

What is the appropriate pedagogy to encourage a continuum concept of singing in prepubertal children?

CERYS PURSER

Student number: 2320814

Word count: 4119

Introduction – rationale and objectives

As a singing teacher-practitioner working with people across a range of ages, I am interested to know why many of the adults that I work with feel that they cannot sing, many of them relating quite vividly, negative experiences of singing that they had in childhood, and in particular at school. This paper aims to reflect on the literature of the child voice with a view to considering what an ideal pedagogical approach could be for the young and pre-pubescent child, that would promote a positive and life-long love of singing.

The research question – defining continuum

In her 1977 book 'The Continuum Concept' Jean Liedloff, having spent time with the Yequana tribe in a remote area of Venezuela, observed a culture of parenting and relationship that suggested this community was somehow in sync with the needs of their infants to the extent that the struggles as often seen in Western contemporary parenting and child behaviour were absent. As a simplification of the main principle, this meant for the subsequent following of Western care givers, the idea that a child born in any culture or at any other time in history, was came into the world with the same expectations and needs. The definition of continuum in this context, and for the purpose of this study means a continuing and shared set of in-built expectations and needs which need to be met for optimal development. This study asks whether a continuum concept is applicable to singing behaviour. Connected to this query is the notion of singing as a 'birth-right' (Smith, 2006) the idea perhaps of something being realised as we develop but in essence the future potential, present from birth and shared by all the generations before us. This study considers whether there is a type of continuum concept relevant to singing and if so, how that might inform a pedagogical approach, starting with the infant, in utero.

The act of singing is a multidisciplinary, multimodal activity (Zhukov, *et al.*, 2021). For some, it is an action that seemingly evolves without much conscious thought and yet for others, experiences in childhood or beyond can lead to the belief that they are "non singers" (Welch *et al.*, 1997). To explore how and why singing develops, and what the optimum conditions and pedagogy could be for the young child it is necessary to consider the evolutionary perspective, physiological and neurological development as well as psycho-social factors. Areas that are

interrelated and applicable across time and cultures, and in particular the extent to which they can or have been shaped and expressed pedagogically or not (Smith, 2006)

Music education has not historically been aimed at infants (Adachi and Trehub, 2012) but the foundations for singing do not just begin with formal education, therefore an understanding of the earliest influences, expectations and capabilities are necessary when considering what a continuum concept of singing might be and the implications for future interventions.

An evolutionary perspective on the development of singing

To consider the optimum conditions for singing to be fully expressed it is useful to reflect on how vocalising developed, which is for the purpose of communication and ultimately survival (Rinta and Welch, 2009). Fundamentally, it is relational, whether communicated intra or inter-personally (Welch, 2005). Dunbar (2023), poses that singing, as a function of music making is born out of the need to manage social bonding and create stability within growing groups. It is suggested that singing, and our innate musicality evolved with other prosocial behaviours to strengthen our relationships with others. (Papageorgi *et al.*, 2022)

Mother and child – the prosody of emotion

The root of vocalising and hence singing behaviour starts with our earliest acoustic experiences within the womb around the third trimester of pregnancy. The older child's ability to recognise emotion in vocalising is most likely related to these earliest experiences. The emotional correlation with certain sounds (Welch, 2005) will shape the contours of the child's own cries and utterances. The prosodic contour and the corresponding neuro-endocrine response becomes a "neuropsychobiological" vocal signature for the growing child (Welch, 2005). These earliest associations are the basis on which we build a life-long engagement with music (Trehub, 2019) and as musical communicators.

