sound and motor imitation, for example, sound like erm ((sings)) Old MacDonald had a farm, E-I-E-I-O ((stops singing)) and I use a toy of a cow, of the pig, ((Interviewer: Yes)) and so on and so forth. Erm I'm practicing motor imitation ((sings and demonstrates the

action of jumping with her fingers)) jumping on the bed. Erm and like that, the child is practising the gesture and he's imitating me. (Online interviews, Speech-Language Pathologist 1)

In certain autistic children, speech difficulties accompany social interaction difficulties. Tarbox et al. (2009) carried out a study in which they employed the chaining procedure to teach echoics (e.g. 'Monday'), to autistic children. Given that songs and singing may facilitate motor and sound imitation in autistic children, future studies may analyse how songs can be combined with the findings of Tarbox et al. (2009) to promote sound and motor imitation in the concerned population. Jeffery (2023) writes that "we can use songs, singing and musical activities with pre-verbal learners or those who prefer alternative means of communication" (p. 203). Her suggestions include using kazoos, microphones and semi-occluded vocal tract activities with straws. In the interview data, Jeffery's view was echoed by two music therapists and a parent of an autistic boy who is MS; the singing setting was described as a scenario encouraging vocalisations to flourish.

... then I bought them, when they were only about four or five, I think, like a karaoke machine. ((Interviewer: Ohh! Okay.)) Yes and he used to sing and scream and erm he was really delighted to hear his own voice, you know, through the speakers then. (Online interviews, Parent 2)

The microphone absolutely is honestly it changed my sessions for children who never really spoke and I'll get some who will sing. They might not know the words but they'll go ((hums the tune of *Five Little Monkeys* without using vocalisations but no words)) and you've got to think these are seven-year-olds who never speak. So, but the mic there and then because they get used to these songs, they get more confident and then actually then they go they want the microphone. They look for that microphone because they know that's when they get to make a sound and they get to make musical sounds ... (Online interviews, Music Therapist 1)

The interviewees suggested that singing can be a passage from sounds to words. Certain autistic children may start from certain sounds which resemble humming or babbling. The discovery of the voice might lead them to try to link appropriate sounds to develop words.

This passage from sounds to words is demonstrated in the extract which follows:

I started teaching a particular student ((Interviewer: Okay.)) who in the previous years was completely nonverbal. Then, during the summer before the students entered the student entered to our school, erm his parents took him to a foreign country and they visited a zoo and he started imitating the sounds of the different animals and from then on, he managed to develop a bit his speech but it was very elementary. Then when I introduce songs during the lesson, he he imitates those sounds too. (Online interviews, Foreign Language Teacher 1)

A singing teacher points out the special pitch ability of an autistic boy who is MS, hinting at the concept of Exceptional Early Cognitive Environment coined by Ockelford (2013). She describes this boy's ability to sing certain sounds or words in specific songs.

So pitch wise, he had sort of a concrete, like, on this note, this is the sound I make with it and it was really, it was very specific, it is very specific and it is very consistent erm. Versus, like, in his talking, sometimes the word even 'yes' isn't always the same, if that makes sense. ... Erm so then erm with some songs with words the first song we used was Do-Re-Mi from *The Sound of Music* ((Interviewer: Yes)) because he could find those places in it, that Do and he was successful with the solfege Do and sometimes, I would say more like forty percent with the words in the song, so Do a deer, a female deer, he would get maybe Do and deer, but the other like miniature little smaller words, in that he wasn't picking up on or he wasn't articulating as quickly. ((Interviewer: Okay.)) Erm, but the whole scale and he was able to sing that in front of an audience ((Interviewer: Wow!)) and erm with his hand signs where they needed to be ... (Online interviews, Singing Teacher 2)

Remarkably, the previous extract raises questions about what solfege during singing sessions might offer to NS, MS, or LS students, especially to promote the first CV sounds like Do, Fa, or Mi. Similar to the observation of Stadler Elmer (2020) that a song consisting of prolonged vowels may be more straightforward for children whose language is still developing, Singing Teacher 2 observes that the autistic boy finds it easier to sing vowels:

Erm there is a song in the level two erm *Resonance Royal Conservatory book* and it's go the ((sings)) ah dee ((stops singing)), oh *Winsome Rover* now I get it, it's ah dee doo ah dee doo dah day and it's got certain nonsense syllables for the chorus of it ... the ah dee doo with that like carefree feeling in that section, he was able to really let go off that erm frustration that he has with the word communication and the shapes because it's so free you can say any vowel or shape with that melody and still get it, so in that song his melody was always correct ... (Online interviews, Singing Teacher 2)

Further analysing in detail the previous extract, one can also highlight that the boy's freedom to sing vocalisations with a song supports the argument of Stadler Elmer (2020) that it may be easier for young children to vocalise sounds with songs than to join syllables to form specific words. Specific songs might be more suitable than others for certain autistic children who are NS, MS, or LS; therefore, the choice and editing, as necessary, of a song can be beneficial when teaching songs to autistic children who are NS, MS, or LS. The choice of specific singing warmups, exercises and songs corroborates the argument of Patel (2011) that music training specifically planned to target particular speech goals may aid in speech improvement.

... it really does help, I feel like a lot of the shapes for this particular student has started connecting since he started singing ... I think that it's a very it's a big little puzzle piece to how he can find those shapes and connects his brain to his erm motor skills that he's using ... (Online interviews, Singing Teacher 2)

The interview data suggests that singing can also be used as a tool to enhance expressive language in autistic children who are NS, MS, or LS. Although speech is important, communication and language skills should be prioritised when helping an autistic child in the first steps of communication development. To instil the first interest in language, songs which are repetitive and familiar to the child may be very impactful:

... I use routine songs. They have loads of repetition and even the melody, usually it engages the children much more especially the nonverbal children to become verbal, to become more interested in language. (Online interviews, Speech-Language Pathologist 2)

Participants noted that for children who are NS, MS, or LS, songs can be very helpful to form the first association between one object and another. A child may link the song *Rain, Rain Go Away* with very bad weather or the song *The wheels on the Bus* with going to school.

Erm this song is used for transition or this song is used before we go out for break, or this song is used before the maths lesson. I believe that in that way, apart from the visuals, the music in conjunction with the visuals, will assist the nonverbal and the not so verbal child ((Interviewer: Okay.)) to understand better transitioning and what is happening around them. (Online interviews, Occupational Therapist 1)

Even when they are when they're doing the cleanup especially, they're singing as well. So it can help them and it can, for example, you can match the song with what they are doing for example. It can help them a lot. (Online interviews, Early-Years Educator 2)

A questionnaire study conducted by Reece (2015) with parents, teachers, carers and music therapists of autistic individuals indicated that “words learnt from songs cross over into everyday activities for 43% of the children with some language delay compared to just 12% of non-verbal children and 36% of children who speak at the appropriate level” (p. 126). This concern was also expressed by a singing teacher with experience with autistic children who are NS, MS, or LS:

... you know you teach them to sing and then you extraculate words from there, it doesn't work so easily that way around erm, at least I don't think so. Let's try to see, erm but a lot of times they do learn things like the alphabet, like how kind of rote learn, how to sing the alphabet song ((Interviewer: Yes)) perhaps that doesn't necessarily help them understand a b c d and each function of that because they may have just memorised the set of sounds in the song rather than having erm awareness of the meaning. (Online interviews, Singing Teacher 1)

The following extract is an experience shared by a parent of an autistic boy who is MS. This situation presents a mother daily building a context for her child to use the words learnt from songs until gradually he can start a short interaction with them.

Erm I think there is erm there is a bit where he's using erm there are situations when he's using words from the songs in the daily life, erm like ... *Who stole the cookie from the cookie jar?* So, cookie, yes, "you want cookie?" ... I understood what he wanted, he's happy that he gets it, so he's happy because I'm happy and get what he wants. ... there are, all the words that he try to, not only regarding the food obviously, that he try to communicate to say in the daily life, I think the maybe ninety percent there are from the vidoes, from the songs, from what he's watching all the time. So even like let's go to wash, I want to wash, or brush teeth, ((sings)) brush teeth number one up and down ((stops singing)), so he can sing and brush his teeth or we wash ((sings)) wash your bum bum wash your bum bum every single day ((stops singing)). So all these words, you know, wash, day, erm sleep, good night, all these things that we hardly notice them because we are used to communicate for me it means a lot, because I understand what he wants, I manage to get somewhere with him. So when he really come to to me every night, to because this is our routine, brush teeth, have a shower and bed. So sometimes, either I'm doing something or it's not the time yet, he's coming on his own and, "mama wash, wash?" So I'm really happy, so he's tired, I understand that he's tired and he wants to have the shower just to be able to go in bed to rest, to sleep. So it helps, there is all these words that he he's using them, I'm telling you the majority they are from the songs. (Online interviews, Parent 2)

The use of words learnt from songs in everyday contexts by autistic children is certainly an area that requires the attention of many researchers. I see songs as a potential tool whose power is starting to show, but the method to extract this power is far from being discovered. Familiar repetitive songs may be modified to encourage autistic children who are NS, MS, or LS to use various parts of speech, including nouns, verbs, prepositions and pronouns. The effect of such techniques requires a lot of attention in future studies.

The primary goal of many singing teachers is not speech, language, or communication goals but music and singing-related goals. In these cases, collaboration with parents and professionals working with the child can lead to the incorporation of certain communication points that the autistic child is working on during the singing session. Examples include choosing between one song and another and answering a preferential or factual yes or no question about a song; an interviewed singing teacher hinted at this.

So I try and see what communication strategies her parents are currently using and I try and use the same ones or if I noticed they're trying to get her to use certain speech like maybe they want her to say, "I want this," instead of just saying the thing, like they're trying to extend her sentences. Then I'll try that also within the lessons, try and ask her things in a way that will reinforce those other communication things outside. And I think that's something that a lot of singing teachers and music teachers can also, just sort of consider chatting to parents about when you're teaching kids in this area because we have such an opportunity to add to their communication even outside of the singing just in the way we talk to them and in the way we put our teaching at the level that they can understand ... (Online interviews, Singing Teacher 1)

The theme *communication as an orchestra, not a solo instrumentalist named 'talking'* focused on how, for autistic children who are NS, MS, or LS, songs and singing may be potential tools to target various communication skills. The next theme discusses the various ways that exist to engage autistic children during singing sessions.

#### **6.4.2 Theme 6: The Art of Drawing Them In**

The second theme developed from the collected data to answer the research question, 'What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS?' is *the art of drawing them in*. Different strategies tailored to the needs of each child may be employed to enhance engagement during singing sessions. A common view amongst participants is that visuals and movement activities may be beneficial when combined with songs and singing to enhance the communication development of autistic children who are NS, MS, or LS. Previous studies focusing on songs and communication development, like those by Simpson and Keen (2010) and Reece (2015), often incorporated different kinds of visuals like pictures or posters. Future studies may analyse how movement can be combined with songs and singing, targeting the improvement of communication skills of autistic children. The first extract which follows is part of an interview with a foreign language teacher and the second is taken from an interview with an early-years educator. These two extracts exemplify the similarities that exist between

the promotion of communication skills development to autistic children who are NS, MS, or LS and to very young children or individuals learning a foreign language at very early stages. All of these situations involve individuals developing their communication, language and/or speech skills at early stages.

... for example, if the song has the verb 'to fly', you do the erm the motion with your hands ((action of flying with hands)). If you have the verb 'to jump' or 'to eat' you you're kind of mimic erm so it's like an addition of drama and dance as well with the song. I find that it is a very helpful method. So what you hear, you can also show. ((Interviewer: Okay, okay and can ...)) It's not just static, you're just sitting down and you're listening to a song and you are learning the words and you're writing them down, but you are engaging them to stand up, get out of their place and start moving around as well. (Online interviews, Foreign Language Teacher 2)

Erm, we also use hand gestures, which helps a lot with hand gestures because once they're moving they're also, their body, it's a four-year-old, so most of the time they want to move. So if for instance we're doing *Twinkle Twinkle*, we're using the hands ((demonstrates the gesture with her hands)). Erm we're also using music instruments, so for instance if the ball is bouncing, then you have erm maracas or you have shakers and the ball is bouncing and we're using them. Erm puppets, we use also puppets and they work they work really well as well. Erm stick-puppets, finger-puppets, for instance for the finger families and you have them on your fingers, or you have the *Old MacDonald's* and you have on your fingers the animals, so those are visuals for them. We give also props to students, let's say we're doing *Old MacDonald* and you give the child a mask each. (Online interviews, Early-Years Educator 1)

Different autistic children require different levels and uses of visual aids. While for a child, a picture or a poster might be enough to link a noun in a song with its meaning, another autistic child may not understand the concept of a picture. For this child, a tangible object may work better. For other children, a visual timetable of singing tasks would be helpful during a singing session or for home practice.

... things that they can hook into ... if I can I have little bags full of soft toys and then they'll take the soft toy out of the bag to match the animal. (Online interviews, Music Therapist 1)

However, it is also relevant to note that any visual may sometimes distract an autistic child during a singing session. Giving children a tangible soft toy or a piece of paper with lyrics and pictures related to a specific song may make them focus on the object presented. For example, a child might keep looking at the lyrics and images related to a song instead of focusing on the song's rhythm. Certain children might not recognise a specific visual object as a communication tool. Every child is unique, so what works with one child might not work with another.

In terms of visual for like, while they're singing, erm that has only been distracting ((laughs)). So it's been, so we have, we like put a card together of like different pictures of like what the text was but the card was physically distracting like it felt like extra things in his hand, kind of idea. Erm and then we're like, okay well, what about lyrics on a paper, on a stand and that was too erm distracting physically as well, like I wanna touch it or I'm looking at the words too much that I forget to sing, erm that kind of yeah, yeah. (Online interviews, Singing Teacher 2)

Testing the effect of Melodic Intonation Therapy (MIT) and speech-language pathology sessions on two children with Developmental Apraxia of Speech, Lagasse (2012) suggested that future studies should analyse the possibility of "a more engaging approach to facilitating communication" (p. 49). An important aspect when trying to increase a child's engagement during a session is to take the child's lead. The interviewees shared experiences regarding children who find it easier to sing words when they see that a song is more motivating for them, or children who prefer to sing one specific song for a particular time. A parent even reported how important it is for her autistic boy to choose his songs, no different from any other individual.

... he doesn't accept me to choose the songs that he listens. ... we have erm those applications that we have working on the on the tablet and it happens to be with songs erm, I can't say that he really enjoys them, erm either because he knows that we are

doing homework ((Interviewer: Okay)) and he but the songs are quite nice but he don't enjoy as much as he enjoy when he choose his own or type of music or type of videos that he wants to watch. So I wouldn't say that I have much involvement in the style and the type of music ((Interviewer: Okay)) that he's listening. (Online interviews, Parent 2)

The majority of interviewees underlined the importance of autistic children choosing songs that they prefer. Nevertheless, parents and professionals expressed different views about the choice and use of non-age-appropriate and age-appropriate songs.

I can't for example, sing a song that, I don't know, that he never listen, erm I can erm but I can't sing a song of Beyoncé for example and try to push because he won't feel attracted. ... he enjoys only the very very childish songs, that rhythm of the nursery rhymes ... (Online interviews, Parent 2)

She still watch a lot of nursery rhymes, for my, if I need to give a percentage, daily, she 80% she watch nursery rhymes and 20% normal, common music, erm common, popular pop, for example or Italian music. (Online interviews, Parent 1)

The phrases 'try to push' in the previous extract of Parent 2 and 'still watch' of the prior extract of Parent 1, suggest that the interviewed parents are concerned that their children prefer non-age-appropriate songs. However, a foreign language teacher and a music therapist expressed a contrasting view to that of the two interviewed parents about non-age-appropriate songs. The foreign language teacher indicates the possible use of non-age-appropriate songs to facilitate early language skills development. The music therapist presents songs like nursery rhymes as potentially useful options in the development of early communication skills.

Okay, so first of all, what I do, for example, imagine that we are learning the means of transport. I go to YouTube and I see whether there are songs related to the means of transport or for example, if there are pedagogical songs because normally we do not use from actual singers, but we use pedagogical songs that are full of vocabulary that we need. ... So they are like, you know, kinder level, they are still learning how to say vocabulary related to the family, the colours, ((Interviewer: Okay.)) to school. So,

unfortunately, if I use regular songs, sometimes, they are too difficult for them. ... I try to find a balance between both pedagogical songs and regular or normal songs. (Online interviews, Foreign Language Teacher 1)

... a lot of traditional songs and lots of nursery rhymes ... I tend to use more of that for singing initially ((Interviewer: Okay)) and then I move and then I use other genres, more for developing other forms of communication. (Online interviews, Music Therapist 1)

The idea that the music therapist expressed in the previous extract corroborates with the observation of Warwick (2019), who, while underlining the importance of improvisation in music therapy, explains that there are “many instances when using pre-composed or recorded music, especially songs familiar to the clients, provided the basis of the therapeutic relationship” (p. 28). A possible balance between age-appropriate and non-age-appropriate songs might be reached when parents and professionals analyse which songs a child best relates to. Taking the child’s lead as much as possible might be an appropriate approach when using songs to improve and facilitate the communication skills of autistic children who are NS, MS, or LS. Unfortunately, we may not always be able to understand a child’s choice for a specific genre of songs. However, if we join the children in their chosen musical journey, we may one day better understand their choices and be able to accompany them in whatever they require from us. The reason a music therapist gives for certain autistic children choosing what might appear to be non-age-appropriate songs for us is particularly striking. She suggests the safety that children might find in certain melodies. The need to sing the same songs over and over again also complements the argument of Ockelford (2013); he explains that for certain autistic children with a superior ability, a musical phrase is never listened to enough because they can spot so many details in it.

And I just think it's singing nursery rhymes and singing familiar songs and singing in with language patterns that they are repetitive so that they get to understand what they mean and and singing the same songs over and over and over and over again so that they get the sense of safety and security and a positive attachment. Erm so that when everything else in the world is not making sense, they've got something to hold on to. (Online interviews, Music Therapist 1)

In the following extract, a parent describes her daughter singing what, for many, might be non-age-appropriate songs to communicate in her preferred way. The girl is described as changing the nursery rhyme words according to her needs. Analysing this case, is there any other way than to do as much as possible to take the child's lead in a musical journey?

When she plays with the toys, she combines the nursery rhyme with the toy she has, for example if she has 10 soft toys, she she sing *Ten In a Bed* and imitate ((sings)), "there were 10 in a bed and the little one said, "roll over roll over"" ... And there is a part 'and one fell out'. She throws one on the floor from the bed, example if she has erm five toys, she sings five monkeys jumping on the bed. ((Interviewer: Ahh, okay.)) And sometimes she changes some nursery words to ((Interviewer: Yes)) adjust to the toys she has, for example, if she has Playmobil toys, she likes them a lot and she sings erm ... ten, example *Ten In a Bed*, let's say that song. ((Interviewer: Okay.)) She says, "10 Playmobil toys in," she she says the toys she has in front of her in the nursery rhymes. ((Interviewer: Okay.)) Even *The Wheels on the Bus* erm, if she has a yellow car, "a yellow bus", if she has an orange bus, she says, "an orange bus", so she changes some words to on the nurs- but still she keeps the rhythm, if you if you don't you don't see the toys she has in front of her you you you say she's singing example *Wheels on the Bus* ... (Online interviews, Parent 1)

After being open to taking the child's lead, the step that follows to aim for maximum engagement of a child during a session is to choose suitable methods and techniques for each particular child. The interview data suggested various methods which can be applied when teaching singing to autistic students who are NS, MS, or LS to improve or facilitate communication skills. When teaching repertoire to students, it was suggested the sessions started with basic musical goals, like understanding basic rhythm and then keeping an eye out for when a change in task is required. Giving students the time needed to master specific goals

was also frequently highlighted. An early-years educator observed that children may feel uncomfortable when asked to sing alone. Thus, children who might not have difficulties with social interaction might feel awkward when singing a song alone. Bearing this in mind, the findings indicate that when planning singing sessions with autistic children, especially those who are NS, MS, or LS, it may be helpful to consider that individuals for whom social interaction can be complex might find it even more challenging to start singing a song during a session.

When you actually tell them to sing by themselves, they usually get shy and they don't want to do it unless they are already full of confidence and they've already been exposed to it, maybe from home and maybe they've been exposed to it also in different contexts, such maybe a singing classes, et cetera. (Online interviews, Early-Years Educator 1)

The data suggests that it might not be so realistic to expect that an autistic child who is NS, MS, or LS will start to sing a specific part of a song or a song when asked to do so. Leaving out words in a song and copying and building on vocalisations sung by children are examples of methods which might be effective with certain children. Taking the child's lead during a singing session, especially a singing session specifically aimed at facilitating the communication goals of autistic children who are NS, MS, or LS, is a step towards avoiding keeping children in a rigid box. This idea was clearly expressed in the following extract:

... so it's erm having to think on your toes a lot of the time and be really adaptive and really responsive and not trying to fit them into a box because I won't do that. I want them to be free to be them and explore who they are and respond how they are. Erm so I think everything has its place. ((Interviewer: Okay.)) And I think schools, as I say I still think schools are very much keeping them in a box, sitting them on the carpet listening to somebody talking at them. (Online interviews, Music Therapist 1)

While knowledge about autism spectrum condition is a must when having an autistic client, as Warwick (2019) exceptionally expresses, "While we do need to understand the

diagnostic criteria, as therapists, we must never forget that we are dealing with a person rather than a condition” (p. 19). Ultimately, only when we start living this reality will we realise how unjust it is to keep an autistic boy in a box or try to get him to conform to what society decides for the majority. This leads to giving students the space they require during every stage of their learning journey and tailoring sessions according to each person’s individuality. Findings hint that not keeping clients in a box can also mean accepting that there are certain autistic children, similar to neurotypical children, who do not like music. A singing teacher reported the following situation:

Erm I did have one student, he was sensitive to music in a negative way and it’s the only one out of the whole time I was practising that he was sensitive to music in a negative way. So one time when I tried singing to him, it really made, like I could tell straight away, it was not good to him and you know later on I found out if the teachers were playing music in the background he couldn’t handle that. So I think just being aware that occasionally there are students that for this sensory issue ((Interviewer: Yes.)) the music is more difficult, but a lot of students it seems it can be quite helpful. (Online interviews, Singing Teacher 1)

Additionally, to avoid restricting someone’s growth and potential, in the collected data, the need to continuously relate to a student and be patient to appreciate the uniqueness of each individual was hinted at. Professionals described learning to deal with an autistic person, not with an autism spectrum condition diagnostic criteria. It is a continuous learning journey to learn how to accompany clients through their exploration of the musical world.

I’m still learning I’m still learning and that’s what’s quite exciting as well. (Online interviews, Music Therapist 1)

The extract that follows is a distinctive example of a singing teacher using examples and language that might be very useful for an autistic child who is learning new singing concepts. The extract demonstrates the significance of the professional’s experience;

throughout the years, the professional can keep learning and refining the methods used during sessions with autistic children. Data also suggests that what an educator learns from an autistic child might be helpful when teaching neurotypical children; in the following extract, this is suggested by the phrase “I do this for all of my students actually”.

... when we're more working on recital prep, I'll give him a couple places to look, like little pens in the pushpin, I do this for all of my students actually, little pins in my wall and you like, “okay there is there is Fiona the pin and there is Fredrick the pin, those are your audience, ((inaudible)) look towards the audience,” and erm that seems to work really well. ((Interviewer: Okay, thank you.)) And he won't wonder as much because of that. (Online interviews, Singing Teacher 2)

Furthermore, a common view among interviewees was the vital role of parents or caregivers in targeting the maximum engagement of autistic children during singing sessions. Often, no one knows the child better than parents or caregivers do. Especially with autistic children who have difficulties communicating with others, caregivers can contribute to a better relationship between the child and professionals, especially during early sessions.

I also tune in to what the parents, the parents sort of indicate to me. So sometimes I can tell from the parents that they know if we try one more time it'll be okay and she'll push through to finish it. But sometimes I can tell from also the parents that they're they're also okay, we should just move on to something else erm and I think that working with any any special needs at all is that you have to always remember your parents are the best support you have as well because they know their child's situation intimately compared to anyone else. They know they know everything more than anyone who sees a child once a week can know ((Interviewer: Yes)) so having a good relationship with the parents and being able to talk to them and be like, “okay, do you think this is working?” (Online interviews, Singing Teacher 1)

Interviewees reported the presence of caregivers during sessions. This finding supports the idea of Lentini (2020), who intriguingly suggests that “the voice teacher should be mentoring not only the child but the parents as well” (p. 24). She explains how crucial it is

for parents to note what is going on during the sessions so that they can monitor their children's practice and progress at home.

That helps with continuation ((Interviewer: Okay)) at home, so they, so they practise what we have been practising during these 45 minutes. ((Interviewer: Okay.)) So that helps with continuation. (Online interviews, Speech-Language Pathologist 1)

The interview findings suggest that the participation of caregivers during sessions with autistic students might be beneficial in certain cases. Apart from mentoring caregivers to take notes of what happens during the session, parents might be encouraged to participate as much as possible in session activities. For instance, after an educator carries out a task with a child, a caregiver can do the same task with the child during the session. This practice is advised by Mize (2020), who emphasises the importance of "coaching" (p. 12) the parents during speech-language therapy sessions. The practical relevance of Mize's coaching argument is echoed in the following extract:

I don't know, this is erm this is a bit where I need help myself. I don't know how to do this. I need advice because me personal, I don't have at all experience. I mean more than to let him to choose his own type of music I can't do, because no matter what I tried, I saw that he's not attracted. So plain and simple, I don't know how to put it in his life, in his daily routine. I have the tool, but I don't know how to use it. You know? So that's why I need advice. That's why I need somebody to to support me in this mission, I need I need somebody to help me, to teach me how to to make him use this erm this music in his life, because it's obviously that he enjoys this music, he's obviously it's obviously that he learn from it, it's obviously that his attention erm it's there when when he wants and when it's regarding the music, so benefits only I would say. The only problem is that I don't know how to make use more of it. (Online interviews, Parent 2)

Suppose caregivers are coached during sessions to sing with their children. The family might then slowly start building a singing culture, which can contribute to developing and enhancing the caregiver-child relationship. Frequently, I observe caregivers who encounter difficulties relating as much as they wish to their autistic children, especially those who are

NS, MS, or LS. Underlining the benefit of using the musical tool to enhance a caregiver-child relationship, Nugent (2019) describes how Interactive Music Therapy “focuses on offering children and families a positive experience and supports both the skill development of the child and the quality of the parent-child relationship ... families can gain new insights into this relationship through the medium of music” (pp. 179-180). The need to cater for a caregiver-child relationship can be felt clearly in the following situation shared by an interviewed occupational therapist:

... at the moment I have a kid, an eight-year-old kid erm, seven, that she is, that she loves, she doesn't speak, but she loves to sing music and generally she speaks, she sings the music from the radio. ... We laugh because erm me and her mother were at school together and we used to love this kind of music, so I tell her like, she's like you, she loves music like you. You know and also like that the mother can associate also herself, can see a bit of herself in the child, because generally they, kids on the spectrum the parents tend to not associate themselves with them because, “no I didn't use to do this,” ... “they don't have anything from me,” ... erm but when I tell them, for example, ... “they resemble you,” they love your kind of, they can connect themselves as a parent more to their child. (Online interviews, Occupational Therapist 2)

Moreover, future researchers may study practical approaches based on music that can help caregivers enhance a relationship with autistic children while giving them tools to encourage the children's communication development and enhancement. The following extract demonstrates the usefulness and the urge for this type of research:

... in this holiday while we were driving, erm we were singing all of us so I mean, me, his father, his brother, so we challenge him, we were singing, like for example, erm the first few words of this song and then we let [Ramon] to continue. To say at least one or two words, we were challenging him to continue the the song. So he really enjoyed the game, he really likes it you know, because we were, keep pushing him. ... Erm and then the parts that he wasn't very clear, we were keep repeating and one by one first and then all together till he manage to get slowly slowly to the correct shape of the word. So we challenge him. If he's got assistance, if there is people or children trying to sing, he will he will enjoy, but on his own like that, just to sing in his own or to say something, it's hard, it's not there yet. (Online interviews, Parent 2)

### **6.4.3 Theme 7: Singing as a 'Common Sense' Tool**

As a mother to a five-year-old daughter and a practitioner-researcher focusing on how singing can tackle communication difficulties in children, especially autistic children, I remember recording the first melodies sung by my 1-year 8-month old daughter, generally while in her car seat. Similar to the observation of Stadler Elmer (2012a), I can say that she could form melodies, like *Rain, Rain Go Away*, before she could adequately pronounce two-syllable words. Her melodies did not include the words of the song. Still, I could recognise vocalisations similar to the song's actual words, like vocalisations close to the words 'away' or 'day', words that typically fell towards the end of phrases. The relationship between the notes was sufficient. My observations are similar to those reported by Papoušek and Papoušek (1981, as cited in Stadler Elmer, 2012a) and Stern (1914, as cited in Stadler Elmer, 2012a), who described the early singing abilities of their children. Correspondingly, the interview data hinted that singing descriptions of young neurotypical children could be similar to those of young autistic children.

[Anna] starts talking thanks to the songs she used to listen, first she used to listen nursery rhymes and her first words, ... they were, for example, erm singing parts from ... *Old MacDonald* ... and *Twinkle Twinkle*. ... And mainly she starts talking at about three years and a half ... (Online interviews, Parent 1)

For children, singing may be an action they do without thinking a lot about how they actually do it; it comes naturally for them. This is suggested by an interviewee, who is an early-years educator.

I observe mostly that students use a lot of sing alongs and song and they make up their own melodies during role play, during erm symbolic play and especially when they are also creating something erm with creative arts, when they're painting, when they are drawing and they start to mumble and also make up their own songs and they compose their own songs. (Online interviews, Early-Years Educator 1)

The previous extract suggests how natural it is for neurotypical children to sing, nearly without knowing that they are doing so; for autistic children, this action may be a more in-depth, intimate experience with sounds. The following extract explains this natural relationship that certain autistic children might experience with sounds and songs. This description continues to support Ockelford's concept of an Exceptional Early Cognitive Environment (Ockelford, 2013), which was discussed in both previous themes developed from the interview data.

... he managed to discover some videos, ... erm regarding the food, so again noises, but erm sounds not noises, okay, sounds, with people preparing or eating like ((imitates the sound of people eating)) ... and a lot of videos with slime, slime. ((Interviewer: Okay.)) The sound of that crackles, you know with the slime like ((sound of crackles)) you know when they mix the slime with the bubbles ((Interviewer: Yes)) inside and it makes that noise, also that noise it attracts him a lot. (Online interviews, Parent 2)

Apart from singing and songs being a 'natural' action for both neurotypical and autistic children, the interview data suggested singing as a 'natural' tool used by several professionals when communicating with children.

... sometimes it's done spontaneously because as you go along you are either a tune pops in your head, or maybe you hear the students picking up on something and you say, "Okay, let's try and facilitate it with a song." (Online interviews, Early-Years Educator 1)

The explained 'natural' action of singing and 'natural' tool of singing led to developing the theme of *singing as a 'common sense' tool*. The phrase 'common sense' was taken from the extract, which follows; the extract is a deeply emotional suggestion by a music therapist with experience with autistic children. In the extract, the music therapist asks why, despite observing the meaning of sounds, songs and singing for autistic children, the potential of singing to enhance the communication skills of autistic children is still underexplored.

Erm I think I think, the only thing I would say is, as adults, you know there's so much research out there about how singing is good for you about how singing promotes good mental health. How singing can enhance your physical health. It's the same for little ones. It's the same for children who you don't think are responding in the way you want them to. So why can we not apply the same logic to that? Common sense! Common Sense! ((laughs)) (Online interviews, Music Therapist 1)

Certainly, many questions remain unanswered regarding the observation of Music Therapist 1; it remains a fruitful area for future research. The use of singing as a tool, which appears to be a 'common sense' method that can potentially be utilised with autistic children to support their communication skills, is suggested in previous studies such as those conducted by Lim (2012) and Reece (2015) as a promising technique that may help with recall in autistic children who are NS, MS, or LS. The following extracts support the suggestions of Lim (2012) and Reece (2015); they show how songs might aid recall and associations with everyday concepts.

... songs help them to memorise more and to memorise faster the words because since there is a rhythm in a song, if they follow the rhythm, sometimes they finish by memorising the words. (Online interviews, Foreign Language Teacher 1)

But also the language used in daily life, if you sing about everything, sing about their routines, sing a song about brushing their teeth, sing a song about brushing their hair, sing a song about eating their breakfast, sing a song, you know just make it musical for them, lighting up all the brain, all the bits that they need so that they always know that that's brushing their teeth. Not, right, "Don't brush your teeth," ((shows with her hand that the instruction just went over the person's head, without the person understanding the instruction)). Hasn't connected with that part of the brain that needs to be connected with. They learn that eventually that's what I have to do, but why not make it and why not make it that experience that they can connect and hold on to? (Online interviews, Music Therapist 1)

Participants suggested that songs might be an easy and effective tool to facilitate the interaction of parents and professionals with autistic children, a suggestion hinted at by Mize

(2020). Mize (2020) discussed the effect of songs on the participation of autistic children in social games. The interviewees portrayed songs and singing as tools that can help you grasp a child's attention without any undesired yelling or shouting.

When we sing songs together, and I need to get their attention, sometimes a song quickly facilitates, redirects their energy. So let's say they're doing an activity and they are all clustered and clustered and they are all everywhere and their focus is like placed everywhere except the activity. When you put, when you insert a melody, or when you insert a tone or a specific song, automatically you gather the attention. For instance, we have a melody specifically for reading and as soon as the students hear the melody they know that we now have to focus on a reading, on reading. So as soon as sing ((sings)) [a song about reading], all of a sudden they know that, okay, time to now focus, we're reading a story and it gets them quite attentive because they know that we are starting something ... (Online interviews, Early-Years Educator 1)

The interviewees indicated that songs have a particular effect on autistic children. However, at the same time, they raised questions about how songs can be used to enhance the communication skills of autistic children, specifically those who are NS, MS, or LS. The extract which follows highlights this observation:

So while I do see children who have been very minimally verbal become a bit more verbal, or I hear reports from carers or parents that they're talking more at home, I don't know if music is like a magic wand ((laughs)) that suddenly fixes you know and helps the brain, I don't really know the science of all of that. But I do think that music has a very important role to play erm sometimes I've seen that erm children can sing the words of a whole song, but that's not reflected in their language skills. Maybe because a whole song can be learnt, whereas language skills are a lot more complex and fluid than that. Erm I think it is a very complex thing, but I think it is a very interesting area and that erm there can be some really interesting work done erm with speech and language therapists about erm you know, music and language. (Online interviews, Music Therapist 2)

The questions raised by the previous extract informed the aim of the third phase of the study, which was an ethnography. The third phase of the study aimed to explore how, while keeping the uniqueness of the child at the centre, I could use singing as a practitioner-researcher to improve and facilitate the communication skills of autistic children who are NS, MS, or LS.

Recognising the potential that in-depth qualitative research can have to analyse intimate, sensitive and personal situations, the qualitative method of an ethnography was seen as the appropriate method to carry out the third phase of the study. A music therapist, who reported that “I sing everything. I very rarely talk in any of my sessions” (Online interviews, Music Therapist 1), suggested the impact that in-depth qualitative studies can have to make autistic children feel more ‘safe’ while learning.

I think there needs to be, what’s the thing is, this, I call it the scientific approach and we are measuring the eye twitches and we’re measuring the amount of times they blink and all of that kind of stuff, which is fine. And I do believe there’s a place for that. But what about the understanding and enjoyment and the happiness and the whole child feels safe and content and is settled and is not having massive reactions or erm is not having erm ((inaudible)) because they can’t cope with what’s happening to them. Why don’t we measure more of that ... (Online interviews, Music Therapist 1)

## 6.5 Conclusion

Chapter Six analysed the first two phases of the study, the mixed-method online questionnaire and the online interviews. An integrated approach suggested in Braun and Clarke (2022), which combined the findings and discussion of the questionnaire and the interviews, was used to present the four developed themes related to the questionnaire data and the three themes developed about the analysis of the online interviews. The themes developed to answer the questionnaire research question, ‘What approaches do teachers of singing consider to be effective in teaching singing to autistic students, including students who are MS?’, were *no cookie-cutter approach* and *the significance of experience*. The themes *singing may get better*, and *it is not only singing that may get better*, were discussed in connection to the research question, ‘What is the impact of teaching autistic students to sing as perceived by teachers of singing?’. The research question of the online interviews was, ‘What are the perceptions of practitioners and parents about how singing can facilitate the

communication skills of autistic children who are NS, MS, or LS?' and the three themes developed in relation to it were *communication as an orchestra, not as a solo instrumentalist named 'talking', the art of drawing them in and singing as a 'common sense' tool*. The first two phases of the study informed the third phase of the study, the ethnography, which will be presented in the following chapter.

## Chapter 7 – Ethnographic Case Series

### 7.1 Introduction

An ethnographic case series consisting of three case studies was written for the third phase of the exploratory study to investigate how, while keeping the uniqueness of the each autistic child at the centre, singing teaching could be utilised to target the improvement and facilitation skills of autistic children who are NS (Case Study 1), MS (Case Study 2), or LS (Case Study 3) (Koegel et al., 2020). As an exploratory study, the presented three case studies do not provide objective measures of improvements in music, speech, language, or communication skills; the research focuses on my observations and feelings as a researcher-practitioner and those of the children and caregivers. The case series offers a written account of the potential use of singing teaching to target various communication skills that could benefit autistic children who are NS, MS, or LS.

### 7.2 Methodological Approach

#### 7.2.1 *The Purpose of the Ethnographic Case Series*

Fusch et al. (2017) explain that ethnography “is an in-depth study of a culture and studies everyday behavior” (p. 924). The ethnography, as an exploratory form of qualitative research, was chosen for the study’s third phase because of its strengths in exploring the potential of singing teaching for autistic children and documenting observations that could be useful for future research in this area. Holloway et al. (2010) state that in ethnography, “ethnographers use the first person throughout their writing to show their personal involvement in the field and consequent influence on the collection and analysis of data” (p. 82). In the writings of the third phase, the “I” clearly signals that the findings are the researcher's observations. To empower the children’s and the caregivers’ views, numerous quotations were included in the ethnographic writing (Holloway et al., 2010).

Brewer (2000) defines a case “as any phenomenon located in space and time about which data are collected and analysed” (p. 188). Brewer further explains that case studies “can address the micro situation of a single person in everyday life or the macro situation of a nation state in the global world” (p. 188). According to Baxter and Jack (2008), the use of various data sources in a qualitative case study approach allows the exploration of the studied phenomenon through different lenses. They explain that case study research is carried out “to answer “how” and “why” type questions, while taking into consideration how a phenomenon is influenced by the context within which it is situated” (p. 556).

Using methods linked to ethnography, ethnographic case studies construct arguments about studied cultures, social groups, communities, or investigate sociocultural phenomena (Schwandt & Gates, 2018). Ó Riain (2009) adds that in an ethnographic case study, the researcher shares experiences with the studied subject. The works of Garcia et al. (2012) and Alharbi (2025) are examples of studies employing the ethnographic case study in the field of speech and language pathology, and the studies carried out by Burri (2018), Çağlayan & Basal (2025), Mac (2022), and Weerachairattana & Buripakdi (2025) are examples of the discussed approach in the education area of study.

