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Music Department

Perceptions of the Singing Voice

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5. Vocal Identity: exploring the relationship between the singer and the voice

" It's not me!"

5.1 Introduction

This chapter begins with the outline of the methods adopted in collecting the data in Phase II, with some details of the analysis undertaken. The themes that arise from these data are explored using the definitions of vocal identity established from Phase I: reflection, construction and expression of the singing voice. Reflecting on the voice will be linked to the levels established in the taxonomy (Table 2.2) from Phase I. Constructing the voice and expression will be linked to other themes that emerged in Phase I.

The different perspectives that were highlighted in the literature review will also be used to structure the analysis of Phase II data using cognitive, physical, acoustic, and expressive classifications.

Table 5.1 is a reminder of the coding used in this part of the thesis.

Table 5.1 Coding used in Phase II

Phase II	
Interviews with solo and choral singers from Phase I [PISAi] [PISBi]	PI: *Phase I* S: *Singer* A: *individual singer code* i: *interview*
Diaries from amateur solo singers [PIIS1d] [PIIS2d]	PII: *Phase II* S: *Singer* 1: *individual singer code* d: *diary*
Recordings of 3 songs [PIIS1Rs-one]	PII: *Phase II* S: *Singer* 1: *individual singer code* R: *recording* s: *song* *one: two: three*
Interviews post recording after play back [PIIS1i] [PIIS2i]	PII: *Phase II* S: *Singer* 1: *individual singer code* i: *interview*
Listener Study 5 amateur non-singing musicians [La-PII1rs-one] i.e. Listener a with Phase II singer 1 with recording song one	L: *Listener* a: *individual listener code* M: *Phase II* S: *Singer* 1: *individual singer code* R: *recording* s: *song* *one: two: three*

The Phase II research design consisted of a diary, recording and final interview with an additional listening study for the purpose of triangulation. Table 5.2 shows the time sequence of the Phase II data gathering with the 22 singers who participated in the study.

Table 5.2 showing diary and interview timing

Singer	Start	Diary	Recording	Interview	Completed
1	5/04	Y	Y	Y	9/04
2	5/04	Y	Y	Y	7/04
3	5/04	Y	Y	Y	7/04
4	9/04	Y	Y	Y	11/04
5	9/04	N	Y	Y	3/05
6	2/05	N	Y	Y	4/05
7	2/05	N	Y	Y	4/05
8	2/05	Y	Y	Y	4/05
9	2/05	N	Y	Y	4/05
10	2/05	N	Y	Y	4/05
11	2/05	N	Y	Y	4/05
12	2/05	Y	Y	Y	4/05
13	2/05	Y	Y	Y	4/05
14	2/05	N	Y	Y	4/05
15	4/05	Y	Y	Y	6/05
16	4/05	Y	Y	Y	6/05
17	4/05	Y	Y	Y	6/05
18	4/05	Y	Y	Y	6/05
19	4/05	Y	Y	Y	6/05
20	4/05	N	Y	Y	6/05
21	4/05	Y	Y	Y	6/05
22	2/05	Y	Y	Y	4/05

5.11 Methods used in Phase II

As seen in the literature reviewed in chapter 4, a holistic perspective rooted in a real world situation can be an effective way of exploring vocal perception in action. An empirical study was devised modelled on the 'critical incident' method advocated by Robson (1999: 254) and the study by Persson (2001) into emotional response to timbre with pianists. Persson was particularly keen to look at the phenomenology of emotion and chose to explore the emotional aspects of conceptualising music. Pianists were asked to learn and study a piece of unknown piano music for 2 weeks, after which it would be recorded and

discussed in an in-depth interview with the researcher. The piece was unnamed and each participant was asked to give it a suitable title. Individual responses to the emotional content of the music were analysed. The method seemed particularly suited to the purpose of this study as it allowed in-depth discourse to be gathered on a similarly difficult phenomenon to conceptualise.

From this model, an empirical study was designed to incorporate a stimulus suitable for a wide range of singers to respond to. The singers were asked to sing and compare the experience of working on and performing a favourite and then two different songs, one with an unfamiliar style and the other in an unfamiliar language. This produced responses through diary notes and interview discourse. The three songs were recorded using professional equipment and an individual CD was made for each singer. This was subsequently played back to the singer who was asked to comment on the vocal sound they heard. This allowed each singer to focus on something tangible and with the aid of the diary notes and the interviews conducted after playing back the recordings, narrative data were gathered from the 22 participants.

A Rode NT2 large diaphragm capacitor microphone was used in omnidirectional mode recording to Cool Edit Pro software on a Sony Vaio Laptop, via a M-Audio AudioBuddy microphone preamp. The recordings took place in teaching studios and private homes. The majority of recordings took approximately half an hour for each singer, with most songs recorded in three takes, in order to ensure that each singer was happy with their performance. Retakes were done if the singer or pianist made a mistake and wished to try again.

Data were collected from May 2004 to June 2005. Teachers from the Association of Teachers of Singing (AOTOS) were approached to suggest singers willing to take part in the study. Singers came from Swansea, Bristol, Bath, Swindon, Cheltenham and Surrey. The singers were asked to fill in a form with contact details and sign an agreement to undertake a diary for one month, to sing and record three songs and to be interviewed after hearing their recording.

Modifications of the Phase II design

Some singers failed to complete the diaries or lost them, but they still wished to continue with the study. Some of the younger singers found it hard to sing a different language so they were allowed to choose another song in a contrasting style. One of the adult singers felt she could only record one of the songs, but three recordings were made of the same song so she was able to discuss the subtle differences between the three performances. One of the younger singers only sang two songs. The average length of interviews ranged from ½ an hour to ¾ of an hour, and the diary word count varied from 500 - 3000 words. Because the interview and diary data differed from singer to singer, with the older singers generally writing and speaking in more detail, the data were analysed as percentages of the narratives for consistent patterns and results. Some of the longer diary and interview narratives produced less data than shorter ones as some singers spoke about non-vocal matters which were not the subject of the investigation.

The purpose of the recording was to give a focus for discussion and though not all the singers sang three contrasting songs the recordings were still able to stimulate the singer to discuss vocal timbre. Similarly the data gained from the post recording interviews were still valuable without the diary evidence. The task set was to sing three different songs, however, the purpose of the research was not to examine how the singers reacted specifically to the different songs but to provide a stimulus for them to compare vocal timbres and describe vocal perceptions. Where the singer felt uncomfortable preparing a song for the recording they were allowed to change it. While this meant the initial aims were modified it did not compromise the main purpose of the research to encourage the singers to talk about their vocal experience. It was more important that the recording was rewarding in order to generate helpful data, rather than insisting on a rigid schedule that singers felt unable to complete. The aim was to make the whole process a positive experience for each individual.

Participants

The singers asked to take part in the Phase II empirical study came from a wide range of backgrounds. A cross-section was achieved of male/female, young/old and it was important that the singers, whatever their ages, were actively involved in singing on a regular basis. None of the singers in this study were professional singers. The professional singers initially approached were too busy to undertake the tasks involved.

The personal correspondence from four professional singers who were willing to give their views on vocal timbre is included in the Phase II data analysis (Singer

J, K, M and N) and will also be referred to in chapter eight along with the diary data from the three professional singers in Phase I. The majority of the singers in Phase II were younger as they were involved with learning how to sing, but older singers also participated and gave another perspective. As will become clear in the data, some singers sang in choirs as well as performing as soloists. The following table gives the repertoire chosen by the singers for the recordings, the song title and composer or genre (Table 5.3).

Table 5.3 List of Songs used in Phase II

Singer	Age/ gender	Taxonomy	A - familiar	B – unfamiliar Language/style	C – unfamiliar Style/genre
1.	B/f	2.2As	O del mio dolce Gluck	Das Verlassene Magdlein Wolf	The Nearness of You Hoagy Carmichael
2.	A/f	2.3As	Let's face the music Berlin	Father's a drunkard Music Hall	Nothing Chorus Line
3.	A/f	2.2As	Doin' what comes naturally Berlin	Nel cor più Paisiello	Bessie's Ballad Merry Wives of Windsor
4.	C/f	3.1As/c	An die Musik Schubert	Ombra mai fui Gluck	Going to Heaven Copland
5.	D/f	3.7A/Ps/c	Maria Weigenlied Reger	Dove Sono Mozart	Ave Maria Caccini
6.	A/f	2.3A/s/c	Funny Honey Chicago	Send in the clowns Sondheim	Tell me on a Sunday Lloyd Webber
7.	A/f	2.3A/s/c	If I were a bell Guys and Dolls	Silent Noon Vaughan Williams	Fields of Gold Sting/Eva Cassidy
8.	A/f	2.1A/s/c	Summertime Gershwin	Vaga Luna Bellini	In his eyes Jekyll & Hyde
9.	A/f	2.1A/s/c	Hushabye Mountain Chitty Chitty Bang Bang		Can't help lovin' that man Show Boat
10.	A/f	2.2A/s/c	If I were a bell Guys and Dolls	Me voglio fa na casa Verdi	Come again Dowland
11.	A/m	2.3A/s	Straighten up Nat King Cole	I'm reviewing Oliver	I get a kick Cole Porter
12.	A/m	2.2A/s/c	If ever I would leave you Camelot	My lovely Celia Munro	Over the mountains Quilter
13.	A/m	2.1A/s	A thousand miles Vannessa Carlton		Your heart Lord of the Rings
14.	A/f	2.3A/s	Memory Cats	Fly me to the moon Bart Howard	Lullaby of Broadway 42nd Street
15.	C/f	3.5A/s	If music be the food Purcell	Bellini	One hand, one heart West Side Story
16.	C/f	4.1A/s		Der Rosenband Strauss	
17.	C/f	3.4A/P/s	Lads in their hundreds Butterworth	'C' by Poulenc	Buddy on the Nightshift Weill
18.	C/f	3.7A/P/s/c	Fear no more Higginson	What good would the moon be? Weill	Widmung Schumann
19.	C/f	3.4A/s	Voi che sapete Mozart	Out of my dreams Oklahoma	Ye banks and braes Burns
20.	A/m	3.4A/P/s/c	Down by the Salley Gardens Arr. Britten	Ich grolle nicht Schumann	Sea Fever Ireland
21.	D/m	2.3A/c/s	Where e'er you walk Handel	Simple gifts Copland	Linden Lea Vaughan Williams
22.	A/f	2.1A/s	In dreams Lord of the Rings	Cradle song Mozart	Little Spanish Town Jenkyns

5.12 Analysis of data

Three types of classification took place

- Singers: by age, gender, taxonomy reference, teacher, preferred musical style, amount of vocalising per week. (Table 5.5)
- Phrases in the discourse of both diary and interview data:
    a. Reflection, construction, expression of the self and voice. (Phase I, see chapter 3.33)
    b. Cognitive, expressive, acoustic, physical descriptions of the voice. (Literature review, see chapter 4.2)
    c. Feeling, sound, space, movement in vocalisation.(Phase I, see chapter 3.6)
- Word classification in diary and interview data: colour, light, temperature, weight, dynamics, texture, shape, age, taste, musical instruments, balance, comfort, energy, effort, feeling. (Phase I, see chapter 3.5)

This analysis was done using colour coded pens and at the end of each diary and interview narrative the phrases or words were counted, a total was made and a percentage calculated and recorded in an Excel programme so that patterns could easily be compared between the different singers' narratives.

The singers were classified according to the different forms of labelling shown in Table 5.5. The ages of individuals were spread over a number of years and generations so these were classified into 4 age bands identified as A (0-17 years);

B (18-24 years); C (25-49 years) and D (50-69 years). The level used in the taxonomy of vocal identity from Phase I is also given in Table 5.5 and in order to identify each singer in the analysis an additional coding with letter and number was devised for the analysis in Excel (see column four in Table 5.5).

It was helpful to have a macro overview of the singer's relationship with their voice as well as a micro perspective: so the amount of time spent each week physically singing was therefore included in the refinements to the classifications. This information was taken from the diary material and the conversations with the singers. 1 – infrequent practice each week, 2 – more frequent practice, and 3 – dedicated and sustained daily singing. The singers came from 11 different teachers and were labelled to identify the teacher (by number) and singer (by small case letter).

By classifying and labelling the singers in this way it was possible to sort the data in Excel so that patterns and clusters could be observed. No significant patterns emerged when the data were analysed by age, gender, teacher code or musical preferences. Differences were observed when the data were analysed according to sense of vocal identity (taxonomy) and the amount of singing that regularly was taking place.

Table 5.4 showing the three main strands of the taxonomy from Table.2.2 represented by the Phase II singers

2. Acquisition of vocal/singing identity
2.1 Initial training
2.2 First performing experience
2.3 Growing sense of self as singer
3. Secure sense of singer identity
3.1 Confidence in technical ability
3.2 Confidence in communicating musically
3.3 A history of performance success
3.4 A growing sense of commitment to study the singing voice
3.5 A sense of personal continuity
3.6 A sense of personal autonomy
4. Pre-loss of vocal identity
4.1 Anxiety about loss of performance skills
4.2 Anxiety about ageing affects
4.3 Anxiety about loss of career

Table 5.5 showing classification for further analysis of Phase II data singers

Singer gender	Age (Band)	Taxonomy	Taxonomy coded	S:song MT:music theatre O:opera	Singing exp. banded	Singing exp. coded	Teacher coded
1f	19 B	2.2	b1	S	1	1.1	T1a
2f	15 A	2.3	c1	MT	3	3.1	T2a
3f	14 A	2.3	b2	MT	2	2.1	T2b
4f	30 C	3.1	d1	S	1	1.2	T3a
5f	60 D	3.7	F1	O	3	3.2	T5a
6f	18 A	2.3	c2	MT	1	1.3	T4a
7f	16 A	2.3	c3	MT	2	2.2	T4b
8f	17 A	2.1	a1	MT	1	1.4	T4c
9f	17 A	2.1	a2	S	1	1.5	T6a
10f	17 A	2.2	b3	S	1	1.6	T4d
11m	16 A	2.3	c4	MT	2	2.3	T4e
12m	17 A	2.2	b4	S	1	1.7	T4f
13m	12 A	2.1	a3	MT	1	1.8	T7a
14f	13 A	2.3	c5	MT	1	1.9	T4g
15f	35 C	3.7	e1	S	2	2.4	T8a
16f	35 C	4.1	e2	S	2	2.5	T9a
17f	39 C	3.4	e3	S	3	3.3	T10a
18f	35 C	3.7	e4	S	3	3.4	T8b
19f	45 C	3.4	e5	S	2	2.6	T8c
20m	18 B	3.4	e6	S	3	3.5	T11a
21m	60 D	2.3	c6	S	1	1.91	T4h
22f	11 A	2.1	a4	S	1	1.92	T7b

The use of discourse analysis was originally devised to gain rich data in the field of social psychology (Potter & Wetherall, 1987: 160); it is also suitable for the needs of music psychology and it was chosen as the main tool for this research because it offers a flexible means of analysis that is neither theory nor method driven (Smith *et al.,* 1995: 81) It can also show manifest and latent content (Billig, 1996: 21), particularly important when direct references to timbre would prove so complex. Therefore the discourse was analysed using different classifications in order to uncover some of the possible hidden meanings within the language used by the singers in the data.

Bregman (1993) believes in the importance of a large number of strategies for grouping and interpreting sensory data because each one is subject to error and the use of a number of relations is a form of protection against failure. He discusses the role played by gestalt groupings when describing the 'auditory scene'.

> The one that tries to group sounds by their spatial origins may not be effective in reverberant environments. The one that groups partials only when they are harmonically related will fail when the event gives rise to inharmonic partials... (Bregman, 1993: 33)

While Bregman is speaking here about specific acoustic phenomena, the relevance of having a large number of strategies for interpreting sensory data is valid for this study. The participants were all engaged in some form of 'auditory sensory gathering' as they were involved in listening to their voices and recording their response through the diaries and actively involved in auditory analysis when listening to the CD in the interview.

It was important to identify the possible strategies used in vocal perception; and to be aware of them when interpreting the data, even though no objective measurements could take place at the time. The maintenance of a 'real world' strategy even during the recording was seen as important. Although the singers were placed in front of a microphone the amount of technical equipment was kept to a minimum. Further studies could include the use of real time visual feedback and laryngograph data collection simultaneously but this would influence the 'real world' context of the data collection. The data is however all stored as sound files and could, in the future, be used to provide spectrographic analysis. The purpose of this study was to study the singers' personal responses and these were compared to the data taken before the recordings were played back to the subjects. The final interview was an opportunity for the singers to explain in more detail how they perceived their timbre, both during the performance and subsequently as listeners to their own recordings.

The analysis used both the conversational aspects of the discourse and the fine-grained analysis of specific references to timbre. However conventions of analysis where all vocal inflections and speech mannerisms are noted (Munro & LeCouteur, 2002) were not adopted in this study, and the transcripts were analysed using word meaning and context only. The data were analysed for aspects of the voice/self relationship and sense of vocal identity, before moving on to a more word specific analysis with relation to metaphors of vocal timbre (chapter 7). The analysis continued with a return to an overview of each singer's phraseology in order to ascertain how much of the singer's discourse focused on physical sensations, emotional or cognitive responses, and, in particular, the

acoustic internal and external auditory experience (chapter 6). It concluded by re-examining the data for references to space and movement (chapter 8) in both professional and amateur singers.