Finding voice – the first sounds

Crying is the first vocal behaviour, and by around eight weeks, more recognisable vowel type sounds emerge with the infant's cooing. All the subsequent 'babbling', which begins to show musical elements such as rhythmic patterns and pitch, develop in relationship and response to the maternal culture. At around six months, the emotion led and exaggerated sound language and melodic shapes that the mother creates in their 'infant-directed speech' (Welch, 2005) become like a game of call and response as the child begins to vocally mirror back to

their mother. The parent instinctively creates the shapes and contours in their musical speech as an invitation for the infant to respond, such that by the end of the first year the associated acoustic and prosodic features are evident in the child's own vocalisations (Trehub, 2019). The infant begins to explore resonant vocal qualities (Titze, 2001) in response to the parent, who, in the presence of the infant often employs a larger and predominantly higher pitch range, modified tone, timing and timbre in the spirit of play or in emotionally coloured responses to a need or state (Asztalos, 2001). Initially the preferred contours for vocal play or interpersonal "communicative musicality" (Welch, 2005) by the infant are downward glissando like vocalisations, before ascending and more complex patterns emerge so that by the second year, shorter phrases, improvisations and the potential for discernible intervals can emerge.

Some research has shown that the infant's preference for singing over speech, engages the singer in the caregiver who shapes their expressions in response to the infant's presence and feedback. (Trehub, 2019). This seems to imply voicing is initially found in relationship and through modelling with in the moment responses. In terms of a possible continuum concept model for voicing, perhaps the expectation for a vocal relationship is key. Of course, this may be a too straightforward view, as many other factors and variables are at play too, for example socio-economic factors (Cristia, 2023) which may determine the length and time spent, parent and child, and the nature of other care givers behaviours, i.e., psychological state or prevalence of in-arms or face to face carrying behaviours (Trehub, 2019).

These earliest experiences and exposure to singing form the foundations for the child's own vocalising, but the surrounding culture will be catalyst for future singing ability (Rinta and Welch, 2008). How uniform this acquisition is relationship is across cultures, requires further clarification too, for example, Cristia's (2023) systematic review of infant directed speech in different populations, finds significant differences in the ubiquity and frequency of vocally led behaviours, one finding of the review is that "infant-directed vocalisation behaviours" were more prevalent in rural than urban classified areas.

The Speaking – singing continuum

By school age, children in Western countries will mostly likely consider singing and speaking as separate (Rinta and Welch, 2009) and perhaps even as different entities. Given that all vocalising employs the same mechanism it is more accurate to state that we have one voice, which can be employed for speech and singing, as opposed to speaking or singing voice. (Rinta and Welch, 2008), suggests that a Western culture of singing with notation, has perhaps constrained vocal spontaneity and expression which in turn shape all aspects of vocal function and development. We all share the same human anatomy and yet voices are made and

develop as part of the dominant culture. In some African countries or example, singing and speaking is more integrated and therefore exists on a continuum, where culture plays a significant role in shaping physiological vocal development (Rinta and Welch, 2008).

Considering singing or speaking as integrated or as separate behaviours can have a significant influence on the shaping of neural networks in the early years, including by educators. (Rinta and Welch, 2008) which is significant when thinking in terms of a continuum concept model for singing. Where there is a culture and tradition of singing as part of daily life it is possible for the child to consider singing and speech as equal in their communicative potential, so that singing is the norm and expected (Rinta and Welch, 2008). Furthermore, it would be useful to consider and compare speech acquisition to singing behaviour, in particular, as a non-threatening or overly critical child led process, where even approximate attempts are rewarded (Williams, 2019). Vernacular language itself is also a factor in singing ability, writes (Mang, 2006) who researched singing in Cantonese children, where it is proposed that the pitch centres of children who speak tonal languages stabilise at an earlier age than their English-speaking contemporaries.

Developing singing behaviours in the pre-pubertal voice

○ Physiological overview

The pre-pubertal years are characterised by considerable physical growth and development, the smaller, incomplete vocal instrument (Hedden, 2012) and smaller lung and rib cage capacity requiring relatively more breath and subglottic pressure (Sergeant and Welch, 2008). The larynx, which for the infant, is positioned horizontally to support feeding and prevent choking (Williams, 2019) begins to descend to towards the adult position during childhood. Vocal output occurs within this changing system and with less differentiated structures, the implications of these factors on practices are for shorter phonation, more frequent breaths an inability to manage quick pitch changes or large dynamic range. From a functional perspective, intonation and pitch matching is also impacted by this limited ability in vocal intensity.

