A Developmental View of Children's Singing

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> Elementary instruction in singing must be made obligatory for every musician.
>
> Richard Wagner (1895)

Research into children's singing has gradually gained momentum since the beginning of this century. These studies have principally concentrated on the identification of children's 'comfortable' singing ranges, and the identification and treatment of children who sing out-of-tune, usually termed 'uncertain singers' or 'poor pitch singers' (p.p.s.). Several investigators have commented that out-of-tune singing appears in different forms (for reviews, see Phillips 1984; Welch 1979a, b, 1985b). The aim of the present article is to discuss these findings and to suggest that children's singing has an underlying developmental process.

Review of recent research

Joyner (1969, 1971) noted that children's ability to sing in-tune was affected by the relative pitch of the target model. He identified three levels of singing ability in his sample of thirty-two twelve-year-olds, i.e. (i) those who sang with no major pitch errors or departures from the melodic outline; (ii) those who were generally erratic in pitch, despite moments of tunefulness, and (iii) those who exhibited 'no hint whatsoever of melodic outline or pitch coincidence' (1969, p. 115).

Joyner reported that just over one third of the children initially rated as having difficulty in singing in-tune (from groups (ii) and (iii)) scored higher (i.e. were more accurate) when the target tune was transposed down a sixth from the key of G to Bb, i.e. to a pitch level that these children found to be more 'comfortable'. This finding would seem to suggest that children's singing ability may be directly related to the musical context in which they are asked to perform, and that the same child may exhibit a variety of singing behaviours depending on the musical context.

This hypothesis is supported by the findings of a more recent study. Sterling (1984) examined the effects of different kinds of harmonic accompaniments on vocal pitch accuracy. Comparisons were made between students singing three melodies to a traditional tonal harmonisation, and to chromatic, dissonant,

quartal, and extended chordal harmonisations. She reports that a subject's ability to sing a melody appears to be affected by its harmonic context, i.e. the more 'traditional' the harmony, the more accurate the singing. This is probably because the subjects were more familiar with 'traditional' harmony rather than any other type. Nevertheless, people performed differently depending on the musical situation in which they were placed.

Additional evidence of this is provided by Harajda and Fyk (1981). They report that children's ability to perceive slight mistunings of musical intervals is significantly better if mistuned intervals are presented in a melodic context rather than in isolation. Perception thresholds were also lower if the intervals were presented using orchestral instruments rather than using pure sinusoidal tones. Again, this suggests that we have a better chance of succeeding at a particular task if it is presented in a form that we are used to (even though it may be wrong to suggest that this will always be the case).

Thus the context can affect both musical perception (Harajda & Fyk) and musical performance (Joyner, Sterling).

Joyner's classification of singing ability into three types was extended by Roberts (1972) to six. Using information from a questionnaire completed by teachers he surveyed the singing ability of 18,902 children, aged four to eighteen years, in fifty-six schools. From the replies, Roberts identifies six categories of singer. These were children who (i) can sing in-tune within their vocal range or who make only occasional pitch errors; (ii) can sing correctly part but not all of the melodic line; (iii) can sing the melodic line correctly but at a lower pitch; (iv) can sing the melodic line correctly but at a higher pitch; (v) do not follow the melodic line at all; pitch very erratic, and (vi) 'monotones' or 'droners'; always completely untuneful with little variation in pitch (Davies & Roberts, 1975, p. 24).

Roberts' categories are supported by the findings of Jones (1977, p. 98). She reports that her sample of thirty-six 'uncertain' singers, drawn from the second, third, and fourth grades, could be grouped into three main singing disability types, i.e. (i) the 'droning' singer, who exhibited little variation in pitch, (ii) the 'random' singer, who approximated the basic contour of the melody, but sang both above and below the melodic line, and (iii) the 'transposing' singer, who changed key whenever the melody moved out of vocal range, with frequent shifts in key centre.

In her subsequent training programme, Jones (1977, p, 99) noted that many of the students could match patterns before they could match pitches, a point which is echoed by Welch (1983, p. 230).

Both Roberts and Joyner also undertook 'remedial' singing programmes with children drawn from their sample groups, concentrating on those who showed the least vocal pitch accuracy (i.e. Joyner's type (iii) and Robert's type (vi)). They both report that some improvement in vocal pitch accuracy was made by

these subjects within the relatively short time of the remedial programmes.

Similar findings have been reported by Gaiser (1961, p. 50), Roberts (1977, p. 277), Jones (1979, p. 180), Welch (1983, p. 223) and Phillips (1984, p. 22).

Some initial conclusions

The above researches indicate that the ability to sing in-tune is affected by training as well as by musical context. So, from a music education standpoint, it may be more sensible to regard the different types of singers described by Joyner, Roberts and Jones not as discrete categories, but rather as points along a developmental continuum of singing ability. By this is meant that singing skills develop gradually through interaction with a musical environment. Our position at any given moment on the continuum will be dependent on current and previous experiences (e.g. depending on the quality of feedback that we have received as to our pitch accuracy). It will also be dependent on familiarity or novelty with the particular musical situation in which we find ourselves. Suddenly being asked to sing in unfamiliar or stressful contexts may produce a regression along the continuum, characterised by less skilful singing behaviour.