As has been illustrated different methods of counting the references to singing and vocal timbre were used in order to identify patterns and clusters. Links and chains were explored, following a similar model to the concept map suggested by Hart (1998). The findings were compared to the general theoretical frameworks available in the literature (see chapter 4), referring to the self and to vocal practice.

The themes that emerged from both Phase I and Phase II data are discussed in chapters five to eight under the following focus points:

- vocal identity
- the mismatch of internal and external auditory vocal perception
- use of metaphor
- concepts of space and movement.

5.13 Initial examination of the data

The data were examined for common themes that might be explained by age, gender or experience in the discourse of the singers. Initially aspects of self and personality were explored using the same features that came out of the Phase I data: reflection of the voice, construction of the voice and expression of the voice. With the singers in Phase II all these aspects of the voice/self relationship

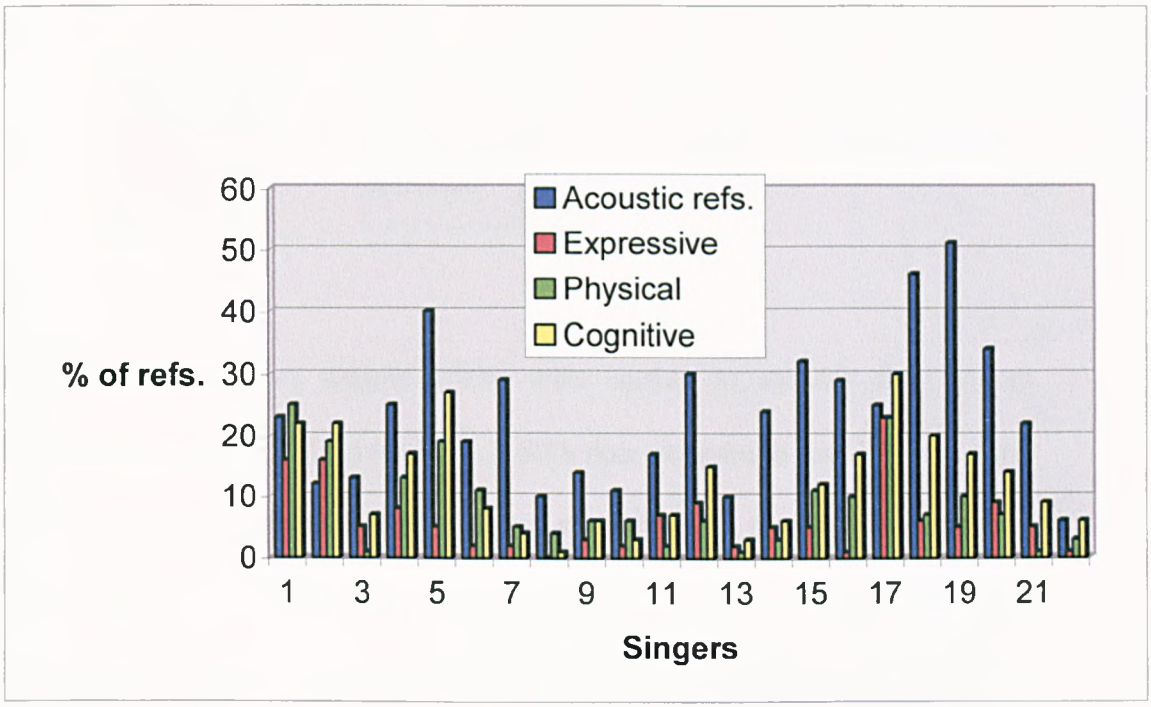
were fairly evenly distributed within the narratives, suggesting that the number of participants, though small showed consistency in their responses. This was the case for both the number of phrases and the number of single word references, concerned with reflection, construction and expression. All the singers reflected on their voice and the majority felt they could control or construct their voice; they had a sense of agency, and felt their voice expressed their feelings. No distinct patterns emerged when the data were analysed by age, repertoire studied, teacher, vocal experience or gender when the percentages of phrase and word references were taken and put into an Excel programme.

The only aspect that emerged was an increase in the use of reflective language in the follow up interview after the play back of the CD recording. The stability of the participants' responses was re-assuring and the fact that more reflective language was used in the interview indicated that the design of the research was achieving part of its objectives, namely to create a situation where singers could reflect on their vocal timbre. **(How do singers think about their voice?)**

Another level of analysis was tried, again by identifying and counting the references used by the singers in the discourse relating to the cognitive, expressive, acoustic and physical aspects of the singing experience. By plotting the numbers of phrases into an Excel programme (Chart 5.1) it was possible to calculate percentages of the phrases used for each singer, and using the classifications used in Table 5.5, to identify singers by separate labels and look for any emerging trends. Teacher, age, gender and repertoire codes were again applied for cross-checking purposes. No consistent patterns appeared; however,

the importance of the auditory and acoustic experience was identified as the largest percentage response featured in the discourse of the majority of singers.

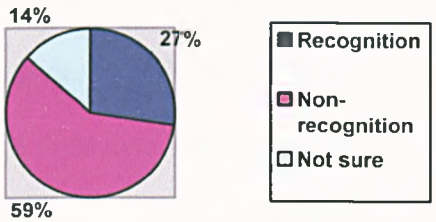
Chart 5.1 showing the percentage of references in each singer's post recording interview



When using the codes created by the taxonomy (Table 2.2 & 5.4), i.e. the level of vocal identity in each singer, and the codes for the number of hours spent actually singing each week, some consistent patterns were revealed. The singers making the highest number of references to the acoustic experience of singing were the more established performers and those participants who spent the most time each week vocalising. The pattern of expressive, cognitive and physical references did not appear to be affected by the hours or years spent singing which suggested that these ways of articulating the singing experience are less determined by training and perhaps reflect aspects of personality or individual learning styles. It also highlights the importance of auditory skills in the teaching

of singing, as only five of the twenty-two singers used less than 40% of the interview discussion referring to the acoustic nature of the singing sound.

Chart 5.2 showing percentage of voice recognition by the Phase II singers



While the majority of singers (73%) were unable to identify their voices confidently on the recording (Chart 5.2: 59% non recognition and 14% not sure) the data given in the diaries and interviews suggested that they all had a sense of vocal identity. They knew that the recording was of their singing voice, they could easily identify the three songs they had sung, but they expressed a sense of disbelief that it was their voice when asked "Does it sound like you?". Table 6.1 in the following chapter gives a list of the responses given. This is examined in more detail in chapter 6 as it was one of the important themes that emerged from the data in Phase II. However, the fact that each singer knew it was a recording of their voice suggests that in some cases, a sense of vocal identity can be independent of any auditory feedback. The following section discusses this aspect, as it explores the data using the definitions of vocal identity established in Phase I.

5.14 Defining vocal identity

The definition of vocal identity developed from the findings in Phase I (see chapter three), offers three perspectives for examining the relationship between the singer and the voice: Reflection, Construction and Expression.

The singers were able to reflect on their voices: they could discuss repertoire in terms of their own particular sound: *'I feel this song suits my voice'* [PIIS1d]; *'I was tired and it sounded quiet and squeaky.'* [PIIS13i].

However, they could also discuss the control they had over their singing voice and showed that they could also talk about the way they had a part in the construction of the voice, even if they did not specifically use the term "construct": '*When I am more confident my voice is more controlled'* [PIIS1d]; '*Once I got used to it, it became easy and effortless'* [PIIS2i]; *'I put more effort into it because I didn't know what I was doing so much'* [PIIS7i] *'I'm concentrating on getting a straight note'* [PIIS16i].

Finally they were able to express something of themselves through the singing voice and there were indications of this expression of the voice-self relationship: '*I find it easy to put the correct expression into it*' [PIISId]; *'I love this song, it is so me'* [PIIS2d]; *"I now know where to place the emotions"* [PIIS3i]; *'Singing is my way of expressing myself'* [PIIS16i]; *'I'm beginning to discover that my voice has got the ability to express moods'* [PIIS21i].

Although some were aware that they had not achieved all they were capable of:

'I can think more of the sound and the meaning' [PIIS4i]; *'It's not very exciting is it?'* [PIIS11i]; *'I've not got any life'* [PIIS14i]; *'I've yet to find out what I'm singing about'* [PIIS18i]; *'Try and express it more'* [PIIS22i].

The majority of singers were found to reveal these three features of vocal identity in their diaries and interviews. Only three singers did not mention any aspects of 'expression' through their singing and while this could mean they were less secure about themselves as singers it is difficult to draw conclusions. (See Table 5.6: singers 8, 9 & 10). Taking the model suggested from the Phase I, the following table highlights the responses from Phase II singers, under the three features of vocal identity.

Table 5.6 showing the aspects of 'Reflection, Construction and Expression' with regard to the singers' voice and sense of self.

Singer	Self-voice-reflection	Self-voice-construction	Self-voice-expression
1	Feel this song suits my voice	When I'm more confident my voice is more controlled	I find it easy to put the correct expression into it
2	I think my voice needs a rest	Once I got used to it, it became quite easy and effortless	I love this song it is so me!
3	My voice is usually 'musical theatre'	I have been working on joining the phrases more	I now know where to place the emotions
4	I really enjoy resonance of notes around middle C	Sound improved when I retracted my neck	Can think more of the sound and the meaning
5	At the end of the day that's a reasonable performance	I know there's an awful lot more that I can do	This still quite quiet, still reflective, she's being philosophical
6	If I didn't have that it wouldn't be me	I think why can't I get it right	I mean they're show songs and so they have a story
7	It seems rather lifeless	I put more effort into it because I didn't know what I was doing so much	I think the third one I did put more expression in
8	It's a strange feeling to be singing nicely and then lose it in half a beat	I don't want to copy it (CD) any more	
9	My voice tends to have a sound of innocence about it	The richness doesn't come in until I do the full on exercises	
10	I definitely think over the years the richness had developed		
11	I came out of accent there	That's hard that note, you just have to get it	It's not very exciting is it?
12	It can sound very blocked in my head	I believe I have done my best in the space and time given	It will be due to my feelings for the piece
13	I was tired and it sounded quiet and squeaky	I developed my own style	I sing songs that make me feel good
14	Sometimes I can do it	I need to be more legato in that bit	I've not got any life
15	A tendency to lose the focus introduced some thinness and slight sharpness	The sensation in the voice created was then mirrored when singing the words	I obtained a translation in order to understand the full meaning of the song
16	I realise that I do not use my voice to maximum effect volume wise	I am concentrating on getting a straight note	Singing is my way of expressing myself
17	The sound I produced was weak and lacking in body and resonance	This is gradually lifting away from the muck	I read them out quietly but meaning them and feeling them
18	I could feel the voice swelling with the ebb and flow of the melody	Attempted the Weill with vvv and zzz	I've yet to find out what I'm singing about
19	I feel more secure re the sound and clarity of notes	Lots of work in higher register	So at least I know what every phrase means
20	I thought it was a bit rigid and hard	It's strengthened my voice	You really feel you can communicate
21	That was quite good there	The vowel sounds can be heightened by the timbre in the voice	I'm beginning to discover that my voice has got the ability to express moods
22	My voice is good today	The louder notes were harder to control	Try and express it more

The following sections discuss the analysis of the data under each category, and with reference to the taxonomy outlined in Table 5.4.

5.2 Self Reflection: how reflecting on the voice illustrates a sense of vocal identity

Reflecting on the voice suggests that the singer is aware of the singing voice as part of himself or herself; using reflective language is an indication of a level of vocal identity when the singer accepts the presence of a singing voice within the body. While for some this is the beginning of a vocal identity, for others it is a mature acceptance of their relationship with singing and performing music using the voice. The participants chosen were all performing singers, hence the focus on levels 2, 3 and 4 of the taxonomy (Table 2.2 & 5.4).

5.21 Reflecting on vocal identity: the experience of initial training (taxonomy level 2.1)

Taking the youngest singers as a starting point, it is possible to see the first awakening of a vocal identity establishing itself through initial training. Singer 13 was a twelve-year-old male who was used to recording his own compositions and reported spending quite a bit of his leisure time listening to and recording songs. His voice was just beginning to change but he retained his high treble sound. His reflections in the diary show that he thought about his own sound as '*nice*' but also felt he was developing his '*own style*' and because he was used to hearing his own voice when recording his compositions he was not surprised to

hear the sound on the CD. He felt '*quite proud*' of it and that he was making his own '*sort of sound*'.

This was in contrast to Singer 22, another young singer of twelve years who had just started lessons. Her diary is full of contrast between her voice feeling '*easy*' and then becoming '*hard, dry and spiky*', because she was unwell. She was not used to hearing her voice on recordings and she commented that she was *'singing a bit higher than my voice wanted to'*. She felt she sounded *a 'bit scrambled'*. These singers show different attitudes to early voice training: one is confident of his developing identity and the other is more critical. In the long term it would be interesting to see which singer establishes an acknowledged vocal identity, in other words, one that is accepted by others. Depending on their learning styles and personalities, it may be that the confident singer has delusions of his capabilities, while the self-critical singer could be more willing to respond to teaching and be keen to improve. Monitoring the causes and effects of future vocal identity would require repeat interviews and a longitudinal study.

These two singers are in the process of initial training and they have had some performance experience. The next group of singers on the other hand, show a more confident sense of vocal identity as they reflect on their successful performing experiences.

5.22 Reflecting on vocal identity: first successful performing experiences (taxonomy level 2.2)

Looking at the contrast between the diary and interview discourse of the Singer 1 and Singer 12, there is a sense of progress in the establishment of a vocal identity but also of more objective critical judgements. Both singers, in their late teens, were used to singing in choral situations but both had recently taken grade 8 examinations and had performed in school concerts as soloists. Singer 1 wrote in her diary about the feelings she had about her singing, using the word *'feel'* or *'feeling'* eleven times in the course of the diary data and twenty times in the interview. She said that she *'didn't realise how much there was a natural vibrato'* in her voice and she talked about what she was *'trying to achieve'*.

Singer 12 had heard his voice before because, like Singer 13, he recorded his own compositions for personal satisfaction. His diary talks about the choices he makes about his sound, *'sometimes struggling with the higher notes because I should go falsetto and I choose not to'*. He talks about the sound not being right *'within my head'*. He says later in the diary, *'another criticism I have of my voice is that, at times, it can sound very blocked'*. In the subsequent interview he reflects *'I still have to admit that it doesn't sound anything like I think it should'* and goes on to say that there is *'room for improvement'*. However he also says about performing in a school concert:

> *I purposely volunteered, I mean I need to, I mean I don't mind showing off my voice and, one thing maybe I've noticed with some people they show off too much and sometimes are slightly proud of it, I hope that's not me.* [PIIS12i]

As a young baritone he is still very close to the voice change and he remarks that although his voice is not as high as it was as a treble, *'to be honest in my mind it*

hasn't changed'. He maintained his vocal identity through the vocal changes of puberty and the fact that he needed to sing suggests a deep-rooted emotional impulse to sing. These two singers seem to fit this level of vocal identity where the experience of successful performing opportunities is expressed by a sense of progress and the development of more critical judgements.

These different levels of vocal identity are difficult to judge on the basis of two studies of qualitative data; however, the value of the taxonomy in highlighting a possible development in a singer's sense of the relationship with their voice can be tested by subsequent research. Within the limitations of this thesis it is possible to detect a pattern of developing vocal confidence as the next two singers show.

5.23 Reflecting on vocal identity: growing confidence in performance (taxonomy level 2.3)

Two singers, aged thirteen, who had more singing experience and were more aware of themselves as singers, were music theatre performers, young actresses and dancers as well as singers. Singers 2 and 3 wrote in detail in their diaries about the songs they were working on and the performances that they had taken part in. Singer 2 talks about tackling a new song in a different style as being *'strange at first'*; she also talks about her singing in terms of *'effort'* and *'effortless'*. As a performer she is aware of the stamina required to maintain a performance on stage and also aware of the movement required whether dancing or acting and the projection of mood and character. In her interview she was very talkative and went into great detail about the performances she had been involved

with and she seemed to have a clear recall of the conversation she had had with people in the 'wings' at the theatre and the way she had prepared herself for the performance. Her reactions to hearing the CD were *'not bad'*; but, she said '*it sounds very young, so angelic, everyone knows what they sound like but it didn't sound like me'*. She was very involved when listening to the CD, saying that she was waiting for each phrase, '*I know what's coming next, am I going to make it or not, oh yes she did, oh no she didn't'*. This ability to critically look outside herself is illustrated by her final comments.

> *There was* [sic] *inklings of me...a slight Welsh accent came in and 'yes that's me', but it's like seeing yourself in the mirror. I thought I'd recognise myself, but I didn't really, really.* [PIIS2i]

Although the recording had cast doubts on her vocal identity in terms of actually recognising her sound, she still displays a confidence in herself as a singer, by her critical appraisal of her performances and the detail which she is looking for in listening to the CD.

Singer 3 was also very aware of the fine details in her performances, she expressed concern if she could not place the emotions in the songs due to lack of technical skills. She reflected in her diary about the difficulties of tackling new songs in unfamiliar styles. There were songs that she '*absolutely loved singing'* and songs which she didn't '*really enjoy'*. However she was prepared to change her vocal style to suit the genre and she was willing to work at the technical difficulties she encountered when practising. In her interview she first commented about where she could make improvements and she felt that the last song, which was in her more familiar musical theatre style, '*naturally sounds like me'*. She recognised where on the recording she sounded *'nervous'* and on the

whole she thought the recording sounded *'really sweet, younger than I am'*. Again she listened attentively to the recordings and was able to be critical in positive and negative ways. She had a clear idea about the music she liked and the music that she felt suited her voice.