○ Pitch perception

The process of developing the ability to perceive pitch begins with audiation, which is the inward ability to hear and compare perceived musical sounds. Just as the infant responds to the prosodic patterns of the maternal voice, so the child learns to audiate patterns. The first

building block in being able to sing pitch related phrases of music is in recognising the shape of a pattern or the “whole” rather than defined pitches (Phillips *et al.*, 2012). Children need to hear their own voices in order to create a loop for feedback enabling them to decode and make adjustments vocally (Phillips *et al.*, 2012).

To embed this feedback loop the child has to be able to recognise and hear their voice, which means opportunities to be able to hear their own voices (Hedden, 2012). The rate at which this “inner hearing” develops (Williams, 2019) in relation to the muscular response and coordination is extremely variable. Some children may demonstrate accuracy as early as 24 months, whereas others it may be closer to eight years (Williams, 2019). For the child learning to relate voice and pitch, the model and context of the sound source is also an important consideration and variable, for example trying to match pitch from a piano or vocal timbre which has different acoustic features to their own can be challenging (Williams, 2019). A key element within a continuum concept pedagogy therefore could be the opportunity for children to hear themselves apart from others. Experiencing the sound, and relating it to contour are the first and ongoing steps to discrete pitching (Hedden, 2012).

Modelling is at the core of the child’s inter related voice development, and research indicates that the female model or male using falsetto matching tone and timbre are the most effective in the pitch matching feedback loop (Hedden, 2012).

As the child learns to model the vocalisations of their culture, the potential for register use will also occur. As well as learning to phonate in different registers, so to the ability to navigate between developing registers needs to be learnt (Phillips *et al.*, 2012, Fuchs, 2009). Many children will habitually favour singing closer to their spoken range in the chest register (Hedden, 2012) and need help to find their head voice (Asztalos, 2021) so the opportunity to model and find vocal sounds in head/falsetto register is an important part of the developmental process in being able to match pitch, in the continuum concept idea.

The parameter of range is a key factor when discussing the developing voice, as it will determine the literature sung, (Schneider *et al.*, 2010) and in turn, engagement with singing activities. In considering a continuum concept approach, with little or no barriers to accessibility and positive development, understanding the expectations around range, both physiologically and perhaps culturally are important. Many researchers agree that range generally develops with maturation (Hedden, 2012; Wassum, 1979; Smith 2006; Skelton, 2007), and that due to anatomical factors individuals will have upper and lower limits (Brunsen 2018; Smith, 2006). Wassum discusses how ranges are “higher and greater than previously reported” perhaps in part, because of changes in attitude toward voice training for children. Likewise, vocal training

is shown to improve vocal range (Mang, 2009) especially in the upper limits (Fuchs, 2009) however, voices need to be considered individually (Brunsen, 2018) not least because of the variables in training (Pieper *et al.*, 2022) and value placed on it (Wassum, 1979) but also to consider those who describe themselves as non-singers (Skelton, 2007). Also, to consider factors such as language, and culture, for example, a lot of the literature is based on English speaking children (Mang, 2006), so further cross-cultural study is required.

Vocal function – a picture of interrelated disciplines

- **Psychological, social and cultural factors**

The child's environment and the stimulation it provides is key to building musical skills. The way in which a child's voice develops or behaves is directly linked to the cultural input received, literally shaping physiological properties is the vocal mechanism through speaking and singing behaviours (Rinta and Welch, 2008). A key factor in this sociological shaping, is the feedback received about their vocal instrument, and the nature of the feedback directly impacts the child's psychological well-being. These relationships are key to the creating the complex neural networks that produce vocalisation and help to put in place the desired behaviours. A positive psychological state is much more likely to engage a child in learning a new skill, as it reinforces the neural networks that communicate between the body mind (Rinta and Welch, 2008, Oney 2017).