Mac (2022) makes use of the phrase “I explored” (p. 1) to indicate how, using an ethnographic case study, she “played many roles at the school” (p. 7) and gained “insight into complicated questions” (p. 1) about charter schools and inclusion. In her work, she discussed three broad themes that emerged from her data, which included semi-structured interviews and participant observation. Garcia et al. (2012) use an ethnographic case series to explore language strategies for families raising autistic children in bilingual environments, and Alharbi (2025) uses an ethnographic case study to focus on speech and language delays. The use of

the ethnographic case series prompts Garcia et al. to recognise the significance of bilingual families' lived experiences when offering language recommendations. In Alharbi, the intervention was specifically designed to reflect the cultural and language needs of the family who participated in the study; "a "researching with" rather than "researching on" approach" (p. 4) was adopted. On the same lines, the ethnographic case series approach I utilised in the study's third phase allowed me to carry out the research "with" (Alharbi, 2025, p. 4), not "on" (Alharbi, 2025, p. 4) autistic children and their caregivers.

As indicated in Appendices K-N, during data collection, the initial plan was to conduct an autoethnography due to its strength as "a direct attempt to bring the participation, attention, and reflexivity of the knowledgeable researcher, as a human agent, into the center of the research scene to get at meanings that cannot be grasped objectively (from a distance)" (Poulos, 2021, p. 33). However, it was later decided that an ethnographic case series with the three interconnected sections of 'context', 'observation', and 'interpretation' could better differentiate what was observed during data collection from my interpretations of what was observed. This systematic approach, based on a tripartite framework, was chosen to separate session experiences from analytical insights, thereby promoting reflexivity and transparency. In fact, I chose to write a case series while conducting ethnographic research. I focused on my own practice rather than observing other practitioners working with autistic children because I wanted to draw on my lived daily experiences to gain a unique understanding of my interactions with autistic children who are NS, MS, or LS, and their caregivers.

### ***7.2.2 The Design of the Study's Third Phase***

The first two phases of the study suggested that every autistic child, like every other individual, is unique. As a result, a specific method based on singing that can be used with all autistic children falling under the descriptions NS, MS, or LS (Koegel et al., 2020) to facilitate

and improve communication skills does not exist (refer to Chapter Six). I decided to carry out an ethnography to explore how, while keeping the uniqueness of the child at the centre, I can use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS.

From my private practice, “Singing to Promote and Enhance Communication”, I invited five autistic children and the caregiver, who typically accompanies them during the session, to participate in the ethnographic study. In other words, children were not explicitly recruited to participate in the sessions to carry out this research study. Keeping in mind that every child is unique, I invited five children whose communication profiles were completely different from one another. Data was collected over six weeks, but since the participants had already been attending sessions, I also included the following data as part of the data collection of the ethnographic study:

- 1) Past session goals and plans;
- 2) Past field notes. These concise field notes contained descriptive and reflexive information.
- 3) Parents were given a document to write down their observations about any communication skills learnt during previous sessions and demonstrated in the daily context by the child.

Consent from caregivers was gained to use data from sessions before the six weeks of the ethnographic study. The University Research Ethics Committee (UREC) approved using retrospective data in the study. Poulos (2021) refers to this process as “mining memories” (p. 27).

During the six weeks of the ethnographic study, the following data were collected:

- 1) A short questionnaire was completed by the caregiver of each child who participated in the ethnographic study.
- 2) Session goals and plans were documented.
- 3) Field notes were written down on a paper notebook exactly after each session or a few hours later. Field notes were concise and contained descriptive and reflexive information.
- 4) Parents were given a small paper notebook to document any differences noted between one session and another.

Children had one or two 45-minute sessions per week, depending on how many sessions per week they had been attending before the start of the ethnographic study. I carried out all the sessions. Sessions missed during the six weeks were replaced in week seven (refer to Table 7.1 for the number of sessions each participant attended). Children had only one or two sessions per week so that other commitments of caregivers and children could be respected. The busy schedules of caregivers and children make it difficult for both to attend a specific service more than twice a week. Sessions took place in a clinic, and a caregiver accompanied the child during every session.

**Table 7.1** *Attendance of the participants*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Child 1 Nicholas	Missed a session and it was	1 session	1 session	Missed a session	Missed a session	1 session

	replaced in Week 7					
Child 2 Ralph	1 session	1 session	1 session	1 session	Missed a session and it was replaced in Week 7	1 session
Child 3 Laura	1 session	1 session	1 session	1 session	1 session	1 session
Child 4 Joseph	2 sessions	1 session (Missed a session and it was replaced in Week 7)	2 sessions	2 sessions	2 sessions	2 sessions
Child 5 Alan	2 sessions	1 session (Missed a session and it was replaced in Week 7)	2 sessions	2 sessions	2 sessions	2 sessions

Based on the two areas of music education, as explained in Ockelford and Markou (2012), the sessions focused on “education *in* and *through* music” (p. 387). Singing was used 1) as a means to facilitate speech, language and communication-related goals and 2) as a way to enhance singing skills, which, indirectly, as demonstrated in phase one of this study, can promote improvement in communication skills.

Goals related to the use of singing to directly facilitate communication skills included:

- a) To participate in a social game using a song.
- b) First, to imitate simple actions in a song. Then, to imitate simple actions.
- c) First, to answer preference-based yes/no questions, specifically questions in the structure, ‘Do you want a cookie?’ in a singing dialogue. Then, in a back-and-forth interaction, to answer preference-based yes/no questions, specifically questions in the structure, ‘Do you want a cookie?’.
- d) First, to sing two words together, with one action word in a singing dialogue. Then, to say two words together, with one action word, in a back-and-forth interaction.
- e) To sing the sound /ɑ:/ as in car.
- f) To sing the CV sound /b/ as in ball + /ɑ:/ as in car.
- g) First, to sing the word ‘cookie’ in a song. Then, to say the word ‘cookie’.

Goals related to the use of singing to indirectly improve communication skills included:

- a) To sing missing words in a song.
- b) To sing missing phrases in a song.
- c) To sing a vocal warm-up exercise: the child sings the vocalisations ‘la – la’ on the same two notes, taking turns with the tutor.

d) To sing a vocal warm-up exercise: the child sings the vocalisations 'la – la' on the same two notes sung by the tutor, who uses the vocalisations 'yo – yo'.

Given the rare nature of this study and the population concerned, I invited specific participants who had already been attending the sessions "Singing to Promote and Enhance Communication". Convenience sampling was the most suitable method for this study. Clear generalisability is not possible in convenience sampling. However, given the very sensitive and rare nature of this study, I wanted to recruit participants who specifically fit in the descriptions of NS, MS, or LS as defined by Koegel et al. (2020), while at the same time each having a communication profile different from one another. I invited five potential participants to take part in the study and then gained informed consent. It was clearly explained to the caregivers and written in the information sheet that participation was voluntary. If invited participants chose not to participate in the study, both the sessions and relationship established would not have been affected.

I did not want the invited participants to feel they could not refuse the invitation. To avoid this, I only gave the invited caregivers brief information about the study during a session. I informed them that if they were interested in participating, they could submit their interest in a Google form invitation (refer to Appendix L). During one of the sessions, I explained the following points to the invited participants:

- 1) I was carrying out a study to explore how singing could improve and facilitate the communication skills of autistic children who are NS, MS, or LS.
- 2) Interested participants would receive a brief email with a link to a Google form to submit their interest and receive more information about the study. The email would contain information about the nature of the study, an explanation of the voluntary participation and a link to the Google form.

3) I highlighted that participation was completely voluntary. If participants decided not to participate in the study, their choice would not affect the existing client/tutor relationship and the sessions. I also explained that they could choose to stop their participation in the study at any point without any negative consequences.

Moreover, an email with a link to the Google form was sent to the potential participants. Only parents who chose the option 'Yes, I am interested to know more about this study and I give permission to the researcher Deborah Pullicino to email me the information sheet and the consent form of the study' were emailed the link to the information sheet and consent form of the study.

For the ethnographic study, I invited five children who had completely different communication profiles from one another. Each child is unique. Nevertheless, from my experience, the communication profile of the five children I invited reflected the main approaches that I typically adopt when teaching autistic children who are NS, MS, or LS. The five invited participants accepted the invitation. The children are described as NS, MS, or LS, according to the description given by Koegel et al. (2020); however, in some instances, children moved from one description to another in different periods or communication areas.

Before the beginning of the ethnographic study, the information sheet, the agreement to consent and a short survey about the caregiver and the child were sent to the caregivers. After reading the information sheet (refer to Appendix M), participants were invited to complete the consent form (refer to Appendix M) which was divided into three sections, each including one or more consent tick boxes. The first section of the consent form focused on what it involved to take part in the study. The second section specified how collected information would be used during and after the project. The third section was about providing information that the researchers could use. At the end of the form, the participants were

invited to answer 'Yes' or 'No' to the question, "Having read the above information, I consent to participate in the study. Please indicate your consent before moving on to the short survey." I explained to the caregivers of children who attended the sessions "Singing to Promote and Enhance Communication" and were not invited to participate in the study, that the invited participants had a diagnosis of autism spectrum condition and had a specific communication profile required for the study.

Furthermore, every caregiver who participated in the study completed a short questionnaire on Google Forms (refer to Appendix M). In this chapter, the reported demographic information about the participants does not include certain information so that the identity of the participants could be protected (refer to Table 7.2). The questions in the form were developed to obtain the required background information about the participants of phase three. The form contained seven questions; one was about the caregiver's musical background and five focused on background information about the child. In the last question, caregivers could add any other relevant information. The caregivers completed the form before the beginning of the six weeks of the study.

**Table 7.2** *Background of the participants*

	Child 1 - Nicholas	Child 2 – Ralph	Child 3 – Joseph	Child 4 – Laura	Child 5 – Alan
Musical background of the caregiver	Never played a musical instrument.  Love to listen to music and to sing.	No musical experience.	Grade 3 piano, but was not practising during the period of the study.	Drum lessons for a short period.  Music is part of the participant’s everyday life.	No musical background.
Gender of the child	Male	Male	Male	Female	Male
Age of the child	4 years	15 years	8 years	10 years	13 years
Diagnosis of the child	Autism	Autism	Autism	Autism	Autism
Therapies that the child attended from birth till the period of the study	Occupational therapy – 2 years till the period of the study	Occupational therapy – 6 years to 10 years (stopped because of the COVID pandemic)	Occupational therapy – 4 years to 6 years (stopped because then significant	Occupational therapy – 2 years (discharged after a short period)	Occupational therapy – 3 years to 8 years

	<p>Speech therapy – 2 years till the period of the study</p>	<p>Speech therapy – 3 years to 10 years (stopped because no evident progress was being seen)</p> <p>Applied Behaviour Analysis (ABA) – 14 years till the period of the study</p>	<p>concerns were addressed and worked on at home)</p> <p>Speech therapy – 3 years to 5 years (stopped because the child started ABA)</p> <p>Applied Behaviour Analysis (ABA) – 5 years to 7 years (stopped due to concerns over the</p>	<p>Behaviour therapy – 8 years (attended only a few sessions as ABA therapy was recommended)</p> <p>Applied Behaviour Analysis (ABA) – 8 years (attended for around 8 months and stopped as no further improvement was being made)</p>	<p>Speech therapy – 2 years to 10 years</p> <p>Padovan therapy – 4 years to 6 years</p> <p>Sessions focusing on social and academic skills – 6 years to 12 years</p>
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			validity of the therapy)	Attended a few sessions of dancing for communication  Speech therapy – 2 years till the period of the study	
The preferred musical genres of the child	Pop music	Nursery rhymes	Nursery rhymes and pop music	Pop music, rock music and nursery rhymes	Classical music

Additionally, Psaila (2023) discusses how the Mosaic approach (Clark & Moss, 2011) can be adapted for children with speech, language and communication difficulties. Psaila presents practical ways for the researcher and the child to work together, including in the clinical setting; her work discusses how to recognise, acknowledge and value the child's voice. The Mosaic approach has three stages:

- 1) Knowledge generation
- 2) Joining together the generated knowledge
- 3) Applying the findings to create continuity, challenge and make the necessary changes.

The tools used during the first stage of the Mosaic approach, a child-led approach, included thorough observation, happy and sad face images and songs chosen by a child. In the second stage of the approach, I interpreted the knowledge generated. As Psaila (2023) emphasises, the role of the researcher at this stage is to analyse all that is said and unsaid while continuously acknowledging the child as the research expert. In the third stage, I used the findings, joined together in stage two, to carry out the necessary actions that reflected the child's voice.

Children's assent was of utmost importance in this study because, although the children who participated had communication difficulties, they had preferences and opinions. I applied the Mosaic approach (Clark & Moss, 2011) to provide adequate and required information about the research study to the children, listen to their voices and avoid tokenistic practices. I started by deciding to include data collected before the six-week study. Since the study was very sensitive, the knowledge generated before the start of the six weeks ensured better application of the Mosaic approach for the best benefit of the children. The first phase of the study, the online questionnaire, suggested that while it takes a specific number of

sessions to get to know how best to work with a neurotypical student, the time required for an autistic child, especially a child who is NS, MS, or LS can be more.

Analysing the communication profile of the children concerned, I decided that instead of gaining consent from the children only at the beginning of the study, it would be better if consent was gained 1) at the beginning of each session and 2) throughout each activity and/or between one activity and another. The three stages of the Mosaic approach were applied 1) during the first session of the study (based on knowledge generated in field notes taken after previous sessions); 2) between one session and another as preparation for the next session; and 3) during all sessions. What follows is a description of how the Mosaic approach was explicitly applied to the participants so that the needs and strengths of each participant were given the necessary importance (refer to Table 7.3, Table 7.4 and Table 7.5). The approach was applied to gain assent from each child and facilitate each child’s right to voice during each section of the session.

**Table 7.3** *Application of the Mosaic Approach with Nicholas*

<p>At the beginning of the session</p>	<ul style="list-style-type: none"> <li>• The non-verbal technique of observation was applied.</li> <li>• There were certain times when the child was tired. In such cases, other activities, e.g., a singing game targeting joint attention, took place instead of the planned session. There were also times when the child was too tired and I had to finish the session earlier. It was challenging to start the first activity with this child, so it was very difficult to ask for consent before initiating the first activity; instead, I</li> </ul>
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	<p>carried out thorough observations during the first activity, which enabled me to act according to the child's preferences.</p>
<p>Throughout each activity and/or between one activity and another</p>	<ul style="list-style-type: none"> <li>• The non-verbal observation technique was applied, including attention to vocalisations, facial expressions and avoidance.</li> <li>• The concept of happy or sad faces could not be used with this child, as the concept was too abstract for him. Before the six weeks, he started working on improving joint attention, looking at concrete items and taking his turn to perform an action, e.g., acknowledging that his mother threw a ball and throwing it back with prompts.</li> </ul>

**Table 7.4** *Application of the Mosaic approach with Ralph, Joseph and Laura*

<p>At the beginning of the session</p>	<ul style="list-style-type: none"> <li>• I intoned the question 'Do you want to sing and play with me?'. I presented two cards, a smiley card with the word 'yes' and the other card with a sad face and the word 'no'. The cards were presented twice. If I presented the cards once, I could not be sure that the intended preference was chosen. The child could get frustrated if I presented the cards more than twice. I could not use two switches, one indicating 'yes' and</li> </ul>
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	<p>another indicating 'no', because the concept of 'yes' and 'no' was not totally mastered. When referring to the concept of 'yes' or 'no' with these children, I am not referring to the verbal use of the two words but to the understanding of the concept.</p> <ul style="list-style-type: none"> <li>• I also applied the non-verbal technique of observation to decide whether to carry on with the session or not.</li> </ul>
<p>Throughout each activity and/or between one activity and another</p>	<ul style="list-style-type: none"> <li>• The non-verbal observation technique was applied, including attention to vocalisations, facial expressions and avoidance.</li> </ul>

**Table 7.5** *Application of the Mosaic Approach with Alan*

<p>At the beginning of the session</p>	<ul style="list-style-type: none"> <li>• According to the definitions given by Koegel et al. (2020), Alan is LS because communication is mainly used for requests. Before the six weeks of the study, the child was working on improving generative language abilities. Therefore, at the beginning of the session, I intoned 'Do you want to sing and play with me?'. I waited for a 'yes' or 'no' answer. To confirm that the answer given was the intended one, I used to repeat the question and present the happy/sad cards.</li> </ul>
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<p>Throughout each activity and/or between one activity and another</p>	<ul style="list-style-type: none"> <li>• Before each activity, I briefly described what the activity would consist of. I waited for a 'yes' or 'no' answer. I did not rely only on yes and no questions. I also presented questions which offered a choice between two or more items. One example was to choose a preferred breath support exercise; the child was invited to choose between the 'frog exercise' and the 'pinwheel exercise'.</li> <li>• Examples of continuity, challenges and changes applied throughout the sessions as required included ending the session earlier if needed, cancelling the session, carrying out a preferred song throughout the whole session if desired and carrying out a task favoured by the child instead of a planned task.</li> </ul>
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The inclusion criteria of the children who were invited to participate in the study were:

- 1) The children had a diagnosis of autism spectrum disorder.
- 2) The communication abilities of the children fit in the descriptions of NS, MS, or LS as defined by Koegel et al. (2020).
- 3) Children with minimal sitting tolerance, who did not follow a one-step instruction, or who had other comorbidities with ASC could still participate in the study.
- 4) The child was not using an alternative nonverbal communication system (such as Picture Exchange Communication System (PECS), written language, signed language, or augmentative

and alternative communication (AAC) devices) as the primary daily method of communication both at home and at school during the six weeks of the study. Reasons for not using an alternative nonverbal communication system as the primary communication method could vary. A possible reason could be that the child had been introduced to the system but did not feel comfortable using it as the primary communication method.

5) Children invited were between four to 16 years old. As explained by Sandiford et al. (2013) “below the age of 5 ... normal language acquisition is still expected” (p. 1299). Therefore, I invited four participants who were older than five years. However, I also invited one participant who was not five years of age to explore how singing could be used to facilitate and improve communication as an early intervention method.

6) Regular attendance.

7) Children attending any other sessions, including speech-language therapy or any other music sessions, could still participate in the study. This was specifically done to respect the daily routine of each participant; participants were not asked to stop any sessions or therapies during the study. The sessions “Singing to Promote and Enhance Communication” did not replace by any means speech-language therapy sessions. On the other hand, they complemented and built on the vital work done by speech-language pathologists. A child could attend speech-language therapy or any other session during the study. The main reason is that the study was an exploratory type of study, not a study which reported objective measures of improvement. Every caregiver was also asked to declare all the sessions and therapies that the child had been attending before the study and during the study (refer to Table 7.2).

### **7.2.3 The Description of Analytic Choices and Processes**

This section focuses on the reflexive thematic analysis (Braun & Clarke, 2022) used to analyse the collected data during the ethnographic study. Like the perspectives on knowledge taken in phases one and two of the study, the online questionnaire and the online interviews, the perspectives on knowledge taken during the ethnographic study were also those of critical realism and contextualism. Throughout the ethnographic study, I reflected on how my background and experiences influenced how I interpreted what was unfolding before me. In addition, I always tried to give a lot of importance to the specific, unique contexts of each child and caregiver participating in the ethnographic study. As I did in the first two phases of the study, I also situated the third phase in a Big Q framework (Braun & Clarke, 2022), which is the foundation of the reflexive thematic analysis I applied to analyse the data. Taking an inductive and experiential approach, the analysis aimed to give a picture of the participants' experiences and was shaped by the collected data not by any existing theories (Braun & Clarke, 2022). Both semantic and latent approaches were applied when exploring meaning. Throughout the third phase of the study, I engaged in "systematic reflexive introspection" (Poulos, 2021, p. 28) because an "ethnographic study is deeply grounded in embodied experiential knowledge generated through intentional self-reflexivity and awareness" (Poulos, 2021, p. 29). Self-reflexivity allowed me to directly experience and study how, while keeping the uniqueness of each autistic child who is NS, MS, or LS at the centre, I could explore the use of singing to facilitate and improve communication skills.

The reflexive thematic analysis phases I carried out to analyse the ethnographic study data were quite similar to the process I described in Chapter Five for analysing the online questionnaire and interviews. I lived an experience with the participants; therefore, the data familiarisation phase was straightforward. I cannot say the same for the data coding phase;

the coding phase was a long, nonlinear phase. As I did in the first two phases of the study, I used different colours, numbers and letters to develop and observe the relationship between different code labels. Like the theme development phase, the coding phase was very long. From time to time, I revisited the coding phase because I wanted to generate codes which allowed me to develop themes that could draw the reader into the world I was experiencing. The long theme development phase was characterised by continuously editing and refining themes and theme names. For more than six months, I focused on five themes I developed from the generated codes. These themes were 1) mind and body warm-ups, 2) breathing and posture, 3) musicianship, 4) vocalising and 5) repertoire. Together, these five themes formed a session focusing on singing targeted to improve and facilitate communication skills.

After further literature consultation and self-reflexivity, theme refinement led to the development of two main themes. The ethnographic study aimed to explore how, while keeping the uniqueness of the child at the centre, I could use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS. The first theme developed was *same subject, adapted goals* and the second was *continuously planning a bridge between singing and communication skills*.

#### **7.2.4 Ethical Considerations**

Ethical thinking was a continuous process throughout the study's third phase. Apart from the basic ethical guidelines of respect for persons, beneficence and justice, the study included ethics of consequences and the protection of the participants' privacy and identities (Adams et al., 2015). To include ethics of consequences, I aimed "to minimize the risks and maximize the benefits of research for others" (Adams et al., 2015, p. 59). To protect the participants' identity, I changed all the participants' names. Any characteristics that could make the participants identifiable were altered. The age of the children was not changed as

it is an essential factor of the study. Relational ethics were acknowledged as much as possible and when deemed appropriate (Adams et al., 2015). During all sessions, if a child or a caregiver became emotionally distressed, the option to stop for a few minutes or to stop the session entirely, as and when applicable, was given. Certain written representations were shared with caregivers and they expressed their opinions about them. A specific application form for phase three of the study was submitted. I received ethical approval from the University of Sheffield for phase three of the study and the previous two phases.

Being aware that incidental discoveries of potential harm to children cared for by the caregivers participating in the ethnographic study could be uncovered during the study, I agreed with my supervisors that in such cases, I would discuss the issue with them or, if need be, seek professional advice from the University Research Ethics and Integrity Manager. Before the beginning of the project, all participants were given my contact information and the contact information of the supervisors overseeing the study. Participants were instructed to raise any complaints or concerns about the research with me. Concerns related to potential exploitation, abuse or harm resulting from involvement in the study were to be reported to the study's Designated Safeguarding Contact. If participants felt their complaint was not handled satisfactorily, they could also contact the Research Ethics and Integrity Manager of the University of Sheffield. I processed all the personal data collected and the University of Sheffield acted as the data controller and was responsible for managing storage and backups. To secure the participants' confidentiality, all collected digital data was safely stored on the University of Sheffield Google Drive and was protected by passwords. At the beginning of phase three, as approved in the ethics application form, I started to analyse the data collected from the short questionnaire on Google Forms by NVivo. However, throughout the process, similar to phase two, I realised I preferred to analyse the specific data manually, so I did not

use NVivo. The collected paper documents were securely locked in a cabinet in a locked office. All information was kept strictly confidential.

### 7.3 Case Series

#### ***7.3.1 Case Study 1 – Exploring the potential use of singing teaching to facilitate and improve the communication skills of two autistic children who are nonspeaking (Koegel et al., 2020).***

##### Context

Using the descriptions ‘nonspeaking’, ‘minimally speaking’ and ‘limited speaking’ given by Koegel et al. (2020), my observations when Nicholas and Ralph began attending sessions indicated that ‘nonspeaking’ best described their communication skills. Throughout the sessions, it was observed that Ralph sometimes shifted between the descriptions ‘nonspeaking’ and ‘minimally speaking’ depending on the situation.

Nicholas is a 4-year-old autistic boy who has no verbal, expressive, or intelligible words or approximations. The child has low sitting tolerance and exhibits behaviours of concern. Severe difficulties are evident in sound and motor imitation, joint attention, and intentional interaction. His mother accompanies Nicholas during the sessions. Prior to the start of the study, Nicholas attended sessions for approximately five months, once a week. The following are Nicholas’s goals during the ethnography, based on Lentini’s (2020) “The Discover, Learn and Grow Curriculum” (p. 57):

##### *Mind and body warm-ups*

To participate in a social game by means of a song or a melody.

### *Breathing*

To learn how to move air in and out of the body.

### *Musicianship*

Introduction to rhythm: To interact with others using sound, specifically to respond to one type of sound by making a sound and making one type of sound expecting a sound to be made in response. (This goal is taken from the Sounds of Intent framework (Sounds of Intent, n.d.-a; Sounds of Intent, n.d.-b; Sounds of Intent, n.d.-c).)

### *Vocalising*

To vocalise in specific parts of the song *If You're Happy and You Know It*.

### *Repertoire: Songs to facilitate communication skills*

To give an object on request during a song.

To choose a requested item from 2 objects during a song.

To imitate two actions in a song.

### *Repertoire: Songs to improve communication skills*

To whistle in specific parts of the song *Happy Birthday*.

Ralph is a 15-year-old autistic boy. The child has good sitting tolerance and displays severe behaviours of concern at certain times. He shows no difficulties with motor imitation and joint attention. His intentional interaction is limited, and sound imitation, such as the basic sound /a:/, is very challenging for him. His mother accompanies Ralph during the sessions. Before

the start of the study, Ralph attended the sessions for approximately one year and two months, once a week. The following are Ralph's goals during the ethnography, based on Lentini's (2020) "The Discover, Learn and Grow Curriculum" (p. 57):

#### *Mind and body warm-ups*

To participate in a social game by means of a song or a melody.

#### *Posture*

To become aware of the best sitting posture for respiratory support.

#### *Breathing*

To understand the concept of stable airflow.

#### *Musicianship*

1. To keep a steady beat in two simple songs.
2. To become aware of different pitches by repeating one word at the end of a phrase in an echo song.
3. To become aware of pitches Do, Re, and Mi by learning the hand sign for these pitches and playing these pitches on a step-bell instrument.

#### *Vocalising*

To prolong a V and a CV sound.

To articulate CV and VC sounds including the consonant sounds [g], [k], [d], [b], [t], [m], [n], [p], or [l].

To articulate the sounds [aɪ] (as in my), [eɪ] (as in day), [ɔɪ] (as in boy), [əʊ] (as in no), and [aʊ] (as in now).

*Repertoire: Songs to facilitate communication skills*

To sing in song words that include the sounds [aɪ] (as in my), [eɪ] (as in day), [ɔɪ] (as in boy), [əʊ] (as in no), and [aʊ] (as in now).

To sing two words together, with one being an action word and one being a noun and then say two words in a back-and-forth interaction.

*Repertoire: Songs to improve communication skills*

To fill in a one-word blank in the adapted version of the song *Rain, Rain Go Away* using a microphone.

Observation

*Snapshots from Nicholas' and Ralph's sessions*

*Nicholas*

I throw him a medium-sized colourful cloth ball and sing the word 'catch' three times on the three notes of an ascending C Major triad. *Catch, catch, catch*. No response. He strolls around the room and sometimes sits down on the yellow or green floor mat. He tries to open the door. I throw him a medium-sized colourful cloth ball. *Catch, catch, catch*. No response. He finds his mother's bag and grabs a banana; I hear the faint crackle of the banana stem and see the banana's skin splitting gently. I throw him a medium-sized colourful cloth ball. *Catch, catch, catch*. No response. I see him wandering around the room, passing near my black socks and nearly stepping on his mother's white socks. He keeps walking around the room, sometimes touching the walls and eating the banana.

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Nicholas' mother told me that he could not blow the candles during his birthday party. He tried, but he could not. According to Nicholas' mother, the boy usually reacts when hearing the song *Happy Birthday*. I decide to give him a small plastic whistle, which is very soft to blow. On the guitar, I play the chords of the song *Happy Birthday*.

The supportive mother holds Nicholas on her lap, and whenever I stop singing, she puts the whistle in front of his mouth. It is a long way. It is difficult for him to close his lips around the whistle; he also bites it. One day, I hear a gentle sound from the little red whistle. Nicholas is slowly acquiring the skill of breathing in and exhaling the air to blow a whistle. He is so happy. His eyes show how proud he is that he is managing to do this task. I keep singing the *Happy Birthday* song from one session to another, and he eagerly waits for his turn to contribute.

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The song is *Row, Row, Row Your Boat*. A crocodile is approaching. Nicholas smiles, seeing his mother and me moving towards him like an enormous crocodile. I give him the microphone.

Nicholas likes the microphone. He covers it with his mouth and is amazed by what this tool can do. I sing.

I: Row row row your boat gently down the stream. If you see a crocodile, don't forget to scream. Aghh!

Nicholas looks at me. He is with me. I sing repeatedly, slowly singing the ending *aghh* of the song and encouraging Nicholas to sing it. His mother does the same while he is having a bath or on the swing. We do it today, tomorrow and then the day after. It is a learning process. Then I hear Nicholas vocalising *aghh* at the end of the nursery rhyme.

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*Nicholas' mother:*

He is also responding by doing sounds when he is prompted to do so. [...] The past week Nicholas has been responding positively during activities. He is engaging more, showing more understanding and being more vocal and clear.

(Nicholas's mother reflecting on her son's progress following singing sessions focused on improving and facilitating communication skills, May 2024)

*Ralph*

A lady enters the room together with her autistic son. There is one chair in the room. The mother brings another chair into the room and instructs her child to sit down on the chair next to her, facing me. Immediately, the boy follows his mother's instruction. Playing simple chords on the guitar, I sing a warm-up exercise focusing on the vowel /ʌ/. I invite the boy to fill in the warm-up song's blank with the vowel /ʌ/. I see the boy trying to open his mouth slowly, but he produces a different sound from the vowel /ʌ/. I am amazed by this strong boy's joint attention and sitting tolerance. I try the same warm-up exercise, but this time focusing on /i:/. The boy's attention is again entirely there and he tries to imitate every movement I do, even trying to imitate me when I raise my hand unconsciously to get rid of a hair strand that blocks my view. As I invited him again to experiment with the vowel /i:/, he tries. He tries again and again. Once more, I hear a different sound than the expected vowel.

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Ralph is fascinated with different sounds. I am aware that Ralph has difficulty with pitch. He cannot change the pitch from one note to another when requested. This makes solfege difficult for him.

I get the colourful small xylophone. I do the *Do* sign with my hand and encourage Ralph to play the note on the xylophone. He does follow the instructions easily. He likes the game we are playing together. I sing the note slowly, looking at him to help him pronounce his CV sound. He manages to say the requested sound. I repeat and repeat. Mum repeats this at home, too. It is time for Ralph to meet the note *Re*. The introduction of note *Re* starts following the same steps as note *Do*. He enjoys playing the *Re* on the xylophone and says the CV sound *Re*. It is now time to try both notes together. I sing *Do*. He does the sign with his hand and plays the note on the xylophone. The same goes for *Re*. He can distinguish the hand signs and the xylophone notes of *Do* and *Re*. The CV sounds *Do* and *Re* are getting clearer. The pitch is not; however, becoming familiar with the hand signs and the instrument notes of the first two notes of the tonic sol-fa structure is an achievement that should be celebrated in itself.

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*Ralph's mother:*

From an almost non-verbal child, with incomprehensible words, to one who repeats, quite clearly [...] The more he realises that people understand him, the more he tries to put more words together. So it's not only the improvement of the vocabulary but also the desire to have a conversation. Music really helps these children with communication problems. [...] Every session few new words, his "toolkit" is getting bigger and bigger and he's really happy to use it in the appropriate context.

(Ralph's mother reflecting on her son's progress following singing sessions focused on improving and facilitating communication skills, May 2024)

### Interpretation

I used short, simple melodies to encourage social interaction with Nicholas. I observed that, although melodies aren't miraculous solutions, they were more effective than unsung words in capturing Nicholas's attention. As Nicholas became more familiar with the melody I used for specific words, and it was sung at home more frequently, he appeared to show increased interest and engagement in the activity. Working with Nicholas on social interaction was not aimed at targeting a specific communication method, such as AAC, writing, or speaking (Mize, 2020). Instead, I focused on improving social interaction so that, in time, Nicholas could choose any preferred method of communication.

Gernsbacher et al. (2008) reported that some autistic children demonstrate difficulties in specific oral-motor skills; it is essential to note that not all autistic children experience these difficulties. Nicholas had difficulty blowing out his birthday candles. The goal related to breathing during his singing sessions focused on learning how to move air in and out of the body. The use of a whistle was very helpful, as he could work on the goal while seeing the result of his action. During his singing sessions, Nicholas could not sing words. This did not mean that he could not engage in a musical conversation with me or his mother. I observed that when he mastered the skill of blowing a whistle, he started to "sing with me" during the song *Happy Birthday* using a whistle. While doing this, he was working not only on his breathing but also on his joint attention, turn-taking, and social interaction skills.

Nicholas's repertoire was divided into two sections. The first focused on songs specifically designed to facilitate communication skills, while the second involved singing songs to improve communication indirectly. Besides using songs to target specific communication goals, such as imitating two actions, Nicholas also engaged in singing for enjoyment (Ockelford & Markou, 2012), thereby potentially gaining skills that could indirectly benefit communication.

I observed that although Nicholas could vocalise, he was unable to do so when requested to. During the vocalisation part of the session, I used the song *Row, Row, Row Your Boat* to encourage Nicholas to make sounds when asked. Marshalla (2017) and Jeffery (2023) recommended tools like microphones and kazoos to help children find their voices. When I handed Nicholas a microphone, he seemed to be enjoying making different sounds. I observed that, while enjoying the music, Nicholas gradually joined his mother and me in singing 'Aghh!' at the end of *Row, Row, Row Your Boat*. I aimed to introduce other vocalisations progressively.

I noticed that Ralph had significant difficulty with sound imitation, particularly with vowel sounds such as /ʌ/ and /i:/. During the vocalising part of the singing session, Ralph focused on producing specific V, CV, and VC sounds by filling in gaps in songs based on his favourite melodies. Although Ralph is 15 years old, his preference for nursery rhymes was clearly noticeable; this preference was respected during the singing sessions. As with all neurotypical and neurodivergent children, I also attempted to expose Ralph to other musical genres. Besides focusing on articulating different V, CV, and VC sounds, Ralph also began practising prolonging these sounds in songs, as I noted that he struggled to extend sounds in speech and singing. His sounds were very brief. I observed that melodies encouraged Ralph to practice prolonging sounds in a safe and comfortable environment.

When I first considered solfege for Ralph, I believed it could help him gradually improve his pitch. Unfortunately, that was not the case. Ralph's pitch difficulties appeared to become more evident when trying to sing the Do and Re notes. Although I did not achieve the pitch improvements I aimed for, I noticed that Ralph was really enjoying his tonic sol-fa activities. I observed that he began to connect with me through hand signs for Do and Re while I played the xylophone, and responded accordingly. His engagement was noted; this was also observed by his mother, who reported that she carried out simple solfege exercises with him at home.

Mize's (2020) suggestion to mentor parents proved beneficial in Ralph's case. Ralph's mother participated in the session with Ralph and me. Watching how Ralph engaged in a task with me, Ralph's mother, during the sessions, often motivated Ralph to do the same task with her without my involvement. I observed that Ralph's mother felt she was gaining a useful tool to support her communication development with her son. Communication between a parent and a neurotypical or neurodivergent child can take many forms; I noticed that Ralph and his mother began exploring ways to incorporate music into their daily conversations.

***7.3.2 Case Study 2 – Exploring the potential use of singing teaching to facilitate and improve the communication skills of two autistic children who are minimally speaking (Koegel et al., 2020).***

Context

Based on the descriptions 'nonspeaking', 'minimally speaking' and 'limited speaking' given by Koegel et al. (2020), when Joseph and Laura attended sessions, I observed that the term that best matched their communication skills was 'minimally speaking'.

Joseph is an 8-year-old autistic boy. He has limited sitting tolerance and sometimes exhibits behaviours of concern. His motor and sound imitation skills are moderate, but his

intentional interaction is limited. The child faces significant difficulties with joint attention. Before the study began, he attended sessions for around two years, once or twice weekly. Joseph's mother is the adult who accompanies him during the sessions. The following are Joseph's goals during the ethnography, based on Lentini's (2020) "The Discover, Learn and Grow Curriculum" (p. 57):

#### *Mind and body warm-ups*

To participate in a social game by means of a song or a melody.

#### *Posture*

To become aware of the best sitting posture for respiratory support.

#### *Breathing*

To understand the concept of stable airflow.

#### *Musicianship*

1. To keep a steady beat in two simple songs.
2. To become aware of different pitches by trying to match the pitch of one word at the end of a phrase in an echo song.
3. To sing the pitches Do, Re, and Mi, learn the corresponding hand signs and explore these pitches on a step-bell instrument.

#### *Vocalising*

To prolong a V and a CV sound.

To articulate the sounds [aɪ] (as in my), [eɪ] (as in day), [ɔɪ] (as in boy), [əʊ] (as in no), and [aʊ] (as in now).

*Repertoire: Songs to facilitate communication skills*

To sing in song words that include the sounds [aɪ] (as in my), [eɪ] (as in day), [ɔɪ] (as in boy), [əʊ] (as in no), and [aʊ] (as in now).

To answer fact-based yes/no questions, specifically questions like *Is this a dog?* or *Can you see a dog?* in a singing dialogue and then in back-and-forth interactions.

To sing verbs ending in -ing followed by a noun in a song and then use these verbs ending in -ing followed by a noun in a back-and-forth interaction.

*Repertoire: Songs to improve communication skills*

To fill in a one or two-word blank in the song *Rain, Rain Go Away* using a microphone.

Laura is a 10-year-old girl with autism. Typically, Laura has no issues with sitting tolerance, but at times, she displays behaviours of concern. Her sound and motor imitations are good. She usually shows limited intentional interaction, and moderate challenges with joint attention can be observed. Before the beginning of the study, she attended sessions for about one year and two months, once weekly. Laura's mother accompanies her during these sessions. The following are Laura's goals during the ethnography, based on Lentini's (2020) "The Discover, Learn and Grow Curriculum" (p. 57):

*Mind and body warm-ups*

To participate in a social game by means of a song or a melody.

*Breathing*

To understand the concept of stable airflow.

## *Musicianship*

1. To keep a steady beat in two simple songs.
2. To match the pitch of a phrase in an echo song.
3. To sing the pitches Do, Re, and Mi, learn the corresponding hand signs and explore these pitches on a step-bell instrument.

## *Vocalising*

To sing the words 'happy', 'sad', 'sleepy', and 'hungry' with appropriate facial expressions and gestures.

## *Repertoire: Songs to facilitate communication skills*

To answer fact-based yes/no questions, specifically questions like *Can you see a dog?* in a singing dialogue and then in back-and-forth interactions.

To sing verbs ending in -ing followed by a noun in a song and then use these verbs ending in -ing followed by a noun in a back-and-forth interaction.

To carry out an instruction with three information-carrying words, sung in a song, and then carry out the instructions without songs.

## *Repertoire: Songs to improve communication skills*

To sing the song *Mr Golden Sun* with fewer prompts.

## Observation

### *Snapshots from Joseph's and Laura's sessions*

#### *Joseph*

I: Hello, Joseph.

Joseph: Silence. [He remains sitting on the yellow mat, occupied with his succeeding challenge to pull up the zipper on his blue and orange jacket.]

I: Hello, Joseph. Hello [I invite Joseph to answer back.]

Joseph: Silence.

I: Hello [I invite him again.]

Joseph: Silence. [He keeps trying to win the challenge he made about the zipper.]

I grab my guitar and start playing the nursery rhyme melody *Are You Sleeping?* I sing different lyrics to it:

I: Hello Joseph, hello Joseph. How are you? How are you? Hello teacher, hello teacher. How are you? How are you?

When I sing the word *teacher*, I point at myself. I sing the lyrics three times. Joseph looks at me, astonished by the sound of the guitar strings. He touches the strings, and I hold his hands to continue playing the melody we are both enjoying. I sing again:

I: Hello, Joseph. Hello Joseph. How are you? How are you? Hello teacher. Hello [I stop].