At one extreme end of the continuum the singing is completely out-of-tune with little variation in pitch, whilst at the other there is perhaps a multi-faceted ability. This not only encompasses singing in-tune, but also singing 'at sight', and performing a vocal repertoire which stretches from medieval neums to Lieder, Opera, Oratorios and more modern works such as Berio's 'Sequenza III' (the notation of which strangely reflects its medieval ancestors!). Perhaps one might also include at this end of the continuum the ability to sing specific pitches merely by thinking about them (often referred to as 'absolute' or 'perfect' pitch, e.g. see Shuter-Dyson and Gabriel 1981, pp. 222–3).[1]

Further empirical support for a developmental view of children's singing

Other evidence of a developmental process may be drawn from Atterbury's (1984) review of selected research into the vocalisations of pre-school children. The review notes that: (*a*) one third of Moog's (1976) two-year-old sample were capable of imitating songs that they had heard, with words being imitated first, followed by the addition of rhythm, and finally by the inclusion of pitch (Moog, 1976, p. 42); (*b*) in Young's (1971) comparison of the ability of kindergarten and grade one aged children to sing a melodic contour, the younger children were the least accurate; (*c*) McKernon (1979) agrees with Moog's stages and notes that at first it is only the words of the 'initial phrase' that are imitated; and (*d*) in a longitudinal study of nine

children reported by Davidson, McKernon and Gardner (1979) the authors suggest that children aged three are able to master the outline of a song, but four-year-olds include more accurate words, pulse, and melodic rhythm, despite the song still lacking an overall sense of tonality.

Each successive investigation reveals that the process of learning to sing involves a complex development of many different skills. This is confirmed by two of the most recent researches into children's singing.

First, Welch (1983, pp. 188–93) investigated the singing ability of two hundred and twelve seven-year-olds as part of a wider investigation into different training procedures with poor pitch singers. The initial purpose of the investigation was to identify those children within the sample who sang out-of-tune irrespective of the pitch centre of the melodies (i.e. to identify children who would have been classified in the least-able categories of the Joyner, Roberts and Jones studies). Approximately one-third on the sample (31·6%) were out-of-tune when attempting to sing two simple test melodies. Yet, despite limiting the pitch range and making sure that the melodies were set in low keys, there were still two broad categories of out-of-tuneness even within this group, i.e. (i) children who sang with some variation of pitch, and because of the low key centres chosen for the two test melodies, sometimes 'coincided' with the required pitch; (ii) children who exhibited virtually no variation in vocal pitch and hardly ever coincided with the pitches contained in the two songs. It was also noticed that during the screening procedure to identify the out-of-tune singers within the original sample, several children were difficult to categorise initially because of fluctuations in their vocal pitch matching ability. It took several re-testings before these children could be assigned to either of the two categories detailed above because of the variable accuracy of their sung responses.

Despite the level of out-of-tuneness, subsequent training programmes revealed that both the degrees of singing disability outlined above were susceptible to improvement, regardless of their initial difficulties (Welch, 1985*a*, p. 246). This implies that the training programmes enabled them to move along the continuum towards positions characterised by more accurate in-tune singing.

In another recent study, Fyk (1985) investigated the effect of varying pitch duration on in-tune singing, using a sample of twenty-eight ten-year-olds. Her results indicate five types of singing ability. In the first, the children had small vocal ranges of a fourth or a fifth, and hardly ever reproduced a vocal pitch within a minor second of the target. They seemed to choose a comfortable pitch which was 'consonant' with the target (i.e. 80% of responses were approximately a fourth or fifth lower than the target), and which they steadfastly maintained with very little fluctuation. Fyk terms these children 'slaves to consonance' (1985, p. 82). The second group, although still producing a

majority of 'consonant' responses (58%), made some 'active' attempt to match the stimulus, and thus made vocal pitch responses which showed considerable fluctuation. Vocal range, however, was still limited, having a maximum extent of a major sixth. With the third group, responses were seen to be much more accurate (22%) than the previous two, and were generally much closer to the pitch targets. The main characteristic of this group's vocalisations was their tendency to 'jump up' from an initial incorrect lower pitch towards the target. In some individual cases this upper pitch happened to match the target, although it was seldom kept. The fourth group tended to tune up or down towards the target, using some form of scaling sequence such as quarter-tone steps, until they stopped at a pitch which they assumed to be accurate, and which they tended to maintain (unlike the children in group three). This group had a vocal pitch range of approximately a minor ninth, and 35% of their responses were correct. The fifth and final group showed a high level of vocal pitch matching ability, and were also capable of sustaining the required pitch (i.e. 81% correct responses).

Fyk also reports that each succeeding group, as well as being more accurate vocally than the previous one, were able to pick up the target pitch from shorter pitch durations (1985, p. 87). For example, where the children in groups one and two succeeded in matching the target pitch, they needed pitch duration thresholds of between 1750ms and 450ms, whereas group five had a mean duration threshold of only 13ms. Fyk also notes that this decrease between groups one and five in the pitch duration threshold necessary for accurate vocal pitch matching corresponds to an increase across the groups in their vocal ranges.