Practice and pedagogy – considerations for a strategy

- **Attitudes and beliefs - Role and impact of school culture and music education**

Singing is often seen as the foundational activity in music education (Lapine, 2008) however, literature suggests a potential mismatch in opinion between teachers who believe that singing presents an activity that is easy to access and the voice scientists who suggest that there is a general gap in the knowledge of vocal function, in teachers leading singing activities (Hedden, 2012). The scientific view is that children can learn best when singing skills are addressed directly (Demorest *et al.*, 2018, Schneider *et al.*, 2010). This concern is fundamental to

informing this study and is reflected in the subsequent strategy, which suggests a holistic approach to voice focused approach to singing activities.

Successful singing ability is mostly judged on pitch accuracy, linked to western musical notation (Wolfs, Boshuizen and Brand-Gruwel, 2023) However, it is important to engage children in tasks where the perceptual features of tonality, amplitude, time and timbre are present as part of healthy vocal development (Wolfs, Boshuizen and Brand-Gruwel, 2023). A vocal curriculum judged primarily on pitch accuracy will not be inclusive of all children and may discourage future engagement and improvement (Rinta and Welch, 2008) it is important therefore to consider not only how pitch accuracy is acquired, but the other parameters for successful singing.

- **The problem of song**

The Limbic (nervous) system is responsible for directing the muscles of the larynx in order to make emotive sounds, such as uninhibited primitive noises in the most efficient way possible. Learning and memorising a song requires different cognitive functions (Rinta and Welch, 2008) and is a complex task when coupled with the vocal parameters involved, such as range, register use, breath management, duration and timbre (Phillips, 1985). If a child has not developed in these areas they may struggle to engage with the singing activity. A popular approach to singing in schools, in particular is a song-based approach, whereby the accurate learning and repetition of song repertoire is the primary focus (Wolfs, Boshuizen and Brand-Gruwel, 2023). A song-based curriculum, which does not focus on voice specific development is not the optimum pedagogical approach in terms of this study, educating those leading singing teaching about voice related behaviours however, including their own, when modelling would be a key priority.

- **Repertoire**

How a child sings is the most critical factor when choosing literature for the child to sing. Understanding and gathering information about their vocal range is important for the task or song to be successful, fundamentally, something that a child will engage with and enjoy (Sergeant and Welch, 2008). Confidence with the vocal parameters may enable the teacher not to rely upon written music and in turn, improvise and work with ideas and motifs that the students themselves have volunteered, giving them ownership of the process too. A challenge to consider is how you might find literature that motivates large groups of children as singing leaders are often expected to engage with significant numbers of children in stand-alone singing sessions, all with very disparate musical tastes and at different stages of development.

This study perhaps makes the case for a model of school singing where smaller groups and individuals can sing together more routinely and have the opportunity to explore their own voices, musical tastes and ideas through improvisation. Of concern, however is how the time pressed generalist school teacher, who is perhaps not confident with their own musical sound production, could facilitate this and is potentially scope for further study and research.

Spontaneous vocalisation – singing as play

In contrast to the this stand alone and song based approach to singing within music education, it is useful to reflect on how children might naturally and spontaneously create music. Children will often incorporate gesture, invented language, movement and drama as part of a holistic exploration, and in response to the inner or outer surroundings (Countryman and Thompson, 2016).

Countryman and Thompson, (2016), researched the spontaneous vocalisations of children up to the age of 12 and evaluated their findings with Dissanayake's structure of aesthetical devices, which is a model based on the pattern of vocal interactions that shape the mother-infant model of vocal behaviours. The parameters are, "patterning, repetition, exaggeration, elaboration and manipulation of expectation" (Countryman and Thompson, 2016) and the study was made by recording and analysing the spontaneous vocalisations of primary school aged children in their known environment, the school playground. In terms of a continuum concept model for singing pedagogy, this is a really useful study as it provides insight into what kinds of parameters are present for children, when they are not having to employ the cognitive effort of memorising a song, and vocalisation is directly linked to emotion, action and communication.