I stop gently and invite him to address me using the word *teacher*. I use no specific instructions. I look at him. He looks at me. He understands. His eyes look directly at mine for some precious seconds. He opens his mouth slowly and fills in the song gap with the word *teacher* in a very soft, nearly shy way. The seven-year-old autistic boy addresses me as "teacher" as he shares a song we are both familiar with.

\*\*\*

Joseph is enjoying singing his song *Bingo*. His mother noticed that he likes the song *Bingo*, so we will do the *Bingo* song. The six guitar strings accompany me while I start singing the song Joseph likes.

I: B-I-N-G-O, B-I-N-G-O, B-I-N-G-O and Bingo was his [I stop. No response].

Maybe the trampoline has a better effect than the guitar. Joseph takes time to determine what is expected from him, where to focus his attention and how to pronounce the requested word. Suddenly, while jumping together, the word *name-o* comes out so nicely. He sings the word *name-o* with a not-so-accurate pitch. At first, I sing many words in the song, and he sings one. That is only the beginning. Staying on his mother's lap, he continues the musical dialogue with me; by the time I only sing *B-I*. He continues.

\*\*\*

*Joseph's mother:*

He is capable of answering 'yes' and 'no' questions. 'Yes' requires some prompting sometimes, but he is capable of saying 'no' [...]. This has enabled us to have some basic conversations with Joseph. For example, if Joseph wants to go play in the garden, he will say, "open door". If we ask if he wants to go outside, he will say, "yes". Words are much clearer [...]. He is now able to follow through with simple instructions even when asked from another room. [...] Eye contact has improved drastically, and he looks intently. We can see that he is looking at us to understand better the situation rather than just to comply.

(Joseph's mother reflecting on her son's progress following singing sessions focused on improving and facilitating communication skills, May 2024)

*Laura*

Laura's mother informed me that Laura likes *The Sound of Music*. I am unsure which songs are her favourite, so I ask her mother to give me more details. Her mother also appears uncertain. I try the song *My Favourite Things*. I start playing the chords on the guitar and singing the first two words. She screams. She runs outside the room. I put the guitar away and together with her mother accompany her outside the room. We go for a short walk in the very short corridor outside the room. We walk along the corridor again and again. I ask her if it is fine for her if I sing *My Favourite Things*. She looks at me profoundly but does not nod, shake her head, or utter *yes* or *no*. I keep my voice very soft and sing while walking with her along the corridor. I smile at her.

I: Raindrops on roses and whiskers on [I stop].

I stop and look at her. Softly, she sings *kittens*. She holds my hand.

I: Bright copper kettles and warm [I stop].

I stop again, and she continues with *woollen mittens*. We are near the door of the room. I step inside; she holds my hand and sits on one of the chairs outside the room. She prefers to stay outside the room today. It is perfectly fine for me to stay outside the room with her. We continue our music conversation.

\*\*\*

Laura sits down on the black chair and sometimes goes outside the room. I let her decide where she feels comfortable doing her singing warm-up. She likes the song *If You're Happy and You Know It*. We play together.

I: If you're happy and you know it, run and run. [We run.]

I: If you're happy and you know it, circle your right arm. [We circle our right arm.]

I: If you're happy and you know it, and you really want to show it, if you're happy and you know it, sing *la la la*. [We sing *la la la*.]

Her mother is sitting down, but I need her help. We do the exercise with different instructions. Then I invite the mother to enjoy interacting with her daughter. I step aside and appreciate the smile on the mother's face. She feels that she can communicate with her daughter. Communicate and play. I remember Laura's mother's words:

Mother: I am in a room. She is next to me but not with me. I cannot talk to her.

\*\*\*

For Laura, the nursery rhyme *Incy Wincy Spider* has a special meaning. Trying to use *I want*, different verbs rarely appear in her short phrases. She knows many verbs. I am sure about that; however, I never hear them. Based on the first part of the melody of *Incy Wincy Spider*, I sing a song focusing on simple verbs.

I: What is mummy doing? Mummy is dancing.

Her mother dances, eats, drinks, walks, cries and jumps. Her mother is satisfied — even I. From a music conversation, I move on to an everyday conversation based on the sung verbs. Laura looks at me and slowly pronounces the verb that describes her mother's action. It was easy for her.

*Laura's mother:*

Laura was able to recognise notes (hand gestures) of Do, Re, Mi in reverse – Mi, Re, Do and sing along with minimal prompts. (May, 2024)

Was able to answer various questions using the verb + ing and noun, example – mummy is eating an apple. (May, 2024)

Said, “hi” to a woman she knows – without prompting. (June, 2024)

(Laura’s mother reflecting on her daughter’s progress following singing sessions focused on improving and facilitating communication skills, May to June 2024)

### Interpretation

During his breathing exercises, I encouraged Joseph to focus on maintaining a stable airflow. Lentini (2020) suggests that when teaching a child basic breathing techniques in singing, the child needs to become aware of moving air in and out of the body. I observed that at first, when Joseph was asked to move air in and out, he used sudden force to expel it. I saw that blowing bubbles was most effective for him. He realised that if he exhaled too forcefully, he could not blow bubbles. As relaxed airflow gradually began to develop, I noticed a slight improvement in the rhythm and clarity of spoken words.

In his repertoire section, Joseph participated in exercises that targeted specific communication skills. He practised responding to fact-based yes-or-no questions. The question "Is this a dog?" was sung using the first part of the song *Baa Baa Black Sheep*. Joseph’s mother and I noticed that the melody helped him engage more, and step by step, he began to understand the use of ‘yes’ and ‘no’ in context. The generalisation of this skill was crucial. I discussed with Joseph’s mother how conversations focusing on ‘yes’ and ‘no’ could

be incorporated into Joseph's daily routine, including during mealtimes, bath times, and bedtime.

Mind and body warm-ups often feature at the beginning of many singing sessions (Lentini, 2020; Williams, 2019). This part of the session can serve as an opportunity to help a child concentrate on what will follow during a singing session. Laura's mother frequently commented on being in the same room as her daughter but unable to connect with her. Using the song *If You're Happy and You Know It*, Laura's mother and I sang and performed different actions, such as 'run', 'dance', 'eat', and 'jump'. I observed that with this song, Laura interacted effortlessly with her mother and me. During her singing warm-up, I aimed to improve her social interaction skills (Mize, 2020).

Children can learn through songs (Ockelford, 2013). Laura enjoyed singing the song *Incy Wincy Spider*. I tried changing the lyrics of this nursery rhyme and observed whether Laura was comfortable with this change. I did this because during sessions, I often notice that some autistic children are not comfortable with changes in songs they like or know well, such as the lyrics, the ending, or specific intervals. I noticed that Laura knew many verbs but did not use them in context. Singing simple verbs such as 'eating', 'drinking', and 'running' to the tune of *Incy Wincy Spider* and acting them out seemed to help Laura begin to develop her initial understanding of how certain verbs can be used in conversations between two or more people. After the song, I played a similar game with Laura, using the same verbs spoken rather than sung. With practice, I noticed that Laura gradually started performing the actions in response to instructions. This suggests that if simple instructions are first introduced through song, autistic children might find it easier to take their first steps in performing clear, simple directions. However, this did not mean that Laura began to use the verbs in her daily

conversations; the skill needed to be generalised to other contexts. I asked Laura’s mother to take photos of Laura doing various tasks, especially those she enjoys, like jumping on the trampoline and feeding her dog. The photos were then used during the session to help Laura use the familiar verbs in context. Whenever possible, real objects were used instead of photos—in this case, Laura’s mother brought her favourite toys so that the verb ‘play’ was incorporated into the session. I also discussed with Laura’s mother the importance of using the learnt verbs and other simple verbs in Laura’s daily routine. Laura’s mother observed that, with prompts, Laura had started to understand better how to use specific verbs in context.

***7.3.3 Case Study 3 – Exploring the potential use of singing teaching to facilitate and improve the communication skills of an autistic child who is limited speaking (Koegel et al., 2020).***

Context

Based on the descriptions ‘nonspeaking’, ‘minimally speaking’ and ‘limited speaking’ given by Koegel et al. (2020), when Alan started attending sessions, I noticed that the term that best suited his communication abilities was ‘limited speaking’.

Alan is a thirteen-year-old autistic boy with excellent sitting tolerance. He rarely displays behaviours of concern. Alan demonstrates good sound and motor imitation skills, as well as intentional interaction. The child has only mild difficulties with joint attention. Before beginning the study, he attended sessions for about 11 months, once or twice a week, accompanied by his mother. The following are Alan's goals during the ethnography, based on Lentini’s (2020) “The Discover, Learn and Grow Curriculum” (p. 57):

*Mind and body warm-ups*

To practice stillness to warm up the mind for singing.

To participate in movement exercises to warm up the body for singing.

### *Posture*

To become aware of the proper standing posture for singing and to have a good posture when singing.

### *Breathing*

To understand the concept of stable airflow and practice this concept in specific games.

### *Musicianship*

1. To keep a steady beat with fewer prompts in three different simple songs.
2. To sing the pitches Do, Re, and Mi, learn the corresponding hand signs and notation and play these pitches on a step-bell instrument and a keyboard.
3. To copy 5-note rhythms on a djembe while singing the numbers 1 to 5.
4. To copy short melodic patterns.

### *Vocalising*

To explore head and chest voice vocalisations.

To sing the consonants /t/ and /d/ more articulate.

To sing the words 'happy', 'sad', 'sleepy', 'hungry', 'angry', and 'excited' with appropriate facial expressions and gestures.

### *Repertoire: Songs to facilitate communication skills*

To describe a picture using a favourite melody and then to describe the same picture using 5 sentences without the use of the chosen melody.

To describe a four-step sequence using a favourite melody and then describe the same sequence without the use of the chosen melody.

*Repertoire: Songs to improve communication skills*

To sing with minimal prompting the song 'You Are My Sunshine' along with a backing track while exploring the concept of a proper singing standing posture.

Observation

*Snapshots from Alan's sessions*

*Alan*

I address Alan and he repeats my exact words. Not always. Sometimes. I address his mother and he flies immediately into his own world. I address him again slowly, using direct words and gentle eye contact. He is with me. I start the warm-up exercises using one note. I throw the ball. He sings. His pitch is perfect. We are together, enjoying this special moment. We are communicating using a smooth, artistic language. I sing a note twice. Again, his pitch is perfect. I continue. His singing voice is beautiful.

\*\*\*

In his diction exercises, Alan is focusing on singing the consonants /t/ and /d/ more articulately. Jumping, playing with the ball, holding hands and laughing, Alan and I work on getting more forward /t/ and /d/ sounds, first in single notes, then in a sequence of notes. It is not difficult for Alan.

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*Alan's mother:*

I believe I should start by saying that Alan is noticeably increasing words to his vocabulary, that allow him to improve the way he communicates his needs. This is not saying that we can have flowing conversations, but more words from his end that allow him to interact with us and clarify his wants. We are noticing that while difficulties still remain, Alan is in a somewhat better position to reply to questions.

(Alan's mother reflecting on her son's progress following singing sessions focused on improving and facilitating communication skills, May 2024)

### Interpretation

I observed that Alan, the autistic boy with limited speech, demonstrated a strong ability to copy short melodic phrases; he rarely had difficulty with pitch. The goals I set with him were based on this observation. During the mind and body warm-up, I realised that it was essential for Alan to practise stillness because he found it hard to let go of what had happened before the session began (Lentini, 2020).

With Alan, I worked on simple posture goals using imitation games; gradually, I encouraged good singing posture during songs. Diction exercises focusing on articulation and projection are vital for singers, even for those who, as Lentini (2020) describes, are at the early stages of discovering their voice. Alan practised singing the consonants /t/ and /d/ more clearly. While he seemed to be improving the articulation of these consonants, I observed excellent joint attention, eye contact, and engagement.

Alan's musicianship goals appeared to range from maintaining a steady beat in simple songs to learning the notation of the first three notes of the tonic sol-fa scale. Getting to know

Alan, I realised how important it was to introduce small steps each session and to continuously revise the material covered from one session to the next. This seemed to help Alan not only develop his musical skills but also stay connected with me during each session. I believe this approach is no different from working with any other student, whether neurodivergent or not.

During his repertoire section, focusing on specific communication goals, one of Alan's aims was to describe a picture using any chosen melody. Alan chose a picture from a set, and I encouraged him to sing a sentence about it with any melody he preferred. The picture he selected showed several children engaged in different actions, such as a girl buying an ice cream and a boy swimming. He sang the sentence, "The girl is buying an ice-cream," to an improvised melody. Together, we used the same melody to create other sentences; I accompanied Alan on the guitar. Then I asked Alan if he would like to write down the five sentences he had sung so it would be easier for him to sing them consecutively. He chose to write his sentences down. After singing the improvised melody with the five sentences about the picture, I encouraged Alan to describe the picture without relying on the melody. I observed that this exercise helped Alan form sentences; however, he repeatedly used the structure "The girl is swimming." I decided that my next goal would be to follow the same steps but encourage sentences with a different structure. I noticed that for Alan, spoken words felt like being wrapped up in his favourite blanket—the singing blanket, which he felt comfortable with.

#### ***7.3.4 Discussion: Interpretation of the Intertwined Three Case Studies Through the Development of Two Themes Using Reflexive Thematic Analysis***

Reflexive thematic analysis was employed to examine the data collected during the ethnography. To interpret the three intertwined case studies, two themes were developed. Maintaining a reflexive journal was crucial for conducting a reflexive thematic analysis. My

experiences during the ethnography had a significant impact on me; they altered the perspective I adopted when working with autistic children and their carers. Throughout this process, I continuously reflected on my experiences. The following extract is part of a reflective journal entry I wrote after a session with Joseph.

*We both knew something was frustrating him, but we could not identify it. Maybe he was tired? Perhaps he was not in the mood for singing activities? I did not start the session. It was wrong to start the session before Joseph felt comfortable and happy. His mother hugged him. I think there is no other person than a mother, father, or caregiver to help in situations like this. His mother took off his tracksuit jacket. Joseph was suddenly okay. I would not have managed to make Joseph feel comfortable without the help of his mother. We started the session. We played and sang together. It was fun for all of us then.*

**Table 7.6** *The themes developed to interpret the intertwined three case studies*

Phase	Aim	Developed themes
Phase 3 The ethnographic case series	To explore how, while keeping the uniqueness of the child at the centre, I can use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS.	Theme 8: Same subject, adapted goals  Theme 9: Continuously planning a bridge between singing and communication skills

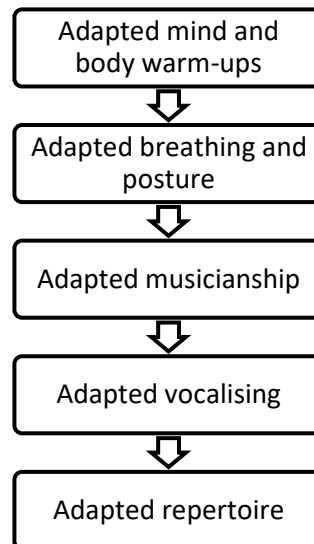
The following two arrow diagrams briefly outline the scope and flow of the two developed themes of phase three (refer to Figures 7.1 and 7.2).

Phase 3: An ethnographic case series

Aim: To explore how, while keeping the uniqueness of the child at the centre, I can use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS.

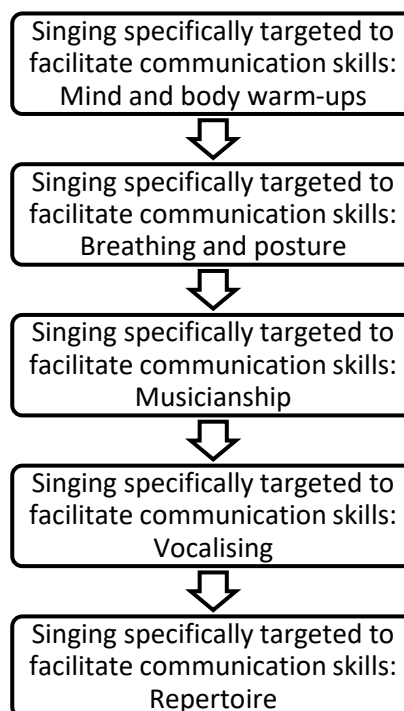
Theme 8: Same subject, adapted goals

**Figure 7.1** *Same subject, adapted goals*



Theme 9: Continuously planning a bridge between singing and communication skills

**Figure 7.2** *Continuously planning a bridge between singing and communication skills*



#### **7.3.4.1 Theme 8: Same Subject, Adapted Goals**

The first phase of the study, the online questionnaire, hinted at the potential that singing teaching could have for autistic students. However, when interpreting the findings of phase one concerning autistic children of different levels and communication abilities, caution must be applied. Only 24% (n=8) of the online questionnaire participants reported teaching experience with autistic students at Level 3. In addition, only 18% (n=6) reported experience with autistic children whose language is non-functional and 24% (n=8) experienced teaching singing to autistic children whose speech consisted of nonspeech vocalisations. The second phase, the online interview, focused specifically on autistic children who are NS, MS, or LS (Koegel et al., 2020). Amongst the interviewed participants, professionals working with autistic children who are NS, MS, or LS were recruited. Finding singing teachers with the required experience was challenging. No participants could be found. I had to submit an ethics amendment so that participants outside the UK or Malta could also be included in phase two of the study. The singing teachers who were eventually interviewed admitted minimal experience with the population in concern; they only experienced teaching one or two students who were autistic and NS, MS, or LS. Precisely, these participants' descriptions of the children they taught were of children who were MS or LS, not of children who were NS. This led me to design an ethnography to explore how I could teach singing to autistic children who are NS, MS, or LS. I was aware that no one method could be adopted and that the uniqueness of each child had to be kept at the centre. To interpret the intertwined three case studies, the first theme I developed from the collected data is *Same subject, adapted goals*. The name of the theme represents the journey I had to explore to find out how I could adapt the sections of a typical children's singing session for autistic children who are NS, MS and LS.

The importance of warm-up exercises is underlined in literature focusing on singing and singing pedagogy (e.g. Alderson & Alderson, 2020; Lentini, 2020; Williams, 2019). Alderson and Alderson (2020) explain that “warm-up exercises are intended to supple and stimulate the muscles, causing increased blood flow and heat (literally *warming-up*). Both mind and body must be prepared and focused prior to beginning a practice session, lesson or performance” (p. 189). Lentini (2020) suggests that warm-up exercises are an opportunity to encourage the collaboration of a child and target focus. The following goals were specifically designed for Alan, the autistic boy who is LS:

*To practice stillness to warm up the mind for singing.*

*To participate in movement exercises to warm up the body for singing.* (Ethnography, Two of Alan’s goals)

Alan entered the session very enthusiastic, sometimes too excited. The practice of stillness seemed to encourage him to let go of events that occurred before the session, and the movement exercises gradually helped him focus on the session’s tasks. Alan followed the step-by-step direct instructions given to him, and therefore, the warm-up goals were objectives typically targeted in neurotypical children’s singing sessions (Lentini, 2020; Williams, 2019). For Nicholas, the warm-up goal was to encourage him to participate for a few seconds with his mother and me during a task. The warm-up goal for him was:

*To participate in a social game by means of a song or a melody.* (Ethnography, One of Nicholas’s goals)

I had a small car, which he liked a lot. To encourage him to draw his attention to me, I used to sing the nursery rhyme *The Wheels on the Bus* and gently invite him to press the horn of the car when I sing, “The horn on the bus goes beep beep beep”. The focus establishment discussed by Lentini (2020) during warm-up exercises was differently targeted in the sessions

of Alan and Nicholas; however, step by step, I observed how they worked to achieve the level of focus they could aim for at that moment.

When working on breathing, the study corroborated Lentini's (2020) observation that for beginner singers, the first steps are the movement of air in and out of the body and the expiration of air without force. For Laura, the 10-year-old MS girl, the expiration of air without force was challenging. In fact, during the sessions, she worked on the following goal:

*To understand the concept of stable airflow. (Ethnography, One of Laura's goals)*

When I tried a pinwheel, Laura was overwhelmed by the object's movement and preferred to go outside the room. I realised that blowing bubbles was a better option for her. Throughout the sessions with her mother, we used to play blowing the biggest bubble, so that Laura could learn how to exhale air slowly. When reflecting on the progress of Laura between one session and another, her mother wrote about the continuous practice of blowing big bubbles at home. This observation of the mother indicated that since she participated in the task with her daughter during the session, she felt comfortable finding appropriate situations to implement singing tasks at home. Nicholas, the four-year-old NS autistic boy, found it very challenging to move air in and out of the body when asked to do so. He could not blow out the candles on his birthday cake. I observed that a small whistle was very helpful for him. His goal was:

*To learn how to move air in and out of the body. (Ethnography, One of Nicholas's goals)*

He required a number of sessions to understand what was expected of him when he was asked to blow a whistle. We used to run around the room, and then he would suddenly look at me when I blew a whistle during a specific part of a nursery rhyme. It seemed that movement helped him to feel at ease. We moved around, ran and jumped on the trampoline. Gradually,

he became interested in blowing the whistle. He tried to blow, but he could not. Holding Nicholas on her lap, his mother worked hard to encourage him to exhale gently to blow the whistle. Working on breathing at a very basic level, I observed how Nicholas slowly succeeded in moving air in and out of the body.

Moreover, proper posture is essential in singing (Williams, 2019); however, the ethnography suggested that in certain situations, each child's uniqueness should be prioritised. It was fine for Joseph to work on the best sitting posture for respiratory support, and for Alan it was challenging but fun to become aware of the proper standing posture for singing and having a good posture while singing a short part of a song. However, it was a different reality for Laura and Nicholas. The application of the Mosaic approach (Clark & Moss, 2011) guided me to decide that it was not beneficial to work on posture with Laura and Nicholas. Both Laura and Nicholas become frustrated when receiving an instruction that affects their liberty of movement in some way or another. Thus, I observed that although it might be possible to work on posture with these two children at a later stage, it was not beneficial for them during the study.

Consistent with the suggestion of the Sounds of Intent framework (Sounds of Intent, n.d.-a; Sounds of Intent, n.d.-b; Sounds of Intent, n.d.-c), a framework guiding how individuals with learning difficulties can enjoy, explore and learn music, the ethnography indicated that it is possible to teach musicianship to autistic children who are NS, MS, or LS. Ralph, a 15-year-old autistic NS boy, worked on keeping a steady beat in two songs that he enjoyed. Another musicianship goal that he worked on was:

*To become aware of pitches Do, Re and Mi by learning the hand sign for these pitches and playing these pitches on a step-bell instrument. (Ethnography, One of Ralph's goals)*

The wording of this goal respected the challenge that Ralph had to produce different sounds, including pitches. The goal targeted the ‘awareness’, not the singing of the three mentioned pitches. Ralph eagerly explored these new concepts using a colourful small xylophone. Since Ralph had no issues with imitation, I observed that doing hand signs for Do, Re and Mi soon became a fun game. Laura was also introduced to the basics of solfege. Her goal differed slightly from that of Ralph because of the differences in communication and singing skills between the two students.

*To sing the pitches Do, Re, Mi, learn the corresponding hand signs and explore these pitches on a step-bell instrument. (Ethnography, One of Laura’s goals)*

Reflecting on Laura’s practice at home, Laura’s mother wrote:

*Laura was able to recognise notes (hand gestures) of Do, Re, Mi in reverse – Mi, Re, Do and singing along with minimal prompt. (Ethnography, Laura’s mother)*

To improve the singing of different pitches, Joseph worked on matching the pitch of a word at the end of a phrase in an echo song (Lentini, 2020). This game was initially challenging for Joseph; the study indicated that repetition and giving students the time required are essential strategies.

Lentini (2020) explains that during vocalising tasks, children “should begin to understand all the efficient sounds their voice can make” (p. 62). I noted that this concept might be beneficial for autistic children who are NS, MS, or LS to help them explore what their voice is capable of producing. While Alan, the 13-year-old LS autistic boy, explored his head and chest voice vocalisations using a microphone, Ralph worked hard to prolong a V and a CV sound. While it was not difficult for Laura to prolong a note, it was extremely challenging for Ralph to prolong any sound. I witnessed Nicholas gradually discover how to vocalise a sound

when requested. Singing the ending 'aghh' of the song *Row, Row, Row Your Boat* was a game that he started to enjoy and play, not only during the session but also with other family members.

Ockelford and Markou (2012) detail how individuals can benefit from “education *in and through* music” (p. 387). The ethnography focused on how singing repertoire could build on the concept highlighted by Ockelford and Markou (2012). Repertoire tasks were divided into two sections: 1) songs to indirectly improve communication skills and 2) songs to directly facilitate communication skills. Working on repertoire to indirectly improve communication skills, Alan explored how he could sing the song *You Are My Sunshine* along a backing track with minimal prompting. He learnt the importance of proper singing standing posture during this task. At the moment of the study, Nicholas was not focusing on singing words. The session steps leading to the repertoire section were targeting air movement in and out of the body, simple vocalisations when requested and improvement of connecting with other people, specifically his mother and me. Therefore, as a song to indirectly improve communication skills, he worked on using a whistle to punctuate the endings of certain phrases of the song *Happy Birthday*. Using a microphone, Joseph filled in one or two blank words in the songs *Rain, Rain Go Away* and *Bingo*. I observed that the blank gradually started to involve more words through repetition.

Jeffery (2023) suggests that singing can be an important tool to “support early verbal skills” (p. 189). The observations from the ethnographic case series support Jeffery's (2023) suggestion. When singing repertoire specifically targeted the facilitation of communication skills, participants explored how they could develop particular communication skills through songs and singing. Nicholas worked on giving an object on request during an adapted nursery

rhyme and Ralph practised singing words containing diphthongs in a song. I witnessed Joseph answering fact-based yes-or-no questions in a song, and Laura discovering how to sing verbs ending in -ing followed by a noun. Alan enjoyed writing lyrics to a simple nursery rhyme to describe a picture and then sing the song.

The theme *same subject, adapted goals* discussed how the ethnographic case series explored the adaptation of singing goals for autistic students who are NS, MS, or LS. Studying the goal adaptations described, it is evident that the more the disciplines of singing pedagogy and speech and language therapy intertwine, the better the results one can obtain when teaching singing to autistic students who are NS, MS, or LS. This leads to the second theme that was developed to interpret the case series: *continuously planning a bridge between singing and communication skills*.

#### **7.3.4.2 Theme 9: Continuously Planning a Bridge Between Singing and Communication Skills**

The ethnographic case series suggests that singing activities must be purposely planned to target specific communication skills. This finding of the ethnographic case series corroborates Patel's (2011) argument, which emphasises the importance of intentionally planning music activities to target speech processing. The title of the second theme developed from the data collected during the ethnographic case series indicated that the 'bridge' between singing tasks and communication goals is not something that results automatically; frequently, this 'bridge' has to be purposely and continuously planned. The title includes the indefinite article 'a', not the definite article 'the'. This is because no one right bridge exists between a specific singing task and a communication goal. Since every individual is unique, the bridge between a singing goal and a communication goal has to be specifically tailored according to the steps that the individual is aiming for. The observation resulting from the ethnographic case series that individuals require plans or sets of goals particularly tailored for

them contrasts with strict protocols described in other studies focusing on melodic phrases and communication skills, such as those in Wan et al. (2011) and Sandiford et al. (2013).

Mind and body warm-ups during a singing session might target social interaction improvement. This supports the idea explained by Ockelford (2013) and suggested in the Sounds of Intent framework (Sounds of Intent, n.d.-a; Sounds of Intent, n.d.-b; Sounds of Intent, n.d.-c) that music may allow individuals to “listen to the sounds that others are making, in a variety of contexts, and to respond appropriately to them” (p. 202). The pediatric speech and language therapist Laura Mize (2020) suggests how songs, such as *If You’re Happy and You Know It*, *Incy Wincy Spider* and *The Wheels on the Bus*, can be used as social games to help the child “pay attention to what you’re doing, stay with you” (p. 62). This aligns with the focus targeted by Dana Lentini (2020), a singing coach focusing on pediatric pedagogy, during mind and body warm-ups.

Furthermore, Alan participated in movement exercises to warm up his body for singing. During tasks related to this goal, he was encouraged to focus on the instructions given and participate in the interaction between him and me. In one of the warm-up exercises, Alan also worked on reducing his echolalia. I sang two of the same notes using the vocalisations yo-yo and he was guided to sing the same two notes using the vocalisations *la-la*. I observed that although the warm-up exercise was challenging for Alan at the beginning, with repetition and practice, he seemed to improve a lot. He started working on different sets of notes. I noted that he also managed to sing triads using the same method. His mother observed a reduction in echolalia and also better attention skills. Reflecting on Alan’s progress, his mother wrote:

*When not directly involved in conversations, Alan is evidently listening and where curiosity kicks in, he takes the initiative to ask or clarify aspects that are being said. For*

*example, if we talk about going somewhere Alan asks (in his own words) about where we are going, at what time we are going, so he knows what's happening. (Ethnography, Alan's mother)*

The warm-up for Nicholas, the four-year-old autistic boy who is NS, involved pressing the horn of a toy bus during the song *The Wheels on the Bus* so that the first steps of engagement with other individuals could be promoted. On the same lines, Laura's warm-up goal was:

*To participate in a social game by means of a song or a melody. (Ethnography, One of Laura's goals)*

This goal was planned for Laura because her mother frequently commented on Laura's challenge to initialise a short interaction. Various songs, such as *If You're Happy and You Know It*, were practised at the beginning of the sessions so that Laura could engage with her mother and me. She was invited to fill out blanks or perform movements sung in different songs. Reflecting on her daughter's progress in social interaction, Laura's mother observed an improvement in social interaction, not only with family members but also with children of similar age to Laura and people that Laura knew.

*Pointed at a leaf whilst in the car and specified that it is a "green leaf".*

*Pointed out that "there's a hole" in her trousers.*

*Saw a kite and told me "kite" and when asked what colour said "yellow kite".*

*Said "hi" to a woman she knows – without prompting.*

*Says "hello" to people she knows to grab their attention.*

*Noticed that, for example, when her cousin started singing "Where is thumbkin", she started using it to initialise interaction with [him] on other occasions. (Ethnography, Laura's mother)*

Additionally, autism is mainly a social communication disorder. However, studies such as the systematic review by Chaware et al. (2021) indicated that oral-motor difficulties in autistic children can sometimes occur. It is crucial to emphasise that being a social communication disorder, autism is not always accompanied by a speech sound disorder. Chaware et al. explain that the two subtypes of motor-speech disorder are childhood apraxia of speech and prosody. Childhood apraxia of speech is described as “an impaired speech production due to difficulty in the muscular control of the speech mechanism” (Chaware et al., 2021, p. 475). Meanwhile, prosody is recognised as “suprasegmental features of speech which include the use of stress, pitch, rate, intonation, and loudness” (Chaware et al., 2021, p. 475). Shriberg et al. (2011) argue that childhood apraxia of speech in autism is quite rare, and Paul et al. (2005) discuss the difficulties observed in prosody in autism. Shriberg et al. (2011) underline how their study, which focused on delayed speech, articulation, childhood apraxia of speech and prosody and was carried out with autistic children and controls, supports the speech attunement framework, not the presence of speech-motor deficits in autism. Further on, they explain that the speech attunement framework “posits that persons with ASD have normal to enhanced auditory-perceptual and auditory-monitoring skills (they tune in), but have affective, social reciprocity challenges that mediate the acquisition, performance, and monitoring of appropriate speech, prosody, and voice in discourse (they variably tune-up)” (Shriberg et al., 2011, pp. 421-422). The ethnographic case series suggested that, although oral-motor difficulties could be present in autistic individuals, the primary difficulty is social communication. Nicholas could not blow a candle and Ralph could not prolong a sound or a note. Nonetheless, it was continuously observed that their main obstacle was social interaction. In this case series, when observed, oral-motor difficulties were more evident in NS children, Nicholas and Ralph, than in MS or LS children, Laura, Joseph and Alan.

Oral-motor difficulties were least observed in Alan. In comparison to Nicholas and Ralph, Laura and Joseph seemed to demonstrate minimal oral-motor difficulties. Laura, Joseph and Alan all exhibited challenges related to prosody. As explored in the second phase of this study, singing might be an effective method to teach certain aspects to autistic children or to communicate with them. The third phase further suggested that various songs and singing-related tasks can be explored to target oral-motor difficulties resulting from “affective, social reciprocity challenges” (Shriberg et al., 2011, p. 421) faced by autistic children.

When planning the bridge between singing goals and communication goals, the singing goals of Nicholas and Ralph were linked more to speech goals than those of Laura, Joseph and Alan. The singing goals of Laura, Joseph and Alan were mainly connected to language goals rather than to speech goals. All singing goals of the five participants were strongly tied to social communication goals. This difference in goal planning of the five participants was primarily possible through the in-depth application of the Mosaic approach (Clark & Moss, 2011). The application of the Mosaic approach permitted the analysis of each participant’s uniqueness and specific needs. When working on learning how to move air in and out of the body, it was evident that for Nicholas, blowing a whistle was highly challenging. However, I noticed that it was more difficult for the boy to understand what was required of him. When small steps were taken to gradually help him connect with his mother and me while understanding the requested task, he was observed blowing the whistle without any problems. I noted that Ralph’s difficulty in understanding the concept of stable airflow was slowly tackled when, hand-in-hand with his mother, I managed to find simple methods to show him an easy way to expire air without a sudden force. While Laura seemed to grasp the concept by blowing large bubbles, bubbles were not the most effective option for Ralph. Ralph was captivated by soap and kept touching and licking it instead of concentrating on blowing

large bubbles. Gradually and gently blowing cotton or tissues appeared to be a better approach for Ralph. The difficulty of discovering what suited Ralph best was overcome, and he seemed to be beginning to understand the concept of stable airflow.

*The link between the words is shorter and shorter. Yesterday, after the session, he saw me going to the shop: he jumped in his shoes very promptly and showed me the door. "Go shop car", he said, with no gap! (Ethnography, Ralph's mother)*

*"Water" came so nice yesterday. "Oa" and "ta" not so glued but good enough. (Ethnography, Ralph's mother)*

*Whistle in Happy Birthday – mostly it is being successful. (Ethnography, Nicholas's mother)*

As explained in the discussion of the theme *same subject, adapted goals*, posture goals were not a priority for all ethnography participants. When singing posture goals were targeted, they were mainly related to communicating a song or a short musical phrase in the best way possible with other people. From tense shoulders and eyes fixed on the floor, I gradually observed Alan relaxing his shoulders and communicating a short musical stanza more confidently. I noted that targeting good singing posture promoted more confidence in communicating through songs and also communicating songs with others.

*... Alan immediately showed interest in singing, evidently singing along with songs that he likes. Such songs include music from his favourite cartoons. This has further evolved by singing along while being led by his sister who is older than him. (Ethnography, Alan's mother)*

While intentionally shaping singing goals to target speech, language and communication goals (Patel, 2011), the study explored the significance of carryover techniques (Marshalla, 2010) and parental coaching (Lentini, 2020; Mize, 2020). The coaching of parents during sessions appeared to give the children a continuous opportunity to apply

learnt communication skills in everyday contexts. As part of the actual session tasks, parents discussed and became familiar with how to incorporate singing goals into their children's daily routine. From being invited to vocalise in specific song parts, Nicholas was invited to vocalise a sound to express his request to be gently pushed forward on a swing when playing with family members. From focusing on a steady beat with fewer prompts in three simple songs, Alan's mother was coached to invite Alan to engage more in simple conversations and work on joint attention.

Moreover, the ethnographic case series explored how musicianship goals during a singing session could be linked to communication goals such as receptive communication skills, motor imitation and joint attention. Nicholas's goal consisted of focusing on basic rhythm in relation to interaction with others through sound; this goal was taken from the Sounds of Intent framework (Sounds of Intent, n.d.-a; Sounds of Intent, n.d.-b; Sounds of Intent, n.d.-c), with the main descriptor being "interacts with others using sounds", Level 2, interactive.

*Introduction to rhythm: To interact with others using sound, specifically to respond to one type of sound by making a sound and making one type of sound expecting a sound to be made in response. (Ethnography, One of Nicholas's goals)*

Motor imitation and joint attention were specifically targeted when working with Nicholas on this goal. Initially, the rhythm played by Nicholas on the small drum was not the most important; the engagement and joint attention that the boy was observed to demonstrate were most crucial. Ralph and Joseph seemed to enjoy keeping a steady beat in two simple songs. While practising this musical skill, the caregivers of the two participants noted improvements in focus and in their interactions with the person keeping the beat with them. The solfege goals of Alan were an opportunity to learn Do, Re, Mi and Fa notations together

with the notations of a crotchet, a minim and a semibreve. Alan was introduced to notations on a small xylophone, but then he was gradually guided to play a combination of the learnt musical notations on a keyboard. Towards the end of the ethnography, I observed him working on the solfege of *You Are My Sunshine*, reading and playing the treble clef notation on a keyboard, and singing while playing the notes. I was working with Alan on solfege and basic notation. The study suggested that goals of this type might be used to work on receptive communication skills and joint attention. I observed that the student had to pay attention to the continuous instructions I gave him and to the beat I was clapping. The described musicianship goal could have influenced the quality of the conversations Alan engaged in, as his receptive communication skills were challenged while working on it.

The vocalising section of a singing session could take various forms depending on the singing student. While Alan worked on showing emotions through different melodic phrases, Nicholas focused on vocalising when requested. It was challenging for Alan to express his feelings and Nicholas found it difficult to focus, engage and vocalise a sound when invited. The two autistic boys worked on two different goals during the singing session's vocalising section. While Alan also focused on singing a more articulate /t/ and /d/, Ralph explored connecting a consonant (C) with a vowel (V) sound and vice-versa while being accompanied on the guitar.

*To sing the consonants /t/ and /d/ more articulate.* (Ethnography, One of Alan's goals)

*To articulate CV and VC sounds including the consonant sounds /g/, /k/, /d/, /b/, /t/, /m/, /n/, /p/, or /l/.* (Ethnography, One of Ralph's goals)

Ultimately, I observed that for children with a similar communication profile to that of Ralph, the vocalising section of a singing session could provide an opportunity to practice CV and VC sounds. In other words, there might be potential for students to improve the clarity of

sounds already used in everyday words. Ralph worked on CV, VC and diphthongs while continuously working on singing goals linked to language-based goals. As Mize (2018) highlights, a child must understand that what he “is trying to say is much, much more important than how he says it” (p. 11). While Sandiford et al. (2013) assigned melodies to targeted words and Wan et al. (2011) focused on bi-syllabic words related to daily activities, Ralph, during the session, did not only focus on pronouncing words or phrases clearly. Importance was also given to the combination of language, speech and communication skills. This approach enabled Ralph to focus not only on speech goals but to work on social communication goals, including speech goals, because autism is primarily a social communication disorder. This leads to how the repertoire section during the ethnography enabled the connection between speech, language and communication skills.

During the section *Songs to improve communication skills*, children practised a song or a set of songs they liked. While practising the chosen song or songs, they indirectly worked on language, speech and communication skills such as attention, eye contact, sound imitation, motor imitation, receptive communication skills, expressive communication skills, the vocalising of different sounds and the singing of various syllables combined in words.

*To whistle in specific parts of the song ‘Happy Birthday’.* (Ethnography , One of Nicholas’s goals)

*To fill in a one-word blank in the adapted version of the song ‘Rain, Rain Go Away’ using a microphone.* (Ethnography , One of Ralph’s goals)

*To sing the song ‘Mr Golden Sun’ with fewer prompts.* (Ethnography , One of Laura’s goals)

*To sing with minimal prompting the song 'You Are My Sunshine' along with a backing track while exploring the concept of a proper singing standing posture. (Ethnography , One of Alan's goals)*

Songs targeted to facilitate communication skills focused on particular communication, language, and/or speech skills that the child could benefit from to progress to the following communication steps. For instance, Nicholas worked on giving an object on request during a nursery rhyme, and Alan wrote lyrics to a song to describe a four-step sequence in back-and-forth interactions with me. I observed how Laura carried out three information-carrying-word instructions in a song, and then followed similar instructions without a song. All of these goals underline the individuality of each child. Every autistic child, like every other neurotypical child, is unique. There is no recipe for how singing goals could be linked to specific language, speech or communication goals. The only recipe is to follow what the child enjoys eating and what diet is most beneficial for the child. In other words, the only approach is to link singing goals to language, speech and communication goals while keeping in mind the musical preferences; the general likes, dislikes and strengths; and the communication needs of the child.

