

Adolescent singers and perceptions of vocal identity

Susan Monks

yarnallmonks@yahoo.co.uk

The link between voice and self-image is so fundamental it is often overlooked or taken for granted. Yet the knowledge of this relationship has much to teach singing teachers and choral directors in making communication with singers more effective, in choice of repertoire, technical development and rehearsal strategies. This study set out to explore the way adolescent singers think about their voices and express themselves through singing. The results produced a rich diversity of evidence which suggests that vocal change is a fruitful area for exploring in greater depth the relationship between the voice, musical expression and the human psyche.

Adolescence is a time of physical change and, often, emotional upheaval. In particular, young singers have a musical instrument that reveals the changes that are taking place within them on a daily basis. The study set out to explore the experience of a group of adolescent singers in one school and their perceptions of self in relation to their singing voice and vocal performance. In order to examine the vocal changes that occur throughout puberty, recordings were made at two-monthly intervals of 30 students aged 11–18 and the results were compared with the findings of other research studies into adolescent vocal development. Case studies were made of 15 of the singers, including their own self-assessments at the end of the year, and a performance study using a video recording of a concert was also undertaken.

Adolescence has proved a fruitful area for research into self-image, and a discussion of this literature and of the link between voice and identity formed part of this investigation. Recent research indicates that children and young people are able to articulate their feelings about their voices, the music that they make and its importance in their lives. If these feelings are recognised and understood by teachers, parents and choral directors, the lives and music-making of these young people can be enhanced.

Adolescence and vocal change

Much has been written about the adolescent male voice and the changes that occur during puberty (Kahane, 1978; Cooksey, 1992; Welch, 1986). Research has also been done on identifying the subtle but still significant changes that occur in female adolescents (Gackle, 1991).

The vocal folds lengthen and thicken during puberty, more significantly in boys' voices and contralto female voices (Titze, 1993; Kahane, 1983; Cooksey & Welch, 1998). It is also becoming clear that the three layers of the vocal folds change in structure during

puberty, with more muscle mass developing (Titze, 1994). The changes do not take place suddenly but over a considerable period of time, anything from six months to two years, and continue to develop into young adulthood. In the adolescent singer, they can cause air to leak through the folds during phonation, resulting in a temporary breathy tone quality. White (1995) has suggested that the way men's vocal folds vibrate differs to that of women's, with children's folds behaving more like adult female folds.

Muscles involved in respiration develop as the skeleton structure enlarges and the muscles grow to accommodate extra lung capacity. There are also changes in breathing patterns as the child matures to adult, and changes in the physical structure of the lungs during puberty (Stathopoulos, 2000).

Bony structures of the head grow, making greater resonant space available, and the internal shape of the mouth and pharynx also develop, affecting articulation and vocal timbre. The development of the singer's formant is highly complex, with obvious differences between the strategies of male and female singers (Sundberg, 1999). The whole issue of posture and the development of the adult body affects adolescents, with some showing considerable unease with the awkward growth spurts and uneven physical balance that sometimes occur.

Responses from a class of 11–13-year-olds reveal the extent to which some young people understand their voice:

'You open your mouth and push something inside you, which lets out a nice noise, your lungs are involved as well. The bag I think it's called, squeezes and lets out a noise. You take a breath – your stomach goes in. Your body filters it and you breathe out.' (female, age 12)

'What happens when you grow and your voice gets lower and darker. Your voice starts to change when you are 12 or 13. It lasts at least 2 weeks at the most.' (male, age 12)

The following vocal definitions were used in this research in order to clarify aspects of singing development:

Pitch/tuning

The ability of young singers to pitch accurately varies considerably. Some research suggests that girls can be prone to pitch variance at some points in the menstrual cycle (Miller, 2000). Vocal fold science is revealing complex changes in the composition of muscle fibre and tissue in pubertal vocal folds (Titze, 1993; Bless & Abbs, 1983; Hertegard, 1994; Gray *et al.*, 1993). Research in the field of neuroscience (Kipke, 2001) indicates that adolescence is an optimum time for establishing new neural pathways which can have implications for intellectual, physical and musical development, such as acquiring accurate tuning.

Vocal range

The work of Cooksey (1992) and Gackle (1991) has identified clear stages in the development of vocal range, although these can arise from vocal habits as well as physical changes in the monthly cycle. In this study singers were asked to make a long vocalised

sing down a scale and then to sing from the lowest to the highest notes in their range and to stop when they felt uncomfortable. In addition, fast, light, five-note ascending and descending scales were used to check the availability of notes in the upper range. The main criterion was to establish the singer's comfortable vocal compass.