Other singers at this level showed an awareness of their confidence and technical abilities; '*The 2nd one was more confident, more life in it.*' [PIIS9i], '*I seem to be growing in my ability to perceive and be aware of changes in dynamics and tempo.*' [PIIS21d]. All these singers showed more confidence than the singers at the previous level but not the same understanding of technical ability as the next level in the taxonomy.

5.24 Reflecting on vocal identity: a growing confidence in technical skill (taxonomy level 3.1)

Singer 4 showed a clear understanding of her technical abilities. She was a mature singer who had sung regularly in choral situations but who had begun to sing solos and was working towards music examinations to improve her skills. She used many *'feel'* references in her diary and wrote critically about her abilities in specific technical terms, '*tension in jaw, lost support, had more harmonics within the voice,*' etc. There were many more references to *'feeling'* in the diary than the interview discourse, which focused more on her thoughts, knowledge of technique and repertoire and the actual sounds she was making. She seemed confused about her '*understanding of resonance*' when it came to the interview, '*when the high note comes out like that it doesn't sound like me singing*'. She spoke about the comfort she experienced when singing in her

lower register, she considered herself an alto, *'it's almost like lying back and relaxing'*. She acknowledges that she has to get used to her sound.

> *I'm very aware that that's where things go wrong, I'm trying not to anticipate it. I think I can hear the sound I want and I don't get it very often, I want the sound that sounds OK...I think that I did have to get used to that's what I sounded like, I know sometimes I've fluffed a note and my teacher will say, 'No, that was good'. I think it was awful and actually it sounded OK.* [PIIS4i]

While this singer shows some confidence in her technical ability she is also aware of the need for further improvements. Her commitment to studying the voice was limited by her physical health, however, the singers in the next level were seriously committed to performing and were singing regularly as soloists in church, concert hall and public events.

5.25 Reflecting on vocal identity: growing sense of commitment to studying the singing voice (taxonomy level 3.4)

Singers, 17 and 19 were different in age and experience but both spoke in great detail about the technical and musical aspects of singing. Both spoke about the mental preparation as well as musical and physical aspects of singing. Their reflections featured specific details on producing the sound they were looking for. Singer 17 said:

> *The Poulenc, by its very meaning and all that it portrays, mentally prepares me, think smaller and into the eyes, initially producing a somewhat nasal sound. This opens up at the back more as long as I have sung Handel.* [PIIS17d]

In the subsequent interview she goes through each song commenting about the vocal colour, the pronunciation of individual vowels and consonants. She was also very involved with the physical feelings that it had produced at the time, she knew where, for example, she had used *'more back'* muscles in the song. Her

frustration was that she had achieved a standard she was proud of in the recording but had subsequently been unwell and had not maintained the level that she had struggled so hard to achieve.

Singer 19 was slightly different in that she had started to train as a classical singer but had realised that she enjoyed singing jazz more than anything else. This personal realisation took place between the diary and recording and the subsequent interview. Her diary reflects much of her natural musicianship; she was a professional cellist and showed a fascination with the resonant capabilities of the voice. She was very methodical in her practice as noted in her diary, and she talks a great deal abut the technical achievements and the vocal colours she was trying to create. She was also very honest about the problems of rehearsing with her young family in the house, as was singer 17. She was interested in the way the Scottish accent was affecting the colours of her folk song. In her diary she was quite analytical in her reflections but when she spoke in the interview she became passionate about the experiences of jazz singing, and the freedom she felt this gave her to express herself truly. She certainly felt that her speaking voice made her '*wince*' but the jazz singing in a lower range had really given her an '*extraordinary experience*', and she was trying to work on that.

> *I really enjoy it and I know what to do with it and I whoop it up and make the most of it and I honestly relish the long notes in the jazz songs, so that's funny, in the classical, I feel I can't handle them properly.* [PIIS19i]

She goes on to describe her vulnerability when singing in a classical style:

> *I think for me its feeling uncomfortable, feeling exposed, feeling very vulnerable, holding on to a note and not knowing what to do whereas on the cello, I know what to do with it and I've got the technical equipment to put the vibrato or tail it off, but in classical singing I don't feel I've got the tools to do that but in jazz I can do it.* [PIIS19i]

She was so secure in her jazz style of singing she had already accepted professional engagements to perform and was continuing with her jazz singing studies as well as her classical voice training.

5.26 Reflecting on vocal identity: sense of personal autonomy (taxonomy level 3.7)

Some singers had a sense of personal autonomy about their vocal identity and they wished to teach singing while continuing to develop their career as a performer. Both singers 15 and 18 were establishing themselves as teachers of singing. They kept detailed diaries of both the musical and technical aspects of the songs they were preparing for the study. Each used a rather detached, almost literary style in their diaries, as if they were writing essays to be read.

> *During this time the words were memorised and then fitted into the rhythm. Allocation of breathing points and possible breathing points were identified within the song.* [PIIS15d]

> *Voice still does not like the Weill. I feel as though the sound should be creamy and relaxed, it sounds thin and weedy to me. The Brahms is much more the thing and the tone is starting to blossom.* [PIIS18d]

Singer 15 was highly critical of her performance on CD, at least for the first song, she felt she was '*quite tight, sharp and flat, all those things, I've heard it like that before*'. However as the recording was playing she became more positive in her awareness and could talk about the involvement in the emotional aspects of the songs. In the final song she recorded she was much happier and reflected on the memories she had of singing the song at a friend's wedding.

> *Out of the three I can make more of a connection with that* [PIIS15Rs-three] *in comparison to the other two, but that's a reflection of where I am as a performer, that one out of the three, you could go, 'ah', it evoked the emotion I intended.* [PIIS15i]

This aspect of the musical memories associated with a song came out in the Phase I interviews as well, the sense of a singer hearing and feeling an earlier vocal performance of the song at the same time as singing it in real time. Singer L recalled having to sing a song from the school production of *Les Misérables* for the funeral of a young school friend, at the request of the parents. This traumatic experience coloured every other performance he gave of the song and even when auditioning months later in London with the same song he found it difficult to maintain equilibrium: '*It was really weird, the effect it had on your performance*' [PISLi]. This area of auditory memory needs more research because it affects the mismatch between internal and external listening from a psychological perspective.

Singer 18 spoke about her emotional comfort in the song she felt was the most successful on the recording, '*I prefer the flow of the Schumann*'. She also talked about '*faulty self-perceptions that can make you do things that harm the voice*'. When talking about a performance she gave in a difficult acoustic, she comments, '*ignore your own perception, get on with what you know is the feeling*'. This seems to suggest that this singer equates feeling with a more reliable source of feedback than an aural perception that could be inaccurate. As a teacher of singing her comments reflected on her own experiences as a teacher with young singers, teaching them to trust in her judgements about the quality of sound rather than their, possibly faulty, aural perceptions. The interviews with these two singers (15, 18) were certainly more informally reflective than the diary narratives that had been more studied in their approach. The interview of Singer 16, on the other hand, revealed a profound change in auditory perceptions.

5.27 Reflecting on the possible loss of vocal identity: anxiety about performance skills (taxonomy level 4.1)

Singer 16 had unfortunately been through a period of poor health and a major abdominal operation. Her diary reflects her health concerns and her desire to get her voice back to full working order. She used the diary to help her in this process, monitoring her progress and making notes to help her technique, she used words to do with *work* a great deal. Her last remarks in the diary were quite poignant.

> *I feel there is more to my voice than I can at present bring out depth-wise and I get glimpse when practising and in lessons of a bigger, warmer sound than usual. Singing is my way of expressing myself and it is vital to my physical and mental wellbeing, but in many ways a fragile instrument as there is a direct correlation I feel, between any upset or emotional problems (or just plain tightness) and the quality of my voice.* [PIIS16d]

For the recording she chose to sing just one song, and so it was decided to use all three recordings she had made of the same song so that she had something to compare and discuss during the interview. She was not very impressed.

> *That has been quite a revelation to me actually, I don't think I would have recognised that as my voice, um, to me there's a lot of glaring things wrong that um, I know I should be working on but I'm slightly disappointed, they are so obvious...* [PIIS16i]

She did go on in the interview to discuss the sensations she felt more fully and she did acknowledge that the whole process had been very helpful. She mentioned the sensations she was aware of in her head and she spoke of the difference in texture between the internal sound she felt was more '*blended*' and the uncoordinated sound she heard on the recording. She felt she was a singer who had always had to '*work*' at her sound and yet she spoke of the sensation when she felt it was all working as being a '*totally natural reflex*', a contradiction of the '*work*' she felt was so important.

The value of the diary and the interview data was the way the singers were able to articulate more clearly the ideas first mentioned in the diaries and in some cases, even contradict their initial conceptions of producing sound as can be seen in this example:

> *Certain phrases sound a bit restricted.* [PIIS19d]
>
> *I wasn't all tight.* [PIIS19i]

As a singer it is important to be able to control the sound and this sense of constructing the voice was the second characteristic of the self-voice relationship. The use of language that describes the construction of the voice also implies that a singer has a sense of agency with regard to the singing voice and shows the ability to control the voice.

5.3 Self Construction: how constructing the voice illustrates a sense of agency and control

Language that shows a sense of constructing or building the voice is a useful and valid indicator of vocal identity. Even though some of the singers reported the negative aspects of controlling the voice, when the voice did not work as they wished, they still exhibited an awareness that they were capable of controlling the sound given the right technique or more helpful circumstances.

5.31 Learning to control the voice in private practice and in the one-to-one teaching situation

Not all the singers spoke in terms of having control over their voices in a direct way; however, most singers implied that they had a part to play in the sound production.

> *I kept singing lower, I made quite a nice sound and decided to keep practising in a low pitch to prepare me for when my voice breaks...As my holiday went on I developed my own style...*[PIIS13d]

Even a very young and inexperienced singer as here [PIIS13] was aware of his role in maintaining the sound he wanted to achieve. Others felt the same: '*I could not project my voice very well*' [PIIS3d]: '*I sound as if I was holding back'* [PIIS3i]; this singer also is consistently aware, between diary and interview, where the sound was not as controlled as she wished.

Some singers [PIIS5] tended to use the same words throughout, in this case, '*could and should'* suggesting a very clear sense of wanting to control the voice: '*could still be smoother...I should be pushing on a bit* '[PIIS5i]. Other singers, notably [PIIS16], kept repeating words to do with concentration and work (as referenced in the last section), this indicated very clearly the struggles this singer had been going through with her return to singing after a major operation.

> *Different dynamics were concentrated on and stresses for repeated phrases, time was spent concentrating on vowels.* [PIIS16d]

> *...and the focus you're concentrating on and the atmosphere it creates.* [PIIS16i]

'Work' does not necessarily have negative connotations but in some cases the singers were aware that the 'work' aspect of singing was intruding into the quality of the performance. While 'work' is necessary, the aim is for 'effortless' singing.

> *Yes, letting go and I think that's the big problem isn't it, that we spend so long working on the detail and trying to get this right and that right and 'have I got the right tone, the right sound', um, you know,' I should be a little louder here, should I be softer, should I be bringing a bit more of a sexy feel or shouldn't I?' ' Should this be all these different things' when actually you should just go for it!* [PIIS17i]

> *I am working on the soprano solos in Haydn's Nelson Mass. At my lesson we worked on breath control and support; started exercises on 'ee' then descending scales on 'ah'. Working on keeping the placing and support right to the end of the exercise; under supervision this worked very well but at home...*[PIIS16d]

This singer highlights the difficulties of working away from a teacher, suggesting the importance of another 'ear' to guide the work in progress, but the aim is for it all to sound as if no actual 'work' is taking place.

> *Yes if everything is working well, it becomes effortless.* [PIIS16i]

5.32 Developing a sense of agency through mental and physical control of the voice

The combination of mental and physical control can be seen here; '*I've just got to work out in my mind how to manage them*' [PIIS5i], '*It's not quite where I want it, I need to shift it'* [PIIS18i]. The next singer distinguishes between the preparation and the performance of the songs; '*Pleased to find that the technical aspects all keep working fairly well, when doing the songs for real.'* [PIIS19d]. They [PIIS19] are also aware of the very different 'work' associated with contrasting genres of vocal music; there are physical aspects of work but also mental readjustments to be made.

> *We've begun to work on that but I hear that now, there's more coming in but it's harder to bring down the lower register and ironically with the jazz, we're trying to work from the lower.* [PIIS19i]

Certain singers were very candid about what they saw as their vocal weaknesses or difficulties.

> *On the loud bit I found it harder to keep the notes than on the quiet bit. The louder notes were harder to control.* [PIIS22d]

While obvious physical problems can be identified the inherent psychological factors are more difficult to isolate and come to terms with.

> *I have a history of ENT problems...It means I take longer to get through the muck, clear it and get above it...I have struggled with the marking trés calme and opening pp. I certainly found it difficult to just slip in...*[PIIS17d]

> *Yes but it's a security thing as well, I think, 'No I can't do it, I won't embarrass myself by doing it'.* [PIIS6i]

> *It's a strange thing to be singing nicely and then to lose it all for half a beat.* [PIIS8d]

Singers are very exposed when it comes to performance and they are immediately aware when something is not going right; '*I think when I started this piece I wondered whether I could pull it off*' [PIIS17d]. In an earlier study (Monks, 2001) this sense of agency appeared in older adolescent singers, aged 15 years; but one of the younger singers in this present study, who was very experienced, shows a growing awareness of her own self vocal control.

> *It is a real quiet song and it's a real ballad song and it can get a bit boring and you've really got to make something out of it, its verse chorus etc. And it's quite a lot of the same words, there's not a lot of movement, you can't jazz it a bit, it's just a song and I'm standing there feeling a bit awkward, the audience don't, but I do.* [PIIS2i]

This suggests that while age is a factor in vocal development, experience and particularly performing experience plays a more important role in a sense of vocal identity. This is where the taxonomy, the model using levels of vocal identity, is a useful tool: some singers though mature in years are vocally inexperienced [PIIS21] and others are young but have developed higher levels of vocal expertise [PIIS20].

5.33 The use of voice quality descriptions

> *But I can sing in a lower Joss Stone sort of voice.* [PIIS13d]

> *I haven't done vibrato but with jazz I do it, again that's something I felt embarrassed about, it was quite fun...* [PIIS19i]

Voice quality descriptions can use the model of another singer or use technical terms such as vibrato; some methods of teaching singing focus on the specific use of voice quality terms. The Estill Method (Kayes, 2000) uses words like, 'belt', 'sob' and 'twang' as descriptions of certain voice qualities. Some of the singers in this study were used to using such terms:

> *We worked on* [PIIS2Rs-two] *which is a Victorian parlour song. It is sung by a little girl who is homeless. So my normal belt quality voice was not used to it. It felt strange at first but once I got into it, singing quietly and child like became quite easy and quite effortless.* [PIIS2d]

However, there is much disagreement in the profession as to what constitutes these vocal qualities. Just because a singer uses these terms it must not be assumed they understand them; a student can pick up labels from a teacher.

> *My voice is usually 'musical theatre', quite loud and expressive, but a few weeks ago in my singing lesson we started working on 'another voice' for classical/operatic songs. At first I found it strange to sing in this way, and hopefully soon I can make it come naturally. I still find singing in my 'musical theatre' voice far more comfortable.* [PIIS3d]

These singers (PIIS2 &PIIS3) feel that the '*music theatre*' quality is their normal voice and associate it with comfortable singing that they can identify with personally. It is appropriate to the music they are familiar with, the musical experience they have obviously grown up with. It is interesting to conjecture whether they sang with this quality from a very young age. Singer 3 wrote in her diary about the problems she was encountering with a more classical style song but she accepts this new vocal quality, when it is used with a song she can relate

to. She obviously does not enjoy the vibrato that emerges when she uses a more classical or '*operatic*' sound.

> *Towards the end of my lesson I was taught a ballad. Even though this is in my operatic voice, I enjoy singing it, because the story line is good.* [PIIS3d]

> *It's good I can see what you can improve, the 2 classical songs were quite vibrato and I didn't like that.* [PIIS3i]

Vibrato is a natural feature of the singing voice, and the perception of it can reveal aspects of a singer/listener's auditory abilities.

> Our auditory system has the ability to listen to complex sounds in different modes. When we listen *analytically*, we hear the different partials separately; when we listen *synthetically* or holistically, we focus on the whole sound and pay little attention to the partial sounds. (Rossing *et al.*, 2002: 142)

Do some singers prefer the straight sound because it is clear and strong with definition? Some singers recognise the carrying power of a good vibrato, and yet others are so used to hearing a pitch variation that they are unaware of the sound becoming an uncontrolled wobble. The second quotation from the beginning of this section illustrates that this particular singer [PIIS19] had a sense of embarrassment about her vibrato but felt this was resolved when she sang in a different style of music (further discussion of vibrato takes place in chapter eight).

5.34 The influence of different musical styles

The purpose of setting up the empirical study with three contrasting songs was to ensure that each singer was presented with some challenge to their usual familiar repertoire. One of the older singers [PIIS18] found her different genre of vocal music, a music theatre song, a real contrast to her usual sacred choral experience.

She writes in her diary about the struggles she undergoes trying to find the appropriate vocal timbre: because it was an American music theatre piece, she was encouraged by her teacher to adopt a different accent but she finds it really difficult to do. Vocal qualities and accents have strong cultural significance and singers are sensitive to these, even if it is unconscious at times.