#### **7.4 Conclusion**

Using an ethnographic case series approach, in Chapter Seven, I explored the potential of singing as a method to improve and facilitate the communication skills of autistic children who are NS, MS, or LS. The tripartite framework of 'context', 'observation', and 'interpretation' employed in each case study enabled a systematic approach that distinguished between what was observed during sessions and my interpretation of the lived experiences with autistic children and their caregivers. The case series ended with an interpretation of the three intertwined case studies, framed by two themes developed

through reflexive thematic analysis. The next chapter concludes the three-phase study by presenting a summary of the main research findings, implications for the field of knowledge, and recommendations for future research.

## Chapter 8 – General Discussion and Conclusion

### 8.1 Introduction

Braun and Clarke (2022) argue in favour of studies “contributing something to a rich tapestry of understanding that we and others are collectively working on, in different places, spaces and times” (p. 120). Building on the tapestry metaphor presented by Braun and Clarke, this study was but a small piece within the process of weaving delicate threads which aimed to form a tiny part of a substantial, ever-changing picture of the tapestry loom of autism, communication skills and singing. Works such as those carried out by Oldfield et al. (2019), Lim (2010), Sandiford et al. (2013) and Wan et al. (2011) suggested how various melodic patterns presented in melodies or songs could facilitate various communication skills, such as improvements in social interaction, receptive communication skills and expressive communication skills. To the tapestry loom that researchers like those previously mentioned have built, the three-phase research study explored how singing teaching might indirectly improve and purposely facilitate the communication skills of autistic children. Other works contributing to the tapestry loom, focused on autistic children who fit the descriptions of autism Level 1 and Level 2 described in the DSM-V-TR (APA, 2022b). In contrast, this study aimed to concentrate on what in DSM-V-TR is referred to as Level 3 autism (APA, 2022b). In this concluding chapter, the research questions/aims of the study are first outlined. They are then followed by a general discussion, joining the three phases of the study: an online questionnaire, a set of online interviews and an ethnographic case series. The study’s limitations, the implications of the study findings on the field of knowledge and suggestions for future research are discussed.

## 8.2 Research Questions/Aims of the Three-Phase Study

The three phases of the research study were an online questionnaire for singing teachers who had experience with autistic students, semi-structured online interviews with parents of autistic children and professionals and an ethnographic study with autistic children and their caregivers. The study aimed to explore how singing education could affect the development and enhancement of singing, speech and communication skills of autistic children, especially those who are NS, MS, or LS. The online questionnaire researched approaches that teachers of singing consider to be effective when teaching singing to autistic students who are MS. The impact of singing teaching on autistic students observed by singing teachers was also analysed in the study's first phase. The findings of the study's first phase informed the design of the study's second phase. The online interviews were specifically designed to explore practitioners' and parents' perceptions of how singing can facilitate the communication skills of autistic children who are NS, MS, or LS. The findings of the study's first two phases led to an ethnographic study with five autistic children who were NS, MS, or LS and their caregivers. During the ethnography, while prioritising the uniqueness of each child, I looked into how I could use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS. Table 8.1 presents the research questions/aims guiding the study's three phases and the participants who took part in each phase.

**Table 8.1** *Research questions/aims of the study*

Research questions/aims	The phase of the study	Participants
1. What approaches do teachers of singing consider to be effective in teaching singing to autistic students, including	Phase 1 An online questionnaire	<ul style="list-style-type: none"> <li>Singing teachers or musical theatre singing teachers based in Malta or the UK with</li> </ul>

students who are MS?		experience teaching singing to autistic students. Teachers teaching singing in schools as part of their curriculum could not participate in the questionnaire.
2. What is the impact of teaching autistic students to sing as perceived by teachers of singing?		
3. What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS?	Phase 2 A set of online interviews	<ul style="list-style-type: none"> <li>• Two parents of autistic children who were NS, MS, or LS</li> <li>• One nursery teacher and one preschool teacher</li> <li>• Two teachers teaching children a foreign language at a basic level (CEFR Level A1-A2 (Council of Europe, 2021))</li> <li>• Two singing teachers with experience with autistic children who are NS, MS, or LS</li> <li>• Two music therapists with experience with autistic children who are NS, MS, or LS</li> <li>• Two occupational therapists with experience with autistic children who are NS, MS, or LS</li> <li>• Two speech-language pathologists with experience with autistic children who are NS, MS, or LS</li> </ul>
4. To explore how, while keeping the	Phase 3 An ethnography	<ul style="list-style-type: none"> <li>• Five autistic children who were NS, MS, or</li> </ul>

<p>uniqueness of the child at the centre, I can use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS.</p>		<p>LS and their caregivers</p>
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### 8.3 Main Research Findings

The sixth chapter of this thesis combined the findings and discussion sections of the first two phases of the study, which were an online questionnaire and semi-structured online interviews. The discussion that concluded the seventh chapter interpreted the intertwined three case studies of the ethnographic case series through the discussion of two themes developed through reflexive thematic analysis. The purpose of the discussion in Chapter Eight is to merge and culminate the thesis's explorations. As indicated in Table 8.2, nine main themes from all three phases of the study were developed in relation to the research questions/aims of the study.

**Table 8.2** *The main themes developed*

Research question/aim	Developed themes
<p>What approaches do teachers of singing consider to be effective in teaching singing to autistic students, including students who are MS?</p>	<p>Theme 1: No cookie-cutter approach</p> <p>Theme 2: The significance of experience</p>
<p>What is the impact of teaching autistic students to sing as perceived by teachers of singing?</p>	<p>Theme 3: Singing may get better</p> <p>Theme 4: It is not only singing that may get better</p>

<p>What are the perceptions of practitioners and parents about how singing can facilitate the communication skills of autistic children who are NS, MS, or LS?</p>	<p>Theme 5: Communication as an orchestra, not as a solo instrumentalist named ‘talking’</p> <p>Theme 6: The art of drawing them in</p> <p>Theme 7: Singing as a ‘common sense’ tool</p>
<p>To explore how, while keeping the uniqueness of the child at the centre, I can use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS.</p>	<p>Theme 8: Same subject, adapted goals</p> <p>Theme 9: Continuously planning a bridge between singing and communication skills</p>

The three-phase study explored how autistic children, even those who are NS, MS, or LS (Koegel et al., 2020) can benefit from education “in” and “through” singing (Ockelford & Markou, 2012, p. 387) to improve and facilitate their communication, speech and language skills. Emphasising that every autistic individual is unique, like any other neurotypical person, the study highlighted that there exists no set of approaches which can be applied when teaching singing to autistic students. Although no specific set of singing teaching approaches can be adopted with all autistic students, the findings demonstrated the importance of the educator’s experience and the need for the educator to collaborate with professionals working with the student. From the perspectives of singing teachers, different professionals, including music therapists and speech-language pathologists and caregivers, the clearest finding to emerge from this study is that when autistic students attend singing sessions which target their learning needs, preferences and strengths, musical and singing skills can flourish. The thoughts and observations of parents and practitioners hint that, in addition to benefits for musical and singing skills, singing education can promote cognitive, creative, social, and emotional development. In the study’s first phase, the viewpoint of singing teachers

suggested that singing training might also be a promising tool to promote communication skills improvement in autistic children.

When focusing on the perspectives of practitioners and parents on how singing teaching can specifically target the facilitation of communication skills of autistic children who are specifically NS, MS, or LS, the study highlighted the importance that communication is viewed as a wide umbrella made up of various skills, not only as the skill of 'talking'. Talking is only one method which can be used to communicate. Choosing whatever method of communication, skills like social interaction, communicative intent and preverbal skills are essential; singing sessions can specifically be planned to target all these vital communication skills, together with other skills such as the enhancement of vocalisations and expressive language.

Furthermore, focusing specifically on autistic students who are NS, MS, or LS, the second phase of the study indicated that, although, as demonstrated in phase one, no specific singing teaching approaches can be used with all autistic students, specific methods do exist which can be helpful to increase the engagement of a child during a singing session. The findings shed light on the importance of not keeping a child in a closed box while constantly taking the child's lead. The current findings support the invaluable contribution that caregivers can give when working with singing teachers. Singing was portrayed as a promising 'common sense' tool that, if explored in future research, might help improve the communication skills of autistic individuals.

When exploring how, while prioritising the uniqueness of each child, I could use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS, the research showed that it is possible to teach singing to the targeted population; however,

the goals have to be designed specifically for each student. For example, while doing vocalising exercises, a teacher working with an autistic student who is LS might work on exploring head voice. Another teacher working with an autistic child who is NS, might focus on encouraging vocalisations on request. Additionally, another significant finding that emerged from this study is that to target the improvement of specific communication skills through singing, continuous planning to reach communication goals through singing-related goals is crucial. Observations suggested that if specific communication skills, which a child benefits from mastering, are thoughtfully linked to singing, it could be easier for the child to achieve the particular communication goal, apply it in different contexts, and continue developing it rather than regress. For certain autistic individuals, singing is a natural and enjoyable activity. Therefore, reaching communication goals through singing might be beneficial. It was observed that since, in some instances, some autistic individuals might find singing easier than speaking, achieving a communication goal through singing might be a method worth considering.

#### **8.4 Strengths and Limitations**

The present study adds to the growing body of research that proposes music and singing as beneficial tools for the holistic development of autistic children, including development in speech, language and communication skills. A strength of this study is the ethnography carried out in the third phase of the research and informed by the findings of the study's first two phases. The ethnography permitted me to be an insider practitioner-researcher, to live an experience with autistic children and their caregivers, and to explore possibilities between singing education and communication, speech and language skills for autistic children who are NS, MS, or LS. The ethnography lays the groundwork for future

quantitative studies focusing on the possible benefits of singing education on the communication skills of autistic children.

Correspondingly, another strength of the study is that it, especially the second and third phases, focuses mainly on autistic children who are NS, MS, or LS, including children with very minimal sitting tolerance and attention span and with the presence of behaviours of concern. The direct involvement of autistic children's caregivers is another strength. The first two phases of the study hinted at the vital role that guardians have when professionals work with autistic children who are NS, MS, or LS. The participation of caregivers in the third phase of the study presented them as direct agents working in collaboration with professionals to target musical and communicative improvements of autistic children.

It is crucial to acknowledge some limitations of the three-phase study. When possible, certain limitations identified in a particular phase were carefully considered when designing the phase or phases that followed. The phase one online questionnaire, completed by singing teachers in Malta and the UK, focused on approaches that teachers of singing consider effective in teaching singing to autistic students who are MS. The questionnaire also studied the impact of teaching autistic students to sing as perceived by teachers of singing. Singing teachers based in Malta or the UK participated in this phase. Thirty-five respondents completed the questionnaire, but one response was eliminated because the respondent declared having no teaching experience with autistic students. The small number of questionnaire responses limited the first phase. However, a few responses indicated that singing sessions are uncommon for autistic individuals. The main weakness of phase one was that only a few participants had experience teaching autistic students who, according to DSM-V-TR (APA, 2022b), are on Level 3 or who have significant communication difficulties. Only 24%

(n=8) of the participants had experience teaching singing to autistic students at Level 3 and only 18% (n=6) reported teaching students with non-functional language. When considering which singing teaching approaches were suggested as effective with autistic students, the profile of the questionnaire respondents must be kept in mind. The same applies when analysing the observed impact of singing sessions on autistic individuals suggested in the study's first phase. Training and experience explicitly related to autism or related areas reported by the questionnaire respondents were also limited. This limitation suggests that the participants' responses were mainly based on what works best through experience instead of answers based on experience in relation to training and education in the studied area. Common practices instead of best practices might have been reported in the questionnaire. During the study's first phase, the general term 'minimally speaking' as defined by Kasari et al. (2013) was used for all autistic individuals with various communication difficulties falling in an understudied clinical population (Bal et al., 2016). This general term might have influenced the responses to the questionnaire. Being informed by the first phase of the study, phase two adopted the terms 'nonspeaking', 'minimally speaking' and 'limited speaking' as described in Koegel et al. (2020), to aim for more clarity when referring to the communication skills of autistic individuals. The questionnaire's questions addressed only observations and thoughts on approaches and benefits of sessions targeting the development of musical knowledge and singing skills. Therefore, the findings from phase one were only the result of sessions focusing on education "in" singing, not on education "through" singing (Ockelford & Markou, 2012, p. 387). Consequently, this limitation was also addressed when designing the research question of the study's second phase.

The second phase explored practitioners' and parents' perspectives on how singing instruction could specifically target the facilitation of communication skills in autistic children

who are NS, MS, or LS. A set of semi-structured interviews was carried out with two parents of autistic children who were NS, MS, or LS; one nursery teacher and one preschool teacher; two foreign language teachers; two singing teachers with experience teaching autistic students who are NS, MS, or LS; and six professionals working with autistic children who are NS, MS, or LS. A limitation of the study is that initially, an inclusion criterion was for all participants of the second phase to be based in Malta or the UK so that the study would reflect practices related to the singing of teaching in these countries. However, an ethics amendment had to be obtained because no singing teachers with relevant experience based in Malta or the UK expressed their interest to participate. As indicated in the study's first phase, this suggests that singing sessions are not only uncommon with autistic students but also very rare with those who are NS, MS, or LS. This observation brings up the question of how comfortable singing teachers feel to teach the population in question. Apart from the difficulty in finding singing teachers with relevant experience based in Malta or the UK, another limitation of the study's second phase is that one of the interviewed singing teachers is also a speech-language pathologist. This might be seen as a strength because a speech and language therapy background influences the singing teacher's responses. Nevertheless, this can be seen as a limitation since the data collected cannot be analysed as a set of responses given by a singing teacher but as responses of a singing teacher and a speech and language pathologist. A question raised by this limitation is whether a background in speech and language therapy when teaching singing to autistic students who are NS, MS, or LS is helpful or a necessity. The design of the study's second phase included interviewing an educational psychologist and a music psychologist. However, no participants who expressed interest in the study felt confident enough to answer a complete set of questions about singing and communication skills. This limitation indicates that although singing might be a potential tool to facilitate the

communication skills of autistic children who are NS, MS, or LS, there is a lack of research linking this area with different professionals. Another source of weakness in the study's second phase is that one set of questions was used for all the participants. When conducting the interviews, I observed that while certain professionals, including speech and language pathologists and music therapists, were supremely confident answering questions concerning their everyday work, certain participants felt less assured when answering specific interview questions.

The last phase of the study explored how, while prioritising each child's uniqueness, I could use singing to facilitate and improve the communication skills of autistic children who are NS, MS, or LS. An ethnography was carried out with five autistic children who were NS, MS, or LS and their caregivers. The third phase is limited by the fact that the study was a six-week study. When teaching autistic students, similar to neurotypical students, achieving results can take longer than six weeks. Results might be achieved after months or years of practice and repetition. All autistic children who participated in the study were accompanied by caregivers who were very present in their children's learning process. This fact might have had a significant influence on the findings. Different findings might have been obtained in cases where the caregiver, for various reasons, cannot follow the step-by-step progress of the child. Communication development has a profound impact on the daily lives of individuals; therefore, the continuous support of a caregiver who lives on a day-to-day basis with an autistic child significantly affects a child's communication progress. Throughout the study, different terminology was used to refer to autistic people. The research process, especially the experience with autistic students and their caregivers during the ethnography, led me to observe that the terminology most favoured at the time of the study was 'autistic person' and 'non/minimally/limited speaking person' instead of 'non/minimally/limited verbal person'.

The lack of uniform terminology during the three phases of the study might have resulted in slight confusion when collecting data; however, this was part of the process of carrying out a study with a population who, as described by Tager-Flusberg and Kasari (2013) is “the neglected end of the spectrum” (p. 476).

The study could have benefited from a greater inclusion of the autistic voice. The Mosaic approach (Clark & Moss, 2011), as described in Psaila (2023), was used during the study’s third phase to gain consent from autistic participants before the study began, prior to each session, and before each different task or activity. However, the three stages of the Mosaic approach—namely, knowledge generation, the integration of the generated knowledge, and the application of the findings—could have been more fully utilised to better understand the thoughts and feelings of each autistic child at each stage of the ethnographic process. An in-depth exploration of drawings, movement, and sensory-based feedback could have added further value. Given the importance of public and patient involvement in autism research (Chen et al., 2024; den Houting et al., 2021), a key enhancement would have been the inclusion of “individuals with ASD and their families in all stages of the research process, from conceptualization to dissemination” (Chen et al., 2024, p. 7). In retrospect, through involving the autistic voice more, I could have co-produced the survey questions in phase one, the interview questions in phase two, and the singing session goals in phase three.

## **8.5 Recommendations for Practice**

Ockelford (2000) explains that music education is not solely limited to developing musical skills, as, like with every other individual, it can “inform wider learning and development” (p. 203). The study findings indicated that the “wider learning and

development” that Ockelford (2000, p. 203) refers to can be frequently misunderstood by many people. It can often completely replace the important aspect that autistic individuals can enjoy and benefit tremendously from learning music for its own sake. An autistic person, exactly the same as every neurotypical person, can enjoy singing a favourite song, developing a particular singing technique, or participating in a concert. Every individual is unique. What is regarded as enjoyable for an autistic person might vary. A young autistic boy might enjoy learning a musical sequence and repeating it, especially if the person has absolute pitch. Participating in concerts might be something other autistic students prefer or utterly dislike. Different types of musical enjoyment should be respected and promoted for every autistic individual when developing singing skills or skills related to any musical instrument.

As explained in DSM-V-TR (APA, 2022b), the features of autistic spectrum conditions include “persistent impairment in reciprocal social communication and social interaction” (Autism spectrum disorder, F84.0). The research findings support the idea that difficulties related to speech and language are not the main obstacles that autistic children might encounter. A teacher might not receive a response when throwing a ball while singing a musical phrase or a song during the first sessions with clients. The children might keep walking around the room or playing with their toys. When children experience severe difficulty with social interaction, problems with communicative intent might dominate before that difficulty is tackled. In these scenarios, the problem is not that the child is unable to communicate by utilising an augmentative and alternative communication method (AAC), speaking with others, using a Picture Exchange Communication System (PECS) or any other communication system. The problem in such circumstances is the difficulty the child is facing with social interaction and communicative intent. When developing communication goals in relation to

singing, in such scenarios, targets should prioritise the development and improvement of social communication.

Interestingly, the findings of this exploratory study suggest that when a child learns words from songs and does not apply them in an everyday context, the problem may not be an issue of not knowing enough vocabulary or not knowing that an 'apple' refers to a red, yellow, or green fruit. The child knows the word 'apple' and knows that apple refers to a red, yellow, or green fruit but is not using the known word to interact with others; sometimes, the word may only be used in contexts similar to when the child is playing alone, for example ordering fruit in a line. A possible solution is to create different contexts to help the child use the learnt word in various situations. This is especially useful when realising that generalisation for certain autistic children may not always be as straightforward as for other neurotypical children. While an autistic boy may sing the word 'apple' in a specific song, he might be treating the word 'apple' as a musical sound similar to a horn sound because of the Exceptional Early Cognitive Environment concept suggested by Ockelford (2013). Another case may be that of an autistic girl who might have made the connection of the sound 'apple' with the actual object of a red, yellow, or green fruit but is still not using it in her everyday communication with others. Another autistic boy may use the learnt word 'apple' in the same five situations, not in all contexts where it can be used. Each situation described is different from one another. Songs can be used in all the described scenarios, but different contexts can be used to meet the needs of each individual.

Furthermore, the exploratory study suggests the possible benefits of songs linked to what the children perceive as fundamental in their daily lives. It was observed that the more a song is linked to something essential for the child, for example, food or an action that the

child likes, like singing, jumping, or running, the more it might be possible for the child to ask for the action linked to the song. When something concrete is present, it might also serve as additional help for the child to associate something with a song. For example, when singing a goodnight song, if constantly pointing to a real bed, the child might understand more the connection between the song and the object related to the action or routine involved.

In addition, the study has implications for understanding how visuals can be used during singing sessions to target the communication skills of autistic children who are NS, MS, or LS. Singing teachers might work with autistic children who have not reached the level of treating a tangible or symbolic visual as a communication tool. In such cases, the use of an object in its specific context during the session can prove beneficial. For example, using a picture of a sandwich during a song may not be easily understood if working on the verb and noun 'eat a sandwich'. However, observations during the third phase of the exploratory study suggest that actually eating a sandwich during a session may be more helpful for the child in associating the targeted verb and noun with their context.

Neurotypical students may find it difficult to sing a whole song or a whole section of a song during singing sessions; the study suggests the idea that for an autistic child with social communication difficulties, to sing a specific song or sections of a song during sessions might even be more challenging. Leaving out words in a song and copying and building on vocalisations sung by children are examples of methods which might be effective with autistic children who are NS, MS, or LS.

The study's findings complement the importance of mentoring parents in works such as those written by Mize (2020) and Lentini (2020). During singing sessions aimed to improve and facilitate the communication skills of autistic children who are NS, MS, or LS, the

continuous participation of caregivers throughout the sessions are invaluable. Caregivers can promote more continuity between one session and another. Guardians of autistic children can also be the ones who know the child best and their input during and between each session can be seen as an opportunity for the singing teacher to build a stronger relationship with the child. Although the presence of a caregiver during a session with young children can be beneficial, special consideration should be taken to choose the best options when teaching teenage or older students.

Moreover, the three-phase study indicates that the collaboration of singing teachers with other professionals, such as speech and language pathologists, music therapists, occupational therapists and psychologists working with students, can be advantageous. When a singing teacher collaborates with professionals working with an autistic child, the child may benefit from a well-rounded learning approach and the teacher may find it easier to tackle specific difficulties which may arise from one session to another. The second and third phases of the study also hinted that when teaching singing to autistic students who are NS, MS, or LS, a background or expertise in speech and language pathology can sometimes be necessary.

The study explored the potential of singing sessions focused on communication skills to support and complement the early work undertaken by speech and language pathologists with young children. The earlier that autistic children improve their communication skills, especially social communication, the better the chance to develop other skills, such as academic ones.

Overall, the study reinforces Patel's (2011) argument that if a professional wants to target communication skills through music, the goals of the sessions should be specifically shaped to focus on specific communication goals. Singing can be something very natural for

certain autistic individuals; as the ethnography explored, building a continuous link between singing and communication goals can be helpful.

## **8.6 Suggestions for Future Research**

The three-phase study explored how singing can be used to improve and facilitate the communication skills of autistic students who are NS, MS, or LS. This research indicated the need for more research focusing on what the DSM-V-TR (APA, 2022b) describes as Level 3 autism and on autistic individuals who are NS, MS, or LS. Severe difficulties in the behaviour and communication skills of the concerned population result in many studies focusing on other levels and communication profiles of the autism spectrum condition.

Building on the first two phases of the study—the online questionnaire and interviews—the third phase, the ethnography, explored how, while focusing on the uniqueness of each child, I could use singing to improve and facilitate the communication skills of autistic children who are NS, MS, or LS. It is important to emphasise that the purpose of this three-phase exploratory research was not to definitely claim that singing improves speech, language, or communication skills in autistic students. Rather, it presents the perspectives and observations of practitioners, parents, and my own insights as a practitioner-researcher. The study does not include objective measurements of improvement in singing or communication skills. A logical next step would be controlled trials targeting autism, singing education, and communication development.

All the phases of the study hinted that singing teachers might perceive teaching singing to autistic students who are NS, MS, or LS as something difficult or something which they might not feel capable of or knowledgeable about doing. Bearing this in mind, future research might explore how singing teachers can be trained to teach the students in question. The study

also suggested that expertise in speech and language pathology can be beneficial, specifically when teaching autistic individuals who are NS, MS, or LS. Research is also needed to determine what speech and language pathology expertise singing teachers need to be equipped with when teaching autistic students with these communication profiles.

The DSM-V-TR (APA, 2022b) explains that autism is mainly a social communication disorder. Further studies could assess the long-term effects of singing education on the social communication skills of autistic students with various communication profiles, including NS, MS, or LS profiles.

As described in the methodology of the ethnography (refer to Chapter Seven), although Sandiford et al. (2013) argue that “below the age of 5 ... normal language acquisition is still expected” (p. 1299), the ethnography included a four-year-old autistic child who was NS. More work needs to be done to determine the benefits of specifically designed singing tasks on the communication skills of infants and toddlers at risk for ASC.

The last two phases of the study suggested that caregivers of autistic children can find it very challenging to actually implement singing tasks in daily contexts to improve their children’s communication skills. Given that certain autistic children perceive singing as an enjoyable activity, further research should be undertaken to explore how caregivers can apply various singing tasks in everyday contexts to target the communication skills of autistic children. Research on how different professionals, including early-years teachers, teachers, learning support educators, occupational therapists and education psychologists, could use singing to improve the communication skills of autistic children would also be worthwhile.

## 8.7 Afterword

I close my eyes, see his face and hear his singing voice. Paul, the autistic boy. His language was not English, Maltese, Spanish, Chinese, French, or German. His language was a medley of *Ave Maria*, *The Prayer*, *Air on the G String* and *Nella Fantasia*. I was lost. I could not resist starting to study the colours and the weaving techniques of the tapestry loom of autism, communication skills and singing that other researchers are currently working on. Paul, the autistic boy. The minimally speaking autistic boy who sings. I close my eyes and hear his singing voice again. It is music. It is also a tool at its very early stages of discovery. I close my eyes. Suddenly, the boy's singing voice harmonises with the singing voice of other autistic children who are nonspeaking, minimally speaking, or limited speaking. Can you hear the intertwining voices weaving an invitation melody? The harmony is an invitation for a shared journey.

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## Appendices

### Appendix A

#### Pilot Study of the Online Questionnaire

##### Pilot study 1

- a) **Question number/s:** General comment

**Original question/s:** /

**Published question/s:** /

**Comment:** Confirmed that 10 minutes is enough to complete all the questions.

**Action taken:** During the editing process, I focused on not increasing the time required for the survey to be completed.

- b) **Question number/s:** General comment

**Original question/s:** /

**Published question/s:** /

(5) How many students have you taught in your singing teaching career in one-to-one or in group sessions?

*Mark only one box.*

- 1-15
- 16-30
- 31-45
- 46-60
- 61-75
- 76-100
- 101-200

- 201-300
- More than 300

(6) Please specify the ages of the students.

*Mark all that apply.*

- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- Older than 20 years old

(13) Who are the professionals you work with when teaching your students?

*Mark all that apply.*

- Educator/s of the student
- Speech-language pathologist
- Occupational therapist
- Psychologist
- Physiotherapist
- No one
- Other: \_\_\_\_\_

**Comment:** It was pointed out that no questions about student demographics were included in the section about singing teaching in general. It was also suggested that a question about the professionals a teacher works with when teaching singing in general was included.

**Action taken:** I added questions about the number of students taught, the ages of students and the professionals that the teacher works with when teaching singing in general.

c) **Question number/s:** General comment

**Original question/s:** /

**Published question/s:** /

**Comment:** A suggestion about terminology was made. 'Autism Spectrum Conditions' was suggested instead of 'Autism Spectrum Disorder' to work to remove the stigma of autism being a disorder.

**Action taken:** I used the term 'autism spectrum conditions' in the research project instead of 'autism spectrum disorders'.

## **Pilot study 2**

a) **Question number/s:** General comment

**Original question/s:** /

**Published question/s:** /

**Comment:** The teacher commented that the questions were straightforward and clear.

**Action taken:** /

b) **Question number/s:** Question 9

**Original question/s:**

(-) Can you describe the room where your singing lessons take place?

**Published question/s:**

(9) Can you describe the room/s where your singing lessons take place? Kindly comment on the colour, the setup, the lighting, the decor and the size of the room/s.

**Comment:** It was suggested that 'room/s' replace 'room' as a person might teach in several different spaces throughout each week.

**Action taken:** I replaced the word 'room' with 'room/s'.

c) **Question number/s:** Questions 10 and 24

**Original question/s:**

(-) What type of songs do you teach to your students?

*Mark all that apply.*

- Nursery rhymes
- Classical pieces
- Jazz songs
- Pop songs
- Rock songs
- Musical theatre songs
- Other: \_\_\_\_\_

(-) What type of songs do you teach to students with ASD?

*Mark all that apply.*

- Nursery rhymes
- Classical pieces
- Jazz songs
- Pop songs
- Rock songs
- Musical theatre songs
- Other: \_\_\_\_\_

**Published question/s:**

(10) What genre of songs do you teach to your students?

*Mark all that apply.*

- Warm-up songs
- Nursery rhymes
- Classical pieces
- Jazz songs
- Rock and pop songs
- Musical theatre songs
- Unaccompanied folksongs
- Other: \_\_\_\_\_

(24) What genre of songs do you teach to your students on the autism spectrum?

*Mark all that apply.*

- Warm-up songs
- Nursery rhymes
- Classical pieces
- Jazz songs
- Rock and pop songs
- Musical theatre songs
- Unaccompanied folksongs
- Other: \_\_\_\_\_

**Comment:** A suggestion to include 'warm-up songs' and 'unaccompanied folksongs' in the multiple-choice options. It was pointed out that I should consider joining the

options 'rock' and 'pop' into one category as it is challenging to distinguish between them.

**Action taken:** I added the options 'warm-up songs' and 'unaccompanied folksongs' to the multiple-choice options. I joined the options 'rock' and 'pop' as one option.

d) **Question number/s:** Questions 11 and 25

**Original question/s:**

(-) Which of the following method/s do you use when teaching singing?

*Mark all that apply.*

- Traditional notation
- Voice to voice
- Recorded backing tracks
- Live accompaniment
- Visual supports
- Movement activities
- One-to-one instruction
- Small-group instruction
- Other: \_\_\_\_\_

(-) Which of the following method/s do you use when teaching singing to learners with ASD?

*Mark all that apply.*

- Traditional notation
- Voice to voice
- Recorded backing tracks

- Live accompaniment
- Visual supports
- Movement activities
- One-to-one instruction
- Small-group instruction
- Other: \_\_\_\_\_

**Published question/s:**

(11) Which of the following method/s do you use when teaching singing?

*Mark all that apply.*

- Traditional notation
- Voice to voice
- Recorded backing tracks
- Live accompaniment (Kindly specify the instrument used in the 'Other' option below.)
- Visual supports
- Movement activities
- One-to-one instruction
- Small-group instruction
- Solfege
- Call and response songs
- Other: \_\_\_\_\_

(25) Which of the following method/s do you use when teaching singing to students on the autism spectrum?

*Mark all that apply.*

- Traditional notation
- Voice to voice
- Recorded backing tracks
- Live accompaniment (Kindly specify the instrument used in the 'Other' option below.)
- Visual supports
- Movement activities
- One-to-one instruction
- Small-group instruction
- Solfege
- Call and response songs
- Other: \_\_\_\_\_

**Comment:** A suggestion to add 'solfege' and 'call and response' as part of the multiple-choice options. It was also recommended that the participants specify which instrument they use if they accompany their students during singing sessions.

**Action taken:** I added the options 'solfege' and 'call and response'. I guided the participants to name the instrument they use if live accompaniment is one of their preferred methods during sessions.

e) **Question number/s:** 12 and 26

**Original question/s:**

(-) How do you measure the singing progress of your students?

(-) How do you measure the singing progress of your students with ASD?

**Published question/s:**

(12) How do you measure the singing progress of your students?

*Mark all that apply.*

- Exam results
- Parental response
- Achieving personal singing goals
- Attendance
- Increased musical knowledge
- Increased sense of enjoyment
- Singer's performances
- Other: \_\_\_\_\_

(26) How do you measure the singing progress of your students on the autism spectrum?

*Mark all that apply.*

- Exam results
- Parental response
- Achieving personal singing goals
- Attendance
- Increased musical knowledge
- Increased sense of enjoyment
- Singer's performances
- Other: \_\_\_\_\_

**Comment:** These two questions were described as “rather loaded” since they required a long and detailed answer. It was suggested that the open-ended question be changed to a multiple-choice question. Possible options included 1) exam results, 2) number of performances, 3) parental response and 4) attendance.

**Action taken:** I changed the open-ended question to a multiple-choice one with seven options. I also added the option ‘other’ to the seven options so that the participants could add any other answers.

f) **Question number/s:** 22

**Original question/s:**

(-) What are the main steps of a singing lesson with students with ASD?

**Published question/s:**

(22) How do you normally plan your singing lessons for students on the autism spectrum? Kindly mention the main parts of your singing lessons.

*Mark all that apply.*

- Vocal warm-up exercises
- Breathing exercises
- Skill-building exercises
- Application of technique to repertoire
- Other: \_\_\_\_\_

**Comment:** To avoid giving the impression that there’s a standard answer that one should give, it was suggested to change ‘a singing lesson’ to ‘your singing lesson’.

**Action taken:** I changed the phrase ‘a singing lesson’ to ‘your singing lessons’. I also changed this open-ended question to a multiple-choice question to make sure that the time required for the survey remained approximately 10 minutes despite the changes

carried out after the three pilot studies. I applied the same changes to question 8, as questions 8 and 22 both focused on session planning.

### **Pilot study 3**

a) **Question number/s:** 8 and 22

#### **Original question/s:**

(-) What are the main steps of a singing lesson?

(-) What are the main steps of a singing lesson with students with ASD?

#### **Published question/s:**

(8) What do you normally include in your singing lessons?

*Mark all that apply.*

- Vocal warm-up exercises
- Breathing exercises
- Skill-building exercises
- Application of technique to repertoire
- Other: \_\_\_\_\_

(22) How do you normally plan your singing lessons for students on the autism spectrum? Kindly mention the main parts of your singing lessons.

*Mark all that apply.*

- Vocal warm-up exercises
- Breathing exercises
- Skill-building exercises
- Application of technique to repertoire

Other: \_\_\_\_\_

**Comment:** The phrase 'main steps of a singing lesson' was highlighted as unclear. The question was suggested to be reworded to something similar to 'how one normally plans the singing session'.

**Action taken:** In questions 8 and 22, since both questions focused on session planning, I changed the phrase 'main steps of a singing lesson' to 'what do you normally include' in question 8 and 'how do you normally plan' in question 22.

b) **Question number/s:** 9

**Original question/s:**

(-) Can you describe the room where your singing lessons take place?

**Published question/s:**

(9) Can you describe the room/s where your singing lessons take place? Kindly comment on the colour, the setup, the lighting, the decor and the size of the room/s.

**Comment:** It was recommended that the type of information required for this open-ended question be specified, e.g., the room's colour and carpets.

**Action taken:** After the question, I added a sentence specifying examples of information required.

c) **Question number/s:** 10 and 24

**Original question/s:**

(-) What type of songs do you teach to your students?

*Mark all that apply.*

- Nursery rhymes
- Classical pieces
- Jazz songs

- Pop songs
- Rock songs
- Musical theatre songs
- Other: \_\_\_\_\_

(-) What type of songs do you teach to students with ASD?

*Mark all that apply.*

- Nursery rhymes
- Classical pieces
- Jazz songs
- Pop songs
- Rock songs
- Musical theatre songs
- Other: \_\_\_\_\_

**Published question/s:**

(10) What genre of songs do you teach to your students?

*Mark all that apply.*

- Warm-up songs
- Nursery rhymes
- Classical pieces
- Jazz songs
- Rock and pop songs
- Musical theatre songs
- Unaccompanied folksongs

Other: \_\_\_\_\_

(24) What genre of songs do you teach to your students on the autism spectrum?

*Mark all that apply.*

- Warm-up songs
- Nursery rhymes
- Classical pieces
- Jazz songs
- Rock and pop songs
- Musical theatre songs
- Unaccompanied folksongs
- Other: \_\_\_\_\_

**Comment:** A suggestion to change the phrase 'what type' to 'what genre' was given.

**Action taken:** I replaced the phrase 'what genre' with the phrase 'what type' in both questions.

d) **Question number/s:** 17

**Original question/s:**

(-) Do you have singing teaching experience with nonverbal or minimally verbal students with ASD?

*Mark only one box.*

- Yes (Skip to question 13)
- No (Skip to question 15)

**Published question/s:**

(17) Do you have singing teaching experience with students on the autism spectrum who are/were minimally verbal? In the absence of a shared definition of 'minimally verbal', for the purpose of this study, as defined by Kasari et al. (2013), 'minimally verbal' refers to students with "a very small repertoire of spoken or fixed phrases" (p. 480); the number of spoken words vary from 0 to 20 or 30.

*Mark only one box.*

- Yes (Skip to question 18)
- No (Skip to question 21)

**Comment:** It was suggested that the specific population referred to in this question would be defined.

**Action taken:** To aim for clarity, I used only the term 'minimally verbal' and added a definition of it.

e) **Question number/s:** 19 and 20

**Original question/s:**

(-) Please specify the ages of the nonverbal or minimally verbal student/s you taught or are currently teaching. Nonverbal students produce only nonspeech vocalisations and minimally verbal students have a repertoire of around 20 to 30 words.

*Mark all that apply.*

- 1-5 years old
- 6-10 years old
- 11-15 years old
- 16-20 years old
- Older than 20 years old

(-) Which descriptions best describe the verbal ability of your nonverbal or minimally verbal student/s?

*Mark all that apply.*

- Nonspeech vocalisations
- A repertoire consisting of around 20 to 30 words
- Inability to communicate in a functional manner
- Ability to communicate using nonverbal communication systems (e.g., Picture Exchange Communication System)

**Published question/s:**

(19) Please specify the ages of the students on the autism spectrum who are/were minimally verbal. In the absence of a shared definition of 'minimally verbal', for the purpose of this study, as defined by Kasari et al. (2013), 'minimally verbal' refers to students with "a very small repertoire of spoken or fixed phrases" (p. 480); the number of spoken words vary from 0 to 20 or 30.

*Mark all that apply.*

- 1-5 years old
- 6-10 years old
- 11-15 years old
- 16-20 years old
- Older than 20 years old

(20) Which descriptions best describe the communicative ability of your students on the autism spectrum who are/were minimally verbal?

*Mark all that apply.*

- Nonspeech vocalisations

- A repertoire of spoken words of around 20 or 30 used communicatively
- Use of language which is non-functional (not used to mean anything)
- Ability to communicate using nonverbal communication systems (e.g., Picture Exchange Communication System (PECS), written language, signed language, augmentative and alternative communication (AAC) devices)

**Comment:** A suggestion to replace the word 'repertoire' with 'vocabulary'.

**Action taken:** I decided to keep the word 'repertoire' to remain as true as possible to the definition given by Kasari et al. (2013), which was the main definition used for 'minimally verbal' during the study's first phase.

f) **Question number/s:** 29

**Original question/s:**

(-) Following singing tuition to a student with ASD, which of the following preverbal skills do you observe an improvement in?

*Mark all that apply.*

- Eye contact
- Imitation
- Attention
- Turn-taking
- Joint attention
- Other: \_\_\_\_\_

**Published question/s:**

(29) Following singing tuition to a student on the autism spectrum, which of the following preverbal skills did you observe an improvement in?

*Mark all that apply.*

- Eye contact
- Imitation
- Attention
- Turn-taking
- Joint attention
- Other: \_\_\_\_\_

**Comment:** It was underlined that 'do you observe' should read 'did you observe'.

**Action taken:** I changed the tense as necessary.

## Appendix B



Downloaded: 02/09/2022  
Approved: 31/08/2022

Deborah Pullicino  
Registration number: 200326355  
Human Communication Sciences  
Programme: Standard PhD in the Human Communication Sciences

Dear Deborah

**PROJECT TITLE:** Teaching Singing to Students on the Autism Spectrum: A Survey

**APPLICATION:** Reference Number 045602

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 31/08/2022 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 045602 (form submission date: 17/08/2022); (expected project end date: 01/06/2023).
- Participant information sheet 1111081 version 1 (03/08/2022).
- Participant information sheet 1103589 version 2 (18/06/2022).
- Participant consent form 1111082 version 1 (03/08/2022).
- Participant consent form 1103590 version 1 (17/03/2022).