Passaggi in the voice

It is a common but not universal feature of singing voices that areas at the lower and upper ends of the voice exhibit a change of vocal quality. Sometimes there appears to be a definite change of tone, and sometimes there can be several notes where the quality is unclear or unreliable. The Italian bel canto singers called these the 'passaggi', and in the adolescent voice these changes in tone quality are often an indicator of vocal changes, as and when they appear throughout the range. Research into vocal registers indicates this can again be due to vocal habits and hormonal changes as well as maturation (Miller, 2000).

Timbre/colour

Timbre in a voice is unique, and though judgements are subjective, teachers learn to detect the distinct colours in students' voices over time. When carrying out a pilot study, the author experienced difficulties identifying voices on vocal exercises alone; the identity of the singers became more apparent when they sang music and therefore a song of each singer's choice was included in the recordings for this research. A major factor in timbre is the distribution of formants in the voice (Sundberg, 1999). More research needs to be done on this aspect of children's voices (White, 2000), particularly in singing as well as speech.

Forced tone/breath control

Breath control appears to be linked to forced tone. A common feature of young singers is to 'create' a clearer, brighter tone by pushing the voice, pressing the larynx into a higher or lower position to tighten the vocalis muscle rather than using better breath control to clarify the vocal sound by controlling air flow. At first sight there may seem to be little difference between the breathing patterns of children and adults, but new research is finding maturational changes in lung capacity, breathing patterns and air flow (Stathopoulos, 2000; Gamble *et al.*, 2000; Sharma *et al.*, 1997).

Breathiness

Excess air in tone is a common but not universal feature of voices during puberty (Bunch, 1995). If young singers are reassured that it is a normal part of vocal development due to the lengthening and thickening of the vocal folds, they can cope with the frustrations that are an inevitable part of having an unpredictable musical instrument. It becomes particularly noticeable in girls' voices from 12 to 14 years, and appears to be a greater problem with bigger and lower voices. Some light sopranos in this study showed no signs of difficulty at all.

Phrasing and articulation

Singing to the end of notes or phrases can imply mental commitment and concentration on the part of the singer. Poor diction in a young singer's performance can indicate a lack of confidence, and is often used in judging a singer's vocal competence in exams and competitions. However, muscle growth can affect these vocal skills, and the increasing amount of orthodontic work done on young people can impede jaw movement and lip, teeth and tongue co-ordination (Vilkman *et al.*, 1996).

Singing and self

As well as making comparisons of previous research on the physical development of the singing voice (Cooksey, 1992; Gackle, 1991), this study was undertaken to identify and explore the psychological factors that are involved in vocal change.

Research into adolescent self-identity suggests that this is a time of role confusion (Erikson & Marcia, cited in Jaffe, 1998). Harris (1998) suggests that adolescents do not necessarily see themselves as being 'growing up children or half completed adults'. She argues that they constitute an enclosed peer-dominated group little influenced by adults and with no conscious desire to enter the adult world (cf. Takaishi, 1992). The influence of the peer group is certainly an important factor in adolescence, and the work of North & Hargreaves (1999), which looked at musical preference acting as a badge of identity, demonstrated a positive link between music, adolescent identity and self-concept. Kroger (1996) quotes Blos (1979), saying that 'puberty is an act of nature and adolescence is an act of man' and making it clear that physical maturity, sexual functioning or social role are not sufficient in themselves to identify the end of adolescence.

To support the argument that voice, identity and self-image are linked, the perspectives of the deaf and blind can be helpful:

There is nothing more personal than a voice. Shyness about using your voice in public – speaking out, screaming, singing, even just saying your own name – is probably the most elemental form of self consciousness. (Ree, 1999: 1–2)

Communicating with the voice is often a combination of visual and auditory cues: while visual cues (Davidson, 1993) tell us a great deal, the unique quality of the voice suggests an important role for auditory cues in singing. Peter White, the broadcaster who has been blind from birth,

had never even considered the construction of self in others, much less considered it a problem: all was in the voice. Character, mood and even person are constructed as fully from voice as in a seeing person from voice and sight. His self, he thought, 'resided' in voice, as we reside in face and voice. (Cole, 1999: 303)

The development of human communication through visual and 'musical' cues has been clearly demonstrated through the work of Trevarthen (1999) into the subtle and often undetected complexities of mother and baby emotional language.