> *I still can't bring myself to ape an American accent...* [PIIS18d]

This aspect of sounding 'foreign' and unnatural links the ingrained vocal personality that comes from speaking with the singer's vocal identity. There is an important relationship between the speaking voice, which has developed since birth, and the singing voice, which can begin at any point in life (witness Singer O's experiences in his seventies). The singing voice has to become flexible and accommodate a variety of languages and styles; it has to adapt the spoken vowels so that they become intelligible at higher pitches than the normal speaking range. The singing voice can be seen as a challenge to an individual's vocal identity, the sung sound can be very different from the singer's normal conversational voice. Several singers mentioned their spoken accent.

> *It sounds too English, I've got my own accent ...and it gets in the way.* [PIIS15i]

> *I would say my vowels are very harsh...due to my accent coming out.* [PIIS12i]

One of the singers is challenged by singing in a different accent; *'It sounds completely different* [Fagin's accent] *but it doesn't change the warmth does it?'* [PIIS11i]. He acknowledges that his vocal sound is still fundamentally the same, as does this singer; '*I suspect my sound's there anyway and it gets slightly dressed up in different ways*' [PIIS19i]. (Further discussion on accents takes place in 6.54.)

Whether the singer is playing a role or singing in a different language the audience seem to want to hear part of the singer in the performance; the expression of true feelings seems to be fundamental.

> *I want to hear the person. I want to be able to identify the voice, feel the emotion.* [PISN]

5.4 Self Expression: how expressing the voice illustrates emotions and feelings

Another crucial aspect of vocal identity is the expression of the singer's self through the voice. Coming to terms with individual vocal timbre is examined first, followed by a look at the relationship between the voice and self. Then the possible proto-types of singers as 'performer', 'creator' or 'explorer' are identified. Finally this section will look at the emotional mismatch when a singer is confronted by vocal shortcomings.

5.41 Coming to terms with individual vocal timbre

The expression of one's personality when the sound produced does not match the self-perception is a dilemma for the singer. Some singers try to sound like someone else and some prefer to use one type of vocal quality. This poses problematic questions with regard to the personality of individual singers. The complex relationship between the singer's personality and their voice cannot be completely explored by employing psychometric tests. It is however, an area that merits further investigation.

> *If I didn't think of it as me, I wonder whether I would like my voice, I don't know whether I like it being me.* [PIIS1i]

This singer acknowledged the recording as her own but then questioned whether she would really like the sound if she had heard it as belonging to someone else.

Many of the singers made comments such as: '*It is weird listening to it'* [PIIS7i]. It seems that hearing one's own voice provokes a feeling in the singer of mixed emotions as if the singer is confronted with a 'self', their voice, that is part of them but is also being heard outside themselves, possibly for the first time. It is clear that sometimes the singer is comfortable with the sound: '*feel more at home with the song.'* [PIIS4d]. At other times the voice is challenging their self-perception; '*I won't embarrass myself by doing it* '[PIIS6i]. Then there are times for the singer when the sound just seems to be frustratingly out of reach.

> *Every now and then you get a note that sounds so nice and you can never get it back again...it happens with the oboe as well.* [PIIS20i]

This mismatch will be explored in more detail in chapter six. Although some aspects of vocal identity have been identified in the data with reference to the taxonomy, the next section explores more specifically the expression of that relationship in the discourse of the singers.

5.42 The personal relationship between voice and self

> *Singing is my way of expressing myself and it is vital to my physical and mental well-being, but in many ways a fragile instrument as there is a direct correlation, I feel, between any upset or emotional problems (or just plain tiredness) and the quality of my voice.* [PIIS16d]

This quote from singer 16 is a reminder of the fragility of the voice/self relationship for some singers; she feels there is a direct correlation between the

voice and the singer's sense of well-being, a feeling shared by many in this study.

This singer [PIIS19] a professional cellist, but beginner singer, mentioned on several occasions the loud and powerful quality in her speaking voice, although she implies it she never actually says it is masculine. She identifies her dislike of her speaking voice, but seems to come to terms with her singing voice in jazz singing, which favours the lower pitch range, in the interview she talks more about her jazz singing than the sound of her recorded songs.

> *I was interested by the apparently 'stentorian' nature of the sound as it seemed to me. Sometimes I have been slightly unnerved by this definite, almost 'unfeminine' sound and can't decide whether to go for it or not!* [PIIS19d]

The singers in this study were all clear about the vocal sound they wanted to produce, even if they felt dissatisfied with the recorded sound.

> *The one I want is the working and very controlled voice.* [PIIS9i]

Some singers accepted the sound as their own even if they could not hear all the colours they thought they had tried to put into their recorded performance.

> *It's so monotone, I think I'm putting lots of colours but that's all coming from my face and I think it needs to come from my sound you know,*
> *I can hear when it's not, you can compare voices to sounds and that's my sound and all I can do is make it more accurate and more consistent, I can't make it sound different 'cos that's me.* [PIIS15i]

Some singers had come to terms with the performing sound, even if it did not match their internal experience. These singers tended to be the ones who were used to hearing recordings of themselves. What is slightly disconcerting is the number of singers who did not like their own sound; with the possible psychological impact that could have on self-esteem and confidence.

I simply copy what I believe it should sound like, although it does not sound right to me in my head. [PIIS12d]

I'm not too happy with my own voice to be honest when I hear it coming out [PIIS12i]
*I know it's me because I've heard me recorded enough times.[*PIIS12i]

I just didn't like my tone, there was a nasal sound to my voice that I didn't like. [PIIS8d]

I'm not going to like what I hear...I remember when I was singing it I was struggling, I wasn't at my best. [PIIS7i]

One of the singers reveals in the interview conversation her sense of vocal identity (the phrase underlined was spoken with more emphasis, the bold italic type is the interviewer). This singer truly identifies that without her voice she would not be the same person, her voice gives her, her identity '*because if I didn't have that it wouldn't be me*'.

How would you say your voice has changed from seven years ago, when you started having lessons?
It is much lower [laughs]
Do you still feel it's your voice?
Yeah, to be honest I can't remember
It's changed but it's still you?
Because if I didn't have that, it wouldn't be me
What, your voice?
Yeah! [PIIS6i]

This singer [PIIS1] shows her frustration with her singing but also acknowledges the potential she feels within.

I hate trying to sing when my voice doesn't sound normal. [PIIS1d]

It doesn't sound as if I was fighting to get the sound out or anything. [PIIS1i]

I do want to perform, I love performing it's just afterwards. I nearly never feel that I've sung to my full potential. [PIIS1i]

On the other hand, an older singer, who performs regularly in amateur groups, has come to a complete acceptance of her capabilities: she can acknowledge the

differences that might have occurred if she had become a professional singer but she knows her limitations.

> *That's not bad I suppose, my voice is as it is, if I had been a professional singer it would have been different wouldn't it? It would be, I would have all the other bits of the instrument, I would have more support, the languages, everything else, but in essence the actual performance, for an amateur, as such, who isn't singing regularly every day, I would have thought that wasn't bad.* [PIIS5i]

She goes on to say:

> *I mean I am pleasantly surprised, I thought there would be, um I mean an adjudicator, there will be an awful lot wrong with it, they can take you apart on everything, but to the listener to the audience I would have thought that was a pleasing performance.*
> *I mean I was listening to the singers last night and one of the singers, she didn't have enough edge and I hit the note, it doesn't have to be louder but you have to hit the note, it's got to be right tuning and it's got to be there straight away, the vowel and the consonant tucked up right against it.*
> *It makes me cross sometimes because I think well I should have been there,* [laugh] *as much as B* [her sister] *tells me, no you wouldn't have lasted, you're not strong enough, you wouldn't stand the pace, she says I haven't got the emotional strength and depth.* [PIIS5i]

She seems to be able to identify her weakness as being a psychological one, of not having the emotional strength, rather than any vocal faults. She prefers to see any insufficiencies in terms of her personality rather than her singing sound. Her success as a singer in amateur circles had given her confidence in her vocal abilities and she is happy to accept her sister's criticism of any weaknesses in character. Her sense of vocal identity is strong, she is happy with her vocal sound but regrets not being able to follow a professional career like her sister. She feels able to critique other singers (who had taken part in a vocal competition where she was stewarding) and compares them unfavourably with her own sound and capabilities.

5.43 Prototypes in singers

Certain prototypes seemed to emerge from the data: the singer as performer, creator and explorer. These were not exclusive but it was useful to see which singers in Phase II revealed any of these characteristics. Some singers who were establishing a vocal personality were definitely performers, *'I do want to perform, I love performing'* [PIIS1i]. Some singers were too inexperienced to show any signs of vocation but some, like singer 2, talked of creating characters, exploring colours as well as enjoying *'Showtime!'* [PIIS2d]. Some singers were more explorers than performers; starting to explore their vocal colours and the repertoire *'I really enjoyed the way at different points you really get going, the contrast in colour and tone'* [PIIS4i].

The ability to be creative suggests an established and strong sense of vocal identity, that the singer is confident will not be compromised by flexibility or expansion in the vocal palette. However the majority of singers in the study were performing singers though some wanted to sing on their own, for their own pleasure, initially. Singers do not have to be performers but it is usually the case that, whatever the challenge facing an audience can be, a singer will want to sing to someone. *'...usually I don't sing it for anyone, I sing it for myself and although admittedly I have recorded them to let people listen to them I record them because I like to hear them performed as a proper thing rather than just vocals,'* [PIIS12i]. In this instance the singer wanted to prepare his performance so that he could present it to his friends in a way he was confident it would be as he wanted it to be. With the rise of home recording equipment many more young singers are preparing CDs as a way of 'performing' to others, that is guaranteed

to meet their own standards, whether for audition purposes or for leisure. Using these means they do not have to cope with nerves or illness or many of the other factors that can ruin a live performance; the ability to give a live performance however, is seen as a fundamental skill by the majority of the sample.

Performing can really lift a singer's sense of vocal identity: singer 17 was preparing for a concert whilst maintaining her diary, and she records the positive after glow from the event.

> *Good session, nerves under control and I feel ready to perform, definitely a mental state which has a very positive effect on the voice.* [PIIS17d]

> *Post concert 2 weeks later. I have been buzzing for days the whole programme really worked I was anxious on the day but not as nervous as I have previously been. I felt ready for the concert or as ready as I was ever going to be given other commitments.* [PIIS17d]

It is interesting that she acknowledges the confidence she has in producing the sound she wants:

> *My voice felt so much more secure than I have ever known it; for the first time I knew what would come out when I opened my mouth! For a start I knew I didn't need my mouth!* [PIIS17d]

Many of the singers mention the emotional response they were hoping to invoke in an audience. The whole performing experience, the connection with the audience, the atmosphere being created, the physical buzz generated, is all identified clearly in the following extract. The singer acknowledges that she needs an audience to achieve this level.

> [PIIS15Rs-three] *Out of the three I can make more of a connection with that in comparison to the other two but that's a reflection of where I am as a performer, that one out of the three, you could actually go 'ah' it evoked the emotion I intended to...I honestly don't ever get into it unless I am singing in front of an audience ...it's the connection you make. It's the whole, it's the adrenalin you get and the focus you're concentrating on and the atmosphere it creates...*[PIIS15i]

Some performers talk about retreating into their own world in rehearsal, in contrast to what they can achieve during performance.

> *Nearly all the time there have been a couple of occasions when I've thought I've performed well, well that's up to rehearsal standard, usually in my practices I'm not worried about what I sound like I can just sing or not, there's not other factors to get in the way. I can go off into my own little world.* [PIIS1i]

The physical involvement seems to be crucial:

> *I was a bit nervous at first but when you're in it you're whole body, you just enjoy it.* [PIIS6i]

Some singers just want to perform more than anything else. Singer 11 is keen to be centre stage whether it is singing or acting, for him the need to perform is very great and it overrides any concerns about ability.

> *No I'm not critical but I think I would do that better or yeah I know this sounds very arrogant, but I could do that better or I'd love to perform that I reckon I can do that...*
>
> *I can't listen to something and say that's very nice if I like a song I want to sing it.*
>
> *when I go to the theatre to a piece of drama I think yeah, I'd like to be there, I can't just watch it. I want to put myself in their shoes, it's weird.* [PIIS11i]

This singer also wants to perform whatever song anyone else is singing, there is a strong competitive spirit, he really wants to be on the stage and not in the audience. Having a strong enough vocal identity that allows the singer to feel secure in their own voice but which allows them to interpret the feelings of the characters in the song, the opera, the musical play is crucial to a performer's skill. The lack of technical skills, however, can make this problematic.

5.44 Coming to terms with vocal shortcomings

Whenever the singers expressed dissatisfaction with the voice, it suggested an emotional mismatch between what the singer wanted to express and what was actually taking place. This still indicates a strong sense of vocal identity, since even though the singer is not actually achieving the level they wish, the perception of what they do want to achieve is very clear to them.

> *Voice still does not sound like me* [PIIS18Rs-three] *I feel as though the sound should be creamy and relaxed, it sounds thin and weedy to me.* [MS18d]

> *I think the timbre of my voice is too thin and reedy for this song. At least it sounds that way to me, which is interesting in itself. I was always under the impression that for someone with a thin tone like me should never attempt to sing the lovely warm arched phrases of Brahms.* [PIIS18d]

Here it is possible to see the link between all three aspects of vocal identity; the singer reflects on her sound, feels she is unable to control it in the way she wishes and that her voice does not express the feelings that are implicit in the song. While for the purpose of discussion and analysis these three features of vocal identity have been separated out, in order to clarify and discuss their significance, it must be remembered that they are all intertwined throughout the discourse, as singing is an holistic experience.

Many singers were surprised that the recording sounded 'boring'. This suggests that they recalled being very involved, with the meaning of the song and yet it was not coming through.

> *I sound really bored on it if you know what I mean...I need to be more happy do you see what I mean? It sounds a bit ...* [PIIS20i]

> *it sounded thin, just not interesting... but it seems rather lifeless, like it's not very textured* [PIIS7i]

> *I sounded so stiff...I'm dead...yeah I've got no life... any swing to it.* [PIIS14i]

Inexperienced singers do not always appreciate this aspect of performing because they feel personally involved at the time of singing, and have a clear idea of their own performance, but they are not aware of how it falls short. Again this indicates a mismatch between the perceptions of the singer and the reality of the sung sound. It is an important factor for teachers and singers to be aware of. The student may feel they are completely communicating the song but the teacher/critic/audience may not pick up that experience at all. (See the listening study in chapter seven.)

5.45 Musical likes/dislikes

Songs that were different from the singers' usual repertoire provoked interesting responses about their musical tastes. It has been noted in the previous section that this challenge highlighted aspects of the singer's construction of vocal identity; it also revealed how they felt the music played a part in expressing their vocal identity.

> *I get the feeling this is not going to be a song I like very much or lies terribly well in my voice.* [PIIS18d]

> *I'm not saying I didn't like it as a song, it's just I didn't like it for me. I didn't like the way I was with it.* [PIIS18i]

This singer says she didn't like the way '*she was with it*'; an indication that her vocal identity and the song just did not match.

When they were singing a familiar and well-loved song the responses were very different: some singers were also able to identify the kind of timbre required for the song and feel that they had achieved what was needed.

> *I enjoyed singing it, I can hear it in the voice and you can hear that it is more relaxed.* [PIIS17i]

> *...but then again with* [PIIS1Rs-two], *I didn't like the start, I didn't come in very well, the voice cracked at the beginning um, but it sounded comparatively really pure which the song needed and was what I was trying to achieve.* [PIIS1i]

However, it was interesting that that particular sound was not one they necessarily wanted personally to be associated with. Professional singers become accustomed to singing many different roles and yet retain their own identity. Inexperienced singers need to learn these skills, both mentally and physically.

> *...but with* [PIIS1Rs-two] *I wouldn't want people to think that's the way I sing,* [PIIS1i]

> *...but I like this song and it comes through,* [PIIS12i]

Two more features between singer and music are revealed in the data that links the musical qualities of the songs with the sense of involvement and the ability of the singer to express the feelings in the music. '*We do the same music every week and I get very stressed out it's just boring.*' [PIIS20i]; this singer is frustrated by the lack of musical stimulation he needs to keep his interest alive, the school choral director is perhaps unaware of this. Another singer in contrast, finds that the new songs are opening up new experiences for him; '*The music enables you to get that across, the abandonment, nothing constrains me,*'[PIIS21i].

5.46 Feelings and emotions

'Feel' words always require some extra explanation, as we use 'feel' in so many different ways.

> ***And when you are in a good mood, do you think it sounds better?***
> *I think it sounds the same and when I'm a good mood I sing songs that make me feel good and when I'm in a sad mood I sing songs that make me feel sad, that make me feel better.* [PIIS13i]

Singers 1, 4 and 19 used "feel" or "feeling" words a great deal, whereas singers 12, 15 and 21 were more analytical in reporting their vocal experience.

> *Singing lesson, warming up, voice felt comfortable and fairly effortless. Practising* [PIIS1Rs-one] *was fun; I love this piece and feel it suits my voice. Quite hard going on the breathing though.* [PIIS1Rs-two] *felt a bit whispy [sic] but breathing fairly easy.* [PIIS1Rs-three] *Much lower range than used to singing and doesn't feel natural to me at the moment.* [PIIS1d]

Here the singer uses 'feel' in 4 different contexts. Firstly she seems to be describing the physical sense of singing *'felt comfortable'*, then it implies a musical or psychological aspect, she *"feels it suits her voice"*; then she describes what she hears, a wispy sound, and finally she describes feeling unnatural, which could be a physical or emotional response or a mixture of several perceptual experiences.