If during the course of the project you need to [deviate significantly from the above-approved documentation](#) please inform me since written approval will be required.

Your responsibilities in delivering this research project are set out at the end of this letter.

Yours sincerely

Kate Chadwick  
Ethics Administrator  
Health Sciences School

Please note the following responsibilities of the researcher in delivering the research project:

- The project must abide by the University's Research Ethics Policy:  
<https://www.sheffield.ac.uk/rs/ethicsandintegrity/ethicspolicy/approval-procedure>
- The project must abide by the University's Good Research & Innovation Practices Policy:  
[https://www.sheffield.ac.uk/polopoly\\_fs/1.671066!/file/GRIPPolicy.pdf](https://www.sheffield.ac.uk/polopoly_fs/1.671066!/file/GRIPPolicy.pdf)
- The researcher must inform their supervisor (in the case of a student) or Ethics Administrator (in the case of a member of staff) of any significant changes to the project or the approved documentation.
- The researcher must comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data.
- The researcher is responsible for effectively managing the data collected both during and after the end of the project in line with best practice, and any relevant legislative, regulatory or contractual requirements.

## Appendix C

8/3/22, 12:31 PM

Teaching Singing to Students on the Autism Spectrum: A Survey

# Teaching Singing to Students on the Autism Spectrum: A Survey

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\* Required

## Participant information sheet

### Research study title

Teaching Singing to Students on the Autism Spectrum: A Survey

### Invitation

You are being invited to take part in a research study. As part of the study, you are being invited to complete an online survey. The survey takes around ten minutes to complete. Before you decide whether or not to participate, it is important for you to understand the purpose of this study and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. If anything is not clear or if you would like further information, feel free to ask. Take your time to decide whether or not you wish to take part. Forms where participants select 'No' to the consent form question, "Having read the above information, I consent to take part in the study. Please indicate your consent before moving on to the questions in the survey," but then goes on to complete the survey, will be securely reviewed and destroyed. Thank you for reading this.

### What is the aim of the study?

The survey is part of my PhD in the Division of Human Communication Sciences, Health Sciences School at the University of Sheffield. My research study aims to answer the following research questions:

1. What approaches are effective in teaching students on the autism spectrum to sing, including students who are minimally verbal?
2. What is the impact on students on the autism spectrum in learning to sing? Are there benefits to other abilities, e.g., speech and communication? Students on the autism spectrum include those who are minimally verbal.

The first phase of the study is a survey that analyses how singing teachers teach students on the autism spectrum, including students who are minimally verbal. Findings from phase one will inform further phases of the study.

### Why have I been chosen?

You are being asked to consider participating because you are a singing teacher based in the United Kingdom or Malta who has experience in teaching students on the autism spectrum.

### Do I have to take part?

It is up to you to decide whether or not to take part. You can withdraw at any time without any negative consequences. No explanation will be requested. If you wish to withdraw from the study, kindly close the web browser to stop answering the survey questions. If you submit the survey, you will not be able to withdraw your data because it is submitted anonymously.

### What will my participation involve? What do I have to do?

You will be asked to follow a link to complete an online survey. The survey consists of 33 questions divided into 3 sections and it is completed in around 10 minutes. Section A includes questions about you and your experience as a singing teacher. Section B asks about the teaching of singing in general. The last section focuses on the teaching of singing to students on the autism spectrum.

### What are the possible benefits of taking part?

There are no immediate benefits from taking part in this survey. However, the data collected may provide useful information about teaching singing to students on the autism spectrum.

Will my participation in this study be kept confidential?

Yes. The survey is anonymous. All the information collected will be kept strictly confidential. No names or identifying information will be collected through the survey. The survey asks you to contact Deborah Pullicino, on the University of Sheffield email account: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk) if you would like to take part in the future phases of this study. It is up to you to decide whether to contact the researcher to take part in future phases of the study or not. In case you decide to email the researcher, your email address will be kept securely and it will not be shared outside the research team. Survey responses will not be linked to any email addresses since the survey is completely anonymous. Email addresses of participants who contact the researcher to take part in future phases of the study will be deleted at the end of the study.

What is the legal basis for processing my personal data?

According to data protection legislation, I am required to inform you that the legal basis I am applying for in order to process your personal data is that 'processing is necessary for the performance of a task carried out in the public interest' (Article 6(1)(e)). Further information can be found in the University's Privacy Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>. Data protection legislation applies to 'personal data', which in the General Data Protection Regulation (GDPR) is defined as 'any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person'.

What will happen to the data collected, and the results of the study?

Throughout this study, only the research team will have access to the survey data. In all write-ups of the results and subsequent publications, the data will be anonymised so you will not be identified or identifiable. Digital data will be safely stored on the University Google Drive and it will be protected by passwords. Beyond the end of the study only anonymised and analysed data will be stored. This will be stored and shared at the University of Sheffield repository Online Research Data for a minimum of 10 years.

Who is organising and funding the research?

Deborah Pullicino is a PhD student in the Division of Human Communication Sciences, Health Sciences School, University of Sheffield. Deborah is leading this research for her PhD study. Professor Judy Clegg and Professor Stephanie Pitts are Deborah's PhD supervisors.

Who is the Data Controller?

The University of Sheffield will act as the Data Controller for this study. This means that the University is responsible for the proper use and storage of your information.

Who has ethically reviewed the study?

This study has been ethically approved by the University of Sheffield's Ethics Committee, as administered by the Health Sciences School.

What if something goes wrong and I would need to raise a complaint about the research?

If you wish to raise a complaint, you should contact the researcher, Deborah Pullicino, email: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk). If you have any concerns related to potential exploitation, abuse or harm resulting from involvement in this study, kindly contact the study's Designated Safeguarding Contact, Professor Judy Clegg, email: [j.clegg@sheffield.ac.uk](mailto:j.clegg@sheffield.ac.uk). In addition,

should you feel that your complaint has not been handled to your satisfaction, you can contact the University's Research Ethics & Integrity Manager, Lindsay Unwin, email: [l.v.unwin@sheffield.ac.uk](mailto:l.v.unwin@sheffield.ac.uk). If the complaint relates to how your personal data has been handled, information about how to raise a complaint can be found in the University's Privacy Notice: <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

#### Contact for further information

For further information about this research, you are kindly requested to contact the researcher Deborah Pullicino, email: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk) or the PhD supervisors, Professor Judy Clegg, email: [j.clegg@sheffield.ac.uk](mailto:j.clegg@sheffield.ac.uk) and Professor Stephanie Pitts, email: [s.e.pitts@sheffield.ac.uk](mailto:s.e.pitts@sheffield.ac.uk). I would like to thank you for reading the information and taking part in this study.

Date: 30th May 2022

### Survey Consent Form

#### 1. Taking part in the research study \*

*Check all that apply.*

I have read and understood the research study information sheet dated 30/05/2022 or the study has been fully explained to me.

I have been given the opportunity to ask questions about the study.

I agree to take part in the study. I understand that taking part in the study will include completing an online survey consisting of a range of questions that take around 10 minutes to complete.

I understand that this survey is phase one of a three-phase research study. The data collected from this survey will inform further phases of the study. Phase two consists of a small number of follow-up online interviews and phase three will be an intervention study. I can indicate my willingness to participate in future phases of the study by contacting the researcher Deborah Pullicino on [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk).

I understand that my participation is voluntary and that I can withdraw from the study at any time; I do not need to provide an explanation for why I no longer want to take part, and there will be no adverse consequences if I choose to withdraw. I can decide not to answer any particular survey question or questions. I understand that I can withdraw from any on-going or future data collection at any time. However, since the survey is anonymous, data cannot be retrieved once submitted.

## 2. How my information will be used during and after the project \*

*Check all that apply.*

- I understand and agree that other authorised researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.
- I understand and agree that other authorised researchers may use my data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as described in the information sheet.
- I understand that if I contact the researcher to participate in future phases of the study, my email address will not be revealed to people outside the study

## 3. Providing information which can be used legally by the researchers \*

*Check all that apply.*

- I agree to assign the copyright I hold in any materials generated as part of this study to The University of Sheffield.

## 4. Having read the above information, I consent to take part in the study. Please indicate your consent before moving on to the questions in the survey. \*

Mark only one answer.

*Mark only one oval.*

- Yes
- No

## Section A: The Singing Teacher

The first section will help me get to know you as a singing teacher.

## 5. 1. Where are you based?

Mark only one oval.

*Mark only one oval.*

- In the United Kingdom
- In Malta

6. 2. How long have you been working as a singing teacher?

Mark only one oval. If required exclude extended periods of absence.

*Mark only one oval.*

- 1-3 years
- 4-6 years
- 7-10 years
- 11-15 years
- 16-20 years
- More than 20 years

7. 3. Which of the following roles best describe your current and past role/s, if applicable, as a singing teacher?

Mark all that apply.

*Check all that apply.*

- Singing teacher in a music or performing arts school/college/conservatoire or university
- Musical theatre voice teacher
- Self-employed singing teacher
- Other: \_\_\_\_\_

8. 4. What are your qualifications linked to your teaching role? Please include all related teacher training courses, as well as any training on autism.

\_\_\_\_\_

### Section B: Singing Teaching

In the following section, I would like to learn about your singing teaching in general.

9. 5. How many students have you taught in your singing teaching career in one-to-one or in group sessions?

Mark only one oval.

*Mark only one oval.*

- 1-15
- 16-30
- 31-45
- 46-60
- 61-75
- 76-100
- 101-200
- 201-300
- More than 300

10. 6. Please specify the ages of the students.

Mark all that apply.

*Check all that apply.*

- 1-5 years old
- 6-10 years old
- 11-15 years old
- 16-20 years old
- Older than 20 years old

11. 7. What is the frequency and length of your singing sessions?

Mark all that apply.

*Check all that apply.*

- 30 minutes once a week
- 1 hour once a week
- 30 minutes twice a week
- 1 hour twice a week
- 30 minutes once every fortnight
- 1 hour once every fortnight
- Other: \_\_\_\_\_

12. 8. What do you normally include in your singing lessons?

Mark all that apply.

*Check all that apply.*

- Vocal warm-up exercises
- Breathing exercises
- Skill-building exercises
- Application of technique to repertoire
- Other: \_\_\_\_\_

13. 9. Can you describe the room/s where your singing lessons take place? Kindly comment on the colour, the setup, the lighting, the decor and the size of the room/s.

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## 14. 10. What genre of songs do you teach to your students?

Mark all that apply.

*Check all that apply.*

- Warm-up songs
- Nursery rhymes
- Classical pieces
- Jazz songs
- Rock and pop songs
- Musical theatre songs
- Unaccompanied folksongs
- Other: \_\_\_\_\_

## 15. 11. Which of the following method/s do you use when teaching singing?

Mark all that apply.

*Check all that apply.*

- Traditional notation
- Voice to voice
- Recorded backing tracks
- Live accompaniment (Kindly specify the instrument used in the 'Other' option below.)
- Visual supports
- Movement activities
- One-to-one instruction
- Small-group instruction
- Solfege
- Call and response songs
- Other: \_\_\_\_\_

16. 12. How do you measure the singing progress of your students?

Mark all that apply.

*Check all that apply.*

- Exam results
- Parental response
- Achieving personal singing goals
- Attendance
- Increased musical knowledge
- Increased sense of enjoyment
- Singer's performances
- Other: \_\_\_\_\_

17. 13. Who are the professionals you work with when teaching your students?

Mark all that apply.

*Check all that apply.*

- Educator/s of the student
- Speech-language pathologist
- Occupational therapist
- Psychologist
- Physiotherapist
- No one
- Other: \_\_\_\_\_

Section C: Teaching Singing to a Student on the autism spectrum

The next section focuses on the teaching of singing to students on the autism spectrum.

18. 14. How many students on the autism spectrum have you taught in your singing teaching career in one-to-one or in group sessions?

Mark only one oval.

*Mark only one oval.*

- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- More than 10

19. 15. Please specify the ages of the students on the autism spectrum.

Mark all that apply.

*Check all that apply.*

- 1-5 years old
- 6-10 years old
- 11-15 years old
- 16-20 years old
- Older than 20 years old

20. 16. The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) refers to three levels of autism. How do you describe the autism level of the student/s you teach or taught?

Mark all that apply.

*Check all that apply.*

Autism Level 1 - Minimum support is required to help these students manage everyday tasks. These students may have concerns with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). They are likely to have no difficulty with verbal communication. / High-functioning autism. / Students previously diagnosed with Asperger's syndrome.

Autism Level 2 - Substantial support is required to help these students manage everyday tasks. These students may have more problems with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). Difficulties with verbal communication may be present.

Autism Level 3 - Very substantial support is required to help these students manage everyday tasks. These students have significant problems with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). Many of these students do not communicate verbally or can use a limited number of words to communicate.

21. 17. Do you have singing teaching experience with students on the autism spectrum who are/were minimally verbal? In the absence of a shared definition of 'minimally verbal', for the purpose of this study, as defined by Kasari et al. (2013), 'minimally verbal' refers to students with "a very small repertoire of spoken or fixed phrases" (p. 480); the number of spoken words vary from 0 to 20 or 30.

Mark only one oval.

*Mark only one oval.*

Yes (Skip to question 18)

No (Skip to question 21)

22. 18. How many students on the autism spectrum who are/were minimally verbal have you taught? In the absence of a shared definition of 'minimally verbal', for the purpose of this study, as defined by Kasari et al. (2013), 'minimally verbal' refers to students with "a very small repertoire of spoken or fixed phrases" (p. 480); the number of spoken words vary from 0 to 20 or 30.

Mark only one oval.

*Mark only one oval.*

- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- More than 10

23. 19. Please specify the ages of the students on the autism spectrum who are/were minimally verbal. In the absence of a shared definition of 'minimally verbal', for the purpose of this study, as defined by Kasari et al. (2013), 'minimally verbal' refers to students with "a very small repertoire of spoken or fixed phrases" (p. 480); the number of spoken words vary from 0 to 20 or 30.

Mark all that apply.

*Check all that apply.*

- 1-5 years old
- 6-10 years old
- 11-15 years old
- 16-20 years old
- Older than 20 years old

24. 20. Which descriptions best describe the communicative ability of your students on the autism spectrum who are/were minimally verbal?

Mark all that apply.

*Check all that apply.*

- Nonspeech vocalisations
- A repertoire of spoken words of around 20 or 30 used communicatively
- Use of language which is non-functional (not used to mean anything)
- Ability to communicate using nonverbal communication systems (e.g., Picture Exchange Communication System (PECS), written language, signed language, augmentative and alternative communication (AAC) devices)

25. 21. What is the frequency and length of the singing sessions of your student/s on the autism spectrum?

Mark all that apply.

*Check all that apply.*

- 30 minutes once a week
- 1 hour once a week
- 30 minutes twice a week
- 1 hour twice a week
- 30 minutes once every fortnight
- 1 hour once every fortnight
- Other: \_\_\_\_\_

26. 22. How do you normally plan your singing lessons for students on the autism spectrum? Kindly mention the main parts of your singing lessons.

Mark all that apply.

*Check all that apply.*

- Vocal warm-up exercises
- Breathing exercises
- Skill-building exercises
- Application of technique to repertoire
- Other: \_\_\_\_\_

27. 23. How do you adapt your physical and social environment to cater for students on the autism spectrum?

Mark all that apply.

*Check all that apply.*

- Change the lighting of the room/s
- Change the setup of the room/s
- Use visual schedules
- Simplify instructions
- Create a predictable schedule (e.g., print a visual schedule)
- Prevent disruptions of routines
- Prevent auditory sensory overload
- Prevent visual sensory overload
- Modify tone of voice and volume control when giving instructions
- Allow the student to choose or shift posture (e.g., walk around while singing, sit or stand)
- Change your expectations
- Develop connection and trust to build a relationship with the student
- Change your attitude and behaviour
- No modifications
- Other: \_\_\_\_\_

28. 24. What genre of songs do you teach to students on the autism spectrum?

Mark all that apply.

*Check all that apply.*

- Warm-up songs
- Nursery rhymes
- Classical pieces
- Jazz songs
- Rock and pop songs
- Musical theatre songs
- Unaccompanied folksongs
- Other: \_\_\_\_\_

29. 25. Which of the following method/s do you use when teaching singing to students on the autism spectrum?

Mark all that apply.

*Check all that apply.*

- Traditional notation
- Voice to voice
- Recorded backing tracks
- Live accompaniment (Kindly specify the instrument used in the 'Other' option below.)
- Visual supports
- Movement activities
- One-to-one instruction
- Small-group instruction
- Solfege
- Call and response songs
- Other: \_\_\_\_\_

30. 26. How do you measure the singing progress of your students on the autism spectrum?

Mark all that apply.

*Check all that apply.*

- Exam results
- Parental response
- Achieving personal singing goals
- Attendance
- Increased musical knowledge
- Increased sense of enjoyment
- Singer's performances
- Other: \_\_\_\_\_

31. 27. Who are the professionals you work with when teaching a student on the autism spectrum?

Mark all that apply.

*Check all that apply.*

- Educator/s of the student
- Speech-language pathologist
- Occupational therapist
- Psychologist
- Physiotherapist
- No one
- Other: \_\_\_\_\_

32. 28. Which difficulties do you normally encounter when teaching singing to a student on the autism spectrum?

Mark all that apply.

*Check all that apply.*

- Sensory issues
- Difficulty to follow instructions
- Attention difficulties
- Sitting tolerance or trouble staying in assigned area
- Difficulty to identify learning targets
- Challenges to work with adults who accompany the child
- Conflicts with parents
- Other: \_\_\_\_\_

33. 29. Following singing tuition to a student on the autism spectrum, which of the following preverbal skills did you observe an improvement in?

Mark all that apply.

*Check all that apply.*

- Eye contact
- Imitation
- Attention
- Turn-taking
- Joint attention
- Other: \_\_\_\_\_

34. 30. Based on your experience, what are the benefits of singing tuition for a student on the autism spectrum?

Mark all that apply.

*Check all that apply.*

- Improvement in behaviour
- Improvement in expressive communication skills
- Improvement in receptive communication skills
- Improvement in listening skills
- Improvement in communicative intent
- Improvement in prosody (the rhythm and intonation of utterances)
- Improvement in social reciprocity (e.g., sharing something with another person)
- Improvement of wellbeing
- Improvement in emotional skills
- Building of social relationships
- Reduction in repetitive and restrictive behaviours (e.g., hand flapping, rocking back and forth)
- Other: \_\_\_\_\_

- 35. 31. How would you summarise the satisfaction and/or challenges of teaching singing to students on the autism spectrum? You can include a short profile of a student who made particular progress.

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- 36. 32. Is there anything else you would like to add?

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33. Do you wish to take part in future phases of this study? If yes, kindly contact Deborah Pullicino on [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk). Your help is much appreciated.

Thank you for taking the time to complete the survey.

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## Appendix D

### **The results of the quantitative questions in the mixed-method online questionnaire**

The mixed-method online questionnaire 'Teaching singing to students on the autism spectrum' was the first part of a three-phase research project. The online questionnaire consisted of 33 questions; the last question invited the participants to contact the researcher if they wished to participate in other phases of the research study. The online questionnaire was open for four weeks and was completed by 35 individuals (n=35). One response was eliminated because the respondent declared no experience with autistic students. As a result, 34 online questionnaire responses are reported in this Appendix. Percentages in the text and in charts were rounded to the nearest whole number and therefore, they may not total 100. The responses added by the respondents to the given options in multiple-choice questions were grouped together and reported in tables. Certain tables in this Appendix present direct quotations taken from online questionnaire answers; direct quotations are presented in italics. Collected quantitative findings are first presented with reference to each specific question. A series of figures comparing responses to different questions will follow in this appendix to further summarise and analyse statistical data.

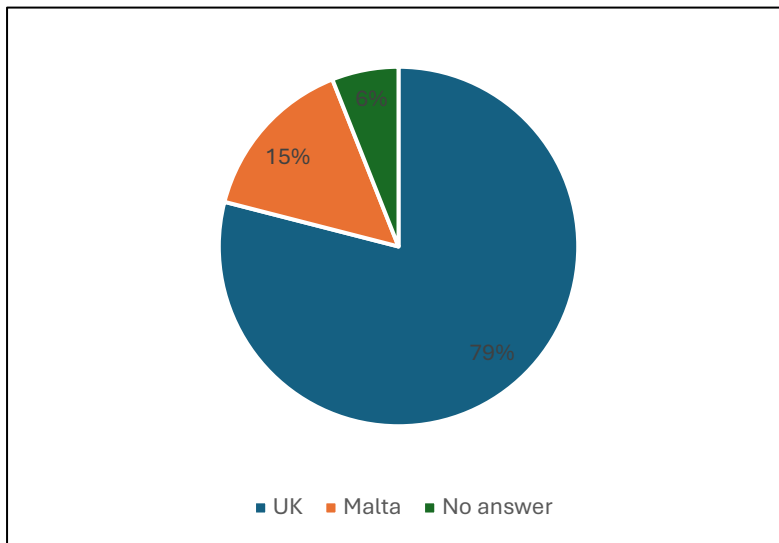
### **Individual questions**

#### **Section A: The Singing Teacher**

##### ***Question 1: Profile of the Respondents (n=32)***

Twenty-seven respondents were based in the United Kingdom (79%) and five in Malta (15%). Two respondents (6%) did not specify their location as either the UK or Malta (refer to Figure 1).

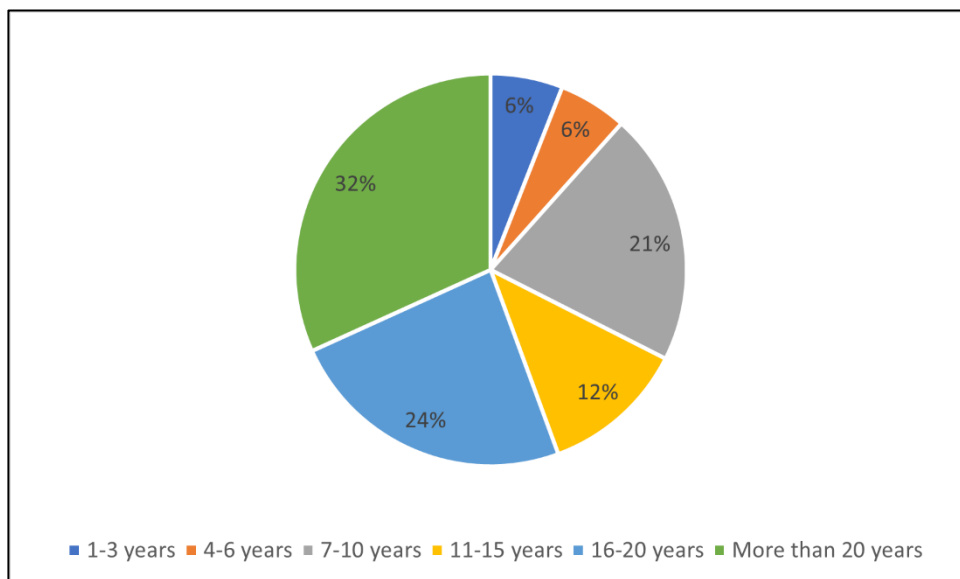
**Figure 1** Profile of the respondents (n=32)



**Question 2: Years of Experience of the Respondents (n=34)**

Thirty-two per cent (n=11) of the respondents indicated more than 20 years of singing teaching experience and the majority (n=19; 57%) seven to 20 years. Only a minority of respondents (n=2; 6%) reported being in the field for less than four years (refer to Figure 2).

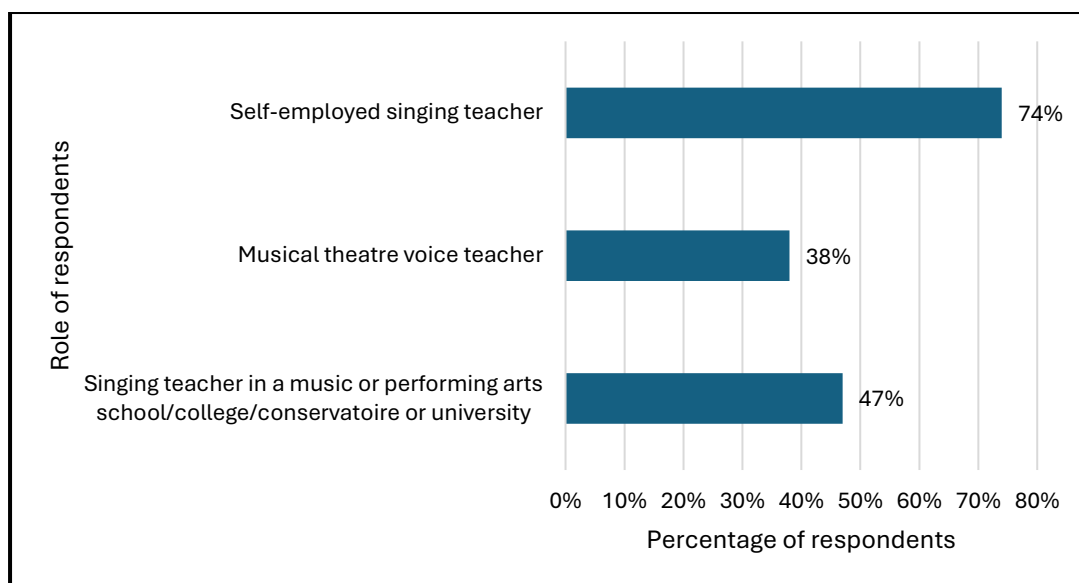
**Figure 2** Years of experience of the respondents (n=34)



### **Question 3: Role of Singing Teachers (n=34)**

When describing their teaching roles during the online questionnaire period or in recent years, most respondents reported being self-employed (n=25; 74%) and the least were musical theatre voice teachers (n=13; 38%). Singing teachers working in a music or performing arts school/college/conservatoire or university added up to 16 (47%) (refer to Figure 3).

**Figure 3** Role of singing teachers (n=34)

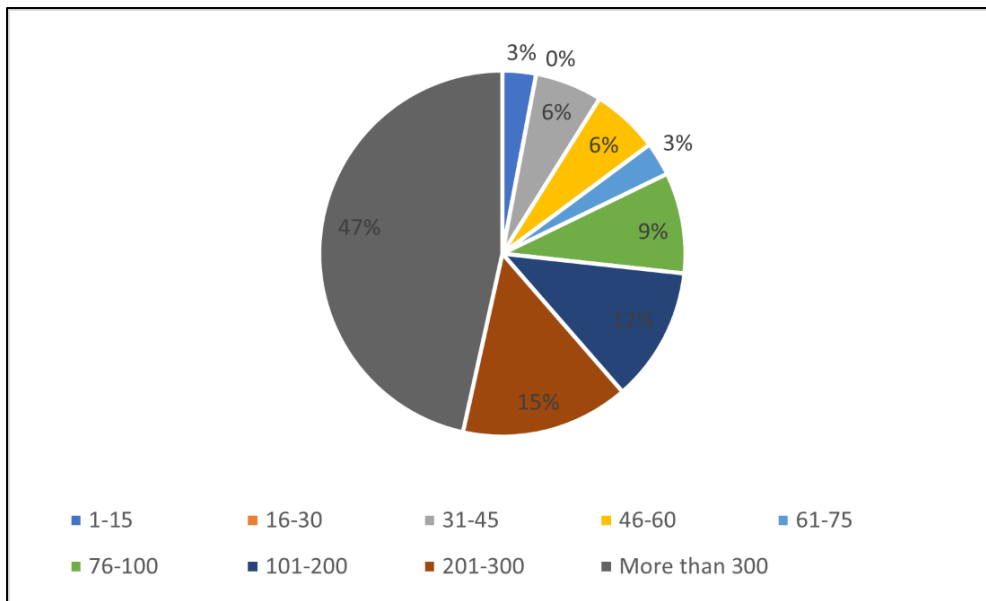


## **Section B: Singing Teaching**

### **Question 5: Number of Students Taught in the Singing Teaching Career (n=34)**

Almost half of the respondents (n=16; 47%) reported teaching more than 300 students during their singing teaching career and 15% (n=5) taught 201 to 300 students. Approximately a quarter of the singing coaches (n=9; 27%) taught 100 students or less (refer to Figure 4).

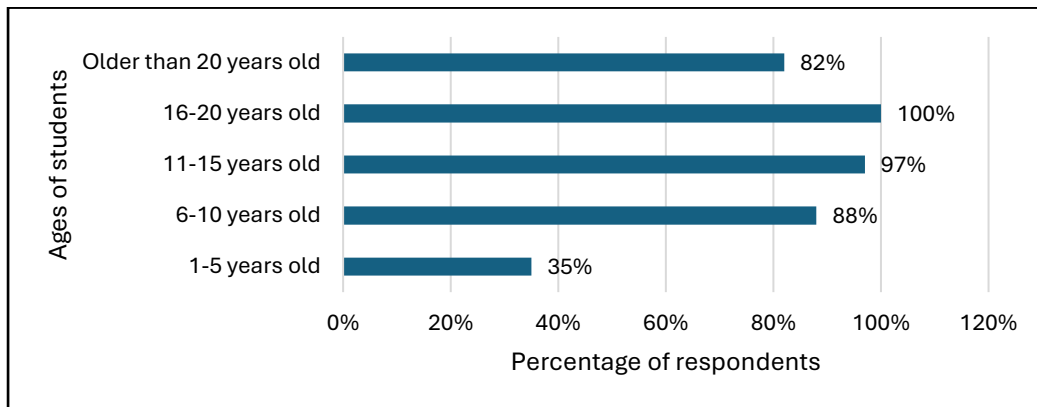
**Figure 4** Number of students taught in the singing teaching career (n=34)



**Question 6: Ages of Students Taught (n=34)**

The most popular age group taught by the respondents was 16 to 20 years old, as all respondents reported having taught students within this age group (n=34; 100%). This age group was followed by 11 to 15-year-olds (n=33; 97%) and six to 10-year-olds (n=30; 88%). The youngest age group (one to five years old) and the oldest age group (older than 20 years) were the least common, with 12 (35%) and 28 (82%) respondents, respectively (refer to Figure 5).

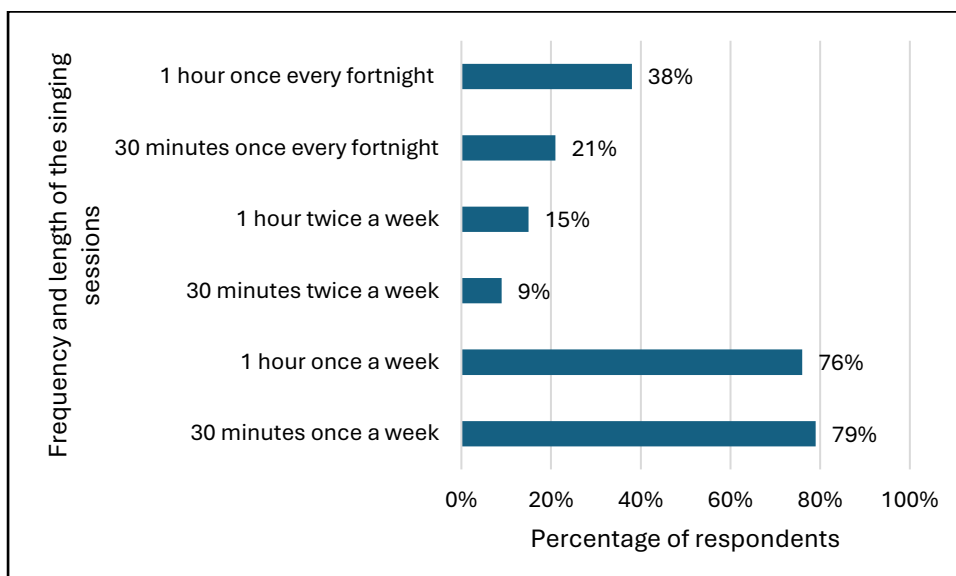
**Figure 5** *Ages of students taught (n=34)*



**Question 7: Frequency and Length of Singing Sessions (n=34)**

Half-an-hour (n=27; 79%) and one-hour (n=26; 76%) weekly sessions were the most common responses (refer to Figure 6). The popularity of fortnight sessions (n=20; 59%) and twice-a-week sessions (n=8; 24%) was less than that of weekly sessions. Added comments indicated 40 or 45 minutes sessions (n=6; 18%), 15 to 20 minutes sessions for young children (n=1; 3%) and one or two hours weekly group sessions (n=2; 6%). Five respondents (15%) reported adjusting the frequency and duration of the sessions according to the situation (Table 1).

**Figure 6** *Frequency and length of singing sessions (n=34)*



**Table 1** Comments reporting variations in frequency and length of singing sessions

*It varies depending on pupil or group*

*As and when required*

*Whenever needed (professional level)*

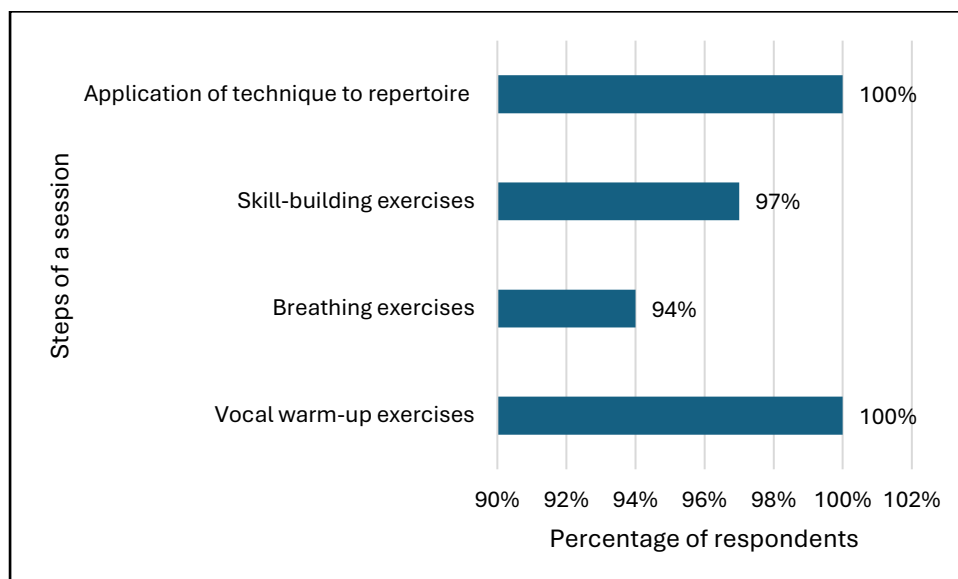
*Depends on the situation, everything from 20 min individual to lectures with 40 for 90 min*

*Occasional lessons*

**Question 8: Steps of a Session (n=34)**

All respondents who responded to this question reported vocal warm-up exercises and application of technique to repertoire as part of their normal singing sessions (n=34; 100%). Skill-building exercises are included by 33 respondents (97%) and breathing exercises by 32 respondents (94%) (refer to Figure 7). Other responses were added to the options given (Table 2).

**Figure 7** Steps of a session



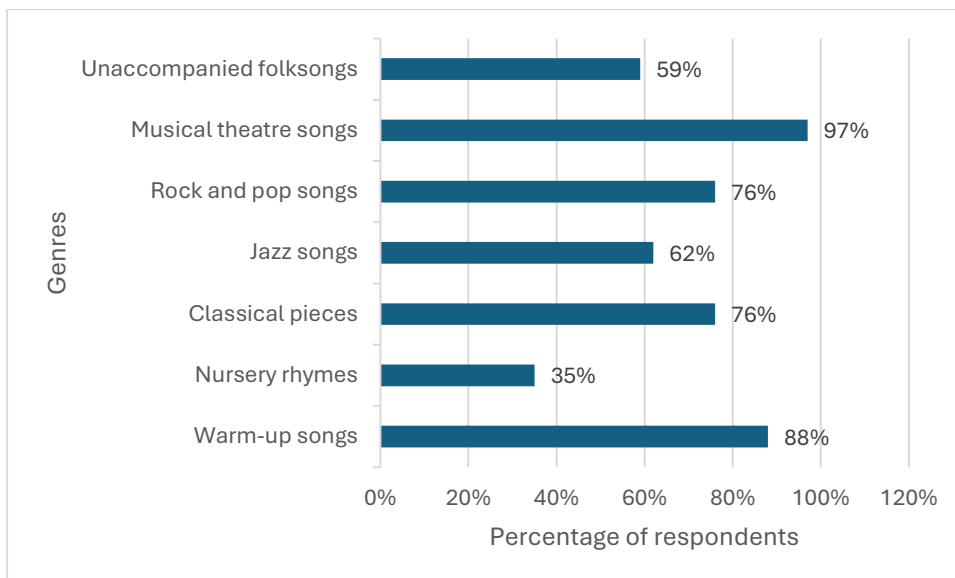
**Table 2** *Other responses to Question 8: steps of a session*

Performance coaching
Encouragement of verbal and preverbal interaction
Vocal health
Music theory
General Well-being
Acting through song
Improvisation
Musicianship
Characterisation
Focus on performance anxiety
Music appreciation and discussion
Reading skills
Posture/alignment exercises
Solfeggio
Physical warm-up and warm-down
Technique exercises
Practice advice
Artist development

**Question 10: Genres of Songs Taught (n=34)**

The most popular songs taught by respondents are musical theatre songs (n=33; 97%), followed by warm-up songs (n=30; 88%). Twenty-six respondents (76%) teach classical pieces and another 26 (76%) teach rock and pop songs. The least popular genres are jazz songs (n=21; 62%), unaccompanied folksongs (n=20; 59%) and nursery rhymes (n=12; 35%) (refer to Figure 8). Other answers were added to the choices given (Table 3).

**Figure 8** Genres of songs taught (n=34)



**Table 3** Other responses to Question 10: genres of songs taught

Simple songs
Onomatopoeic songs
Rhythmic songs
Call and response songs
Traditional songs

Improvisation and songwriting

Songs chosen by the student

Studies

Accompanied folksongs

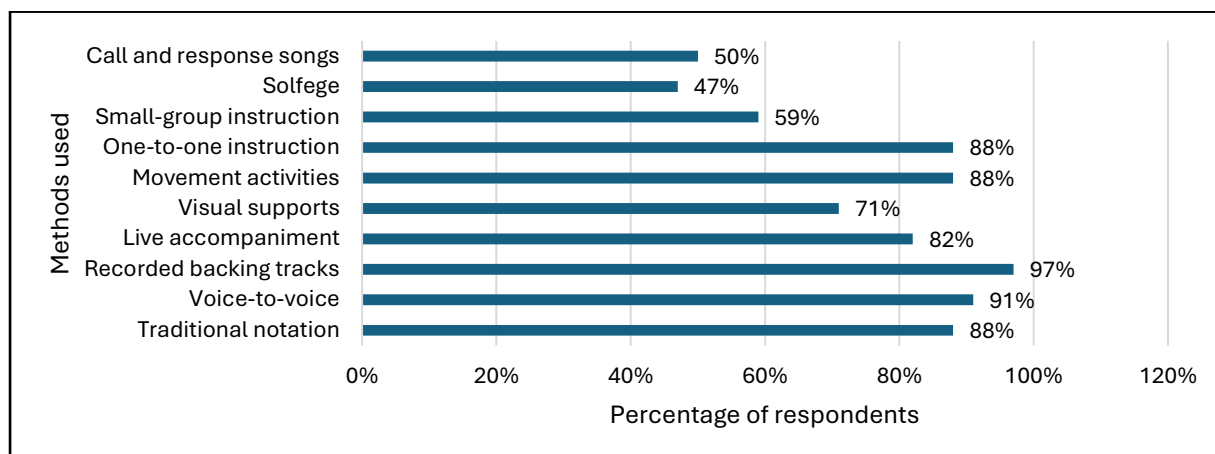
Religious music

Operetta, oratorio, art song and opera

**Question 11: Methods Used When Teaching Singing (n=34)**

The four most common reported methods are recorded backing tracks (n=33; 97%), voice-to-voice (n=31; 91%), traditional notation (n=30; 88%), one-to-one instruction (n=30; 88%) and movement activities (n=30; 88%). Live accompaniment was chosen by 28 respondents (82%). The respondents were instructed to indicate the instrument used for live accompaniment. The piano is used by 22 respondents (65%), the guitar by four respondents (12%) and the ukulele by two respondents (6%). Two respondents (6%) and five respondents reported using two or more musical instruments (15%) to accompany their students. Table 4 lists additional information provided by the respondents about live accompaniment. Less popular methods used during singing sessions are visual supports (n=24; 71%), small group instruction (n=20; 59%), solfege (n=16; 47%) and call and response songs (n=17; 50%) (refer to Figure 9). Table 5 lists other added responses.