The implication for educators is in recognising the musical competency that children already hold and that offering opportunities to play, dramatise, improvise and compose with their voices is an important element of their voice development and indeed, with themselves.

- **Skill acquisition and implicit memory**

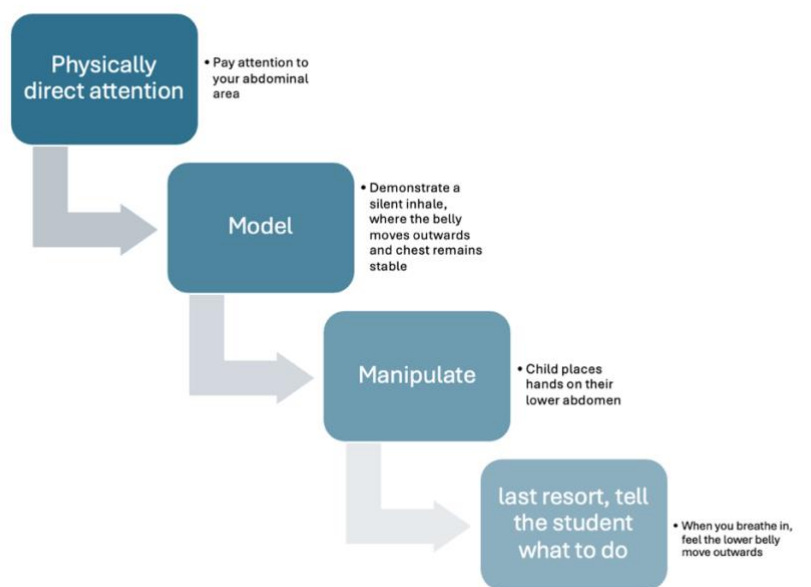
"Something to experience" (Verdolini, 2000)

Learning to sing is a skill that we can acquire, so key to this study is examining how a pedagogy might create the optimal conditions for that. Our perceptual processes govern our implicit memory, which is memory without conscious awareness, enabling us to efficiently acquire new skills. Implicit memory is created by the repetition of perceptual processes that are context and modality specific (Verdolini, 2000).

As a model for optimal child-voice pedagogy this would mean incorporating sensory and perceptual information into training, i.e. less verbal commands more doing, this would seem to be counter to the commonly debated practice (Aslaksen and Lorås, 2018) of teaching according to the modality specific strength of the learner (Verdolini, 2000).

According to Verdolini the modality that is required for the task is the best and most relevant modality through which to train it. Once the learner has produced the task, repetition in different contexts is key. Verdolini (2000) suggests four steps to employ to maximise skill acquisition.

Four steps to skill acquisition with possible example, based on Verdolini, (2000)



Strategy

In considering a continuum concept type model of vocal pedagogy for the pre-pubescent child a suggested strategy would be a flexible and holistic approach, that builds upon early voice behaviours and acquisition, whilst also placing high value on the teacher – child relationship. The strategy is a suggestion to remain flexible with vocal parameters as well as placing the focus on voice as single entity, consisting of singing and speaking behaviours where children can be taught to experience singing as a normal activity, albeit with different applications and task specific requirements for motor co-ordination.