Evidence from a variety of sources suggests that there is a link between vocal sound and a sense of self.

We understand music as the embodied voice, produced directly from a human throat or by instrumental proxy... On some level, we glimpse the body behind the voice, a body whose voice refers to the imagined socio-emotional essence of its figurative producer (Barthes, 1977). (Tolbert, 2001: 86–7)

Greenfield (2000: 70) suggests that the evolution of the larynx, as a means of emitting non-nasal sounds, goes back to the Neanderthals. The work of psychologists studying the musical responses of newborn babies (Papousek, 1996) makes a fundamental link between musical vocal communication and human development.

Research design

There were three main areas of the research:

- a longitudinal study, where recordings were taken every two months of 30 singing students in an independent secondary school;
- case studies of 15 students from the initial database and taken over the age range of 11–17 years, with self-assessment by the students of their progress over one year;
- a performance scenario, where 15 singers took part in an informal concert and commented on the video of their performance.

Data were also collected from questionnaires sent to post-adolescent singing students of another teacher, interviews with two past students and a research diary which was maintained over the year of the study.

In the remainder of this article, brief summaries of the data from these studies are examined and general conclusions are made about their relevance to music education.

The longitudinal study

Thirty singing students in an independent secondary school agreed to take part in this study. Each had a weekly half-hour lesson with the same teacher, who was also the researcher. At the beginning and end of each term, ten minutes of the lesson were recorded, which consisted of a few exercises to warm up the voice followed by a song of the student's choice. Each singer had their own tape, so that by the end of the year there were several recordings of the singer taken chronologically throughout the year. In fact only 15 tapes had the complete set of recordings, beginning May 2000 to May 2001 at approximately two-monthly intervals, but there were three from each year group ages 11–17. These singers were used for a more detailed analysis of vocal changes, and they were also asked to give a self-assessment of their vocal progress over the year by interview and questionnaire during the last lesson of the summer term; together these formed the case studies.

Each tape was listened to as soon as possible after the recording took place and notes were taken: at the end of the year, the whole tape was studied for details of change. The following vocal skills were used to judge the voices: these were based on the teacher's 15 years of experience, on preliminary questionnaires to singers and teachers, and on previous research findings. *Pitch/tuning*: accuracy of pitch is often an indication of uneven vocal growth or muscle instability. *Vocal range and passaggi*: the singing compass and the areas

of register change are also common indicators of vocal maturity. *Timbre and resonance*: the singer's unique voice is made up of the distribution of formants and has links to self-expression. *Breathing and breath control, forced tone and breathiness*: air in the tone appears for a number of reasons, but maturation of the vocal folds and lung capacity, poor auditory perception and vocal habits are the most important. *Phrasing and articulation*: these aspects of musical performance tend to be used as a clear indication of a singer's belief in themselves, the song and their confidence in communicating to an audience.

The majority of the singers were able to control the pitch of their singing voice with reasonable accuracy, although some girls and boys found it more difficult at the height of the vocal change process (12–14 years), which tends to confirm the findings of Cooksey (1992) and Gackle (1991). The vocal range was reduced in some of the singers, again in the 12–14 years range, with some singers showing considerable vocal insecurity around the passaggi. There was a general loss in vocal resonance over the whole sample, but it was more pronounced in the 12–14 age range. Breath control was reasonable but not outstanding with this age group, but breathy tone quality was a common feature in the 12–14 age range. Poor diction and singing to the ends of phrases did not appear to be linked to age.

Case studies

Three singers from each year group (11–16 years) formed the 15 case studies. At the end of the study, in their final lesson, the singers were asked to give their own assessment of their vocal progress over the previous academic year. They were given a sheet with some suggestions to prompt their responses, under the headings of range, evenness, colour, breathiness, strength and confidence. They were also asked to comment on any other aspects that had affected them or their voice over the year; their comments were recorded on tape.