**Figure 9** *Methods used when teaching singing (n=34)*



**Table 4** *Additional information given by the respondents about live accompaniment during singing sessions*

*I use piano accompaniment carefully (not too loud, not always mirroring the melody line).*

*I sometimes use a backing track with the piano part removed and then I play that live.*

*Guitar and piano (chords not sight read)*

**Table 5** *Other responses to Question 11: methods used when teaching singing*

Emotion, mood and character choice cards

Props (e.g., costumes)

Dalcroze movement activities

Anatomy images and models

Kodály

Acting exercises

Mindfulness

Exploration of voice and harmony by means of improvisation exercises

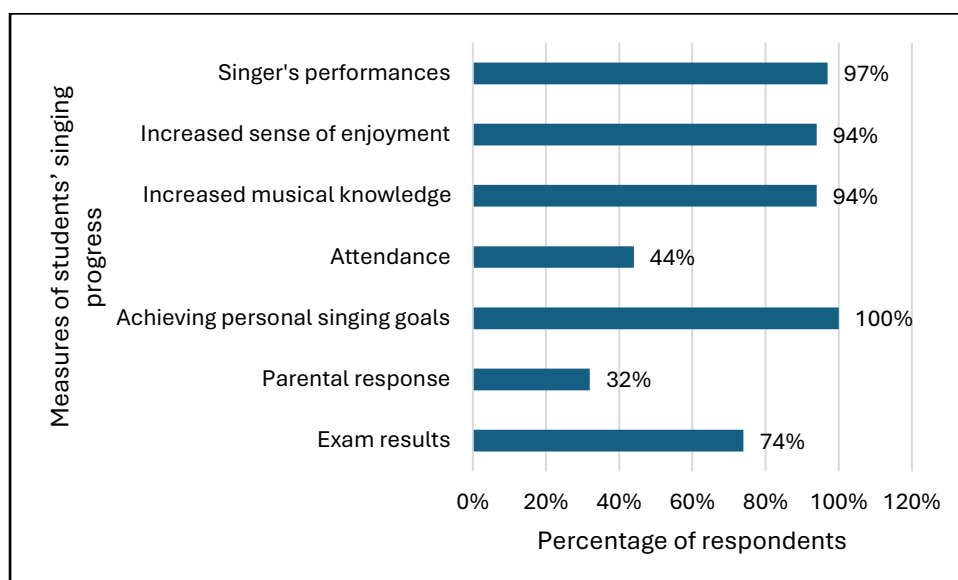
Acting Through Singing Techniques

Relaxation manoeuvres

**Question 12: Measuring the Students' Singing Progress (n=34)**

The achievement of personal singing goals was the most common option (n=34; 100%) reported to measure the progress of the students, followed by the performances (n=33; 97%). Increased musical knowledge and an increase in the sense of enjoyment were each chosen by 32 respondents (94%). Almost three-quarters of the respondents (n=25; 74%) indicated that they use exam results to measure students' progress. The attendance was chosen by 15 respondents (44%) and the parental response by 11 respondents (32%) (refer to Figure 10). Other specific responses were added (Table 6).

**Figure 10** Measuring the students' singing progress (n=34)



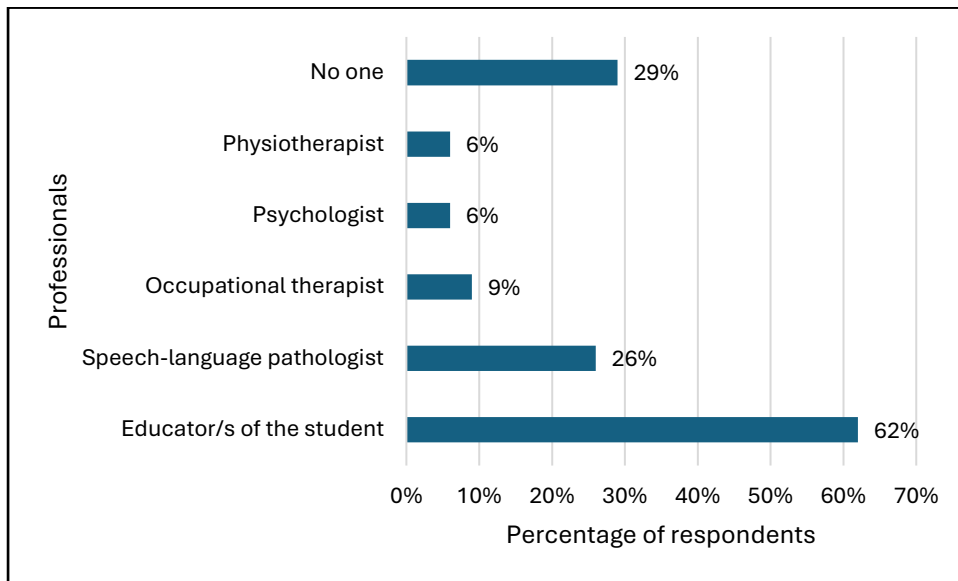
**Table 6** *Other responses to Question 12: measuring the students' singing progress*

Improvement in confidence
Increase in range, power and control
Pupil self-assessment
Recording of sessions
Commitment to practice
Participation in wider-linked activities
Focus on mental health and anxiety management

**Question 13: Working With Other Professionals (n=34)**

Other teachers of the students are the professionals that online questionnaire respondents mostly work with when teaching singing (n=21; 62%). Ten respondents (29%) indicated that they do not work with other professionals. Collaborations with speech-language pathologists (n=9; 26%), occupational therapists (n=3; 9%), psychologists (n=2; 6%) and physiotherapists (n=2; 6%) were also reported (refer to Figure 11). Other responses were added to the options given (Table 7).

**Figure 11** Working with other professionals (n=34)



**Table 7** Other responses to Question 13: working with other professionals

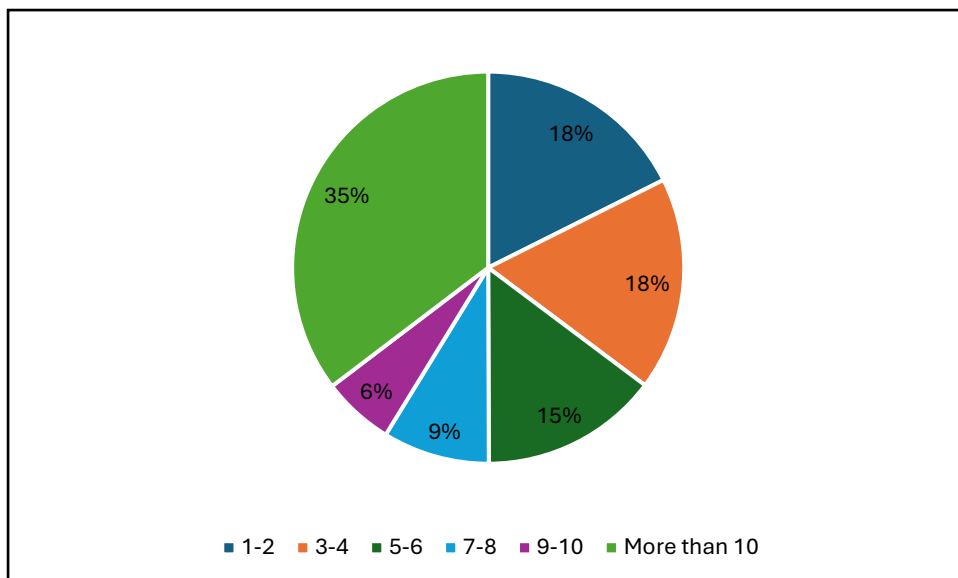
Other musicians
Stage and music directors
Choreographers and studio producers
Information from other professionals is passed on by students, parents, or other teachers.
Educational psychologist
SENCO (Special Educational Needs Coordinator)
ENT (Ear Nose and Throat specialist)

## Section C: Teaching Singing to Autistic Students

### **Question 14: Number of Autistic Students Taught in the Singing Teachers' Career (n=34)**

Thirty-five per cent of the respondents (n=12) taught more than 10 autistic students in their teaching career in one-to-one or group sessions, 6% (n=2) taught nine to 10 students and 9% (n=3) taught seven to eight pupils. Approximately half of the respondents (n=17; 51%) taught six or fewer autistic students (Figure 12).

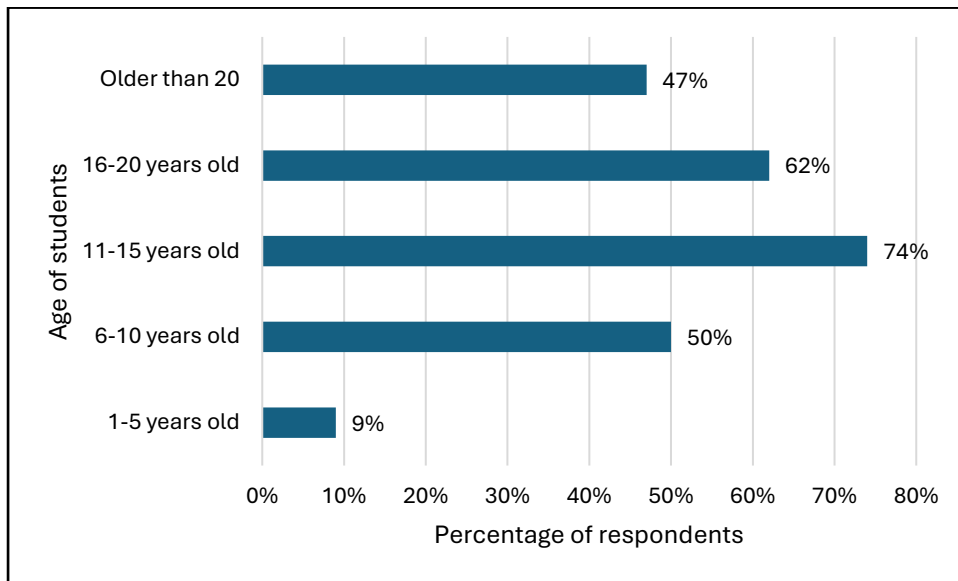
**Figure 12** Number of autistic students taught in the singing teachers' career (n=34)



### **Question 15: Ages of Autistic Students (n=34)**

Twenty-five online questionnaire respondents (74%) taught students aged 11 to 15 years and 21 respondents (62%) taught 16 to 20-year-old students. Half of the respondents had teaching experience with six to ten-year-olds (n=17; 50%). The less common age groups are students over 20 years old (n=16; 47%) and students aged one to five years old (n=3; 9%) (refer to Figure 13).

**Figure 13** *Ages of autistic students (n=34)*



**Question 16: The Level of Autism of the Students Taught (n=34)**

The online questionnaire respondents were asked to indicate the level of autism of students taught. With reference to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (American Psychiatric Association, 2013), three levels of autism were given as options.

**Autism Level 1** - Minimum support is required to help these students manage everyday tasks. These students may have concerns with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). They are likely to have no difficulty with verbal communication. / High-functioning autism. / Students previously diagnosed with Asperger's syndrome.

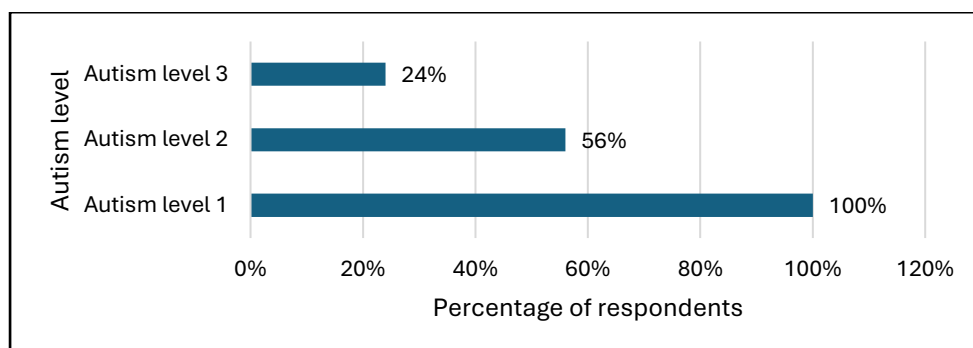
**Autism Level 2** - Substantial support is required to help these students manage everyday tasks. These students may have more problems with social skills and restrictive and repetitive

behaviour (e.g., hand flapping, rocking back and forth). Difficulties with verbal communication may be present.

**Autism Level 3** - Very substantial support is required to help these students manage everyday tasks. These students have significant problems with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). Many of these students do not communicate verbally or can use a limited number of words to communicate.

Based on the level definitions, 34 respondents (100%) reported having teaching experience with students at Level 1 and 19 respondents (56%) with students at Level 2. Only about a quarter of those who answered this question (n=8; 24%) reported having teaching experience with autistic students at Level 3 (refer to Figure 14).

**Figure 14** *The level of autism of the students taught (n=34)*

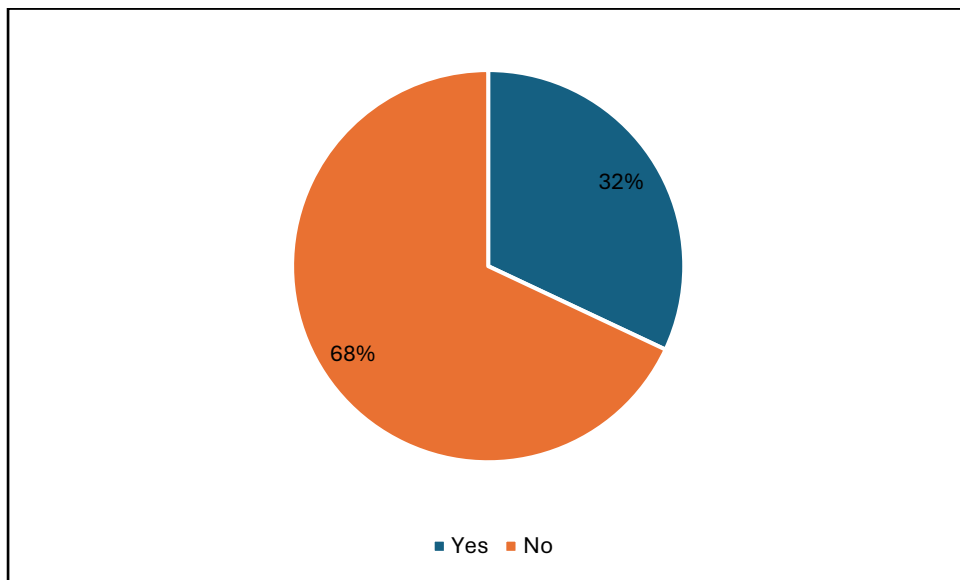


**Question 17: Singing Teaching Experience With Autistic Students who are Minimally Speaking (MS) (n=34)**

Respondents were asked to indicate whether they have experience teaching singing to autistic students who are MS. It was explained to the respondents that, in the absence of a shared definition of ‘minimally speaking’, for the purpose of this study, as defined by Kasari et al. (2013), ‘minimally speaking’ refers to students with “a very small repertoire of spoken or fixed

phrases” (p. 480); the number of spoken words varies from zero to 20 or 30. Twenty-three respondents (68%) reported having no experience with autistic students who are MS and only 11 respondents (32%) reported teaching this specific population (refer to Figure 15).

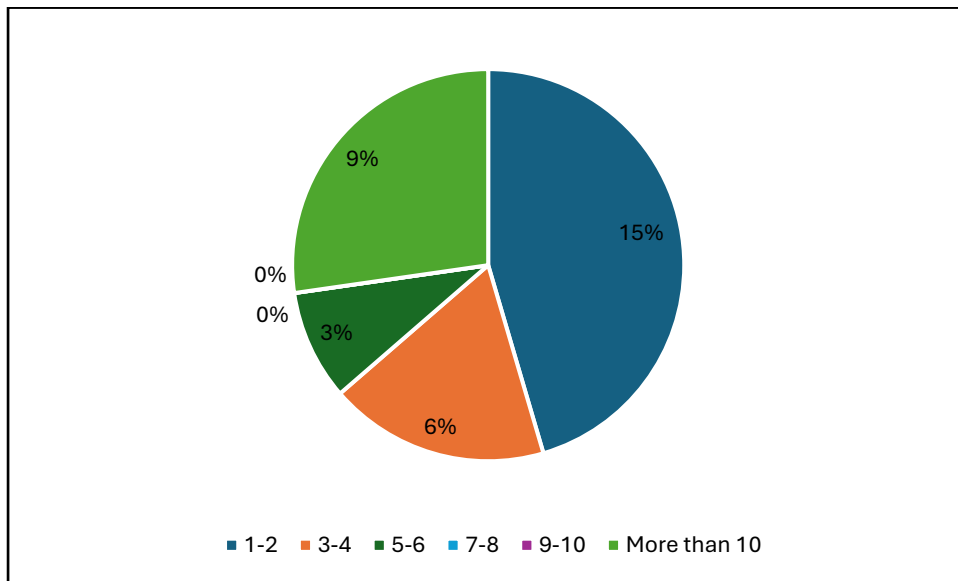
**Figure 15** *Singing teaching experience with autistic students who are minimally speaking (n=34)*



**Question 18: Number of Autistic Students who are Minimally Speaking (n=34)**

Respondents who reported having experience with autistic students who are MS (n=11; 32%) were guided to indicate the number of students taught. Five respondents (15%) reported that they taught one to two students, 6% (n=2) three to four students and 3% (n=1) five to six students. Only three respondents (9%) indicated that they taught more than 10 students (refer to Figure 16).

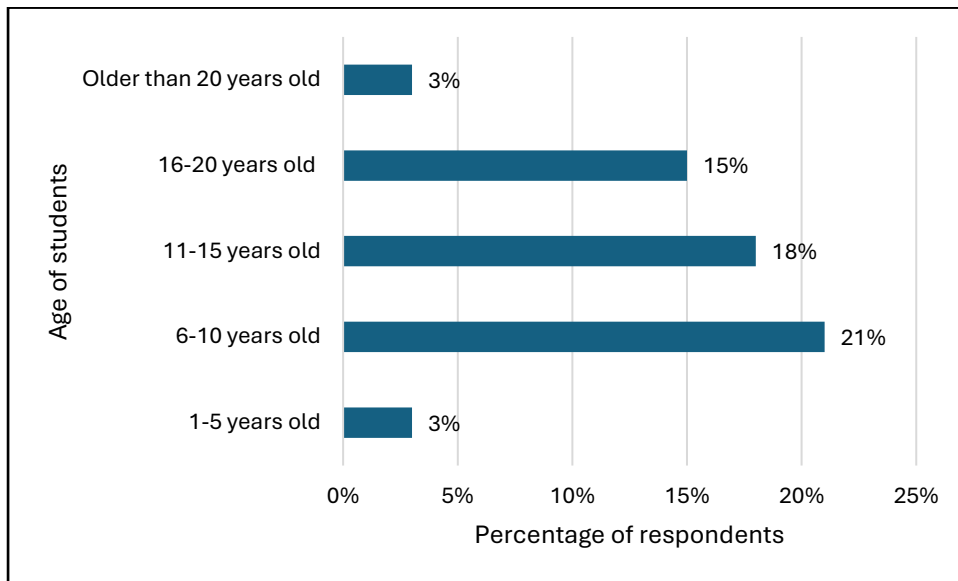
**Figure 16** Number of autistic students who are minimally speaking (n=34)



**Question 19: Age of Autistic students who are Minimally Speaking (n=34)**

Respondents who reported having experience with autistic students who are MS (n=11; 32%) were instructed to indicate the age of the students taught. Seven respondents (21%) reported teaching students aged six to 10 years and six respondents (18%) taught 11 to 15-year-old students. Five respondents (15%) taught students aged 16 to 20 years. One respondent (3%) reported having singing teaching experience with one to five-year-old children and another respondent (3%) indicated experience with students older than 20 years (refer to Figure 17).

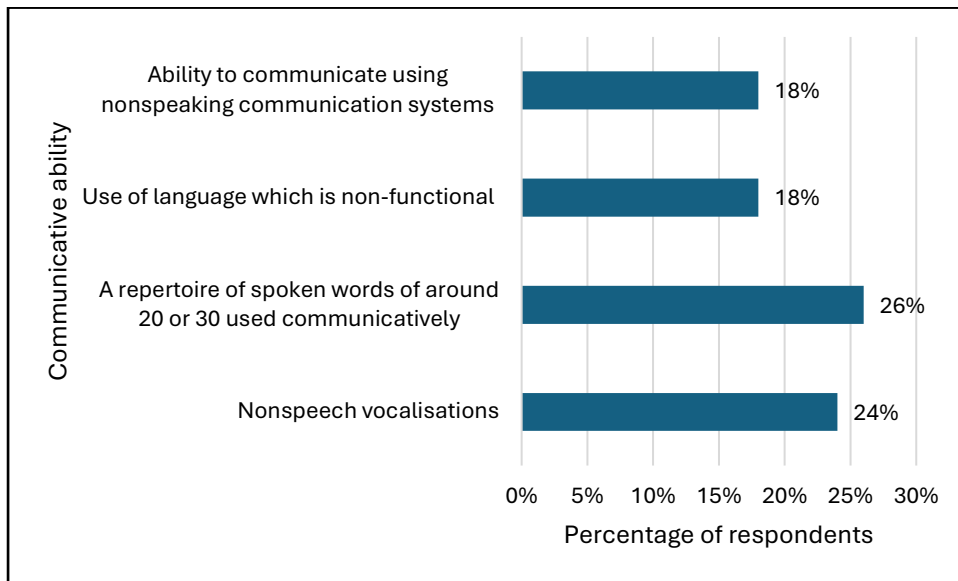
**Figure 17** Age of autistic students who are minimally speaking (n=34)



**Question 20: The Communicative Ability of Autistic Students who are Minimally Speaking (n=34)**

Respondents who reported having experience with autistic students who are MS (n=11; 32%) were asked to choose descriptions that best describe the communicative ability of the students taught. The online questionnaire respondents were given four options. Nine respondents (26%) reported experience with students who had a repertoire of 20 to 30 words used communicatively and eight respondents (24%) taught students whose vocalisations were non-speech vocalisations. Six respondents (18%) reported teaching singing to students whose use of language was nonfunctional (not used to mean anything) and another six respondents (18%) indicated experience with students who used nonspeaking communication systems to communicate, including Picture Exchange Communication System (PECS), written language, signed language and augmentative and alternative communication (AAC) devices (refer to Figure 18).

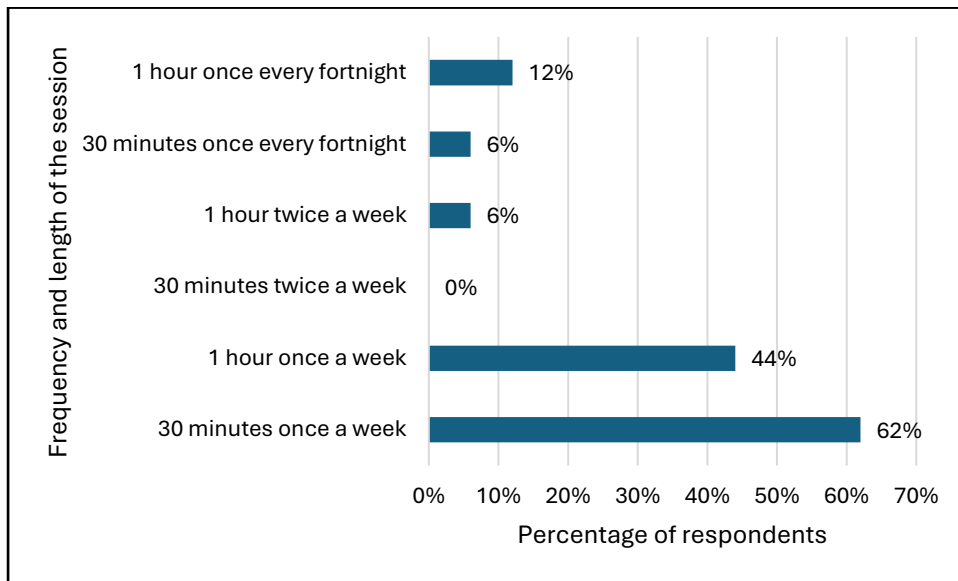
**Figure 18** *The communicative ability of autistic students who are minimally speaking (n=34)*



**Question 21: Frequency and Length of Singing Sessions of Autistic Students (n=34)**

The most popular response was a 30-minute weekly session (n=21; 62%), followed by an hour weekly session (n=15; 44%). Sessions on a fortnightly basis (n=6; 18%) or twice a week (n=2; 6%) were less popular (see Figure 19). Other session durations added in the comments are 20 minutes (n=1; 3%) and 45 minutes (n=2; 6%). A participant (3%) reported giving sessions within a school day and, as indicated in Table 8, four respondents (12%) reported varying the duration and frequency of the sessions as required.

**Figure 19** Frequency and length of singing sessions of autistic students (n=34)



**Table 8** Comments reporting variations in frequency and length of singing sessions of autistic students

*20-40 mins once a week (length depends on how much they are enjoying it)*

*As and when required*

*In this instance, sporadic, project-based (student's priority and skilled proficiency is towards other instruments)*

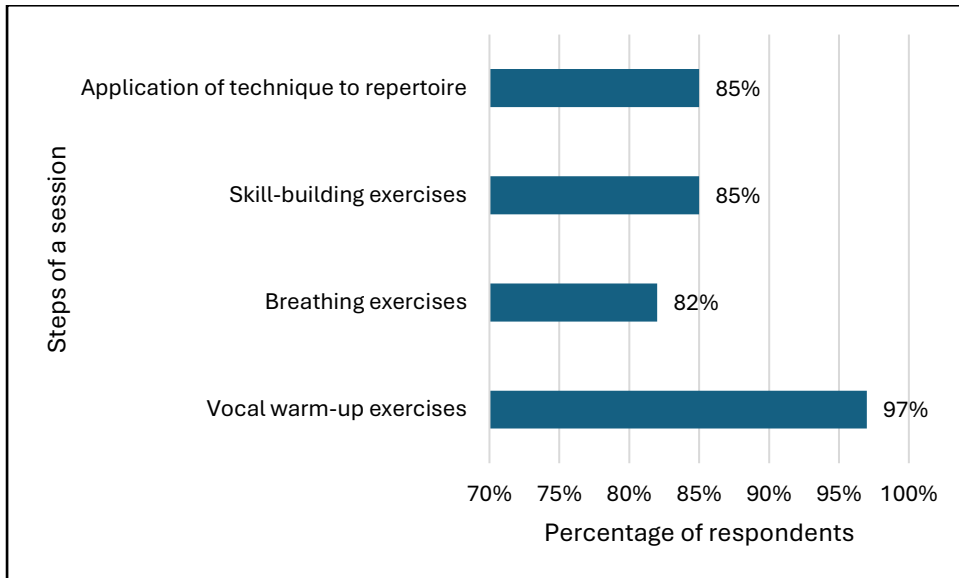
*It all depends on the situation*

**Question 22: Steps of a Singing Session for Autistic Students (n=34)**

Almost all respondents (n=33; 97%) reported including vocal warm-up exercises during singing sessions of autistic students; however, breathing exercises are only included by 28 respondents (82%). Skill-building exercises and the application of technique to repertoire are

each carried out during the sessions by 29 respondents (85%) (refer to Figure 20). The answers added to the options given are listed in Table 9.

**Figure 20** Steps of a singing session for autistic students (n=34)



**Table 9** Other responses to Question 22: steps of a singing session for autistic students

Student-led
Music skills as communication
Compositions of students
Emotional check-in
Games
Musicianship
Characterisation
Music theory

Focus on performance anxiety

Physical warm-up and warm-down

Practice advice

*Breath work can be a little vague without a sound related activity to feel the effect of it*

The structure of the session is based on the student since each student is different

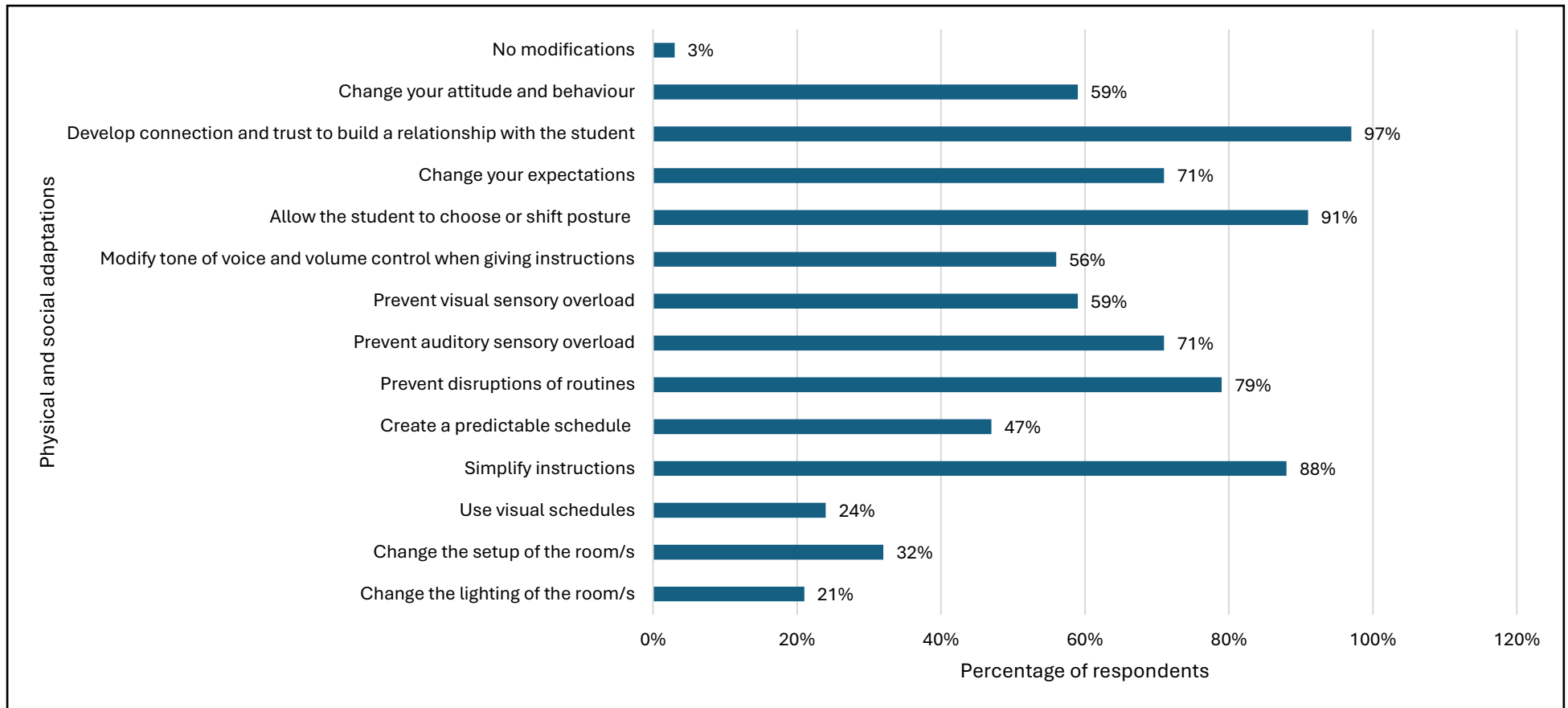
The session is based on the songs the student would like to learn

*Listening to and singing along to favourite songs*

### **Question 23: Adaptation of Physical and Social Environment (n=34)**

Almost all the respondents indicated that the development of connection and trust is crucial to building a relationship with the student (n=33; 97%). Thirty-one respondents (91%) reported movement, such as allowing students to choose or shift posture, such as walking around while singing throughout the session and 30 respondents (88%) reported simplification of instructions. These adaptations were followed by the prevention of routine disruptions (n=27; 79%), prevention of auditory sensory overload (n=24; 71%), change of expectations (n=24; 71%), prevention of visual sensory overload (n=20; 59%), change of own attitudes and behaviour (n=20; 59%) and modification of voice tone and volume control when giving instructions (n=19; 56%). Less common answers were the creation of a predictable schedule (n=16; 47%), the change of the room set-up (n=11; 32%), the usage of a visual schedule (n=8; 24%) and the change of the room lighting (n=7; 21%). Only one participant (3%) reported applying no modifications to the physical and social environment when teaching autistic students (refer to Figure 21). Table 10 lists the answers added to the options given.

**Figure 21** *Adaptation of physical and social environment (n=34)*



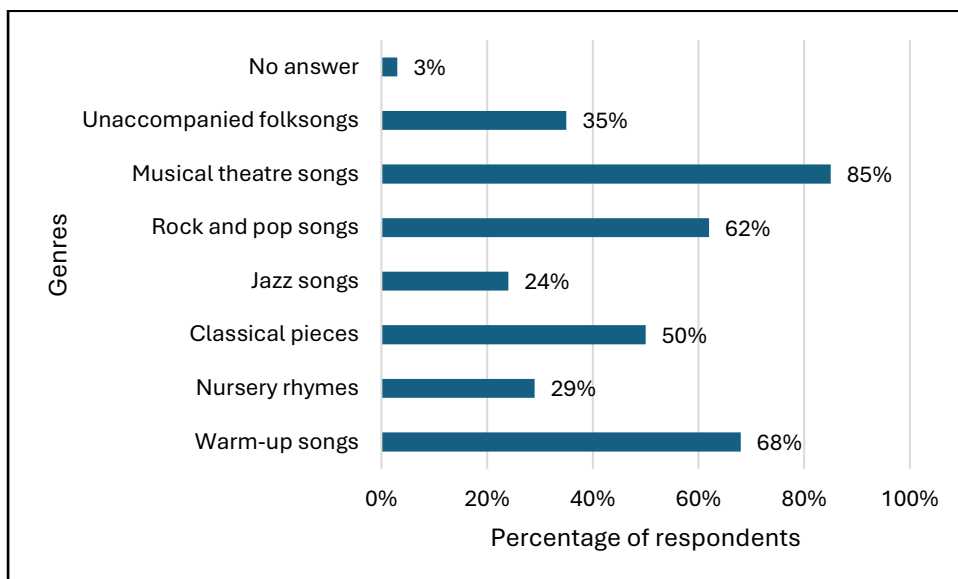
**Table 10** *Other responses to Question 23: the adaptation of the physical and social environment*

Changes depend on the student
Repetition
Adapt to a slower pace
Play is allowed

**Question 24: Genres of Songs Taught to Autistic Students (n=33)**

Musical theatre songs are the most popular songs taught to autistic students by the respondents who answered this question (n=29; 85%), followed by warm-up songs (n=23; 68%), rock and pop songs (n=21; 62%), classical pieces (n=17; 50%) and unaccompanied folksongs (n=12; 35%). Almost a third of those who responded to this question (n=10; 29%) reported teaching nursery rhymes (refer to Figure 22). The least popular songs taught are jazz songs (n=8; 24%). Other answers were added to the options given (Table 11).

**Figure 22** *Genres of songs taught to autistic students (n=33)*



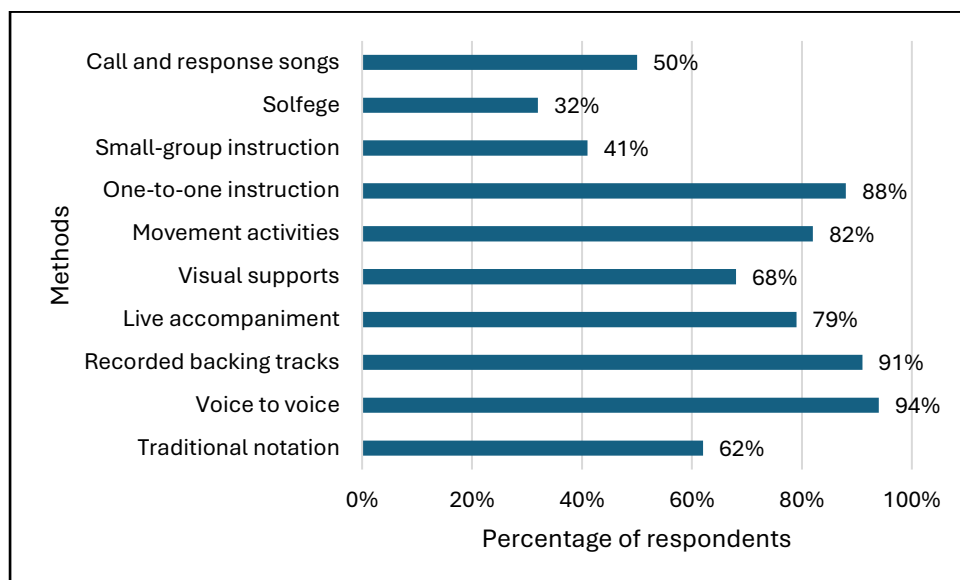
**Table 11** *Other responses to Question 24: genres of songs taught to autistic students*

Simple songs
Rhythmic songs
Onomatopoeic songs
Songs chosen by the student
Accompanied folk songs

**Question 25: Methods Used When Teaching Singing to Autistic Students (n=34)**

Thirty-two respondents (94%) reported using voice-to-voice when teaching autistic students. Voice-to-voice was followed by recorded backing tracks (n=31; 91%), one-to-one instruction (n=30; 88%) and movement activities (n=28; 82%). Live accompaniment was chosen by 27 respondents (79%). The respondents were instructed to indicate the instrument used for live accompaniment. The piano is used by eight respondents (24%), the guitar by one participant (3%) and percussion instruments by two online questionnaire respondents (6%). Table 12 lists additional information given by the respondents about live accompaniment. Additional responses indicating more than one instrument used by a participant were also included in Table 12. Less common methods used are visual supports (n=23; 68%), traditional notation (n=21; 62%), call and response songs (n=17; 50%), small group instruction (n=14; 41%) and solfege (n=11; 32%) (refer to Figure 23). Other responses were added to the options given (Table 13).