Summary and Implications

From all the findings in the above researches it is possible to hypothesise a developmental continuum of singing ability which is characterised by several stages (see Fig. 1).

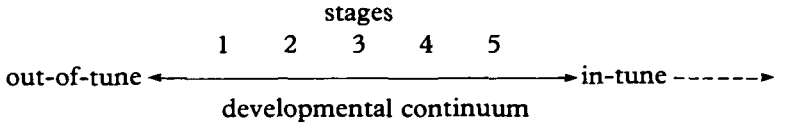

Fig. 1. The developmental continuum of singing ability.

These are: **Stage 1.** The words of the song appear to be the initial centre on interest rather then the melody. Often there is very little variation in sung pitch, perhaps because some children find it impossible to attend to more than one parameter of the song at any one time, and the words are, for them, the primary dominant feature. In response to a pitch stimulus children

appear to choose a 'comfortable' vocal pitch rather than attempt to match the target. There is some evidence, however, that the 'comfortable' pitch is frequently 'consonant' with the pitch target.

Stage 2. There is some variation in sung pitch which may occasionally coincide with the target. There is a growing awareness that vocal pitch can be a conscious process and that changes in pitch are controllable.

Stage 3. A more 'active' attempt is made to control vocal pitch by making the voice 'jump' intervals towards the target. More individual pitches are matched correctly. Melodic outline follows the general contours of the target melody. Vocal range continues to increase.

Stage 4. Children are now able to make some fine tuning of pitches. The melodic shape and composite pitches are mostly correct, but some changes of tonality may occur if the pitch targets become uncomfortable or outside the still relatively limited vocal range.

Stage 5. No major pitch or melodic errors. There is a high level of vocal pitch matching ability. Vocal range is both higher and lower than previously. After this stage has been reached the developmental process continues (----⇒), and embraces such skills as are needed for performing much more complex music, for singing accompanied by a variety of instruments, for singing 'at sight', and not least, for all the singing skills required in performing with artistic interpretation.

So these stages are not necessarily meant to be either definitive or exclusive, because future researches will certainly allow them to be refined, modified and altered. Their main purpose within the present article is to suggest that children's singing can be thought of as a developmental process, and that teaching strategies should account for this. Both empirical research and practical experience indicate that, irrespective of age, any group of children will exhibit a variety of singing behaviours which are susceptible to some form of improvement. Such improvement is indicative of movement along the developmental continuum. The teacher's role involves a recognition of the complexity of this singing development. A child who shows evidence of being at one of the less skilled stages should be regarded as a client for development, rather than necessarily revealing an irretrievable lack of ability in music. Many of the youngest children, for example, find that school singing presents them with a whole variety of problems. These include such things as: (i) the difficulty of hearing their own responses when placed in a group; (ii) the infrequent opportunity of singing alone, and of being helped individually; (iii) the need to practise and feel secure on a limited number of pitches, or even just one pitch (as chant), before attempting some of the traditional school song repertoire; (iv) the need to practise words and music separately before putting them together, and for some children the more basic need to practise the notes without the added complication

of language at all; (v) and also the need to be taught how to use their voices effectively both in speech and song, which includes the proper control of the breath.

Some children seem to progress quite easily through these developmental stages, others will need sympathetic handling if they are not to get stuck at one particular skill level. Otherwise there will be yet more adult out-of-tune singers reporting that their present lack of singing ability is due to the 'improper instruction' they received as children (from Mawhinney and Cuddy's (1984, p. 12) study of adult 'tone deafness' in which over 90% of their sample thought that, even as adults, their disability could be corrected).

Progress along the continuum is possible given sufficient interaction with a supportive, stimulating and varied musical environment. Even without such interaction, some children will make progress, but the rest will be relying on their teachers for a recognition of their present ability level, and for a singing curriculum geared to their particular needs. Then perhaps we shall encounter fewer unfortunate singers of the type discussed in Coleridge's 'Epigram on a Volunteer Singer'.

Swans sing before they die – 'twere no bad thing
Should certain persons die before they sing'.

(from R. Giddings (1984)
Musical Quotes & Anecdotes)

Notes

1 Such a proliferation of musical abilities at the upper end of the continuum may be seen as a logical extension of Gardner's (1983) theory of multiple intelligencies. In his book *Frames of Mind* Gardner postulates several discrete but linked intellectual competences, one of which is music (1983, pp. 99–127). If such a view of intellectual functioning is tenable then it would seem logical to postulate that musical intelligence which relates to language, spatial intelligence, bodily movement, aesthetic feeling, logic and mathematics, must of necessity be multi-faceted in that these relationships can produce special musical behaviours. For example, Gardner relates music and mathematical intelligences in the understanding and manipulation of rhythm which includes repetition and transformation of number, ratio, form and pattern (1983, p. 126). In the same way the different singing behaviours exhibited by singers at this end of the continuum may also be discrete but linked competencies.

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