The Year 7 (age 11–12) singers mentioned a lack of confidence in their self-assessment but still showed considerable perception in their comments:

'The range changes very often from high to low, and the other way. It's quite even, it's got more colour but not a lot of breath though it's quite strong. I have changed quite a lot over the past year but I haven't got a lot of confidence.' (Carmen)

'I think my range has stayed roughly the same, maybe slightly lower. I think it is fairly smooth, maybe a few wobbles but only when I have been suffering from sore throats and colds. I think I have more colour in my voice now but no breathiness, I don't think!! I think I have about the same strength, I really don't know. I think I had a little less confidence at the beginning because the whole aspect of the senior school scared me a little bit. I'm OK now. I think I have changed in the way I sing because my last teacher taught me to sing with my throat from when I was about six but now I'm using my diaphragm more.' (Emily)

By Year 8 (ages 12–13) the singers talk of gaining confidence, though they are very aware of uneven tone and changes in the vocal range:

'I feel my voice has dropped slightly, it is lower in range, smooth sounding with slightly more strength. I am more confident and more mature and the festival made my voice feel good in what I am singing.' (Jack)

'I think my range has changed, my voice is not very even, but it is a bit stronger. It isn't very clear but I feel more confident. I think my voice sounds better than at the start of the year and I can sing deeper.' (Rosie)

Year 9 singers (13–14 years old) also mentioned vocal range, colour and confidence but also were aware of growing maturity:

'I can reach higher notes I couldn't before, my breath is more spaced and controlled, I am slightly more confident but I have had lots of sore throats.' (Emma)

'My voice is higher, more mature, brighter, a bit stronger and doing the musical gave me confidence. I am more grown up.' (Amy)

Year 10 singers (ages 14–15) spoke of being able to control the voice and were more obviously 'owning' their sound. They were aware of adverse conditions, coughs and colds, as were the other year groups, but they seemed more confident about their technique and their ability to cope with vocal insecurities:

'My voice has fallen down to tenor range and is gradually falling and will be falling into bass. My voice is more bumpy as I am losing the top notes. My voice colour is red! Gradually I am getting a better sound, I need to improve this, as the voice falls into bass and tenor range I should have more strength. I am getting more confident. I have had lots of coughs and colds and kidney infections which haven't helped.' (Daniel)

More comments were made about vocal colour by the Year 11 singers (aged 15–16):

'My voice is becoming fuller and brighter, it's the same at the top and I have less trouble with the low notes. It's a bit breathy in the middle, there are more harmonics and a richer colour, it is stronger especially at the bottom. I have more confidence in singing solos, I am still scared of singing French – not much has changed for me personally.' (Chrissie)

'I can sing a lot higher now with a stronger and more confident sound. I feel more comfortable with higher notes, I feel like they are within my reach. The voice is more even though there is still a gap between high and low. I need to work on breath control, the voice is a lot stronger now. I don't have confidence to sing solos in front of an audience but I am more confident about singing, chapel choir has helped. Back and leg problems have not helped posture and breathing; it has been very uncomfortable and affected it a lot.' (Claire)

'I feel my range has increased and also developed, the evenness has improved, it has a warmer, deeper colour. Breath control has improved though it was good last year as well, strength has been helped by choir singing and harder grade exams. Confidence is at an all time high, I've never felt better. I've become more mature but there has not been a lot of personal change.' (Tom)

When the comments used by the students in their self-assessments were analysed, they fell into three main categories: vocal technique, vocal timbre, and personal development,

though it must be stressed that this was a brief summary taken at the end of the academic year as part of the final lesson.

On the subject of vocal technique, 11 out of the 15 singers talked about the strength of the voice, 14 out of 15 spoke about changes in their vocal range, but only 6 commented on breath control. Nine mentioned the evenness or uneven qualities in their sound. Vocal timbre was discussed in terms of breathiness or lack of breathiness (6 singers); 9 singers talked about colour using words like 'richness', 'depth' and 'warmth'. Personal development tended to be seen as growth in confidence in both physical and psychological maturity and also as a result of greater vocal technique and stability.

Although the singers were given space to add comments of their own, most did not choose to do so; their self-assessment was guided by the author to evaluate the singers' perspective on the vocal skills being analysed in this particular study. The research was exploratory and makes no claims to be objective; more research with other young singers is required to investigate these initial findings.