**Figure 23** *Methods used when teaching singing to autistic students (n=34)*



**Table 12** *Additional information given by the respondents about live accompaniment during singing sessions with autistic students*

Guitar and piano
Piano and percussion (tuned and untuned)

**Table 13** *Other responses to Question 25: methods used when teaching singing to autistic students*

Kodály
Improvisation
Change of lyrics
Any method which is helpful for the student

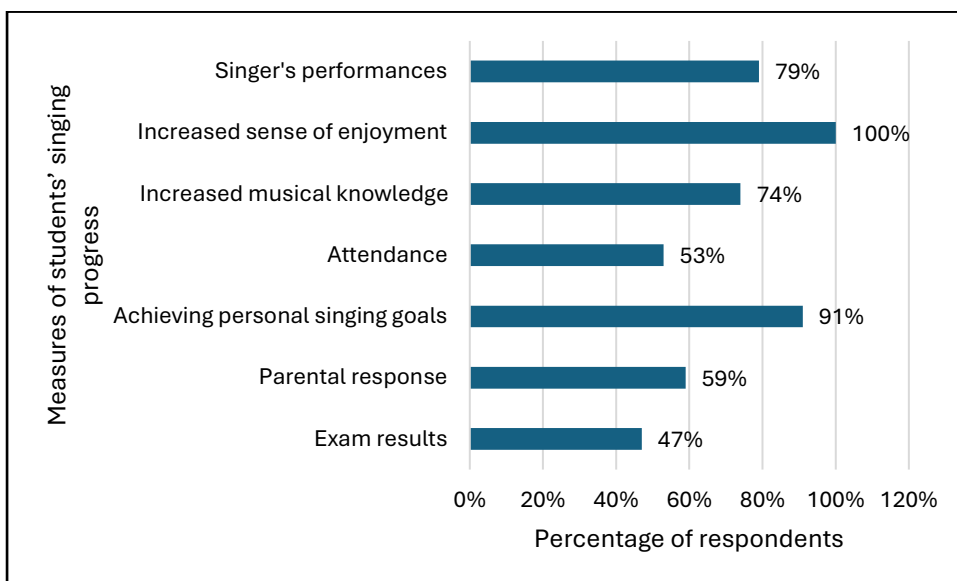
Stick notation

Acting through singing techniques

**Question 26: Measuring the Singing Progress of Autistic Students (n=34)**

An increased sense of enjoyment (n=34; 100%) is the most popular factor that helps online questionnaire respondents measure the singing progress of autistic students. The achievement of personal singing goals is an indicative measure for 31 respondents (91%), the performance of singers for 27 respondents (79%) and an increase in musical knowledge for 25 respondents (74%). More than half of those who answered this question (n=20; 59%) indicated that parental response is an essential measure. Attendance (n=18; 53%) and exam results (n=16; 47%) were the least popular measures (refer to Figure 24). Other responses were added (Table 14).

**Figure 24** Measuring the singing progress of autistic students (n=34)



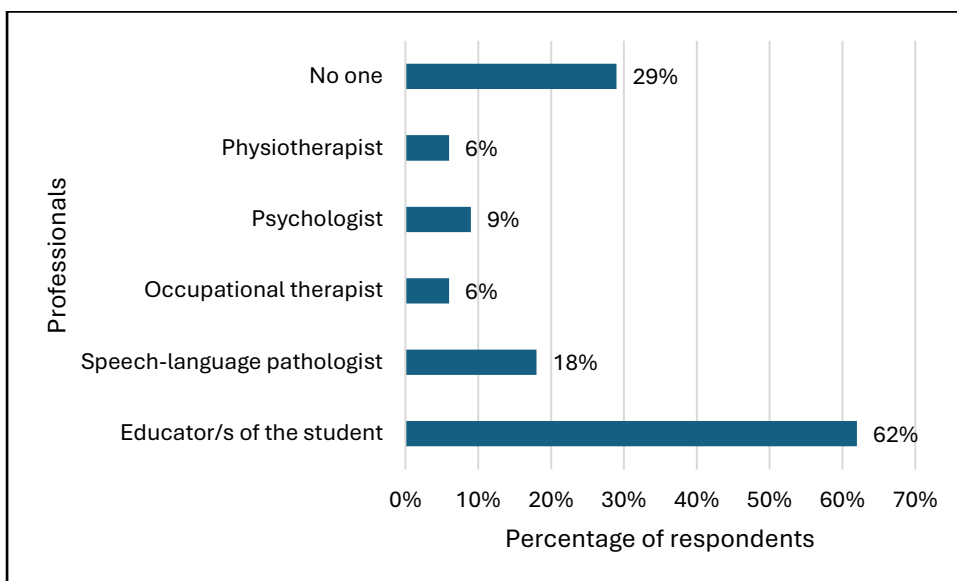
**Table 14** Other responses to Question 26: measuring the singing progress of autistic students

Confidence
Feedback from other individuals working with the student
Recordings of lessons
Engagement

**Question 27: Working With Other Professionals When Teaching Autistic Students (n=34)**

More than half (n=21; 62%) of those who answered this question reported working with other educators of the student. Ten respondents (29%) reported working with no one. Collaboration with speech-language pathologists (n=6; 18%), psychologists (n=3; 9%), occupational therapists (n=2; 6%) and physiotherapists (n=2; 6%) was also reported (refer to Figure 25). Other responses were added to the options given (Table 15).

**Figure 25** Working with other professionals when teaching autistic students (n=34)



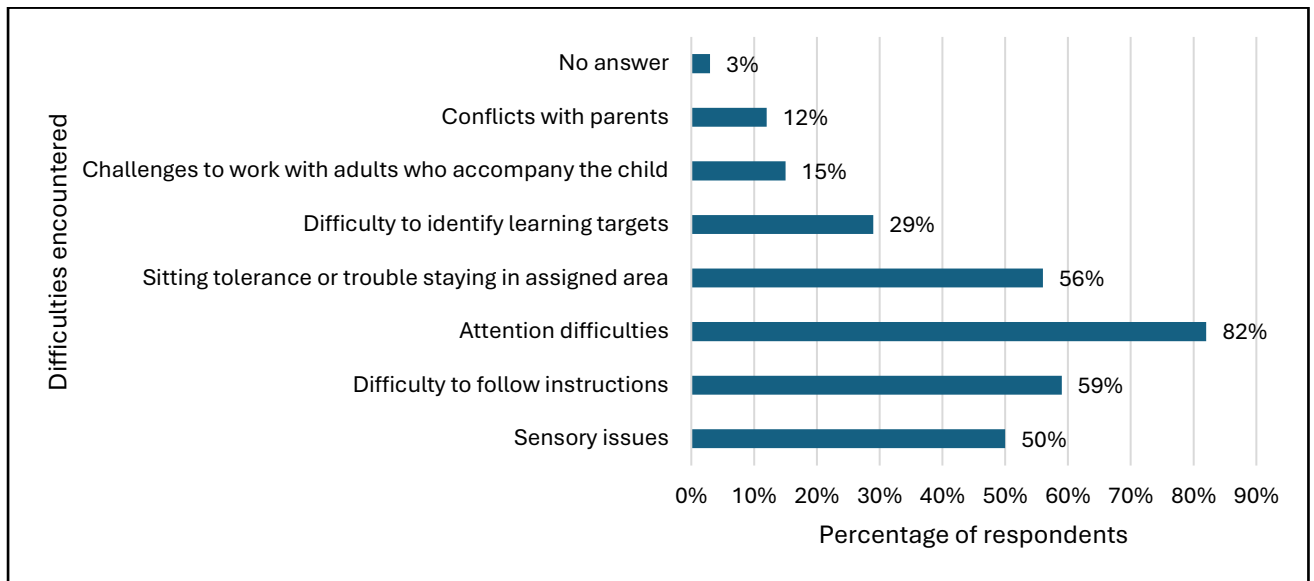
**Table 15** *Other responses to Question 27: working with other professionals when teaching autistic students*

Teaching / Learning Support Assistant
Stage and music directors
SENCO (Special Educational Needs Coordinator)
Parents or carers

**Question 28: Difficulties Encountered When Teaching Singing to Autistic Students (n=33)**

Respondents reported that attention is the most common difficulty when teaching an autistic student (n=28; 82%), followed by difficulty following instructions (n=20; 59%), problems with sitting tolerance or staying in an assigned area (n=19; 56%) and sensory issues (n=17; 50%). The difficulties which seem to be experienced less by the online questionnaire respondents are the challenge to identify learning targets (n=10; 29%), the difficulty to work with adults who accompany the student (n=5; 15%) and conflicts with parents (n=4; 12%) (refer to Figure 26). Other responses were added to the options given (Table 16).

**Figure 26** Difficulties encountered when teaching singing to autistic students (n=33)



**Table 16** Other responses to Question 28: difficulties encountered when teaching singing to autistic students

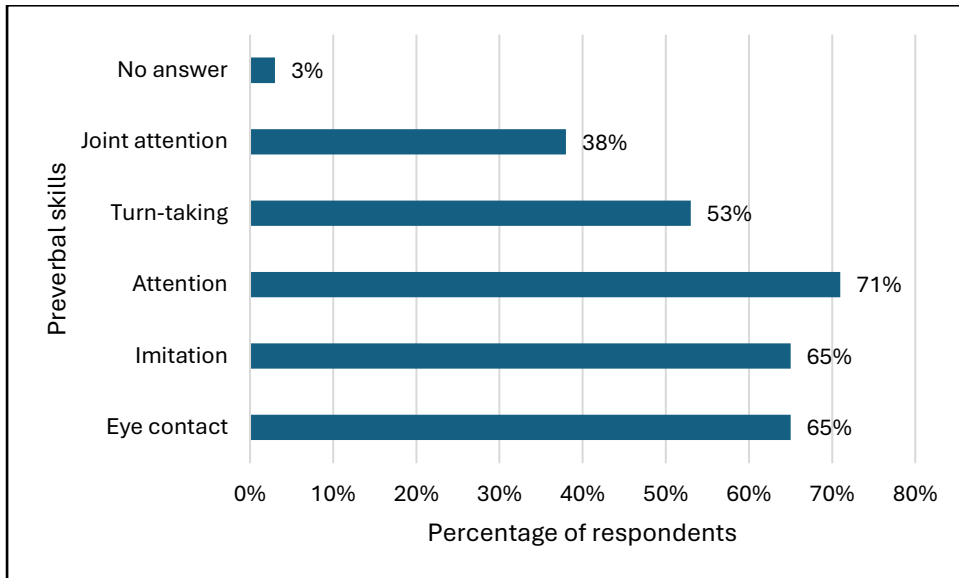
No difficulties
No general pattern
Difficulties with transitions
<i>Difficulty in embedding learning so that they can take it outside of the classroom</i>

**Question 29: Observed Improvement in Preverbal Skills (n=33)**

An improvement in attention (n=24; 71%) was reported by respondents, followed by an improvement in eye contact (n=22; 65%) and an advance in imitation (n=22; 65%). Improvement in turn-taking skills was observed by 18 respondents (53%) and improvement in

joint attention by 13 respondents (38%) (refer to Figure 27). Table 17 lists the responses added to the given options.

**Figure 27** *Observed Improvement in preverbal skills (n=33)*



**Table 17** *Other responses to Question 29: observed improvement in preverbal skills*

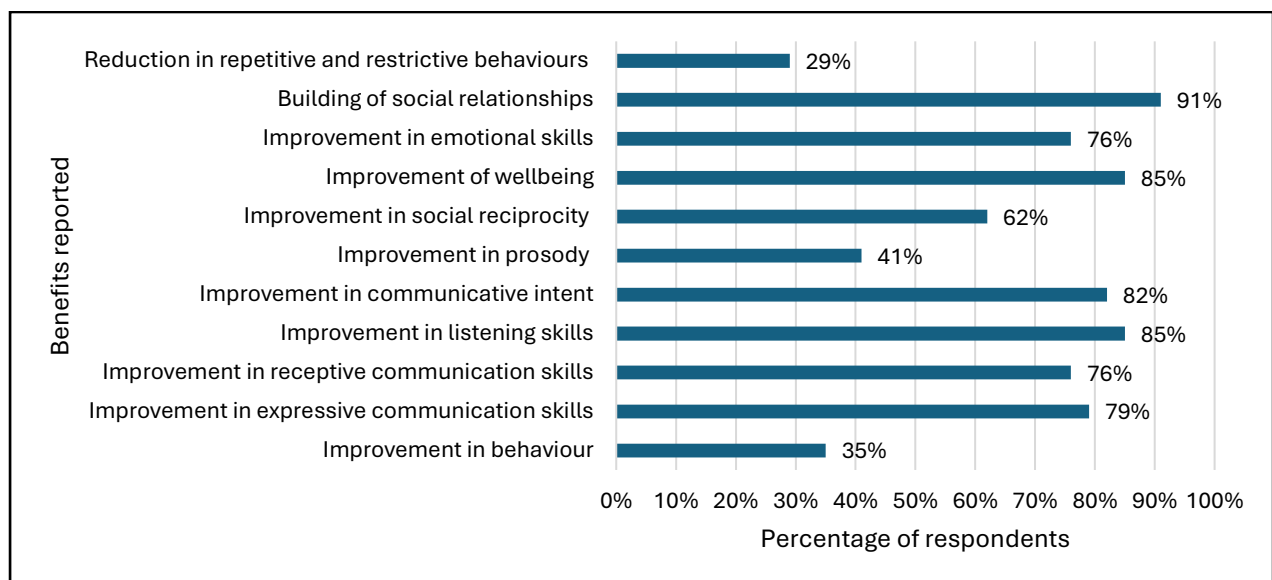
An increase in trust
Improvement in listening skills
<i>When singing becomes their special interest then many issues take care of themselves</i>
Improvement in general communication skills

**Question 30: Observed Benefits of Singing Tuition for Autistic Students (n=34)**

Almost all respondents indicated the building of social relationships (n=31; 91%) as a benefit of singing tuition, followed by better well-being (n=29; 85%) and improvement in listening skills (n=29; 85%). More than three-quarters of those who answered this question observed

an improvement in the communicative intent of the students (n=28; 82%). Twenty-seven respondents (79%) noticed an improvement in expressive communication skills and 26 respondents (76%) emphasised the advancement in receptive communication skills. Improvement in emotional skills was reported by 26 respondents (76%) and development in social reciprocity by 21 respondents (62%). The least improvement was reported in prosody (n=14; 41%), behaviour (n=12; 35%) and reduction of repetitive and restrictive behaviours (n=10; 29%) (refer to Figure 28). Other comments were added to the options given (Table 18).

**Figure 28** Observed benefits of singing tuition for autistic students (n=34)



**Table 18** Other responses to Question 30: observed benefits of singing tuition for autistic students

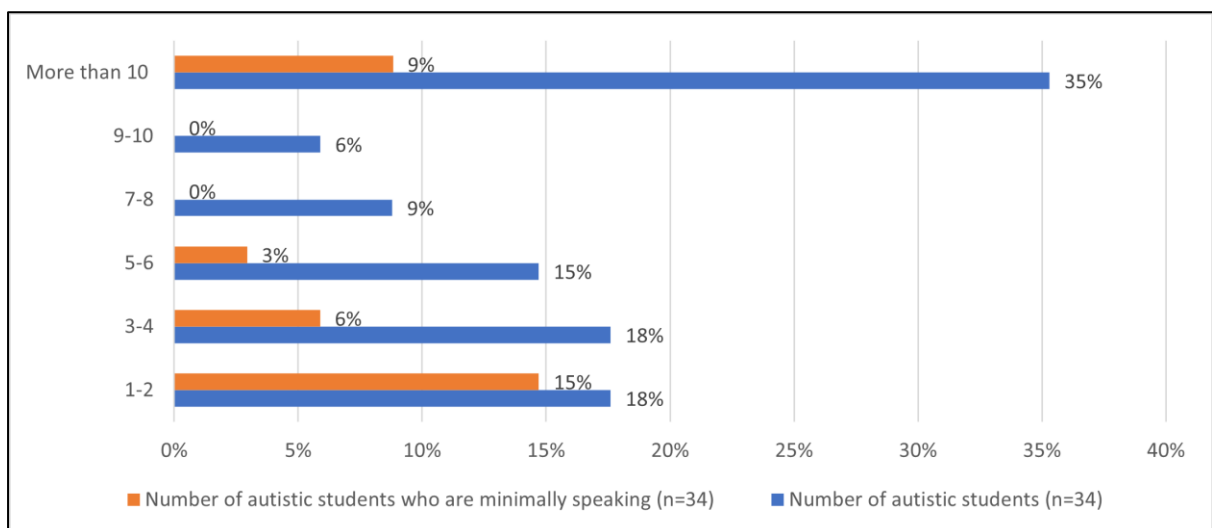
<i>Helps them to express themselves through other talents they might not know they had</i>
<i>Better singing!</i>
Empowerment improvement

## Comparing responses of different questions

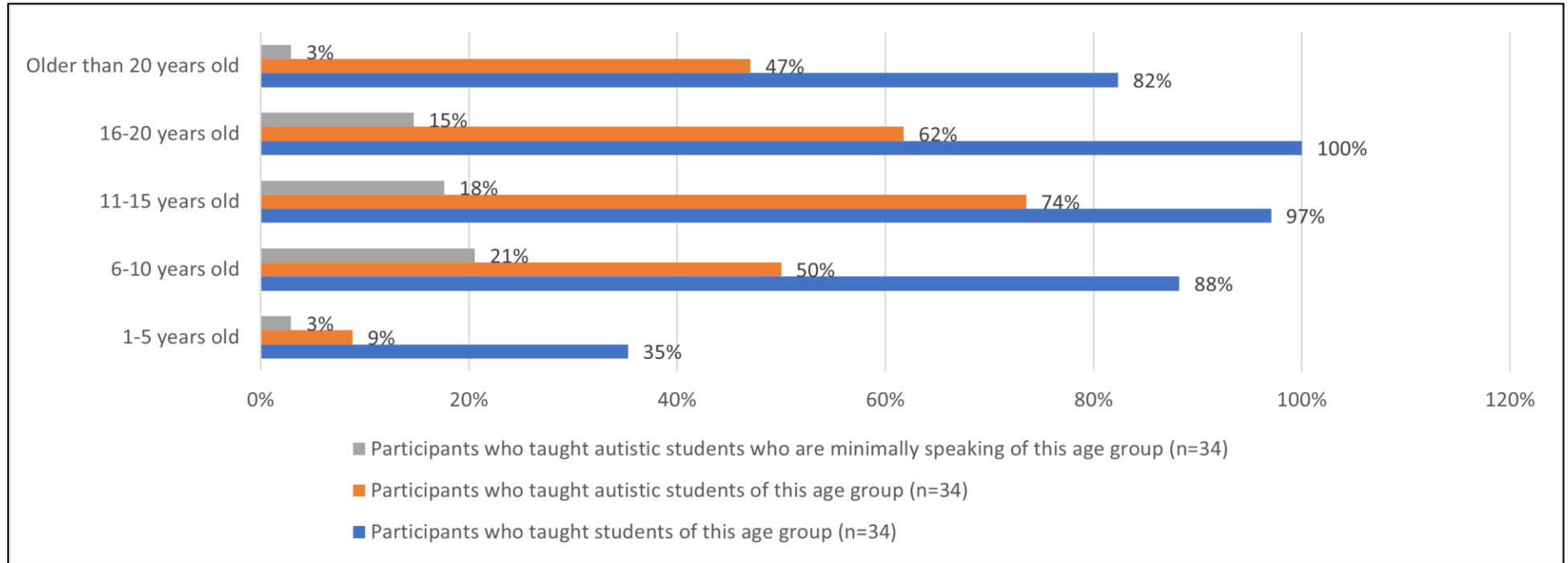
### A picture of who answered the questionnaire

The three figures which follow give a picture of who completed the online questionnaire. Figure 29 compares the number of autistic students taught by the respondents with that of autistic students who are minimally speaking. Further on, Figure 30 presents the ages of students taught by the participants with the ages of autistic students and autistic students who are minimally speaking. Figure 31 summarises the percentage of participants who taught autistic students Level 1, 2 and 3, students who are minimally speaking and also students who are minimally speaking with different communication abilities.

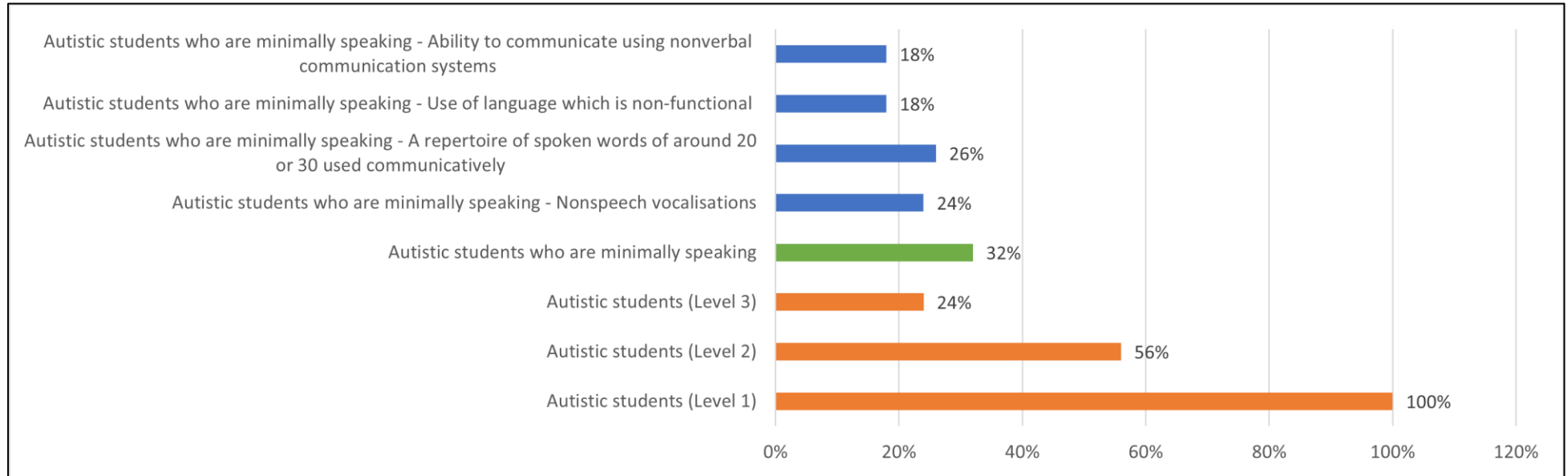
**Figure 29** *Number of autistic students taught by the respondents (n=34) versus the number of autistic students who are minimally speaking taught by the respondents (n=34)*



**Figure 30** Age groups taught by respondents



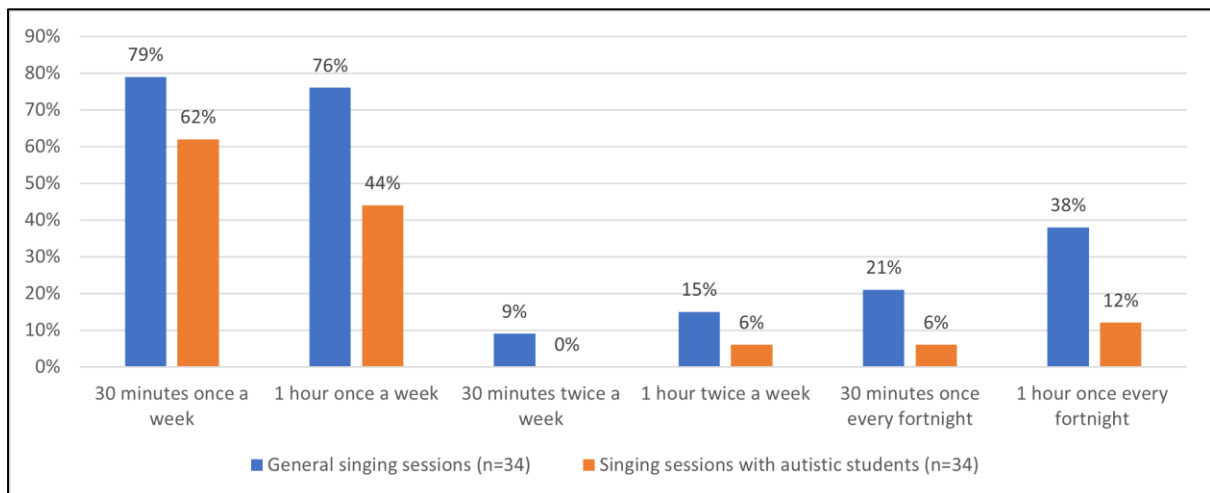
**Figure 31** *Specific levels of autism and communication abilities of students taught (n=34)*



## The Frequency and Length of Sessions

By analysing the number of respondents who conduct weekly and fortnight sessions, one can remark that weekly singing sessions are the most popular, both for general singing sessions and for sessions with autistic students (refer to Figure 32). This suggests the importance of regular sessions for both groups. It is also interesting to note that for autistic students, half-hour sessions are more common with respondents than one-hour sessions.

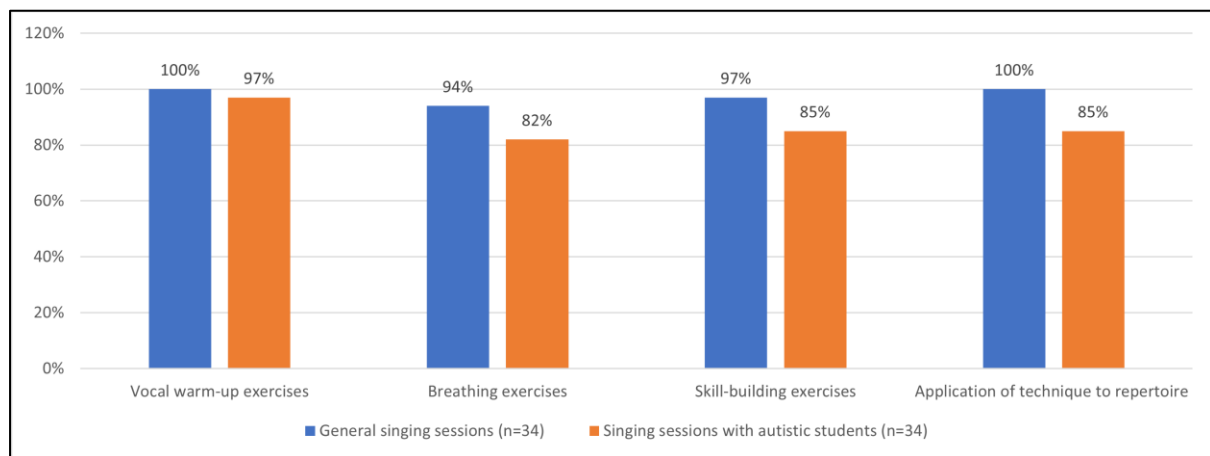
**Figure 32** Frequency and length of general singing sessions (n=34) versus the frequency and length of sessions with autistic students (n=34)



## Steps of Sessions

The steps of general singing sessions and those of sessions with autistic students reported by respondents seem to be very similar (refer to Figure 33). Vocal warm-up exercises, breathing exercises, skill-building exercises and application of technique to repertoire are all included in the compared sessions by most of the respondents.

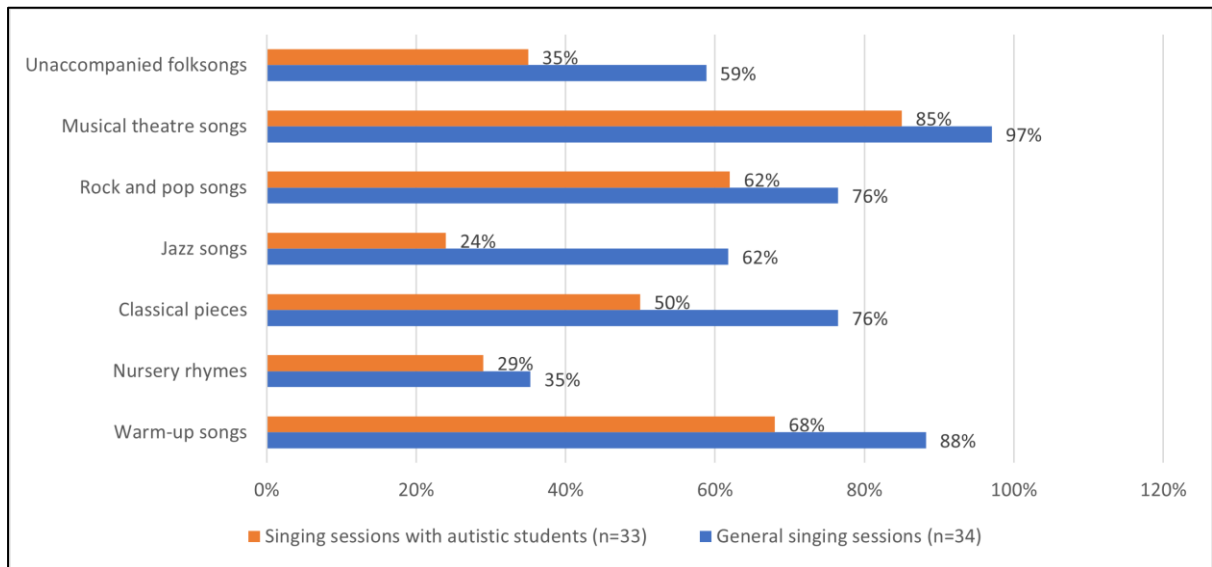
**Figure 33** Steps of general singing sessions (n=34) versus steps of sessions with autistic students (n=34)



### Genres of Songs Taught

Overall, the online questionnaire data indicates that the musical preferences of autistic individuals are similar to those of typically developing individuals (see Figure 34). Classical pieces are taught to autistic students by 50% of the respondents (n=17) and rock and pop songs by 62% (n=21). Compared to 62% (n=21) who taught jazz songs in general singing sessions, only 24% (n=8) reported teaching jazz songs to autistic individuals. Furthermore, only 29% (n=10) reported teaching nursery rhymes to autistic students.

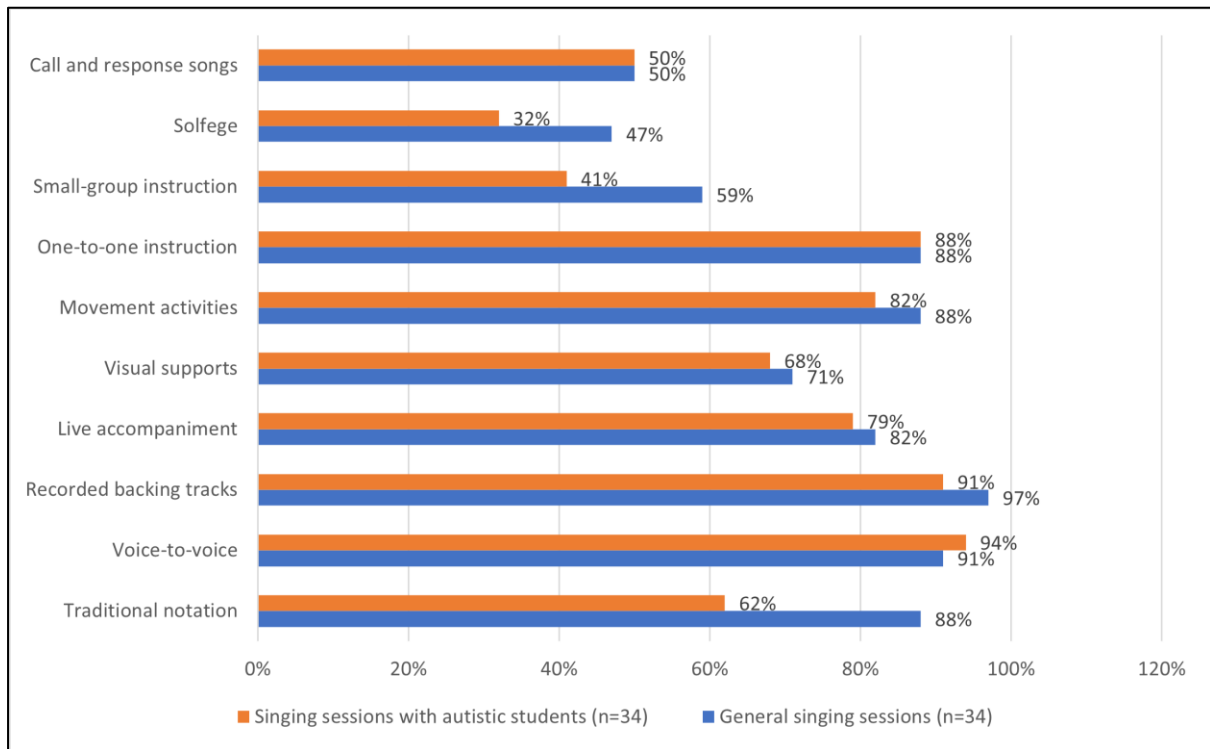
**Figure 34** Genres of songs taught during general singing sessions (n=34) versus genres taught during sessions with autistic students (n=33)



### Methods Used During Sessions

An interesting finding was that only 21 respondents (62%) use traditional notation with autistic students in contrast to 30 respondents (88%) who reported using this method in general singing sessions. Small group instruction is also more preferred in general singing sessions (n=20; 59%) than in sessions for autistic students (n=14; 41%). Movement activities (n=28; 82%) and voice-to-voice (n=32; 94%) are commonly used during sessions with autistic students. For autistic students, live accompaniment (n=27; 79%) is less popular than the use of recorded backing tracks (n=31; 91%) (refer to Figure 35).

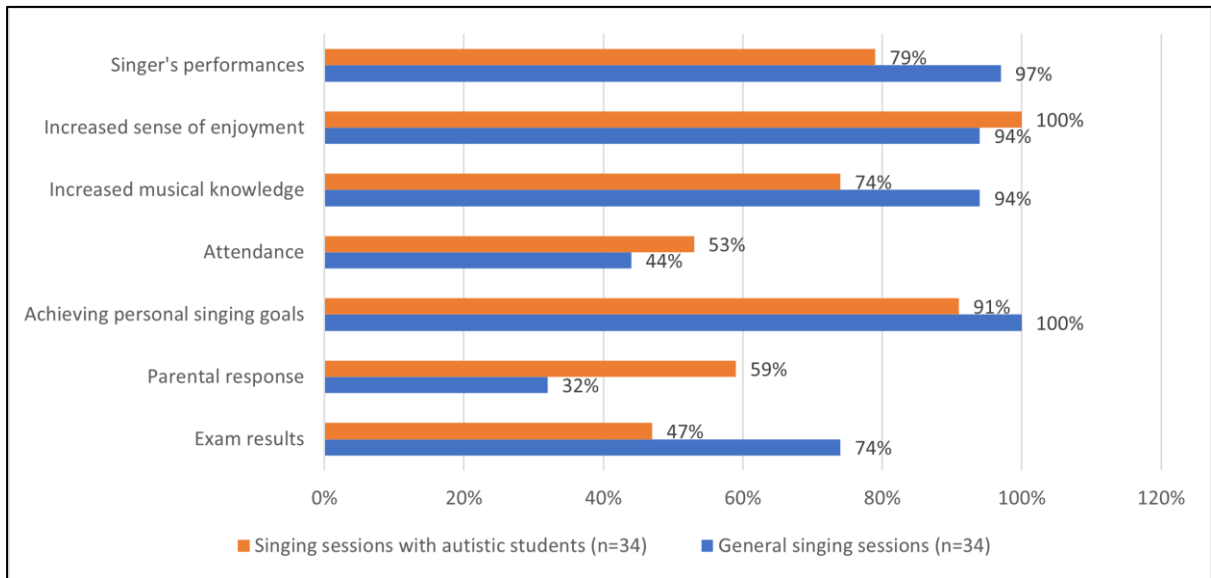
**Figure 35** *Methods used during general singing sessions (n=34) versus methods used during sessions with autistic students (n=34)*



### Methods Used to Measure the Progress of Students

Although exams are used to measure student progress by 25 respondents (74%) in general singing sessions, they are only used by 16 respondents (47%) when teaching autistic students. Similarly, increased musical knowledge is only an indicator for 25 respondents (74%) when teaching autistic students, compared to 32 respondents (94%) who use it to measure students' progress in general singing sessions. The study suggests that the parental response may be more crucial when teaching autistic students (n=20; 59%) than when giving general singing sessions (n=11; 32%). It is interesting to note that the performance of autistic students is an indicator for 27 respondents (79%), in contrast to 33 respondents (97%) who reported this option as an indicator of the progress in general singing sessions (see Figure 36).

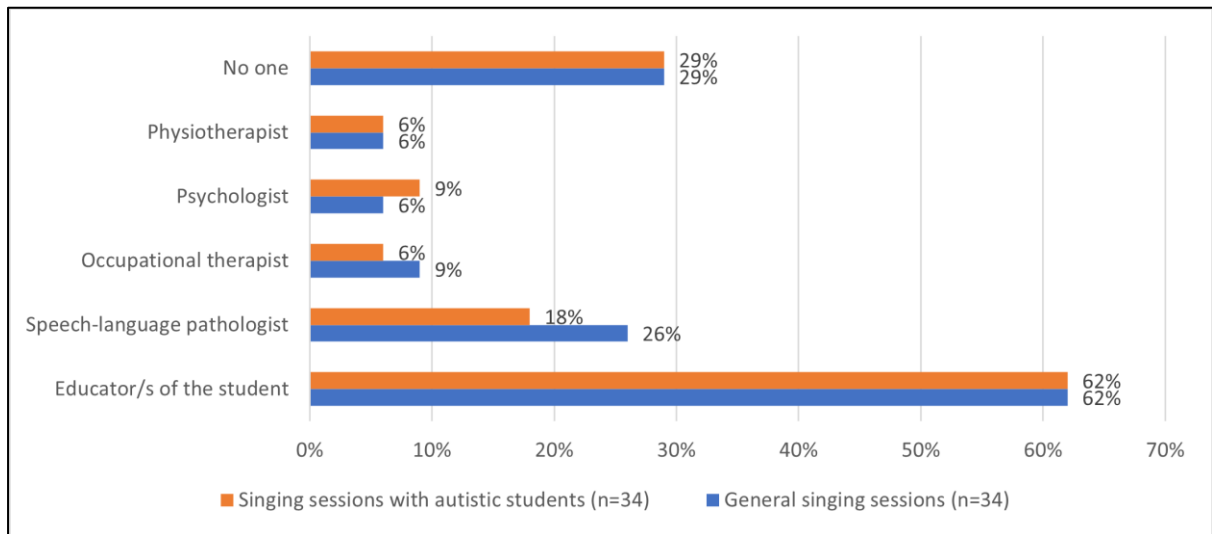
**Figure 36** *Methods used to measure students' progress during general singing sessions (n=34) versus methods used to measure students' progress during sessions with autistic students (n=34)*



### Collaboration With Other Professionals

A minimal difference was reported between working with other professionals when conducting general singing sessions and when teaching autistic students (refer to Figure 37). In both scenarios, while more than half of the respondents (n=21; 62%) indicated collaboration with other educators, only a few respondents reported working with other professionals who are not educators. In both cases, nearly one-third of the respondents (n=10; 29%) reported working with no other professionals.

**Figure 37** Working with other professionals during general singing sessions (n=34) versus working with other professionals during sessions for autistic students (n=34)



## Appendix E

### Pilot Study of the Online Interviews

**Table 19** *Online interviews: pilot study 1*

Question number	Original question	Suggestion	Edited question
1	What is your experience about songs and singing and the facilitation of the communication skills of the children in question?	To consider that <i>facilitation and of the children in question</i> might confuse the interviewee.	What is your experience with songs, singing and communication skills?
2	What do you think about different musical genres and the facilitation of communication skills of these children?	To eliminate <i>of these children</i> to aim for clarity and conciseness and also because the question was going to be answered by educators who do not teach children on the autism spectrum and also by parents.	<i>What do you think about different musical genres and the facilitation of communication skills?</i>
3	What is your experience about methods which can be used to present songs to these children or to encourage them to sing?	To consider rewording the question to aim for more clarity.	<i>What is your experience with methods that can be used to present songs to encourage singing?</i>
4	What is your opinion about the effect of songs and singing on the joint attention of these children?	To change <i>joint attention</i> into <i>attention</i> so that terminology familiar to all interviewees is used. To consider rewording the question to aim for	What is your opinion about the effect of songs and singing on attention?

		more clarity and conciseness.	
5	What are your observations about singing, sitting and movement activities?	/	/
6	What are your observations about singing and visuals?	/	/
7	What is your experience with methods that can be used to include songs and singing in the daily routine?	/	/
8	What are your observations about the use in context of words and sounds learnt in songs?	To consider rewording the question to aim for more clarity and to address the question of why children can sometimes sing a whole song but do not make or make limited use of language in daily life.	What are your observations about the singing of songs and the language used in daily life?
<p>Other comments: I discussed with the music therapist of Pilot Study 1 whether to include a question about assessment. The music therapist explained that her sessions are more child-led, but a useful method, especially to help the therapist reflect on the child's progress, is rating scales. Since a question about assessment was not going to be relevant to all interviewees, for example, to parents, it was decided not to be included.</p>			

**Table 20** *Online interviews: pilot study 2*

Question number	Original question	Suggestion	Edited question
1	What is your experience with songs, singing and communication skills?	/	/
2	What do you think about different musical genres and	To consider rewording the	What are your observations about

	the facilitation of communication skills?	question to focus on observations and experiences.	different musical genres and the facilitation of communication skills?
3	What is your experience with methods that can be used to present songs to encourage singing?	/	/
4	What is your opinion about the effect of songs and singing on attention?	To consider that attention might have a different meaning for different persons. To consider rewording the question to focus on observations and experiences.	What are your observations about the effect of songs and singing on attention? Explain what you are referring to when you use the term 'attention' in your answer.
5	What are your observations about singing, sitting and movement activities?	/	/
6	What are your observations about singing and visuals?	/	/
7	What is your experience with methods that can be used to include songs and singing in the daily routine?	/	/
8	What are your observations about the singing of songs and the language used in daily life?	/	/
Other comments: /			

## Appendix F



Downloaded: 22/12/2023

Approved: 08/09/2023

Deborah Pulicino

Registration number: 200326355

Human Communication Sciences

Programme: Standard PhD in the Human Communication Sciences

Dear Deborah

**PROJECT TITLE:** The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal through singing teaching: Semi-structured interviews

**APPLICATION:** Reference Number 051178

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 08/09/2023 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 051178 (form submission date: 07/09/2023); (expected project end date: 31/12/2024).
- Participant information sheet 1124474 version 3 (01/09/2023).
- Participant consent form 1124475 version 3 (01/09/2023).