> [PIIS4Rs-two] *1st run through. Not outstanding day for tone today, feels high for me though nothing above E flat and tessitura mainly below B so it isn't. Enjoyed relaxing into lower notes, I don't like not understanding the text but don't trust this translation. It feels less meaningful so harder to feel at home with it.* [PIIS4d]

Singer 4 talks about the feel of the voice as *'too high'*, a mental blockage or a physical one, or again, a mixture of the two. She goes on to use 'feel' in terms of the meaning and understanding of the song.

> *I feel I am able to relax much more on the top notes and that some of the work on the others has carried over to this one. Now I am more used to the intervals and harmonies it's easier to relax into the sound. I also feel*

> *I have crossed a threshold as I now have some idea what it feels like to have a relaxed jaw and when it is I feel my tone is much warmer. The top notes feel lower too, but I still don't like D.* [PIIS4d]

She also wants to 'feel' more relaxed and then she indicates a psychological barrier; a '*threshold*' has been overcome and then the physical well being follows and she is aware of the tone being *'warmer'*. An acoustic sensation is being noted and then she senses a different experience in terms of the position of the high notes. So many contrasting sensations at one time, confirms the multi-layered perceptions involved in singing. The physical sensations are closely linked with the psychological changes as this singer shows:

> *Can also feel diaphragm and stomach muscles doing their business, even in jazz singing where not necessary to pack such a punch.* [A – her teacher] *complimented me on my voice, I feel quite positive about all this now...* [PIIS19d]

Some singers were able to very analyse their feelings very clearly, an example of Seashore's (1938) 'intelligent' musicians perhaps?

> *Yes I can be quite critical on that now* [PIIS12Rs-two], *I've definitely done it a lot better actually it was a good piece to learn um, admittedly it was quite an easy one, I quite liked that's one thing I do find if I enjoy the piece I learn it easier which is why I didn't like...* [PIIS12i]

This singer is very specific in the way she approaches learning a new song:

> [PIIS15Rs-two] *I did a small amount of research into the composer and the context of the song...I obtained a translation of the words in order to understand the true meaning of the song...Knowing this is fundamental to the performance...in conjunction with research, familiarisation of the notes and the tempo was gained through 'note-bashing' on the piano, listening to a recording of the song and a recorded accompaniment.* [PIIS15d]

> [PIIS21Rs-three] *I tackled the first verse again. Had forgotten almost all of it from yesterday. The best way to remember seems to be to imagine the scene in a series of pictures, the words seem to come to mind more easily that way.* [PIIS21i]

This singer [PIIS21] makes his description of emotional experience sound detached when recalling the experience at interview:

> *You can get carried along with it and also I find that with that, the music gives you more of an opportunity to express emotions.* [PIIS21i]

The ability to be really critical in a detached way is a useful skill and singer 5 was able to listen to the entire recording, pointing out minor discrepancies in the tone she wanted to achieve without undermining her sense of vocal identity.

> *I think it sounds as rich as it ought to, but I can still do better*
> *still be deeper and more supported.*
> *I would have thought it would have picked up where things were not right*
> *some of these little things I've just got to work out in my mind,*
> *how to manage them, it's just a bit of stage management isn't it*
> *and I've really got to be focussed or I'll lose it.*
> *Those really nasty sounds and a couple of them, I was under the note,*
> *and I need to support them.* [PIIS5i]

It does not always follow that the analytical skills and self-criticism result in a lack of emotional involvement. The ability to articulate the sensory experience of singing often produces subtle layers of perception and suggests the foundation of more advanced concepts of timbre.

> *With those kinds of songs I can produce a warmish sound, that's not like, um, a pop-style warm, not sure how to describe it, um, like a, 'I'm supposed to be a big tough guy but actually I'm quite a sweet softie inside', soft voice.* [PIIS12i]

5.5 Summary

How do singers *think* about their voice?

This chapter has shed new light on the question of how singers think about their voice. By exploring the data in terms of the singer's self as described in reflection, construction and expression of the singing voice, it has been possible to see how a 'vocal identity' is established. Reflective language about the voice

indicates the singer is acknowledging their voice as part of their overall identity and sense of 'being' in the world. Language that implies a sense of agency, of the singer constructing the vocal sound, provides further proof of the singer being engaged in the active production of the singing voice. Expressing feelings and emotions through music and the voice, relies on the fact that a certain level of vocal ability has been achieved. These features of vocal identity are interactive in the whole development of the person as a singer and Phase II has shown that these are useful and valid ways of investigating vocal identity.

Vocal identity can develop over time; it can be extended by performance opportunities and it can be creative and exploratory. The perception of a vocal identity can be analytic or holistic, and is in many ways dependent on the personality of the singer, however, active participation seems to be the key to the establishment of a successful vocal identity.

The biggest test for vocal identity is when a singer hears their voice as others might hear it and the recording of the singers presented to them at the interview did provoke a reappraisal of vocal identity for some singers. They had to match what they heard with the mental and aural picture they had established of their voice. (cf. Callaghan, 1999).

The next chapter discusses this internal/external mismatch more fully, with specific references to the interview data after the singers heard the recording of their songs. Many of the points raised in this chapter will be revisited in the

context of the aural readjustment between the singers' internal perception and the externally perceived recording.

6. Auditory Vocal Perception: the mismatch of internal and external experience in the singer

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6. Auditory Vocal Perception: the mismatch of internal and external experience in the singer

6.1 Introduction

The discussion in the previous chapter, though concerned with identifying the establishment of vocal identity within the singers, also highlighted the problems encountered when a singer did not recognise their sound or wish to acknowledge it as their own. Some singers spoke of not liking the sound they heard on the recording. However, the mismatch can be experienced both as positive and negative within the singer's own perception. There are situations where the singer prefers the sound they hear inside and does not want to acknowledge or 'own' the voice everyone else can hear. In the reverse situation, a singer can feel unhappy about the sound they hear in their head and try to compensate for that by altering it when others perceive the external sound as perfectly satisfactory.

Real time visual feedback (Batty *et al.,* 2002) can go some way to give both teachers and singers a tool for discussing the auditory differences but even when trying to match the visual spectrographic image to the acoustic sound it cannot be assumed that teacher and student are 'hearing' the same sound. It would appear that there are fundamental auditory and acoustic differences between the singer's internally perceived sound and the external sound as heard by a teacher or an audience and while this is well established in the research literature it has largely been ignored in many books on vocal pedagogy (Fourcin, 2006). If a singer is establishing a sense of vocal identity but is then confronted by a sound they feel

and hear is not their own, the implications can be significant. This chapter explores how singers react and how the revelation of the external sound seems to affect their vocal identity and discusses whether they experience any benefit from the experience.

The ability of a singer to 'hear' and 'listen' is often under-rated by other musicians. It is a complex area of study and vocal pedagogy books (Brown, 1996) tend to refer the reader to search in the relevant literature. The ability to hear and to store sounds in auditory memory are vital for a singer to progress in their vocal development. One of the professional singers in Phase I made two interesting comments, revealing his skills of auditory vocal perception, '*My ear was caught by a local tenor'* [PISN]. This happened when the speaker was a young boy, it is interesting that he says his '*ear'* was caught. He goes on to talk about the voice change and speaks about the importance of aural memory.

> *I was devastated not to be able to sing so high without hurting my throat. Somehow the whole aural memory of that high register helped me to find my falsetto again a few years down the line.* [PISN]

These aspects of auditory memory will be explored in this chapter and the possible implications for singers and teachers will be noted.

This chapter begins with initial findings from the diary and interview narratives and then examines further references to the literature in response to these results. In chapter five it was noted that the percentage of narrative devoted to acoustic/auditory perception was greater in the majority of singers than any other characteristics that emerged (Chart 5.1), and the second section of the chapter explores particular data relating to the acoustic features of voice and identifies

the common themes that emerge. The third section of the chapter discusses the psychological responses to the internal/external mismatch of vocal perception.

At this point in the data analysis, the need to return to the literature to seek corroboration from other studies in auditory and acoustic fields was identified, particularly as there were relatively few references to the mismatch of auditory perception in the singing pedagogy literature, so the fourth section links the narrative findings with an examination of the current literature. Finally the chapter will close with a look at the implications for the singer, the singing teacher and vocal coach and examine the possible tools for investigating the mismatch.

6.2 Exploring the narrative: the auditory perception of the singer

How do singers hear their voice?

The largest proportion of the data gathered in Phase II interviews (Chart 5.1) featured elements of the acoustic nature of singing and the sense of hearing the voice. Sometimes the references were indirect and implied the auditory awareness that was taking place.

> *It's more about learning how it feels when you're singing not listening to how it is.* [PIIS15i]

> *I wasn't really aware especially of the shaping near the end, I wasn't really aware I had done that and I don't think I did that necessarily in any rehearsal.* [PIIS17i]

> ***I don't hear the weakness in your lower range***
> *... but it feels it, perhaps because what's coming back isn't at the same intensity.* [PIIS18i]

These quotes show how listening is often linked with feeling and how an awareness is not necessarily taking place at the time of performance. The last singer 18 speaks about the intensity of sound which she feels is lacking in the recording, a view not shared by the interviewer. This sense of strength that is heard in the head but not experienced when listening to a recording is one recurrent theme in the data and links the thinking, hearing and feeling aspects of the research questions (see also the discussion on 'strong/weak' metaphors 6.52).

The assumption in a teaching studio is often that the hearing mechanisms and abilities of singer and teacher respond to sound in the same way. Judging by the data gathered in the Phase I questionnaires and the listening study, the singer's ear can react very differently and this is supported by evidence from the literature which suggests that teachers make judgements on the basis of what the outcomes (examination results, audition success etc.) may apply as a result of the evaluation (Fiske, 1994: 75).

6.21 Exploring the narrative: the auditory perception of the listener

When looking at the data gained from the listening study (see also chapter seven), where ten singers' recordings were chosen and played to five listeners; there was a disparity of judgement about the vocal qualities as had been found in the Phase I studies, when singing teachers heard the ten female singers singing Handel (chapter three). It must be acknowledged that there are a number of unknown factors about the hearing of all the participants in both the Phase I and Phase II studies; age, industrial noise induced hearing loss, temporary hearing

loss due to coughs and colds, subjective taste and personal judgement can all affect auditory perception. Individual hearing abilities are an important area for investigation but can only be explored speculatively in this study as no audiometric testing took place. The diversity of judgements in the listening study do help to illustrate the complexities of any study into auditory perception and further discussion of these results takes place in the next chapter (7.5) where the metaphorical language used to describe vocal timbres is also discussed in greater detail.

The important point to note here is the difference in individual response to sung sound between an audience and the participant's perspective. Individuals will pick out certain features in an 'auditory scene' (cf. Howard, 2005) and ignore others. Vocal perception has an element of individual choice which is not always discerned consciously, as was seen in the variety of responses to the same singing sound in the Phase I listening questionnaires, however there was some consistency in the responses.

6.22 Exploring the narrative: consistent themes

Looking at the difference the singer felt or heard between the internal singing sound and that experienced on the recording was, in almost all cases, an experience of hearing higher resonance on the CD feedback than that which was heard in their heads. They also spoke of the strength of resonance in the internal perception as compared to their perception of weak resonance on the recording. There were also several references to the apparent youthfulness of the external sound, compared to the mature sound they heard internally. This does seem to

support the work done by von Békésy and others since 1932 (Fourcin, 2006: 233), in which it has been demonstrated that the transmission of the speaking voice through bone conduction and brain fluids gives internal feedback that is biased towards lower harmonics. These findings seem to have had little impact on singing research except for the work relating to singing in tune and the development of real-time visual feedback (Welch, 1985, Howard *et al.*, 2004), though there is general agreement that the internal sensations of sound are different from the sound heard externally. This seems to be of vital importance particularly when dealing with young or emerging, inexperienced voices who may not be aware of these subtleties. This would appear to be a vital part of a singing teacher's understanding and yet there is very little empirical evidence which corroborate these findings in the real world context.

It became apparent as Phase II progressed that there would be a need to return to the literature for more specific references to the internal auditory perceptions of singers. While the initial survey of the singing pedagogy literature identified this 'mismatch' between the internal and external auditory feedback, there seemed to be few studies in this area. Speech science and psycho-acoustics were two of the disciplines where this had been explored in some detail.

6.3 Examining the literature on auditory vocal perception

6.31 Timbre

While the perception of vocal pitch may be relatively easy to explain, the perception of vocal timbre is a different matter. Pitch and loudness affect timbre

but the intangible quality of a singer's voice is made up of more than these two features. Moore (1997) discusses the complexities of defining and analysing timbre, suggesting that perceptual differences between sounds are closely related to the differences in the spectra of the sounds, the overall distribution of spectral energy. He suggests that there are a maximum of 37 dimensions to cover the audible frequency range (Moore, 1997: 247). However, he also points out that the transmission path and room reflections can alter the magnitude and phase spectrum of the sound. The distinction between the source and the stream of sound that he alludes to (Moore, 1997: 249) is also relevant.

The source is the physical entity that causes the acoustic pressure waves, but the stream is the 'percept of successive and/or simultaneous sound elements as a coherent whole, appearing to emanate from a single source' (Moore, 1997: 249). Thus vocal perception involves analysis of the stream as well as the source of the sound. If the vibrating folds (the vocalis muscle) are the 'source', then the clicking of vocal fry (pulse register which occurs during the lowest vocal frequencies, a long closed phase of the folds in each vibratory cycle) is a comparatively simple sound to perceive. It is the complexity of the 'stream' that contributes to and stimulates auditory vocal perception. In other words, it is the building up of sound waves from the simple beginnings of vibration to the interactive acoustic phenomena of words and musical phrases achieved in the singing sound that produces the complexity of vocal perception.

6.32 Registers

Registers are a common reference point for describing vocal qualities. Voice scientists prefer to define registers in terms of laryngeal behaviour rather than in acoustic terms and there seems to be general agreement that loft, modal and pulse registers are terms that are less confusing than others (Mathieson, 2001: 78, Miller, 1986: 115-126). However singing teachers and pedagogy books still refer to head, middle and chest qualities when describing vocal timbre. The physical sensation of singing in these different ranges and the ease of relating these to familiar places in the body seems to explain the predominance of such terms amongst singers, even when they are not fully understood and do not relate to the physical adjustments taking place.

6.33 Loudness/harmonics

While loudness does at first appear to be different from timbre, there are changes in the harmonic spectra when the energy is increased and the singer sings louder. Thus it would appear that the loudness of the sound increases the amount of energy in the higher harmonics as compared to soft singing, thereby affecting the timbre (Rossing *et al.*, 2002: 388). If a singer sings at different pitches, the relationship between the fundamental and the harmonics result in a change of timbre, but equally the same pitch can be sung using either 'chest voice' or 'head voice' and create differences in the frequency patterns. It is common for the inexperienced singer to complain that the song feels 'too high' because it needs to be sung with more energy and the voice responds by favouring the higher harmonics. This is illustrated by the different approaches in solo or choral singing, where the solo singer will tend to employ a more prominent singer's

formant in comparison to the choral singer (Rossing *et al.*, 2002: 390). Sometimes the lack of a strong auditory feedback for a choral singer when singing with relatively fewer harmonics can affect their ability to pitch (Sundberg, 1987). Internal head-borne transmission has been discussed already but it is important to reiterate that the internal head transmission paths, while having an impact on the sensation and monitoring of the voice, may differ from person to person (Fourcin, 2006: 233).

6.34 Auditory memory

When people make judgements about musical sound, there are those who look for 'correct' evaluations and those who are better at making relative judgements (Fiske, 1994: 79). But as well as these differences in cognitive approach, the storage of auditory memory governs the ability to assess, perceive, retrieve and produce sounds. The phonological loop in working memory is complex and sounds will be interpreted and stored in terms of their meaning as well as in some auditory form. It is possible to recognise familiar sounds and familiar voices and remember melodic phrases and large passages of music.

Arguably the most important sets of sounds perceived belong to speech but the formants of phonemes differ depending on which phonemes are combined together. The motor theory of speech perception suggests hearing speech is according to the way it is produced, in other words, it is a perception based on action (Styles, 2005: 155). Sounds are initially stored in 'echoic' memory and can then be transferred to long-term memory. Baddeley (1996) identifies the phonological loop as having two interacting parts; the phonological store that

contains speech-based information, and the articulatory store that is based on inner speech. These have been called the 'inner ear' and the 'inner voice' (Styles, 2005: 153). Singers tend to make use of both these 'aides memoires' whether or not they are fully conscious of doing so (Tomatis, 1991).

Auditory memory also offers some explanation for the continuing acuity of the ear in maturity when the ability to perceive the highest frequencies has begun to deteriorate.

6.35 Lack of sensory feedback

One of the difficulties for singers is that while the larynx may have some sensory nerve endings that trigger important reflexes these are not dependent on conscious perception. Both the diaphragm and the larynx have been poorly supplied with proprioceptive nerve fibres.

> Perhaps the brain has evolved so that the structures that are essential for breathing and life, the larynx and the diaphragm are "protected" by not being able to be brought to conscious perception and voluntary intervention. (Davis, 2006: 219)

Thus a singer has to rely on the many other forms of biofeedback and auditory memory available. Investigating the psychological response to the auditory experience can provide some further elucidation of the complexities of vocal perception.