Vocal changes in adolescence appear to be more complex than previously identified by Cooksey (1992), Gackle (1991) and Kahane (1978), as new research is indicating (White, 2000), and the changes take place over a considerable period of time, continuing into young adulthood:

'When my voice broke I was singing in the parish choir. The choirmaster listened to my "new" voice and told me I was a bass. I believed this until about 6 or 9 years later when another choirmaster checked my range and said I was a tenor.' (questionnaire to older singers)

Female voices are just as susceptible as male voices to change, though it appears that girls with lower voices experience more noticeable fluctuations in vocal quality:

'I think my voice has become more grown up this year, I think my voice has got lower and it is a bit uneven; the colour has got darker but I don't think it is wispy. The voice is quite strong but it sometimes does funny things.' (Laura, age 12)

Students can articulate clearly what is going on physically in their voices and seem aware that the changes are affecting vocal performance:

'I feel that my voice has become a little stronger and a little bit louder over the past year. I think I can sing a little bit higher but I still find it hard to get the top notes. It is a bit uneven on the high notes. I don't think the colour has changed much but it has become a little stronger. I think my voice is a bit breathy when I sing.' (Nihal, age 13)

Most of the singers wanted to sing better and wanted clear guidance to help them achieve an optimum performance, even if it was just in a lesson for their own pleasure:

'I feel great when I am standing and singing but I am not sure about doing a solo in front of an audience.' (Nihal, age 13)

It seemed that the singers were just as keen to improve their vocal sound for self-satisfaction as for passing an exam or doing a concert performance. This suggests that singing has strong links with a sense of self:

'Sometimes I go through a stage when my voice sounds awful but then it's alright and sounds better. My voice can be colourful if I want it to be. It has changed a lot. I don't think my voice sounds breathy. I think it has become stronger. My confidence has grown because I feel I am getting better at singing.' (Katy, age 15)

The psychological effects of vocal change on the adolescent singer have still to be explored fully but the initial findings of this study show that greater knowledge of this stage in a singer's development is needed to improve the quality of singing education.

Performance study

In undertaking the performance study, the aim was to look in particular at aspects of the relationship between the physical changes and a sense of self. The main categories emerged from data collected through interviews and questionnaires to other singers and from the literature on self-image (Gallagher & Shear, 1999):

- self as agent – being active in producing vocal sound:

'if I engaged a bit more, not much, a bit, I could produce a bigger sound' (Richard – interview with past student)
- self as part of a group or choir:

'enjoyed singing – as I always have – but feel the protection of the crowd' (questionnaire to post-adolescent singers)
- self as entertainer – giving to an audience:

'I seize every possible chance to perform simply because it is a chance to give something back into life, as well as being hugely enjoyable.' (Joanna, 17 years – interview with past student)
- self as the voice – or the objective view of the voice outside the self:

'As a tenor, my voice has a purity which I like but an edge which I do not like. It has been like swapping Guinness for cold Chablis.' (questionnaire to post-adolescent singers)
- self within limits – wanting to be safe – not too high or too low:

'Can I stop? I'm getting all flustered and my voice doesn't work when I'm all hot and flustered.' (Jessica, 16 years – research diary)

As part of the investigation a video recording was made of 15 singers aged 11–18 during an informal lunchtime concert at school in one of the music classrooms. At their next lesson singers were asked to write down their reactions to their performance at the concert, and were then shown the performance on a TV in the teaching room with just the teacher present. They were asked to jot down their feelings having seen themselves on the video; a tape recorder was left on throughout the lesson to catch any verbal comments. The video recording also enabled some verification, albeit in a limited way, of the researcher's

judgements. The video was given to two other singing teachers who gave an indication between the following extremes of the students' performances:

- confident/ill at ease
- expressive/passive
- controlled voice/wayward voice
- engaged with audience/withdrawn
- smiling/non-smiling.

This was matched to the researcher's assessments and the results were closely in agreement in the majority of cases.

The responses of the singers before and after the video were analysed to bring out the comments relating to their physical, emotional, musical and intellectual reactions. These revealed that the majority felt better about their performance having seen the video; they were perceptive in their comments and clearly gave their reasons for their responses. Eleven out of the 15 singers felt that the video showed their performance in a more positive light than they had recalled, 3 felt it was the same as they had expected and only 1 felt it was worse than she thought:

'It looks better than I thought it would, I looked more confident.'

'It's as bad as I thought it would be.'

'It was better, I was pleased with that.'

They all discussed some of the physical sensations associated with the performance:

'I felt I was going red.'

'I rock too much.'

'I kept grabbing at my throat during the song. I move my hands too much.'

'My throat felt sore and dry.'

Not all of them registered the audience in their reactions:

'I kept on looking down instead of to the audience.'