The following amendments to this application have been approved:

- Amendment approved: 06/12/2023

If during the course of the project you need to [deviate significantly from the above-approved documentation](#) please inform me since written approval will be required.

Your responsibilities in delivering this research project are set out at the end of this letter.

Yours sincerely

Sophie Tomlinson

Ethics Administrator

School of Allied Health Professions, Nursing and Midwifery

Please note the following responsibilities of the researcher in delivering the research project:

- The project must abide by the University's Research Ethics Policy: <https://www.sheffield.ac.uk/research-services/ethics-integrity/policy>
- The project must abide by the University's Good Research & Innovation Practices Policy: [https://www.sheffield.ac.uk/polopoly\\_fs/1.671066/file/GRIPPpolicy.pdf](https://www.sheffield.ac.uk/polopoly_fs/1.671066/file/GRIPPpolicy.pdf)
- The researcher must inform their supervisor (in the case of a student) or Ethics Administrator (in the case of a member of staff) of any significant changes to the project or the approved documentation.
- The researcher must comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data.
- The researcher is responsible for effectively managing the data collected both during and after the end of the project in line with best practice, and any relevant legislative, regulatory or contractual requirements.

## Appendix G

5/15/25, 11:03 AM

The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verb...

The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal through singing teaching: Semi-structured interviews - Survey for nursery and/or preschool educators and teachers teaching children a foreign language at a basic level (CEFR Level A1-A2)

\* Indicates required question

---

1. Email \*
-

## Participant information sheet

### Research study title

The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal through singing teaching: Semi-structured interviews

### Invitation

You are being invited to take part in a research study. As part of the study, you are being invited to participate in a short survey and a 15-20 minutes interview. Before you decide whether or not to participate, it is important for you to understand the purpose of this study and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. If anything is not clear or if you would like further information, feel free to ask. Take your time to decide whether or not you wish to take part. Forms where participants select 'No' to the consent form question, "Having read the above information, I consent to take part in the study. Please indicate your consent before moving on to the short survey," but then goes on to complete the short survey, will be securely reviewed and destroyed.

### What is the aim of the study?

The interview is part of my PhD in the Division of Human Communication Sciences at the University of Sheffield. My research study aims to answer the following research question: How can singing teaching specifically target the facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal?

This study is the second phase of the three-phase research project 'Teaching an art and a voice - The teaching of and through singing to children on the autism spectrum, including children who are nonverbal, minimally verbal or limited verbal, to improve and facilitate communication skills'. The first phase of the study was a survey that analysed how singing teachers teach students on the autism spectrum, including students who are minimally verbal. Findings from phase one informed phase two of the study and findings from phase two will inform the last phase of the study.

### Why have I been chosen?

You are being asked to consider participating because your experience with children on the autism spectrum who are minimally verbal or with children whose language is still developing is valuable for this study.

### Do I have to take part?

It is up to you to decide whether or not to take part. You can withdraw at any time without any negative consequences. No explanation will be requested. If you wish to withdraw from the study, kindly close the web browser to stop answering the short survey.

### What will my participation involve? What do I have to do?

You will be asked to complete a short survey to give basic characteristics about you. The online interview will then consists of eight questions and will be carried out on Google Meet. The interview takes around 15 to 20 minutes and it will be video recorded.

### What are the possible benefits of taking part?

There are no immediate benefits from taking part in this study. However, the data collected may provide useful information about teaching singing to students on the

autism spectrum.

**Will my participation in this study be kept confidential?**

Yes. All the information collected will be kept strictly confidential. In all write-ups of the findings and subsequent publications, the data will be anonymised so that it cannot be identifiable.

**What is the legal basis for processing my personal data?**

According to data protection legislation, I am required to inform you that the legal basis I am applying for in order to process your personal data is that 'processing is necessary for the performance of a task carried out in the public interest' (Article 6(1)(e)). Further information can be found in the University's Privacy

Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>. Data protection legislation applies to 'personal data', which in the General Data Protection Regulation (GDPR) is defined as 'any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person'.

**What will happen to the data collected, and the findings of the study?**

Throughout this study, only the research team will have access to the collected data. In all write-ups of the findings and subsequent publications, the data will be anonymised so you will not be identified or identifiable. Digital data will be safely stored on the University Google Drive and it will be protected by passwords. If you give consent, Google Meet Transcription will be used to transcribe the recording of your interview. If consent is not given, the interview is transcribed manually. Beyond the end of the study only anonymised and analysed data will be stored. This will be stored and shared at the University of Sheffield repository Online Research Data for a maximum of 10 years.

**Who is organising and funding the research?**

Deborah Pullicino is a PhD student in the Division of Human Communication Sciences, University of Sheffield. Deborah is leading this research for her PhD study. Professor Judy Clegg and Professor Stephanie Pitts are Deborah's PhD supervisors.

**Who is the Data Controller?**

The University of Sheffield will act as the Data Controller for this study. This means that the University is responsible for the proper use and storage of your information.

**Who has ethically reviewed the study?**

This study has been ethically approved by the University of Sheffield's Ethics Committee, as administered by the School of Allied Health Professions, Nursing and Midwifery.

**What if something goes wrong and I would need to raise a complaint about the research?**

If you wish to raise a complaint, you should contact the researcher, Deborah Pullicino, email: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk). If you have any concerns related to potential exploitation, abuse or harm resulting from involvement in this study, kindly contact the study's Designated Safeguarding Contact, Professor Judy Clegg, email: [j.clegg@sheffield.ac.uk](mailto:j.clegg@sheffield.ac.uk). In addition, should you feel that your complaint has not been handled to your satisfaction, you can contact the University's Research Ethics & Integrity Manager, Lindsay Unwin, email: [l.v.unwin@sheffield.ac.uk](mailto:l.v.unwin@sheffield.ac.uk). If the complaint relates

to how your personal data has been handled, information about how to raise a complaint can be found in the University's Privacy Notice: <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

**Contact for further information**

For further information about this research, you are kindly requested to contact the researcher Deborah Pullicino, email: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk) or the PhD supervisors, Professor Judy Clegg, email: [j.clegg@sheffield.ac.uk](mailto:j.clegg@sheffield.ac.uk) and Professor Stephanie Pitts, email: [s.e.pitts@sheffield.ac.uk](mailto:s.e.pitts@sheffield.ac.uk). I would like to thank you for reading the information and taking part in this study.

Date: 5th June 2023

Consent form

**2. Taking part in the research study \***

*Tick all that apply.*

- I have read and understood the research study information sheet dated 05/06/2023 or the study has been fully explained to me.
- I have been given the opportunity to ask questions about the study.
- I agree to complete a short survey to give basic characteristics about me.
- Survey collected data will be safely stored on the University Google Drive and it will be protected by passwords.
- I agree to participate in an online interview which consists of eight questions and will be carried out on Google Meet. The interview will take around 15 to 20 minutes and it will be video recorded.
- Video recorded interviews will be stored on the University Google Drive.
- I agree that Google Meet Transcription will be used to transcribe the recording of my interview.
- I understand that my participation is voluntary and that I can withdraw from the study at any time; I do not need to provide an explanation for why I no longer want to take part, and there will be no adverse consequences if I choose to withdraw. I can decide not to answer any question or questions in the short survey and in the interview.

## 3. How my information will be used during and after the project \*

*Tick all that apply.*

I understand and agree that my words may be quoted in publications, reports, web pages, and other research outputs. I understand that I will not be named in these outputs.

I understand and agree that other authorised researchers will have access to the survey data and the video interview data only if they agree to preserve the confidentiality of the information as requested in this form.

I understand and agree that other authorised researchers may use the survey data and the video interview data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as described in the information sheet.

## 4. Providing information which can be used legally by the researchers \*

*Tick all that apply.*

I agree to assign the copyright I hold in any materials generated as part of this study to The University of Sheffield.

## 5. Having read the above information, I consent to take part in the study. Please indicate your consent before moving on to the short survey. \*

Mark only one answer.

*Mark only one oval.*

Yes

No *Skip to section 5 (Thank you. )*

Survey: Nursery and/or preschool educators and teachers teaching children a foreign language at a basic level (CEFR Level A1-A2 (Council of Europe, 2001))

These questions will allow the researcher to gain background information about you as an educator.

## 6. 1. Profession

---

7. 2. Area of specialisation (if applicable).

---

8. 3. Number of years working in the role described in question 1.

---

9. 4. Approximately, how many children have you worked with? Please answer this question with a focus on the typically developing children you worked with, not with a focus on the children on the autism spectrum that you taught.

---

10. 5. Please specify the ages of the children that you worked with. Please answer this question with a focus on the typically developing children you worked with, not with a focus on the children on the autism spectrum that you taught.

---

11. 6. Kindly comment about your musical background.

---

12. 7. Is there anything else you would like to add?

---

Thank you.

---

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Google Forms

## Appendix H

5/15/25, 11:04 AM

The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verb...

The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal through singing teaching: Semi-structured interviews - Survey for singing teachers, music therapists, psychologists, occupational therapists, and speech-language pathologists

\* Indicates required question

---

1. Email \*
-

## Participant information sheet

### Research study title

The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal through singing teaching: Semi-structured interviews

### Invitation

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### Why have I been chosen?

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There are no immediate benefits from taking part in this study. However, the data collected may provide useful information about teaching singing to students on the

autism spectrum.

**Will my participation in this study be kept confidential?**

Yes. All the information collected will be kept strictly confidential. In all write-ups of the findings and subsequent publications, the data will be anonymised so that it cannot be identifiable.

**What is the legal basis for processing my personal data?**

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**What will happen to the data collected, and the findings of the study?**

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This study has been ethically approved by the University of Sheffield's Ethics Committee, as administered by the School of Allied Health Professions, Nursing and Midwifery.

**What if something goes wrong and I would need to raise a complaint about the research?**

If you wish to raise a complaint, you should contact the researcher, Deborah Pullicino, email: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk). If you have any concerns related to potential exploitation, abuse or harm resulting from involvement in this study, kindly contact the study's Designated Safeguarding Contact, Professor Judy Clegg, email: [j.clegg@sheffield.ac.uk](mailto:j.clegg@sheffield.ac.uk). In addition, should you feel that your complaint has not been handled to your satisfaction, you can contact the University's Research Ethics & Integrity Manager, Lindsay Unwin, email: [l.v.unwin@sheffield.ac.uk](mailto:l.v.unwin@sheffield.ac.uk). If the complaint relates

to how your personal data has been handled, information about how to raise a complaint can be found in the University's Privacy Notice: <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

**Contact for further information**

For further information about this research, you are kindly requested to contact the researcher Deborah Pullicino, email: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk) or the PhD supervisors, Professor Judy Clegg, email: [j.clegg@sheffield.ac.uk](mailto:j.clegg@sheffield.ac.uk) and Professor Stephanie Pitts, email: [s.e.pitts@sheffield.ac.uk](mailto:s.e.pitts@sheffield.ac.uk). I would like to thank you for reading the information and taking part in this study.

Date: 5th June 2023

Consent form

**2. Taking part in the research study \***

*Tick all that apply.*

- I have read and understood the research study information sheet dated 05/06/2023 or the study has been fully explained to me.
- I have been given the opportunity to ask questions about the study.
- I agree to complete a short survey to give basic characteristics about me.
- Survey collected data will be safely stored on the University Google Drive and it will be protected by passwords.
- I agree to participate in an online interview which consists of eight questions and will be carried out on Google Meet. The interview will take around 15 to 20 minutes and it will be video recorded.
- Video recorded interviews will be stored on the University Google Drive.
- I agree that Google Meet Transcription will be used to transcribe the recording of my interview.
- I understand that my participation is voluntary and that I can withdraw from the study at any time; I do not need to provide an explanation for why I no longer want to take part, and there will be no adverse consequences if I choose to withdraw. I can decide not to answer any question or questions in the short survey and in the interview.

## 3. How my information will be used during and after the project \*

*Tick all that apply.*

I understand and agree that my words may be quoted in publications, reports, web pages, and other research outputs. I understand that I will not be named in these outputs.

I understand and agree that other authorised researchers will have access to the survey data and the video interview data only if they agree to preserve the confidentiality of the information as requested in this form.

I understand and agree that other authorised researchers may use the survey data and the video interview data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as described in the information sheet.

## 4. Providing information which can be used legally by the researchers \*

*Tick all that apply.*

I agree to assign the copyright I hold in any materials generated as part of this study to The University of Sheffield.

## 5. Having read the above information, I consent to take part in the study. Please indicate your consent before moving on to the short survey. \*

Mark only one answer.

*Mark only one oval.*

Yes

No *Skip to section 5 (Thank you. )*

Survey - Singing teachers, music therapists, psychologists, occupational therapists, and speech-language pathologists

These questions will allow the researcher to gain background information about you as a professional.

## 6. 1. Profession

---

7. 2. Area of specialisation (if applicable).

---

8. 3. Number of years working in the role described in question 1.

---

9. 4. The Diagnostic and Statistical Manual of Mental Disorders, DSM-5-TR (5th edition, text revision) refers to three levels of autism. How do you describe the autism level of the children you worked with?

Mark all that apply.

*Tick all that apply.*

Autism Level 1 - Minimum support is required to help these children manage everyday tasks. These children may have concerns with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). They are likely to have no difficulty with verbal communication. / High-functioning autism. / Children previously diagnosed with Asperger's syndrome.

Autism Level 2 - Substantial support is required to help these children manage everyday tasks. These children may have more problems with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). Difficulties with verbal communication may be present.

Autism Level 3 - Very substantial support is required to help these children manage everyday tasks. These children have significant problems with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). Many of these children do not communicate verbally or can use a limited number of words to communicate.

10. 5. Which of the following descriptions (Koegel et al., 2020) best describe the verbal abilities of the children that you worked with? If required, please refer to Koegel et al. (2020) for a more detailed description of each term.

Koegel, L. K., Bryan, K. M., Su, P. L., Vaidya, M., & Camarata, S. (2020). Definitions of nonverbal and minimally verbal in research for autism: A systematic review of the literature. *Journal of Autism and Developmental Disorders*, 50(8), 2957–2972. <https://doi.org/10.1007/s10803-020-04402-w>

Mark all that apply.

*Tick all that apply.*

- Nonverbal - Children over 18 months with no verbal expressive intelligible words or approximations
- Minimally verbal - Children who use significantly fewer words than the typical number of words used at their age
- Limited verbal - Children whose verbal abilities are better than those of the children who are described as "minimally verbal", but still significantly below the expected level of a child of the same age

11. 6. Approximately, how many children on the autism spectrum who were nonverbal, minimally verbal or limited verbal (Koegel et al., 2020) have you worked with? Refer to question 4 for a short description of the terms "nonverbal", "minimally verbal", and "limited verbal" and to Koegel et al. (2020) for a detailed description of each term.

Koegel, L. K., Bryan, K. M., Su, P. L., Vaidya, M., & Camarata, S. (2020). Definitions of nonverbal and minimally verbal in research for autism: A systematic review of the literature. *Journal of Autism and Developmental Disorders*, 50(8), 2957–2972. <https://doi.org/10.1007/s10803-020-04402-w>

---

12. 7. Please specify the ages of the children on the autism spectrum who were nonverbal, minimally verbal, and limited verbal that you worked with. Refer to question 4 for a short description of the terms "nonverbal", "minimally verbal", and "limited verbal" and to Koegel et al. (2020) for a detailed description of each term.

Koegel, L. K., Bryan, K. M., Su, P. L., Vaidya, M., & Camarata, S. (2020). Definitions of nonverbal and minimally verbal in research for autism: A systematic review of the literature. *Journal of Autism and Developmental Disorders*, 50(8), 2957–2972. <https://doi.org/10.1007/s10803-020-04402-w>

Mark all that apply.

*Tick all that apply.*

- 1-5 years old
- 6-10 years old
- 11-15 years old

13. 8. Kindly comment about your musical background.

---

14. 9. Is there anything else you would like to add?

---

Thank you.

---

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## Appendix I

5/15/25, 11:04 AM

The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verb...

# The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal through singing teaching: Semi-structured interviews - Survey for parents

\* Indicates required question

---

1. Email \*

---

## Participant information sheet

### **Research study title**

The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal through singing teaching: Semi-structured interviews

### **Invitation**

You are being invited to take part in a research study. As part of the study, you are being invited to participate in a short survey and a 15-20 minutes interview. Before you decide whether or not to participate, it is important for you to understand the purpose of this study and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. If anything is not clear or if you would like further information, feel free to ask. Take your time to decide whether or not you wish to take part. Forms where participants select 'No' to the consent form question, "Having read the above information, I consent to take part in the study. Please indicate your consent before moving on to the short survey," but then goes on to complete the short survey, will be securely reviewed and destroyed.

### **What is the aim of the study?**

The interview is part of my PhD in the Division of Human Communication Sciences at the University of Sheffield. My research study aims to answer the following research question:

How can singing teaching specifically target the facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal?

This study is the second phase of the three-phase research project 'Teaching an art and a voice - The teaching of and through singing to children on the autism spectrum, including children who are nonverbal, minimally verbal or limited verbal, to improve and facilitate communication skills'. The first phase of the study was a survey that analysed how singing teachers teach students on the autism spectrum, including students who are minimally verbal. Findings from phase one informed phase two of the study and findings from phase two will inform the last phase of the study.

**Why have I been chosen?**

You are being asked to consider participating because your experience with children on the autism spectrum who are minimally verbal or with children whose language is still developing is valuable for this study.

**Do I have to take part?**

It is up to you to decide whether or not to take part. You can withdraw at any time without any negative consequences. No explanation will be requested. If you wish to withdraw from the study, kindly close the web browser to stop answering the short survey.

**What will my participation involve? What do I have to do?**

You will be asked to complete a short survey to give basic characteristics about you. The online interview will then consist of eight questions and will be carried out on Google Meet. The interview takes around 15 to 20 minutes and it will be video recorded.

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

There are no immediate benefits from taking part in this study. However, the data collected may provide useful information about teaching singing to students on the autism spectrum.

**Will my participation in this study be kept confidential?**

Yes. All the information collected will be kept strictly confidential. In all write-ups of the findings and subsequent publications, the data will be anonymised so that it cannot be identifiable.

**What is the legal basis for processing my personal data?**

According to data protection legislation, I am required to inform you that the legal basis I am applying for in order to process your personal data is that 'processing is necessary for the performance

of a task carried out in the public interest' (Article 6(1)(e)). Further information can be found in the University's Privacy Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>. Data protection legislation applies to 'personal data', which in the General Data Protection Regulation (GDPR) is defined as 'any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person'.

### **What will happen to the data collected, and the findings of the study?**

Throughout this study, only the research team will have access to the collected data. In all write-ups of the findings and subsequent publications, the data will be anonymised so you will not be identified or identifiable. Digital data will be safely stored on the University Google Drive and it will be protected by passwords. If you give consent, Google Meet Transcription will be used to transcribe the recording of your interview. If consent is not given, the interview is transcribed manually. Beyond the end of the study only anonymised and analysed data will be stored. This will be stored and shared at the University of Sheffield repository Online Research Data for a maximum of 10 years.

### **Who is organising and funding the research?**

Deborah Pullicino is a PhD student in the Division of Human Communication Sciences, University of Sheffield. Deborah is leading this research for her PhD study. Professor Judy Clegg and Professor Stephanie Pitts are Deborah's PhD supervisors.

### **Who is the Data Controller?**

The University of Sheffield will act as the Data Controller for this study. This means that the University is responsible for the proper use and storage of your information.

### **Who has ethically reviewed the study?**

This study has been ethically approved by the University of Sheffield's Ethics Committee, as administered by the School of Allied Health

Professions,  
Nursing and Midwifery.

**What if something goes wrong and I would need to raise a complaint about the research?**

If you wish to raise a complaint, you should contact the researcher, Deborah Pullicino, email: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk). If you have any concerns related to potential exploitation, abuse or harm resulting from involvement in this study, kindly contact the study's Designated Safeguarding Contact, Professor Judy Clegg, email: [j.clegg@sheffield.ac.uk](mailto:j.clegg@sheffield.ac.uk). In addition, should you feel that your complaint has not been handled to your satisfaction, you can contact the University's Research Ethics & Integrity Manager, Lindsay Unwin, email: [l.v.unwin@sheffield.ac.uk](mailto:l.v.unwin@sheffield.ac.uk). If the complaint relates to how your personal data has been handled, information about how to raise a complaint can be found in the University's Privacy Notice: <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

**Contact for further information**

For further information about this research, you are kindly requested to contact the researcher Deborah Pullicino, email: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk) or the PhD supervisors, Professor Judy Clegg, email: [j.clegg@sheffield.ac.uk](mailto:j.clegg@sheffield.ac.uk) and Professor Stephanie Pitts, email: [s.e.pitts@sheffield.ac.uk](mailto:s.e.pitts@sheffield.ac.uk). I would like to thank you for reading the information and taking part in this study.

Date: 5th June 2023

Consent form

**2. Taking part in the research study \***

*Tick all that apply.*

- I have read and understood the research study information sheet dated 05/06/2023 or the study has been fully explained to me.
- I have been given the opportunity to ask questions about the study.
- I agree to complete a short survey to give basic characteristics about me.
- Survey collected data will be safely stored on the University Google Drive and it will be protected by passwords.
- I agree to participate in an online interview which consists of eight questions and will be carried out on Google Meet. The interview will take around 15 to 20 minutes and it will be video recorded.
- Video recorded interviews will be stored on the University Google Drive.
- I agree that Google Meet Transcription will be used to transcribe the recording of my interview.
- I understand that my participation is voluntary and that I can withdraw from the study at any time; I do not need to provide an explanation for why I no longer want to take part, and there will be no adverse consequences if I choose to withdraw. I can decide not to answer any question or questions in the short survey and in the interview.

**3. How my information will be used during and after the project \***

*Tick all that apply.*

- I understand and agree that my words may be quoted in publications, reports, web pages, and other research outputs. I understand that I will not be named in these outputs.
- I understand and agree that other authorised researchers will have access to the survey data and the video interview data only if they agree to preserve the confidentiality of the information as requested in this form.
- I understand and agree that other authorised researchers may use the survey data and the video interview data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as described in the information sheet.

**4. Providing information which can be used legally by the researchers \***

*Tick all that apply.*

- I agree to assign the copyright I hold in any materials generated as part of this study to The University of Sheffield.

5. Having read the above information, I consent to take part in the study. Please \*  
indicate your consent before moving on to the short survey.

Mark only one answer.

*Mark only one oval.*

- Yes  
 No *Skip to section 5 (Thank you.)*

### Survey - Parents

These questions will allow the researcher to gain background information about you and your child.

6. 1. Kindly comment about your musical background.

---

Questions 2-7 are questions about your child.

7. 2. Gender

Mark only one oval.

*Mark only one oval.*

- Male  
 Female  
 Other

8. 3. Age

---

9. 4. Diagnosis of the child.

---

10. 5. The Diagnostic and Statistical Manual of Mental Disorders, DSM-5-TR (5th edition, text revision) refers to three levels of autism. How do you describe the autism level of your child?

Mark only one oval.

*Mark only one oval.*

- Autism Level 1 - Minimum support is required to help these children manage everyday tasks. These children may have concerns with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). They are likely to have no difficulty with verbal communication. / High-functioning autism. / Children previously diagnosed with Asperger's syndrome.
- Autism Level 2 - Substantial support is required to help these children manage everyday tasks. These children may have more problems with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). Difficulties with verbal communication may be present.
- Autism Level 3 - Very substantial support is required to help these children manage everyday tasks. These children have significant problems with social skills and restrictive and repetitive behaviour (e.g., hand flapping, rocking back and forth). Many of these children do not communicate verbally or can use a limited number of words to communicate.

11. 6. Which of the following descriptions (Koegel et al., 2020) best describe the verbal ability of your child? If required, please refer to Koegel et al. (2020) for a more detailed description of each term.

Koegel, L. K., Bryan, K. M., Su, P. L., Vaidya, M., & Camarata, S. (2020). Definitions of nonverbal and minimally verbal in research for autism: A systematic review of the literature. *Journal of Autism and Developmental Disorders*, 50(8), 2957–2972. <https://doi.org/10.1007/s10803-020-04402-w>

Mark only one oval.

*Mark only one oval.*

- Nonverbal - Children over 18 months with no verbal expressive intelligible words or approximations
- Minimally verbal - Children who use significantly fewer words than the typical number of words used at their age
- Limited verbal - Children whose verbal abilities are better than those of the children who are described as "minimally verbal", but still significantly below the expected level of a child of the same age

5/15/25, 11:04 AM

The facilitation of communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verb...

12. 7. Kindly indicate the preferred musical genres of your child.

---

13. 8. Is there anything else you would like to add?

---

Thank you.

---

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## Appendix J

### Phase 2: Semi-structured interviews – Interview Questions

1. What is your experience with songs, singing and communication skills?
2. What are your observations about different musical genres and the facilitation of communication skills?
3. What is your experience with methods that can be used to present songs to encourage singing?
4. What are your observations about the effect of songs and singing on attention? Explain what you are referring to when you use the term 'attention' in your answer.
5. What are your observations about singing, sitting and movement activities?
6. What are your observations about singing and visuals?
7. What is your experience with methods that can be used to include songs and singing in the daily routine?
8. What are your observations about the singing of songs and the language used in daily life?

## Appendix K



Downloaded: 15/05/2025  
Approved: 30/04/2024

Deborah Pullicino  
Registration number: 200326355  
Human Communication Sciences  
Programme: Standard PhD in the Human Communication Sciences

Dear Deborah

**PROJECT TITLE:** An autoethnography – Singing to facilitate and improve communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal  
**APPLICATION:** Reference Number 057870

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 30/04/2024 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 057870 (form submission date: 18/04/2024); (expected project end date: 01/07/2027).
- Participant information sheet 1131257 version 2 (22/12/2023).
- Participant information sheet 1131258 version 4 (17/04/2024).
- Participant consent form 1131259 version 2 (22/12/2023).
- Participant consent form 1131260 version 4 (17/04/2024).

If during the course of the project you need to [deviate significantly from the above-approved documentation](#) please inform me since written approval will be required.

Your responsibilities in delivering this research project are set out at the end of this letter.

Yours sincerely

Kate Chadwick  
Ethics Admin  
School of Allied Health Professions, Nursing and Midwifery

Please note the following responsibilities of the researcher in delivering the research project:

- The project must abide by the University's Research Ethics Policy: <https://www.sheffield.ac.uk/research-services/ethics-integrity/policy>
- The project must abide by the University's Good Research & Innovation Practices Policy: [https://www.sheffield.ac.uk/polopoly\\_fs/1.671066!/file/GRIPPpolicy.pdf](https://www.sheffield.ac.uk/polopoly_fs/1.671066!/file/GRIPPpolicy.pdf)
- The researcher must inform their supervisor (in the case of a student) or Ethics Admin (in the case of a member of staff) of any significant changes to the project or the approved documentation.
- The researcher must comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data.
- The researcher is responsible for effectively managing the data collected both during and after the end of the project in line with best practice, and any relevant legislative, regulatory or contractual requirements.

## Appendix L

5/15/25, 11:01 AM

Invitation to receive more information about the autoethnography 'Singing to facilitate and improve communication skills of chil...

Invitation to receive more information  
about the autoethnography 'Singing to  
facilitate and improve communication  
skills of children on the autism spectrum  
who are nonverbal, minimally verbal, or  
limited verbal'

\* Indicates required question

---

1. Email \*

### The nature of the study

- During the six weeks of the study, sessions will be as usual.
- You will be given a document to write down any communication skills learnt during previous sessions and demonstrated in the daily context by the child.
- You will be asked to complete a short survey.
- During the six-week period, you will be given a small paper notebook to document any differences noted between one session and another.
- Session goals and plans of previous sessions and sessions during the six-week period will be used for the study. Field notes taken during past sessions and field notes that will be taken after each session during the six-week period will also be part of the data collected for the study.

### Voluntary participation

Kindly note that participation is completely voluntary. If you decide not to participate in the study, your choice will not affect the existing client/tutor relationship already established. Your decision will also not affect the sessions. In addition, you should be aware that you can choose to stop your participation in the study at any point without any negative consequences.

2. Do you like to receive more information about the autoethnography ' Singing to facilitate and improve communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal'? Please note, that if you express your interest to know more about this study, you will receive a detailed information sheet. Then, if you wish, you can give your consent to participate in the consent form which follows the information sheet. Kindly note that if you express your interest to know more about this study by choosing 'yes' in this question, you will not be giving your consent to participate in the study. You will be invited to give your consent in another form. \*

*Mark only one oval.*

- Yes, I am interested to know more about this study and I give permission to the researcher Deborah Pullicino to email me the information sheet and the consent form of the study.
- No, I am not interested to know more about this study.

---

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## Appendix M

5/15/25, 11:05 AM

An autoethnography – Singing to facilitate and improve communication skills of children on the autism spectrum who are nonv...

# An autoethnography – Singing to facilitate and improve communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal

\* Indicates required question

---

1. Email \*

---

## Participant information sheet

### **Research study title**

An autoethnography – Singing to facilitate and improve communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal

### **Invitation**

You are being invited to take part in a research study. As part of the study, you are being invited to participate in an autoethnography. Before you decide whether or not to participate, it is important for you to understand the purpose of this study and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. If anything is not clear or if you would like further information, feel free to ask. Take your time to decide whether or not you wish to take part. Forms where participants select 'No' to the consent question, "Having read the above information, I consent to take part in the study. Please indicate your consent before moving on to the short survey," but then goes on to complete the short survey, will be securely reviewed and destroyed.

### **What is the aim of the study?**

The autoethnography is part of my PhD in the Division of Human Communication Sciences at the University of Sheffield. My research study aims to explore how, while keeping in the centre the uniqueness of each child, I can use singing to facilitate and improve the communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal. This study is the third phase of the three-phase research project 'Teaching an art and a voice - The teaching of and through singing to children on the autism spectrum, including children who are nonverbal, minimally verbal or limited verbal, to facilitate and improve communication skills'. The first phase of the study was a survey that analysed how singing teachers teach students on the autism spectrum, including students who are minimally verbal. The second phase was a set of semi-structured interviews with parents of children on the autism spectrum and with different professionals. Findings from phases one and two informed phase three of the study.

### **Why have I been chosen?**

Together with your child, you are being asked to

consider participating because this study will focus on how singing can facilitate and improve the communication skills of children on the autism spectrum who are nonverbal, minimally verbal, or limited verbal.

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

Participation is totally voluntary. You can withdraw at any time during the six weeks of data collection without any negative consequences. No explanation will be requested. If you decide not to participate in the study, your choice will not affect the existing client/tutor relationship already established. Your decision will also not affect the sessions.

### **What will my participation involve? What do I have to do?**

1. You will be asked to complete a short survey to give basic characteristics about you and your child. The questions in this survey will help me to gain background information about you and your child.
2. For six weeks, your child will continue his or her singing sessions as usual. If you usually attend one session per week you will keep attending one 45-minute session per week and if you usually attend two sessions per week, you will keep attending two 45-minute sessions per week and you will accompany your child. Sessions missed during the six-week period will be replaced during week seven if possible. Session goals and plans, together with field notes that I will write after each session will contribute to the data collection. During the study, field notes will be written down on a paper notebook exactly after each session or a few hours later. Field notes will contain descriptive and reflective information. The notes will be concise but with the required amount of detail.
3. You will be given a paper document to document any communication skills demonstrated in the daily context learnt from the sessions that took place before the start of the study.
4. During the six-week period of the study you will be given a small paper notebook to document any differences in communication skills noted between one session and another.
5. Session plans and goals, together with field notes related to sessions that took place before the six-week period of the study will be included in the autoethnography.

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

There are no immediate benefits from taking part in this study. However, the data collected may provide useful information about how singing can be used to facilitate and improve the communication skills of children on the autism spectrum.

**Will my participation in this study be kept confidential?**

Yes. All the information collected will be kept strictly confidential. In all write-ups of the findings and subsequent publications, the data will be anonymised so that it cannot be identifiable. I aim to keep all data confidential; however, if any harm to children is disclosed by parents, I need to share the information with a third party.

**What is the legal basis for processing my personal data?**

According to data protection legislation, I am required to inform you that the legal basis I am applying for in order to process your personal data is that 'processing is necessary for the performance of a task carried out in the public interest' (Article 6(1)(e)). Further information can be found in the University's Privacy Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>. Data protection legislation applies to 'personal data', which in the General Data Protection Regulation (GDPR) is defined as 'any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person'.

**What will happen to the data collected, and the findings of the study?**

Throughout this study, only the research team will have access to the collected data. In all write-ups of the findings and subsequent publications, the data will be anonymised so you will not be identified or identifiable. Digital data will be safely stored on the University Google Drive and it will be protected by passwords. All paper documents collected will be securely locked in a cabinet in a locked office and at the end of the project, they will be destroyed. Beyond the end of the study

5/15/25, 11:05 AM An autoethnography – Singing to facilitate and improve communication skills of children on the autism spectrum who are nonv...  
only

anonymised and analysed data will be stored. This will be stored and shared at the University of Sheffield repository Online Research Data for a maximum of 10 years.

#### **Who is organising and funding the research?**

Deborah Pullicino is a PhD student in the School of Allied Health Professions, Nursing and Midwifery, University of Sheffield. Deborah is leading this research for her PhD study. Professor Judy Clegg and Professor Stephanie Pitts are Deborah's PhD supervisors.

#### **Who is the Data Controller?**

The University of Sheffield will act as the Data Controller for this study. This means that the University is responsible for the proper use and storage of your information.

#### **Who has ethically reviewed the study?**

This study has been ethically approved by the University of Sheffield's Ethics Committee, as administered by the School of Allied Health Professions, Nursing and Midwifery.

**What if something goes wrong and I would need to raise a complaint about the research?**

If you wish to raise a complaint, you should contact the researcher, Deborah Pullicino, email: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk). If you have any concerns related to potential exploitation, abuse or harm resulting from involvement in this study, kindly contact the study's Designated Safeguarding Contact, Professor Judy Clegg, email: [j.clegg@sheffield.ac.uk](mailto:j.clegg@sheffield.ac.uk). In addition, should you feel that your complaint has not been handled to your satisfaction, you can contact the University's Research Ethics & Integrity Manager, Lindsay Unwin, email: [l.v.unwin@sheffield.ac.uk](mailto:l.v.unwin@sheffield.ac.uk). If the complaint relates to how your personal data has been handled, information about how to raise a complaint can be found in the University's Privacy Notice: <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

**Contact for further information**

For further information about this research, you are kindly requested to contact the researcher Deborah Pullicino, email: [dpullicino1@sheffield.ac.uk](mailto:dpullicino1@sheffield.ac.uk) or the PhD supervisors, Professor Judy Clegg, email: [j.clegg@sheffield.ac.uk](mailto:j.clegg@sheffield.ac.uk) and Professor Stephanie Pitts, email: [s.e.pitts@sheffield.ac.uk](mailto:s.e.pitts@sheffield.ac.uk). I would like to thank you for reading the information and taking part in this study.

Date: 16th April 2024

Consent form

## 2. Taking part in the research study \*

*Tick all that apply.*

- I have read and understood the research study information sheet dated 16/04/2024 or the study has been fully explained to me.
- I have been given the opportunity to ask questions about the study.
- I understand that my participation and my child's participation are voluntary and that we can withdraw at any time during the six weeks of data collection; we do not need to provide an explanation for why we no longer want to take part, and there will be no adverse consequences if we choose to withdraw.
- I agree to complete a short survey to give basic characteristics about me and my child. The questions in this survey will help the researcher to gain background information about me and my child.
- I agree that for six weeks, my child will participate in one or two 45-minute sessions per week and I will accompany my child. Sessions missed during the six-week period will be replaced during week seven if possible. Session goals and plans, together with field notes that I will write after each session will contribute to the data collection.
- I give consent to Deborah Pullicino to include in the autoethnography session plans and goals, together with field notes related to sessions which took place before the beginning of the study.
- I will be given a paper document to write any communication skills, demonstrated by my child in context, learnt from the sessions that took place before the start of the study.
- During the six-week period of the study I will be given a small paper notebook to document any differences in communication skills noted between one session and another.
- I understand that all collected digital data will be safely stored on the University Google Drive of Deborah Pullicino and it will be protected by passwords.
- I understand that all paper documents collected will be securely locked in a cabinet in a locked office and at the end of the project, they will be destroyed.

## 3. How my information will be used during and after the project \*

*Tick all that apply.*

- I understand and agree that my child's words or actions may be quoted or described in publications, reports, web pages, and other research outputs. I understand that my child will not be named in these outputs.
- I understand and agree that my words may be quoted in publications, reports, web pages, and other research outputs. I understand that I will not be named in these outputs.
- I understand and agree that other authorised researchers will have access to the collected data only if they agree to preserve the confidentiality of the information as requested in this form.
- All data will be kept confidential. However, if any harm to children is disclosed by parents, information will be shared with a third party.
- I understand and agree that other authorised researchers may use the collected data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as described in the information sheet.

## 4. Providing information which can be used legally by the researchers \*

*Tick all that apply.*

- I agree to assign the copyright I hold in any materials generated as part of this study to The University of Sheffield.

## 5. Having read the above information, I consent to take part in the study. Please indicate your consent before moving on to the short survey. \*

Mark only one answer.

*Mark only one oval.*

- Yes
- No    *Skip to section 5 (Thank you.)*

### Survey

These questions will allow the researcher to gain background information about you and your child.

## 6. 1. Kindly comment about your musical background.

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Questions 2-7 are questions about your child.

7. 2. Gender

Mark only one oval.

*Mark only one oval.*

Male

Female

Other

8. 3. Age

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9. 4. Diagnosis of the child as stated in the most recent psychological report.

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10. 5. Please list all therapies that your child attended from birth till today. Please write also how old was the child during the period that he or she attended the particular therapy and, if applicable, the reason for stopping the therapy.

Examples:

Occupational Therapy - 2 year old till 7 years old - Discharged

Occupational Therapy - 5 years old till 8 years old - Stopped due to tantrums during the sessions

Occupational Therapy - 5 years till present

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5/15/25, 11:05 AM

An autoethnography – Singing to facilitate and improve communication skills of children on the autism spectrum who are nonv...

11. 6. Kindly indicate the preferred musical genres of your child.

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12. 7. Is there anything else you would like to add?

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Thank you.

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