6.4 The psychological response of singers to the mismatch of internal and external auditory feedback

This section will examine the initial responses of the singers to the CD recording. It will look at both the positive and negative effects of coming to terms with the external sound. It will discuss the different strategies for re-adjustment by the singer and also examine the possible influence of physical health and the changes that take place during puberty. The influence of the teacher and of different teaching styles is also discussed where it figures in the data. Finally this section will address the awareness of an inner ear and inner voice in some singers and the problems of singing close to another singer.

Table 6.2 which follows, shows some of the responses of the Phase II singers on hearing the CD of their songs played to them at the post-recording interview.

6.41 Hearing the external recording of the voice: initial responses to the mismatch of auditory vocal perception

Table 6.1 showing the responses of singers to hearing the recording

Singer	Higher on recording	Like you or not	Lower on recording
1		*No*	
2	*It sounds very young*	*No*	
3	*High girlie voice*	*Not really*	
4	*Sounded thin*	*Not really*	
5	*Could be richer*	*My voice is as it is*	
6	*Lighter and higher*	*No*	
7	*I thought it was more deep, rich* *I sound a lot younger*	*No*	*It sounds older as well*
8	*It sounded breathy and hollow, it's weak*	*No*	
9	*Lighter and purer* *Old-fashioned sound*	*Not really*	
10	*Not strong enough, the recording sounds higher*	*Kind of, it felt like someone else*	
11	*It's very quiet*	*It sounds really weird*	
12		*It doesn't sound anything like I think I sound*	*I don't hear the same pitch at all, it always seems a couple of notes higher in my head*
13		*Yes, 'cos I record myself a lot*	
14	*I sound so high I sound like my younger sister*	*No*	
15		*Yes , I'm used to hearing myself on minidisk*	
16	*It's quite a shrill tone, I think I've convinced myself I've got a warmer richer tone*	*That's quite a shock actually, I didn't realise I was quite so quavery*	
17		*Yes, but it's a lot richer and deeper than I thought*	*Deeper*
18	*It's terribly young, it's shallower than it sounds in my head*	*No*	
19	*That's high*	*Well if anything it sounds a bit fuller, I don't know whether it sounds like me*	
20	*It's not as warm as when you sing it*	*Just about, but it never sounds like you*	
21	*It's got a bit more resonance than I anticipated*	*Yes, it does it's not as thin and tinny as I thought it would be, because my tape recorder is not as good as your CD player*	
22	*I think my voice was singing a bit higher than my voice wanted to*	*Not really*	

All the singers comment on their sound in the recording: for some, it was a revelation, for some a pleasant surprise, while others expressed some disappointment. Some singers were very used to hearing their own voices, albeit on amateur recording equipment. The two singers who felt that the recording sounded lower than the internal feedback were singer 12, a boy whose voice was only just begin to settle after puberty and whose auditory memory may not have adjusted to the changes, and singer 17, a female singer who experienced a lot of sinus problems whose internal sensations would be compromised. This suggests that periods of vocal change or poor health may also indicate sensory changes, and that these altered perceptions may create a different acoustic experience internally. In future research the use of accurate audiogram testing would help to verify this.

> *I think the other thing about it generally is that my voice seems to be more resonant than I thought it was... that's the biggest surprise really, there's a kind of warmth I didn't think was there, um, maybe because my tape recorder's not as good quality, as your CD player, um... I think there are little details that tend to spoil it, like I'm holding on to those, too long and some of the notes get lost, I need to hold them on longer and when I listen there are some bits that aren't bad at all and you think well, the whole thing could be like it wouldn't be bad. So there are moments when you think that's not bad at all, patchy* [laugh] [PIIS21i]

> *I'm actually quite, sort of, amazed at the sound I am producing because I didn't think I would be able to achieve it like that.* [PIIS21i]

In this case [PIIS21] the singer is a retired teacher who has just started studying singing. Without actually undertaking a hearing test it is difficult to conjecture what were the levels of his auditory abilities. In his diary he writes chiefly about the theory, sight-reading and aural exercises he is working on. It is only very rarely that he refers in his diary to his own personal sound quality but he does respond to this quite clearly in the interview when prompted by the recording. He can obviously hear his sound when it is on CD but it would appear, by his

reaction, that he has not particularly taken note of this during the performance for the recording and this could be evidence of an aural perception that is under developed, or a slight hearing loss, or a mismatch between auditory and psychological memory. He was one of the older singers in the study and there could be other possible explanations, his inexperience as a singer, for example. What does emerge is that while he was not consciously aware of his vocal sound when practising at home or even when making the CD but when confronted with the sound of his voice on the recording he is able to articulate his ideas more clearly.

6.42 Positive and negative effects of hearing the voice externally

Some singers had very immediate responses on hearing their song on CD.

> [PIIS18Rs-three] *Bloody hell!*
> *I didn't think I could sing like that!*
> *Did you know I was going to be surprised at that one? That's not me ...that's nearer a complete performance than either of the other two by a long shot.* [PIIS18i]

Singer 18 was completely surprised by the third track as the opening expletive illustrates. She was obviously delighted with her performance and felt there was a significant difference in vocal quality between the final song and the other two on the recording, something that was less evident to the researcher. It provokes an interesting question as to whether, in fact, it was the impact of the music, or the actual vocal quality she created that produced the response. Again, this illustrates a psychological component within vocal perception that is apparent but difficult to measure.

The psychological scene of a singer's performance is highly complex and often when a singer is in a learning situation the perceptual judgment has different parameters to the ones that might be adopted on hearing the same performance in recall. The following quote illustrates this clearly, the singer has tape recorded the lesson but is pleasantly surprised when listening to it at leisure.

> *Have just got round to listening to my tape of above lesson and interestingly the tone was not as bad as I had felt it was that day. It also improved noticeably as I got to grips with the 6/8 keeping it much stricter and allowed the words to find their natural speech pattern. I certainly don't have it tripping off the tongue yet but I think if I work on it, keeping it all very strict for the moment and concentrate on the speech pattern, the whole piece might find a bit more space.* [PIIS17d]

Singer 20, a very experienced boy treble who had made many professional recordings as a soloist and with his choir, recalls the difficulties he has in recognising his sound on CD.

> **Do you think it sounded like you?**
> Just about, but it never sounds like you. I've got a recording when I was a treble and I thought 'Is that me or did you get some other person to do it?' but they said it was me. [PIIS20i]

Singer 16 was not used to hearing herself on CD and was visibly unnerved during the play back and interview. However she goes on to acknowledge in the interview, that the process, however painful, had been a useful experience and taught her more about her voice than hours of lessons.

> *That's quite a shock actually, it must do I suppose, I didn't realise it was quite so quavery.* [PIIS16i]

This singer has anticipated the sound as she was used to hearing herself on mini-disc, but she can still recall her shock and surprise at hearing her singing sound.

> *It sounds like I thought it did, I sound quite tight and I was sharp and now I'm flat and all those things. I've heard it like that before.*[PIIS15i]

Interestingly when asked if it sounds like that in her head she explains that she is trying not to listen but to feel the sound:

> *I'm trying not to do that 'cos I did when I first started with A* [her teacher] *about 2 and a half years ago, I was listening to how I was singing and it was getting in the way so I try to stop listening and listen to it afterwards to try and correct it. It's more about learning how it feels when you're singing not listening to how it is, so it's kind of changing that mental thought process, it has definitely had a ...you've kind of picked me up in the middle of the process. The last year and a half there have been real challenges; if you'd listened to that a year ago it would be different again I suspect.* [PIIS15i]

The following young singer, aged 12, was happy to accept his sound, he was very used to recording himself and he tended to hear his voice only in terms of its pitch, or his state of health. The subtleties of vocal timbre were still not articulated fully though his diary was very personal and distinctive, with added pictures and stickers awarded for his own efforts.

> ***Does it sound like you?***
> *Yeah 'cos I record myself a lot so...*
> *Yeah I was quite proud of that.* [PIIS13i]

Singer 11 was used to hearing his voice, having completed his GCSE recordings the previous year, but he still acknowledged the '*weirdness*' of the whole experience, as do the others.

> *Yes that's the first recording that sounds like me, no, not really the GCSE ones are... Okay, that's really weird, when you listen to yourself does it sound really weird?* [PIIS11i]

Another singer, a year older said; *'From personal experience I know that what I sing does not sound to others as it sounds in my head.*'[PIIS12d] but then acknowledges that it is difficult to match up the sounds in his head with the sounds that come out, '*I still have to admit it doesn't sound anything like I think I sound.'* [PIIS12i]

One of the professional singers from the Phase I spoke about her reaction to hearing a pirated recording made by a fan many years previously and played to her, years later:

> *A man came and said I'd like to give you a little present and it was CD that he'd pirated at various performances I'd done in the 70's at Sadlers' Wells and places like that and so I came back and there was me, 30 years ago, and it wasn't me, it was another woman, another singer, so that was very strange, I was quite impressed I must say hearing it with 30 years' difference, though I never could listen to myself, I could not listen, I hated it, I was, I always felt the tuning wasn't right, it was ergh!* [PISJi]

Thirty years on she barely recognises herself and though she admires it from a distance it reminds her about all the times she has had to listen to herself, presumably on recording industry CDs and not been happy with the experience. She goes on to say that with the perspective of thirty years '*you are not seeing it as a personal thing at all...you are using different critical faculties*'; she acknowledges that it was a real bonus.

6.43 Lack of recognition but then re-adjustment to vocal identity and vocal perception

Some singers were very clear that there was an obvious mis-match of vocal perception *'It doesn't sound like me'* [PIIS8i]. Others could compare the memories of the singing sound over time and could explain why the differences in timbre were apparent, '*I'm hearing a much fuller sound* [in her head] *but the thing is, the early tapes I have it, I get a proper warm up. I have an incredibly full powerful sound but it never comes through unless I've done a proper hour of practice'* [PIIS9i].

The same singer also makes an interesting evaluative comment about her timbre, *'It's when I'm hearing a nice sound inside that it's very pure coming out'* [PIIS9i]. This suggests she has come to accept the differences between internal and external voice colours and has decided which sound she prefers. This singer is still young (aged 17 years) but perhaps with feedback from parents, peers and teacher she has identified the sound she wants to maintain. This does pose questions for teachers. With very young, emerging voices there is a danger of using labels, like 'pure' and 'sweet' when the voice has not finished maturing and which could well develop more complex vocal colours that the singer may find hard to accept as their own. This singer may wish to retain the 'pure' sound she has identified as her own, with the possible encouragement of teacher and parents.

Teaching developing voices requires the flexibility to adapt to the changing vocal identity as the vocal timbre becomes increasing complex and versatile. Young singers can be left with the unsatisfactory feeling that their emerging voice is not something they can identify with, *'It didn't really sound like me, you can see the similarities but it still felt like someone else'* [PIIS10i].

For some singers there was a clear re-adjustment to their self-perceptions as the interview progressed and some singers can be seen to identify the voice within themselves by the end. How much this is due to songs they were singing, or the immediate auditory adjustments being made, or the realisation that it was really their voice and once they had got over the initial shock they could identify it more clearly, is difficult to say.

Singer 21 found that he could identify his sound but that there were differences, he was one of the older singers and as a retired teacher he had probably become used to hearing his speaking voice even though he was an inexperienced singer, '*yes it does actually, yes, but it doesn't sound as thin and tinny as I thought it might, it's got a bit more resonance in it than I had anticipated*' [PIIS21i].

The problems of identifying what the singer experiences from the words used in the narrative exposes the complexity of the aural experience. Singer 20 says '*It's not as warm as when you sing it...*'[PIIS20i], which suggests that the internal experience for her when singing has more harmonics in the feedback but it could also suggest an emotional feeling. 'Warm' has different connotations depending on context.

Singer 14 got to the third song on the CD [PIIS14Rs-three] and then said '*This to me sounds like the way I sing it now, for the first time it sounds like my voice, how I sing it.*' [PIIS14i] This could be due to recognition of the song as being closer to her style or it could have been the ear adjusting to the recorded sound.

The following narrative illustrates the difficulties involved in articulating the experience of hearing sound from a different perspective. There seems to be a kinaesthetic response as well as an auditory one. The singer also refers to her sound as being older and complains that she does not sound as mature as she was expecting to sound. This was a very confusing experience for this singer as she thought the recording sounded both younger and older than she was expecting it

to (see Table 6.1). It illustrates the difficulties of articulating vocal timbre and the lack of vocabulary to articulate differences clearly.

> *I don't know, it just doesn't sound like me. I don't know, it's just that it doesn't feel like how I sound at all when I sing*
> ***So how does it feel when you sing what's different about it?***
> *I don't know* [silence] *I think my vowels sound a bit different and I dunno, I thought it was more like deep, rich. It's kind of normal*
> ***It sounds richer, deeper when you're singing than how it comes out?***
> *Yeah I dunno, and it sounds older as well. I think, when I'm singing. I don't sound so adult* [PIIS7i]

This was a younger singer and as can be seen in the following two sections, general health and hormonal changes also contribute to the mismatch of auditory perception.

6.44 Influences of general health on the mismatch of auditory vocal perception

The following three quotes from singer 1 indicate possible blockages in the nasal area that have affected her perception of the sound quality. She articulates very clearly the strange experience of recognising a sound as being one's self and yet of not being able to identify what exactly is strange about the sound.

> *It doesn't sound at all like you think, I mean I know I had a cold but it sounded much more nasal than I thought, it sounded as if I was singing through my nose, which was quite weird.* [PIIS1i]

> ***What song sounded most like you?***
> *I don't know, I think they all sounded like me.* [PIIS1i]

> *You can hear it exactly how it sounds, even if you put your hand up to your ear and listen to when you are speaking which is what I try and do sometimes. I could feel it was me, the noise sounded like me but a strange 'me'. A 'me' that had had something changed about it, which I couldn't quite work out.* [PIIS1i]

At one point she can say that all the songs sounded like her and then later she describes it as being a 'strange' identity. This illustrates the complex relationship

between the singer's sound and the vocal identity already examined in Chapter five. This confirms the validity of using an holistic approach to the voice.

> *What I hear is important, when my Eustachian tubes are blocked I can't sing very well. If I pop my ears and someone is listening they say that they can hear the difference and this is also when I am at the piano and can't hear myself.* [PIIS4i]

This singer discusses the difficulties she has when her ears are blocked but also the effect of the piano masking her aural awareness when she is practising. The value of studying singers in the context of performing and rehearsing cannot be underestimated. Auditory perception is affected by so many factors that can be often overlooked in laboratory studies and the evidence presented in these data confirms the complexity of vocal experience.

6.45 Influences of pubertal change on the mismatch of auditory vocal perception

Voices undergoing vocal change are an example where auditory and the physical skills are often not co-ordinated (Monks, 2001). With young singers there can be a feeling of loss of control, of the voice being unable to do what it wants to: this singer has not yet achieved a sense of being able to control the voice herself.

> *I think my voice was singing a bit higher than my voice wanted to. I sound a bit scrambled.* [PIIS22i]

'*Scrambled*' suggests confusion both in physical and cognitive senses in the singer and many of the singers felt unsure about their capabilities, '*It is a lot richer and deeper than I thought I was capable of*' [PIIS17i]. Another singer said '*I don't get the higher sounds in my head, I'm doing things without noticing them*' [PIIS10i]. This singer is becoming conscious of the unconscious aspects of

her singing; the recording is helping her to identify aspects of her performance that she feels she could control once she is aware of them.

Some singers had a particularly mathematical and concise notion of the 'space' of their voice, '*I sound so high, yes it sounds like my voice is double the height*' [PIIS14i]. Again this singer comments on the difference between the feeling in her head and the sound on the recording, a comparison between a kinaesthetic perception and an auditory perception. So many singers commented that the recording sounded higher than the sound they were used to hearing in their heads, the room where the recording was played back could have been another hidden factor. The majority of playbacks occurred in the same room that the recording had taken place, or a similar sized room.[3]

Both the following singers talk about the sound being lighter and higher on the recording. Singer 6 is adjusting her vocal perception and identity as she talks through the experience. Singer 7 also adjusts her vocal identity and decides that she too likes the sound of her recorded voice. Both girls were in late adolescence, coming out of the period of pubertal change in girls' voices where the voice is at its most unstable and breathy; the experience of having some feedback enabled them to reappraise their sound.

> *No, it sounds lighter than how I feel it in my head,* [PIIS6i]
>
> *Well, I think it's like when you speak and you hear yourself recorded and it doesn't sound like you but it does sound a lot lighter than when it does*

[3] Singer 2 and 3 heard their recording played back through headphones on a 'Walkman' but in both these cases the response was that the recording sounded higher and younger than they had anticipated. It was after these interviews that the researcher decided to play back the CDs in a compatible room using the same playback machine at each subsequent interview, just in case the playback equipment was affecting the results.