'I need to look up more.'

'I needed more expression in my face.'

'I was staring at Laura the whole time.'

'Must watch body language.'

In discussing the vocal sound, Maddy and Amy talked about volume ('I need to be louder, I want to be louder'; 'I just couldn't get it out'), Carmen and Katy mentioned pitch ('I did my voice too high'; 'I struggled with the high notes') and Emily and Tom discussed vocal quality ('It didn't feel like it sounded like that – I felt as if I was losing my voice, I kept cracking the notes'; 'A bit breathless on the last phrase of the first verse').

Only two singers commented that the recording didn't sound like their voices. It may be that the other singers accepted the sound recording more readily, or it may be that they do not see the voice as an 'object' to be discussed (Gallagher & Shear, 1999: xvii).

The adolescent singers in this study were not necessarily concerned with their visual appearance in a singing performance. They seemed to be concerned about the sound they made and how they communicated to the audience:

'I thought I sounded OK, I was quivering, I was very conscious about the way I was standing. I was twitching – I was nervous though the children were all much younger than me.' (Jess, age 17)

They felt better after seeing their performance, which suggests that their initial assessment may have been more self-critical than necessary:

'Better than I thought it would be... I could see what I was doing wrong, I should have sung out more to everybody else and stopped moving my feet, but I did stand up surprisingly straight... yes quite nervous but it didn't show too much.' (Rosie, age 14)

They appeared to be able to think maturely about their performance and could make use of the video as a teaching tool:

'I must keep still, yes it's better than I thought, I thought I sounded really flat. I communicated OK – it was good – I liked that but I was so frightened when I did it.' (Chloe, age 15)

Teachers and choir trainers need to be aware that adolescent singers can be extremely self-critical and a positive and encouraging response can improve singers' self-esteem without needing to resort to inaccurate or over-indulgent remarks. An interesting aspect, not covered in this particular study, is the appropriate use of vocal timbre in different musical styles. Many of the singers in this study were known to perform with different vocal qualities when singing in the school 'pop' music competition. As singers mature, their experience during adolescence forms an important part of their developing vocal identity; this continues to form part of the author's current research.

Conclusions

The sense of vocal identity shown by these young singers reveals a close relationship with their sense of self. Singers were often more concerned with personal vocal development than with public acknowledgement through passing exams or doing well in competitions. Adolescent singers were able to talk about their singing in a clear and sensitive way:

'as a treble dark red, as an alto really vibrant red, tenor – yellow, 1st bass – orange, 2nd bass – gradually getting back to red almost as it was before.' (Richard, age 16 – interview with past student)

All three studies show evidence to suggest that adolescent singers are very aware of the vocal changes that occur during puberty and the effects of this on their performance. Even though they do not always understand the reasons why their voices are unpredictable, they are conscious of the development of the vocal instrument. The data from the longitudinal

study, while undertaken over a year with a small number of students in one school, resonates with the research of others in this field (Cooksey, 1992; Gackle, 1991). Some evidence also points to the direction future research could take: for example, more study is required into the physical and psychological reasons for breathing patterns. In particular, the more detailed case studies revealed the self-awareness of young singers and their need to be reassured that vocal insecurities are normal and not permanent. By the age of 15, singers were beginning to realise they could take more control of the voice and work through the changes with technical exercises that could make a difference, indicating a sense of 'agency' (Sheets-Johnstone, 1999). However, for some, the power of the voice and the music transcended any sense of self-control:

'Sometimes a performance can shift from being merely entertaining, to something almost indefinable. There is a point when I become so utterly overwhelmed, and enveloped in its power that I come out of myself and my voice and the music becomes one.' (Joanna, age 17 – interview with past student)

The performance study also highlighted some dilemmas of adolescent singers in terms of accurate self-criticism in performance. Many of the singers were positively encouraged by seeing the video recording of their performance, which suggests that this could be used as a teaching tool. Teachers and choral directors do need to boost the confidence of young singers at this stage of development when their self-image can be low and their expectations are less than their actual achievements:

'I do feel I have grown up but I am still a little girl inside. I think the exam and the festival have made me more confident.' (Laura, age 11)

Young singers are sensitive to criticism; while some appear to be over-confident in their abilities and unrealistic in their desire to follow someone else's image, others are lacking in confidence and over-critical of themselves. Guiding them to be realistic in their self-assessment is part of a teacher's obligations.