Child voice specific tasks

- Literature determined by range

Speak - sing

- Develops familiarisation with vocal parameters from an early age
- Can support register awareness and development
- Helps to embed experience of voice as a single entity

Opportunities to play and improvise

- Employs innate musicality
- Encourages agency and engagement with singing
- Can be used to support skill acquisition, through exploring repetitions of musical ideas in variable contexts

Support skill acquisition sensory perception

- Includes modelling the task in the modality in which it is to be performed
- Supports physiological aspect of singing

Patterns and prosody

- Use of short tonal patterns to support audiation feedback and learn vocal control
- Pitch contours linked to emotion, which engage primal sounds
- Engages all parameters linked to vocalising, not just pitch accuracy
- Can be done with individuals and groups

Conclusion

In an attempt to explore what the 'birth-right' potential is for the human voice, I'm not suggesting a reductive approach to singing pedagogy, or the absence of musical notation. The exploration and ideas discussed here are an attempt to frame child voice pedagogical approach in its fundamental nature. Overall, that voice use is born out of relationship, first between the mother and child and then as part of the culture into which it is born. Voices are made through the need to communicate, reflect and model the world around them.

Critical reflection

○ Introduction

I am going to use Gibbs' model of reflective practice (Gibbs, 1988) as I felt that in order to benefit from the practice, I needed a process approach, where I could follow steps and stay on point. I like the fact that the Gibbs model is a cycle for continuous improvement (Finlay, 2008) and is something I can return to as I progress on the MA journey.

○ Description

I chose to explore what an optimal pedagogical approach to teaching pre-pubescent children could be. My perspective at the outset was to explore singing, not as a stand-alone activity but in relation to its evolutionary processes, to context and culture. I took inspiration from the idea of 'The continuum concept' which is behind the principle of attachment parenting and explored this concept in relation to singing in a Western context.

○ Feeling

Academic study is an entirely new journey for me and the concentration time required was difficult to manage with family and work commitments. Time constraints led me to feel as though I wasn't able to research possible literature in depth, which led to feelings of frustration and concern that I would not be able to produce and complete work of a standard that I was happy with or that enquiry would remain superficial. Once I felt I had title that was highly relevant to my work and had a clear objective, I was genuinely excited and motivated by the prospect of furthering my knowledge and of being able to apply it in practice.

○ Evaluation

What worked really well for me was to ground my work as closely as possible in the self-study provided in our student resources and to try and focus on grounding my planning and enquiry in the process not in the conceptual. This was a real breakthrough for me and I was able to

plan my assignment and steps needed without over thinking or over working and the structure remained similar throughout. Some of the previously overwhelming feelings about writing lessened with a shift in thinking that the writing was actually a summation of the end of the process. I was then able to enjoy the study. The biggest challenge came in creating a system to capture relevant literature, the solution to this was to order research within the framework of my assignment plan. Even though I haven't been able to dig into some of the literature as thoroughly as I would have liked to or unpick gaps in my knowledge that it has revealed, I certainly feel more informed as a practitioner.

- **Analysis and conclusion**

The processing involved in reading academic papers is a challenge for me and knowing how to organise and filter information. On reflection, I need to have a smarter method of researching ongoing to avoid inefficient use of time, and am going to look at study methods and resources that might support this, such as spaced repetition (Swallow, 2021) and Pomodoro technique (<https://www.pomodortechnique.com>)

In relation to the research question, I felt the literature had much more synchrony than in my previous assignment, possibly because it was linked to a more specific and original enquiry. However, on reflection I did fall into the trap of staying closely to literature that proved my argument but did not develop my critical voice.

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Personal Development Plan

What?	Why?	When?
Singing mammas leader training	Linked to module 1 study question, learning to deliver an evidence-based approach supporting maternal mental health and promoting healthy mother-infant relationships through singing.	May – July 2024
Set up and plan Collaborative Vocal improvisation practice group Revise previous training	To develop my skills in facilitating vocal improvisation in the settings where I work	first session planned for July with a group of volunteers plan to have a group running in October 2024
Schedule a weekly VSC studio content short course	To undertake further CPD in relevant areas of interest	Starting June 2024
Explore body-mind practice such as Feldenkreis Method	To promote better wellbeing and self-care	Weekly and ongoing sessions starting in September 2024