> *when I'm singing, it feels like it's a lot heavier, a lot lower and I prefer that to what I hear in my head.* [PIIS6i]
>
> [PIIS6Rs-two] *mm, yes, that sounds nice as well, again it doesn't sound like I think, it also sounds a lot higher than when I hear it in my head, I don't know why that is?* [PIIS6i]
>
> *There's a lot of brightness in it than I thought there was...*[PIIS6i]
>
> *I think the 3rd one I did, it's also interesting to hear that my voice is a lot stronger on the top than I thought it was, like on my higher notes. I felt I was a lot securer and it was a nicer sound and maybe I should do more high things...*
> *I always thought my low voice was a lot better but actually I think my high voice has improved a lot.* [PIIS7i]

Of course, vocal change is a factor for all young singers, in particular pubescent boys, and two in this study identify the mismatch they experience between the treble and emerging baritone sound. Teachers of singing may assume that the aural skills have caught up with the physical changes taking place in the larynx. The work of Tomatis (1987/2005) suggests this may not always be the case as the following example illustrates:

> *I mean I don't hear the same pitch at all, I think it's something personal really,*
> ***No, lots of people find that the sound goes through the bones...***
> *Yeah but it always seems a couple of notes higher in my head. I always find trouble pitching because it's always not what's in my head,*
> ***Okay...***
> *Which is why?*
> ***So you think it sounds higher in your head?***
> *When I'm thinking it but also sometimes when I'm singing it, which is why I have a tendency to go an octave up,*
> ***That could be because your voice is just getting used to being an octave down, now that it's in your baritone range,***
> *True, that is why I also think, I find it easier to learn it from the piano, if I've heard the piano before hand, just 'cos it's easier.* [PIIS12i]

It was not uncommon to find the singers demonstrating with their hands the perceptual effects they experienced inside.

> *It's shallower ... it sounds* [makes a horizontally narrow space with hands] *than it sounds in my head.* [PIIS18i]

Here singer 18 demonstrates that the sound on the recording is not as full as the sound felt in the head. This aspect of internal resonance has implications for microphone techniques. So much vocal performance is now amplified and many successful singers work happily in recording studios and 'radio miked' up on stage. An opera singer, on the other hand needs to fill a large opera house using natural means of amplification. The differences between the internal and external sound are difficult to measure but chapter eight begins to explore this feature of vocal perception through the perception of space and movement in the voice.

Returning to possibly the most significant period in the life of a male singer, the change at puberty; the following three singers were identified as emerging from that period of change and coming to terms with their new sound. The first singer expresses a sense of loss, as he had had very positive experiences as a treble in one of the top choral establishments in the country. The other two boys still feel it is their own sound. This confirms earlier research into adolescent vocal identity (Monks, 2001) when boys, having emerged from the five stages of voice (Cooksey, 1992), feel the new baritone sound has returned to the qualities of their treble voice but an octave lower (Monks, 2003). There were also incidents in the narratives of the Phase I singers who had experienced memorable vocal change in adolescence (see chapter three).

> ***About the change?***
> *It's a bit sad really I liked being a treble, but never mind... I just kept singing straight through it, I think loads of people do different things, they stop for a year... 'cos I think I found it difficult when I wasn't singing so much everyday.* [PIIS20i]

The need to keep singing can be as a result of wanting to stay as a treble voice, or it can be the pleasure of singing whatever the vocal range.

> ***And do you feel your voice has changed, as a treble you used to sing in the Abbey?***
> *Yeah as a treble, oh god, how long ago was that now,*
> ***Can you remember how it felt? What it sounded like?***
> *It was a lot higher, but to be honest in my mind it hasn't changed, I know it has changed but in my mind,*
> ***It hasn't changed?***
> *No, and I can still reach quite high in falsetto, uh, which in cases is worrying.*
> ***No it isn't, every man is capable of doing it, they just don't choose to...***
> *Ergh, but going to the high soprano is still a bit worrying.* [PIIS12i]

The singer says singing back in the high treble sound is unnerving, he calls it soprano now which suggests he is aware that it is the female range and inappropriate for him.

> *I thought it was more gravelly but that was because I was singing it slightly lower but on the first one it was pure and but I could go quite loud in places. I think I was sort of making a nice sound but my own sort of sound.*
> ***Do you feel that sound portrays your character?***
> *Yeah probably,*
> ***Your voice has changed quite a bit over the year, how has that felt?***
> *It's weird because you've got to try and sing but you can still sing through it because one minute you've got to sing the high notes in the school choir and then all of a sudden it just drops but you get used to it and you can still sing the songs you love to sing, just change them to suit you.* [PIIS13i]

This last singer is using the songs to help manage the change and he also shows a strong sense of being in charge of the change and his own vocal personality. Singer 12 identifies the possible problems of retaining a feminine sound but also seemed quite relaxed about it. Adolescent voices, in particular, go through a phase where the vocal quality is breathy and unfocussed, and with boys, the pitch and range of the voice changes dramatically. It is due principally to the physical changes taking place in the larynx, the laryngeal mechanism increasing in size and the development of layers in vocal fold tissue; but these may not be the only factors involved.

One factor may be the hearing ability of the singer. In a previous study (Monks, 2001), a young singer who was experiencing prolonged breathiness into her late teens gave her teacher some cause for concern. It was suggested that she arranged a visit to an ENT surgeon for a laryngoscope investigation: it turned out that her vocal folds were perfectly healthy but that she was deaf in one ear. This confirms the importance of adequate auditory monitoring of singers at all ages; the voice can only sing what it hears (Tomatis, 1987/2005: 131).

6.46 Influences of teacher and teaching styles on the mismatch of auditory vocal perception

The relationship between singer and teacher is often a very close one. The teacher is the external 'ear' of the singer and has to nurture, guide and develop the singer in the long-term development of a unique sound. It is no surprise to find evidence in the data of the singer's reliance on a teacher's judgement about vocal timbre. Singer 4 is very aware of her own limitations when it comes to hearing and how difficult it is to achieve the vocal sound she wants to create. She is also aware that her own perception is not always to be relied on and she trusts her teacher for re-assurance.

> *I'm very aware that that's where things go wrong. I'm trying not to anticipate it. I think I can hear the sound I want and I don't get it very often, I want the sound that sounds OK. I think that I did have to get used to that's what I sounded like, I know sometimes I've fluffed a note and my teacher will say, no that was good, I think it's been awful and actually it sounded OK. I'm more comfortable with F's and G's my E flat and E are terrible. I don't think my understanding of resonance, when the high notes come out like that it doesn't sound like me singing. The long note sounded fairly resonant. I lost support in the end.* [PIIS4i]

Further discussion of the relationship between the language used by teachers and students will take place in chapter seven (7.3), when the metaphorical terms in the data are examined.

6.47 Using an inner voice and an inner ear

The description of 'inner voice' and 'inner ear' that Styles (2005: 153) refers to, identifies two components of working memory that help to store acoustic information into long term memory. The inner ear is picking up the acoustic information and the inner voice is like the articulatory processes of sub-vocal speech. The singer experiences this 'rehearsing' of speech in order to retain the lyrics of a song in the memory; a singer can also use the musical patterns of the song to aide this aspect of memorisation. It would appear that singers can also 'rehearse' their songs internally using another voice.

One thing that emerged in two of the singers was surprising and it prompted a re-examination of the data and literature to investigate the matter further. This singer revealed in the interview that he had been using his teacher's female voice (my voice) in the internal rehearsal of the song.

> ***When you compare listening to it with what's inside your head how does that feel?***
> *Oh I don't sing it in my voice,*
> ***You don't sing it in your head?***
> *No I sing it in <u>your</u> voice,*
> ***Oh heavens!***
> *I'm not joking. as in like because you know, oh sorry,*
> ***Don't be. I'm embarrassed that you're singing in your head in my voice.***
> *No, no, 'cos when I was having lessons with my old teacher I used to sing in his voice, because he's basically the equivalent of your voice, but in a male, really strong so I'd sing it in his voice because if you sing, I just*

> *remember this, when I was rehearsing, practising that German song, I'd sing it in your voice,*
> ***So you could hear me singing it?***
> *Yes but then I'd sing, if I just thought, but then I'd sing it in my voice,*
> ***Would you say you had a strong memory for voices?***
> *Yes reasonably, yes I suppose, but I can also sing it in my voice but if I wanted to know how its done, I can just remember what you sang it like; the way you sang it and the same when I worked with A* [his previous teacher]. [PIIS11i]

The imitation of his teachers' voices appears to be a genuine experience, associated with learning a difficult song, but this singer also used all sorts of recordings to learn new material. The singer was a natural performer and had played many roles in school drama, including the pantomime dame. He had a good ear for mimicry and yet he found it difficult to listen to instructions in a lesson. It appeared that he could pick up the timbre of his teacher's voice in his auditory memory in order to learn the nuances of the language and the levels of expression required. [4]

The question still remains: why do singers choose to hear another voice inside? The role of echoic memory may have a bearing on this but it is also important to be aware that the recording industry has given easy access to vocal models, straight through the earpiece, to so many young people. The rise of Karaoke and television talent shows is further evidence of this desire to imitate other singers.

It could also be something to do with a singer's personality and ability to 'mimic' others. The desire of young singers to emulate the current pop stars of the day is

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[4] In a singing lesson where both teacher and student are sharing vocal perceptions and experiences, some students will find it easier to follow visual and physical cues, other auditory, others metaphorical and others psychological strategies. For some students the dynamic of the lesson may be so unnerving, singing in front of someone else, that no learning takes place at all. Good teachers can often intuitively adapt their teaching to the student's optimum learning style but there appears to be little evidence that teaching programmes include this element of pedagogical expertise.

often discussed anecdotally but this example is of an older singer adopting similar techniques to develop her sound.

> *At the back of my mind I can hear singers singing this but that's not helpful but it's interesting because I've just been doing lots of jazz singing in a lot lower range and I don't know whether that's colouring the way I hear it because in some ways it sounds a bit, oh that feels a bit high and I can't tell whether it really does sound like that or whether my perception I mean.* [PIIS19i]

> *Going back to the Jazz singing, I know we're not supposed to be talking about that, I'm actually getting really into it and I'm making a deliberate effort there which I think is reasonably successful, trying to make different sounds...I mean some of the songs are by Ella. I'm not saying for one moment that I will ever sound like her but I'm aiming for that sort of sound and there's one by Marilyn Monroe, so I'm trying to sound like her, so as A says I'm trying to put more sounds in my armoury so I sound a bit like Cleo, I'm thrilled so to some extent I am but trying to sound like other people and it actually makes for quite a varied thing.* [PIIS19i]

One aspect that does shed light on this is the difficulty experienced when the 'inner voice' cannot be heard because of the close proximity of someone singing much louder as can happen in certain choral situations.

6.48 Choral singing: problems arising from singing next to someone else

In the Phase I data singers who sang in choirs often mentioned the problems associated with singing next to a strong singer in a choral setting, and in Phase II another problem was identified, that of having weaker neighbouring singers. '*I find it difficult being next to people who don't try and can't be bothered, they just don't care*' [PIIS12i]. This singer finds the lack of empathetic response from his fellow choir members is having a detrimental effect on his own singing. Whereas this singer finds that the strong singers in the choir are really affecting her ability to hear herself sing and she highlights the dangers of trying to make her own voice heard.

> *When somebody's standing next to you and singing really loud with a really powerful voice and especially when it sometimes isn't quite in tune. It's not that she's a really awful singer – it's when she pushes. I think a lot of people of my sort of age, when their voice is developing a lot, a lot of power is starting to come out in the voice, they sometimes don't know what to do with it and it gets out of control and when you're standing next to someone like that, you don't realise you're doing it sometimes. But you try, so that you can hear yourself and they're not in your ear, but with her it's impossible and I ended up losing my voice.* [PIIS1i]

Another young singer expresses a similar feeling:

> *Some are OK, some are enthusiastic but some sing operatically in choir they sing really loudly in these huge squeaky voices and everyone gets annoyed with them.* [PIIS20i].

In the diary of one of the professional singers [PIpsd-two] in Phase I, the singer spoke about the negative attitudes of the singers around him, making his voice feel small and insignificant and reduced in value (see 3.62).

The next section brings together the main themes that have emerged from the narrative by looking at the specific vocal descriptions highlighted in the internal/external auditory mismatch: higher/lower sounds and thinner/thicker sounds. It will link these findings to the literature and will also look at the impact of strong/weak descriptions, older/younger voice qualities and the perception of spoken accents.

6.5 Linking the narrative and the literature: specific vocal qualities identified when articulating the mismatch of auditory vocal perception

6.51 Linking the narrative and the literature: higher/lower, thinner/thicker sounds

One aspect of the internal auditory experience that emerged clearly was the amount of high or low resonance experienced by the singers, but this also seemed to be linked with a thin or thick quality in the sound. While not unanimous, the majority heard this mismatch of acoustic resonance specifically enough to make some comments about the height or depth of sound, the richness, or thinness, or the light or heavy nature of the sound.

> *It sounded thin, just not interesting.* [PIIS7i]

This was a confusing experience for some who could not decide whether it felt higher than they heard or lower. However the general consensus appeared to be that the sound they heard inside when they were singing favoured the lower harmonics, which is consistent with current research on the speaking voice (Fourcin, 2006).

Tomatis (1987/2005: 66) describes three auditory circuits that operate during singing. The first and in his words, the best, is bone conduction, and then he identifies the two circuits which arise in the larynx, the air conduction which relies on muscles and tendons and then the mouth circuit which he maintains is not good because the air is dispersed in such complex ways as to give a false impression. He also suggests that the preponderance of low pitches singers hear is due to the low frequencies expanding in a circle 'bathing the outside of the ear'. The distinction of the two auditory circuits in the larynx is a curious one but

can be useful as it illustrates that the air vibrating immediately above the larynx is still in a tube whereas the air vibrating in the mouth and pharyngeal area is in a more complex space and gives rise to more complex acoustic patterns as well as kinaesthetic sensations. The singer perceives the air vibrating immediately outside the ear as lower in harmonics and this is confirmed in part by Fourcin (2006) and by the response of the singers in this study to hearing the lower sounds they experience when singing. Thus the proximity of the lower frequencies in the acoustic pattern of the air waves around the head add to the internal perceptions of a lower sound through bone conduction.

As already discussed in chapter four (Table 4.1), Thurman *et al.* (2000) suggest that the use of muscles in the larynx produce vocal qualities that cause but also reflect the acoustic pattern. The 'shortener-lengthener' muscles, the thyroarytenoid and cricothyroid, produce these effects. More shortener than lengthener muscle use, gives a light thin tone and more lengthener than shortener muscle use, gives a thicker and more full-bodied tone.

The question arises as to whether there is a link between the action of the larynx and the ear. There seems to be little evidence in the research literature and no empirical studies that address this specifically in singing except for the work of Tomatis.

The work of Alfred Tomatis in the 1950's was seen at first as a bit eccentric. He began his study of singers because his father, a well-known professional singer, referred fellow singers to his son (Alfred Tomatis was a specialist doctor in

auditory problems) if they were experiencing vocal problems. Tomatis studied the ear and its functions with particular reference to those injured by excessive engine and bombing noise during the Second World War. When he began working with singers he noted the relationship between their auditory abilities and the health and function of the singing sound. It is only in recent years that his work has been corroborated by research programmes in Canada and the United States (Leeds, 2001). His premise that the ear is the superior regulator for the whole body has had an impact on learning programmes as well helping non-singers with hearing loss. However, the singing profession has been slower to catch on to the important principle of maintaining an active auditory vocal perception when singing; what Tomatis would call a 'listening posture'. The ear, connected as it is to 'the brain, the nervous system with all the peripheral nerves, both motor and sensory, and the muscles used for singing' is the key to balanced vocal production (Tomatis, 1987/2005: 68). While some of his explanations are unreliable, the observations he made from the singers he worked with suggest that the ear may have greater importance to vocal development than has hitherto been acknowledged.

Experiencing the voice as high or low, thick or thin is, in acoustic terms, the perception of formants in the sung sound. There are suggestions that some perceptual dimensions of the voice quality might be physiological (Sundberg, 1999: 194); the high larynx position that produces an increase in the formant frequencies, for example, can result in a description of vocal quality that is 'high'. Sundberg says the 'perception of voice seems to be very influenced by one's acquaintance with one's own voice' (Sundberg, 1999: 194). This implies

that singers and their audience are responding to the singing sound they hear by measuring it against their own voice and the perceptions they associate with singing themselves. When the singers and listeners hear a recording they are responding to the feelings they experience at laryngeal level as well as all the other aspects of performance. Non-singers will not necessarily experience the sung sound in this way when they listen to a singer.

Higher/lower, thicker/thinner vocal qualities have acoustic characteristics that can be mirrored in the physical changes taken place in the musculature. They also interact with auditory perception and psychological factors can form part of the perceptual processes taking place especially if the act of 'listening' produces another physical response at a sub-conscious level. These aspects are also linked with the strength and weakness of the sound, again in terms of acoustics, physical muscle changes, auditory perception and psychological response.

6.52 Linking the narrative and the literature: strong/weak sounds

There cannot be many people who would confess to having a weak voice; it has negative values with which few singers would want to be associated. However, many of the singers identify this quality in their voices when comparing it to the sound they confidently heard inside their heads when singing.

> *I try not to go above a B flat because as soon as I got above that it felt so namby pamby* [PIIS19i]

> *I think it sounded breathy and hollow...it feels a lot stronger when I'm actually singing than when I listen to it...they are not as strong as I would have thought.* [PIIS8i]

> *I didn't like the beginning, I didn't think it was strong enough.* [PIIS10i]

This singer goes on to say that the internal experience of singing is very different.