The physical changes of puberty in terms of vocal growth have been documented in the last 30 years but more significant details are emerging from various research projects around the world (White, 2000). Qualitative evidence can be useful as an addition to scientific analysis, medical evidence and neurological advances, and psychological perspectives can provide a helpful insight for the singing teacher and choral director.

The social context of singing, the nature of different styles of singing and how these affect vocal development and self-image are important areas of research, and the choral experience in cathedral choir schools is currently under investigation (Welch & Howard, 2002). However, research in other areas of education is required to balance this, and teachers in all schools need to know how young singers modify their voices to please the choir trainer. Young singers are sensitive to good choral practice and how much they learn and understand about the mechanics of the voice is often down to the choral director. Teachers who want voices that blend and not voices that 'stand out' can have a direct influence on young singers wishing to develop individual timbre to pursue a solo career:

'My voice has different ranges and better intervals, but the range goes up and down and the evenness varies each week. There are rich lower notes and the breathiness depends on the songs and the pitch.' (Beccy, age 15)

Studying young singers in musical situations seems fundamental to this research; the particular characteristics of vocal colour really become apparent when the singer sings music rather than isolated tones. In exercises, individual timbre and the personality of the voice do not come through, and this has great importance in terms of the individual vocal development of the solo singer. It is not uncommon for young singers to alter their vocal colour depending on the style of music, just as they are able to modify their speaking voices to the social group they happen to be with.

The findings of this study have identified a need for further research; the links between perceptions of vocal sound and the sense of self were found to be complex. The kinds of language used when describing vocal timbre also need investigation: by researching the narratives of singers of different ages and experience, a clearer understanding of the singing experience can be made available to teachers, choral directors and performers. It is only by listening to singers in musical situations as performers or teachers that research can continue to have relevance in the real world of music education. The young singers' responses to vocal changes taking place within them suggests that the need for this type of research is fundamental to furthering our understanding of the singing voice and perhaps could shed light on the continuing debate about the self and self-consciousness.

References

- BARTHES, R. (1977) *Image, Music, Text*. New York: Farrar, Straus & Giroux.
- BLESS, D. M. & ABBIS, J. H. (1983) *Vocal Fold Physiology: Contemporary Research and Clinical Issues*. San Diego, CA: College-Hill Press.
- BLOS, P. (1979) *The Adolescent Passage: Developmental Issues*. New York: International Universities Press.
- BUNCH, M. A. (1995) *Dynamics of the Singing Voice*. Wien/New York: Springer-Verlag.
- COLE, J. (1999) 'On being "faceless": selfhood and facial embodiment'. In S. Gallagher & J. Shear (Eds), *Models of the Self*. Thorverton: Imprint Academic, pp. 301–18.
- COOKSEY, J. M. (1992) *Working with the Adolescent Voice*. St Louis, MS: Concordia Publishing.
- COOKSEY, J. M. & WELCH, G. F. (1998) 'Adolescence, singing development and National Curricula design'. *British Journal of Music Education*, **15**, 1, 99–119.
- DAVIDSON, J. W. (1993) 'Visual perception of performance manner in the movements of solo musicians'. *Psychology of Music*, **21**, 103–13.
- GACKLE, L. (1991) 'The adolescent female voice'. *Choral Journal*, **31**, 8, 17–25.
- GALLAGHER, S. & SHEAR, J. (1999) *Models of the Self*. Thorverton: Imprint Academic.
- GAMBLE, J., BETHELL, D., DAY, N. P., LOC, P. P., PHU, N. J., GARTSIDE, I. B. & WHITE, N. J. (2000) 'Age related changes in microvascular permeability: a significant factor in the susceptibility of children to shock?' *Clinical Science (Colch)*, **98**, 2, 211–16.
- GRAY, S. D., HIRANO, M. & SATO, K. (1993) 'Molecular and cellular structure of vocal fold tissue'. In I. R. Titze (Ed.), *Vocal Fold Physiology*. California: Singular Publishing, pp. 1–35.
- GREENFIELD, S. (2000) *The Private Life of the Brain*. London: Penguin.
- HARGREAVES, D. J. & NORTH, A. C. (1999) 'Developing concepts of musical style'. *Musicae Scientiae*, **3**, 2, 193–216.
- HARRIS, J. R. (1998) *The Nurture Assumption*. New York: The Free Press.
- HERTEGARD, S. (1994) 'Normal and pathological glottal closure patterns at different ages'. *Voice*, **3**, 17–26. British Voice Association.
- JAFFE, M. L. (1998) *Adolescence*. New York: Wiley.

- KAHANE, J. C. (1978) 'A morphological study of the human prepubertal and pubertal larynx'. *American Journal of Anatomy*, **151**, 11–20.
- KAHANE, J. C. (1983) 'A survey of age-related changes in the connective tissues of the human adult larynx'. In Bless & Abbs (1983), pp. 44–9.
- KIPKE, M. D. (2001) 'Adolescent development and the biology of puberty: new research on brain development during the adolescent years'. From [http://www.nap.edu/html/ado_dev_bio_pub/\(03/01/01\)](http://www.nap.edu/html/ado_dev_bio_pub/(03/01/01)).
- KROGER, J. (1996) *Identity in Adolescence*. London: Routledge.
- MCGUIRE, W. J. (1999) *Constructing Social Psychology: Creative and Critical Processes*. Cambridge: Cambridge University Press.
- MILLER, R. (2000) *Training Soprano Voices*. Oxford: Oxford University Press.
- NORTH, A. C. & HARGREAVES, D. J. (1999) 'Music and adolescent identity'. *Music Education Research*, **1**, 1, 75–92.
- PAPOUSEK, H. (1996) 'Musicality in infancy research: biological and cultural origins of early musicality', in I. Deliège & J. A. Sloboda (Eds.), *Musical Beginnings: Origins and Development of Musical Competence*, pp. 37–53. Oxford: Oxford University Press.
- REE, J. (1999) *I See A Voice*. London: Harper Collins.
- SHARMA, P. P., GUPTA, P. & DESHPANDE, R. (1997) 'Lung function values in healthy children (10–15 years)'. *Indian Journal of Pediatrics*, **64**, 1, 85–91.
- SHEETS-JOHNSTONE, M. (1999) 'Phenomenology and agency: methodological and theoretical issues in Strawson's "The Self"', in S. Gallagher & J. Shear (Eds), *Models of the Self*. Thorverton: Imprint Academic, pp. 231–252.
- STATHOPOULOS, E. T. (2000) 'A review of the development of the child voice: an anatomical and functional perspective', in White (2000), pp. 1–12.
- STRAWSON, G. (1999) 'The self', in S. Gallagher & J. Shear (Eds), *Models of the Self*. Thorverton: Imprint Academic, pp. 1–24.
- SUNDBERG, J. (1999) 'The perception of singing', in D. Deutsch (Ed.), *The Psychology of Music*, 2nd edn, pp. 171–264. London: Academic Press.
- TAKAISHI, K. (1992) 'The influence of significant others on the formation of own self-image'. *Japanese Journal of Psychology*, **63**, 1, 1–7.
- TITZE, I. R. (1993) *Vocal Fold Physiology*. California: Singular Publishing.
- TITZE, I. R. (1994) *Principles of Voice Production*. Englewood Cliffs, NJ: Prentice-Hall Inc.
- TOLBERT, E. (2001) 'Music and meaning: an evolutionary story'. *Psychology of Music*, **29**, 84–9.
- TREVARTHEN, C. (1999) 'Musicality and the intrinsic motive pulse: evidence from human psychobiology and infant communication'. *Musicae Scientiae*, Special Issue (1999–2000), 155–215.
- VILKMAN, E., SONNINEN, A., HURME, P. & KORRKO, P. (1996) 'External laryngeal frame function in voice production revisited: a review'. *Journal of Voice*, **10**, 1, 78–92.
- WELCH, G. F. (1986) 'A developmental view of children's singing'. *British Journal of Music Education*, **3**, 3, 295–303.
- WELCH, G. F. & HOWARD, D. M. (2002) 'Gendered voice in the cathedral choir'. *Psychology of Music*, **30**, 1, 102–20.
- WHITE, P. (1995) 'Some acoustic measurements of children's voiced and whispered vowels'. *Voice*, **4**, 1–15.
- WHITE, P. (1999) 'Formant frequency analysis of children's spoken and sung vowels using sweeping fundamental frequency production'. *Journal of Voice*, **13**, 4, 570–82.
- WHITE, P. (Ed.) (2000) *Child Voice: Papers from an International Symposium held at KTH, Stockholm*. Stockholm: KTH Voice Research Centre.