When I sing it feels really loud. [PIIS10i]

Not all the singers were disappointed with their recorded sound. This singer heard a fuller sound from the recording '*Well, if anything it sounds a bit fuller from when I hear it. I'm trying to work out what it is, in some ways I'm quite pleased'* [PIIS19i]. This singer is one of the older singers and this could reflect a change in the auditory capacity due to ageing or it could reflect her understanding of the bone conduction auditory circuit as a result of more vocal experience. This younger singer feels the sound is lighter '*It's much lighter, purer, than what I hear when I am singing'* [PIIS9i].

If these differences in internal hearing, the older singer hearing a fuller sound and the younger hearing a lighter sound, are due to the process of ageing or the reliance on different auditory circuits which the singer acquires with experience, this merits further research. The implications could be that older singers have a different 'auditory vocal map' as the reference point from which they learn, in contrast to that of a younger singer. This may include aspects of auditory memory as well as muscle memory acquired over periods of training.

The strength of a voice can be described in terms of volume, intensity, and power. It is important to note that loudness is a psychophysical measure assessed by an auditory system and involves the full spectrum of sound, not just the amount of sound (Titze, 1994: 219). Titze goes on to describe acoustic power as a physical measure of the amount of energy produced and radiated into the air

per second and volume as the amount of sound produced, often measured in decibels. Intensity of sound, on the other hand, seems to describe the complexities of radiation from the vocal source (Titze, 1994: 220). Intensity of vocal sound seems to cover these aspects of strength and weakness noted in the data (see chapter 7 for more discussion on the use of metaphors).

Increased lung effort and higher pitch seem to produce an increase in vocal power and these can be measured using procedures such as inverse filtering. A vented mask is placed over the mouth and nose to detect all the airflow from the singer, rather like a microphone capturing acoustic pressure, this device captures acoustic flow (Titze, 1994: 224). The mouth flow is converted into an electrical signal and scientists, with knowledge of vocal tract formants, can identify the acoustic power generated at the glottis. The vocal tract magnifies the sound radiating from the mouth and scientists can use their knowledge of how the vocal tract exploits the tuning of the formants (the harmonics) and measure the intensity of sound produced from the combination of air-flow, acoustic-flow and formant tuning. The intensity or strength of sound appears to be a combination of all three aspects of vocal production. The singers in the study who experienced 'hearing' a strong sound were relying on the feedback produced by the internal acoustic environment. When they heard the recorded sound as 'weak' they perceived the lack of formant tuning in the vocal tract. Adjustments taking place in the vocal tract are subtle and not easy to monitor internally. The singer has to adjust to these changes and build up an auditory and kinaesthetic memory for the production of optimum intensity of sound.

Of importance here is the singer's formant, identified physiologically and acoustically by Sundberg (1987), as a secondary peak of acoustic energy around 2,000-3,000 Hz, which allows the singer's voice to carry over a full orchestra. The shaping of the vocal tract and the length of the resonator, in conjunction with the thickness of the false vocal folds creates the singer's formant (Titze, 1994: 240). However the dangers are that singers seek the intensity of sound by 'pressed phonation'; where singers press the voice to increase loudness, brightness and excitement. This is easy to do; the muscles (laryngeal adductor-abductor or opener-closer muscles) are some of the fastest muscles in the body because they need to protect the airway for life survival (Titze, 1994: 248). Therefore they react quickly to the singer's demand for more strength in the voice. This does not necessarily feel uncomfortable in the short term but can produce vocal damage long-term.

It would also appear that our ears are provided with natural protection against noise pollution.

> There is a muscle in your ear called the tensor tympani, which automatically decreases the mobility of the tympanic membrane when sounds become too loud...When females sing high notes they approach the area where the ear is most sensitive. This triggers the tensor tympani, giving you the illusion that your voice is too soft...It has been estimated that if the tensor tympani were not there, the sound inside your head could produce a tone as much as 20db *above* the threshold of pain! (Brown, 1996: 200)

The singer has to come to terms with an auditory feedback that is problematic, and a laryngeal mechanism that can respond without consciousness to the whole gamut of psychological messages taking place. The balance of posture, breath, physical energy, musical and emotional involvement all have an effect on healthy phonation (McKinney, 1982: 89) and therefore focussing exclusively on vocal

tract resonance can be counterproductive with inexperienced singers. To compound these complexities there are the issues relating to age and physical growth that have already been noted (6.45).

6.53 Linking the narrative and the literature: older/younger sounds

One of the aspects that emerged from the very first interview in Phase II was the surprise singers expressed that they sounded so young. This might not be thought unusual in the younger singer, possibly anticipating more maturity than they had in reality, but several of the older singers gave a similar response.

Singer 3, one of the younger singers, was very disappointed that she sounded so young:

> *Inside when I sing in a lesson it sounds different. On the CD it sounds really sweet, young, younger than I am* [13yrs]. *I didn't realise that it shook so much but it comes in the wrong place, I don't know why?* [PIIS3i]

Singer 19 was reassured when the final song was played to her, as she felt she sounded more mature. This was a singer who had only just started to explore her singing voice, though a highly respected professional orchestral musician of 20 years experience, '*I think that sounds better, it sounds more grown up in a way*' [PIIS19i].

Singer 18 was another older singer, who performed regularly and who had started to teach singing. She was surprised herself at her response that she sounded so young, but again became reassured when the final song was played to her and sounded more mature, more a sound she could identify with. Whether in

fact there was a real difference in sound quality, due to the music or style of song, or whether this was the ear adjusting to the perceptions of the mind and making 'sense' of the sound experience is something that this singer is clearly aware of.

> *It's terribly young; which is an odd thing for somebody to say.* [PIIS18i]
>
> [PIIS18Rs-two] *That's very different, more mature to me, to me it sounds more mature, it may be the German, it may be that it is a romantic song.* [PIIS18i]

Other singers made the connection between the style of the song and the timbre of voice. Singer 9 described her sound as older but then qualified it by saying it was old-fashioned. She went on to describe it as similar to Edith Piaf.

This highlights the question of how audiences adjust to vocal colours over the history of recorded sound. It illustrates the enormous complexity of vocal timbre; when is a sound 'old', is it the sound of an older singer or a singer from the past? An 'old' recording of a singer, even when cleaned of crackles and surface noise, is immediately identifiable in the style of delivery and the colour of vowels. It is unclear what singer 9 means when she says she sounds like Edith Piaf; she was not singing a French song, or a song that would have ever been sung by Edith Piaf. It could be that she was just identifying with a vocal 'echoic' memory played on a recording by her older parents. She went on to describe her voice as being lighter than she expected and maybe by identifying it as similar to a famous singer, she was accepting the sound on the CD as a 'bona fide' sound quality.

Young and developing singers are often anxious to put a vocal identity to the sound. It is reassuring to feel that the voice has a place; that it 'fits' in the world of singing. Young singers hear many different role models, although some only hear one kind of genre and can only match up their sound to that type of singer. This young singer had listened to some diverse vocal sounds according to her response:

> *What leapt to mind was that it was an older sound in the sense of old fashioned...*[PIIS9i]

Several of the younger, school age singers, referred to their younger sisters, with some embarrassment. Psychologically they were not happy to accept a sound that suggested they were not more mature.

> *Yeah but I sound a lot younger in this one.* [PIIS7i]

> *I sound like my sister I think, it doesn't sound like me or what I thought sounded like me...Now I sound like my sister definitely...younger...this one sounds more like me, may be I've got used to hearing my voice.* [PIIS14i]

Again it is noted that the singer has aurally adjusted to some extent by the time the final song was played on the CD. This does validate the research design of using three recordings for the playback interview.

Family similarities in voice patterns mean that this 'auditory matching' with a younger sibling is not necessarily unusual but the reaction of the singers to this similarity suggests that vocal, as well as actual, maturity is something the singer is searching for. If young singers are seeking to emulate a more mature sound than perhaps they are physically capable of, there could be dangers to the fragile vocal mechanism. Teachers of singing need to be aware that some young singers are actively seeking a mature sound, an expression of their desire for an older

identity. At the opposite end of the spectrum, however, is the singer who does not want to grow up and who retains the young voice of childhood as they cling to an identity that refuses to mature.

As singers age, there will be changes in the body; physical changes at the larynx include the loss of elastic and collagen fibres which can make the vocal folds stiffer and thinner. There is also the potential for a loss of smoothness at the edge of the vocal folds (Nair, 1999: 179); however Nair cites this important point about the ageing voice.

> The notion that this decline occurs gradually and progressively (linear senescence) is open to challenge. It appears possible that many of these functions can be maintained at a better level than expected until very near the end of life, perhaps allowing a high-quality singing or acting career to extend into or beyond the seventh decade. (Sataloff, Spiegel & Rosen, 1998: 128, cited in Nair, 1997:179)

Ageing does not appear in many manuals of vocal pedagogy except for a few paragraphs. This, perhaps, reflects the notion that a singer will develop and exercise a healthy larynx and thus preserve agility and longevity. Speech science does devote more research into the ageing voice and Mathieson highlights various aspects of the ageing process but stresses that physiological age can be unrelated to chronological age (Mathieson, 2001: 112). She does make the link between a well-preserved voice and self-respect and self-image.

In this study the reaction of singers to sounding younger than they thought perhaps reflects the qualities of timbre relating to strength and increased colour, discussed in the previous sections. The difficulties of articulating vocal timbre and the lack of vocabulary resulting in the use of terms like 'older' and

'younger'. There seems little evidence in the literature for a clear explanation of these results.

6.54 Linking the narrative and the literature: aspects of accent/speech

This area covers the cultural and social implications of musical performances; conventions of style and fashion dictate some performance practices and while this study is chiefly focussing on psychological aspects of vocal timbre and perception these factors need to be acknowledged.

This aspect was looked at briefly in chapter five with reference to a singer's sense of identity and vocal image, for example, singer 18 feeling awkward at using an American accent. A singer's speaking voice has obvious effects on the sung sound. The majority of amateur singers will spend a higher percentage of their day speaking than singing; which is not the case with many full time professional singers.

Singer 21, an older male singer, started singing lessons for the first time in retirement, is very aware of the relationship between his singing and speaking voice and also very sensitive to any trace of local accent in his sound. He appears to apportion any change in vocal colour to the flow of breath rather than any trace of a local spoken accent.

> *There's that odd way I say 'notes'; that could be the vowel sound, which kind of jars and I'm not quite sure. It's very odd really, you grow up in a particular area like I did and there's not a touch of Bristol in my speech at all, um, but uh, I think there's something about the way that I breathe which I think is not helping the flow.* [PIIS21i]

Singer 19 was able to respond to the subtle differences of linguistic sounds, she *'was interested to reflect how much an accent can be adapted and tweaked in a song'* [PIIS19d]. She also has a strong emotional reaction to the sound of her speaking voice.

> *Ah yes, now that's interesting, yes I absolutely hate the sound of my speaking voice, on recordings and I've been trying to work out if the same applies to my singing voice and maybe it's not so. Most of us have heard our speaking voice on recordings but when I listen back to some of my early lessons I find myself wincing, I don't know, it's so difficult, I think dear me, that's so...I mean everyone feels that. You're so familiar with yourself, I don't know.* [PIIS19i]

There is a sense of a deep familiarity with one's self through the spoken voice that is heard by the speaker every day. Singer 12 has got confused here with the meaning of terms with vowels and consonants but it is his comment about his accent coming through that is relevant here. Just as in the case of Singer 21, trying to get rid of his Bristol accent, this much younger man is trying to hide his Cornish accent:

> *I think I got most of them pretty well, I think the major critique of that which I still do is vowels [sic] I mean I can partially blame my accent for that, my actual accent, I miss out vowels especially t's and d's. Would that be the Cornish accent coming through?* [PIIS12i]

The idea of a regional accent, that places the singer 'at home', is an interesting aspect of vocal identity. The ability to produce different linguistic accents for performance of art song or operatic repertoire is obvious and opera houses use vocal coaches for that purpose. However singing in different genres often implies subtle changes in accent, music theatre of American tradition sounds more 'American'. Singing a Noel Coward song often requires an idiosyncratic English accent. Much of the material in popular music specialises in producing the vocal

timbre and accent amenable to an adolescent culture and the possible sub-cultures within that.

When people first come to singing, their initial experience is often to sing in their speaking voice accent, however the production of vowels in some regional accents does not allow for the maximum resonance to be achieved. A singing teacher will then try to open up the vowel sounds, clarify the consonants and improve the quality of airflow in order to achieve a satisfactory singing sound. If the singer then feels this is no longer a match for their 'vocal identity', they can feel frustrated and lacking in self-worth. The adjustment to an optimum singing voice from a spoken voice takes time and the readjustment of vocal identity can take place over months and years not just weeks.

The literature of singing pedagogy is full of references to the production of vowels and consonants required for good singing, but little mention of the variety of spoken accents students of singing bring to the teacher nor the psychological implications involved. Speech scientists are more aware of this aspect of voice as speech therapy is often involved in the modification of speaking habits to prevent vocal disorders and to encourage meaningful communication.

> Superimposed on the permanent anatomical voice features are many possible 'voice settings'. These are the muscular adjustments of the vocal tract, which are learned unconsciously in the family and later on, in the school, social, professional or occupational group. They affect the timbre of the voice as well as determining the characteristic levels of volume and pitch. As they are habitual, there is no awareness of them in the majority of speakers, although they can be controlled by the individual. (Mathieson, 2001: 5)

The interesting points to note are that accents affect timbre, volume and pitch and that accents are often unconscious. Accents also have sociological implications

and in some cases have class status, which again impinges on a sense of self-identity and self worth. Amongst the few investigations into this aspect of voice, research in Edinburgh found that higher social status was associated with 'creaky' phonation and lower social status with more whispering and harshness (Mathieson, 2001: 6).

6.6 Summary

How do singers *hear* their voice?

This chapter has highlighted the difference between the internal and external auditory perception of the sung sound. It has also produced evidence as to how singers *think* about their voice and how it *feels* to sing.

It is possible to see the variety of response in the singers when confronted with a mismatch in vocal perception. Some singers were pleasantly surprised and reassured by hearing themselves on CD, others found it a more disappointing experience, confirming their worst fears about their vocal technique. Giving the singers a recording of their voices was a productive tool for amassing data on this subject.

In the interviews some singers showed their ability to readjust their sense of vocal identity as they learnt to come to terms with the external sound they had produced. This could reflect their maturity within the sense of vocal identity and an ability to learn and accommodate changes in vocal timbre as technical skills are acquired.

However, factors that must be acknowledged in any examination of auditory feedback are the levels of hearing abilities and the physical health of the singer. Blocked sinuses, blocked ears, infections and pubertal changes can all cause hearing loss and a sense of insecurity. If ageing causes significant differences in auditory ability this impact on vocal perception needs further research both for singers and singing teachers.

While this discrepancy between internal and externally heard sound appears problematic it should provide the teaching situation with a vehicle for discussing vocal timbre and vocal quality. The teacher and student can benefit from learning to share the articulation of these fundamental aspects of singing.

However singing with others can hinder vocal perception and also lead to insecurity of vocal identity. Choral opportunities can be extremely valuable for singers as well as being musically and emotionally satisfying. The problems of standing too close to other singers so that the auditory monitoring of the individual is impaired should be avoided.

Investigating this aural mismatch has identified particular vocal qualities within the data of the singers in this study. These seem to be related to the ability of the singer to tune the formants that resonate within the vocal tract to achieve maximum colour, depth and strength in the voice. The fact that some singers were disappointed that their sound on the recording was young and not mature, suggests that all these aspects contribute to the 'fully developed' sound they were trying to achieve. The intrusion of spoken accents was also seen as part of the

mismatch; the difference between the vocal identity of the speaking voice persona being different from the singing voice persona.

The psychological implications of these findings have had little empirical investigation and references in the literature to these aspects of auditory vocal perception have tended to be 'en passant'. Further study in this area is important because of the implications for vocal education. Before moving on to chapter 7 a brief discussion of the tools used in this investigation follows.

6.61 Tools for investigating the mismatch of internal and external auditory vocal perception in singers

Having identified some of the aspects of an auditory mismatch between the internal and external perceptual listening for the singers, the question remains as to which tools are most effective to investigate vocal perception further. The psychoacoustic and audiology disciplines are beginning to create more sophisticated diagnostic tools but in this study the discourse of the singers was the means of explorative work. By examining the way singers talk about the mismatch, further insights can be revealed into the internal processes of vocal perception; using the discourse of singers to find useful tools for investigation involved separating out the metaphorical language that appeared in both the diaries and the interviews.

Use of metaphorical language

One of the ways to examine the internal/external auditory mismatch is to explore the singer's use of metaphor for possible explanations. This is a simple form of

discourse analysis which can lead to insights but which must be acknowledged as having subjective influences.

Use of technology

The technology available is becoming increasingly sophisticated but it is far from being able to replicate the analytic and processing capabilities of the ear (Howard, 2005). The work of this study has been characterised by psychological perspectives and a 'real world' grounded theory approach. It is hoped that the findings that result from this enquiry can be followed up by scientific studies focussing on the auditory mismatch that the singer experiences and audio metric testing.

The following chapter looks at the classification of words identified in Phase I and the specific use of metaphors to describe the singing experience in more detail; further analysis is made of the listener and singer responses, comparing the individual preferences for types of metaphors and the perceptual processes taking place that are implied.

7. Use of Metaphor: evidence for and an explanation of auditory vocal perception

7.1 Introduction
- 7.11 Linguistic style and choice of vocabulary
- 7.12 The description of sound
- 7.13 Links with the literature

7.2 The metaphors used in Phase II
- 7.21 Temperature, weight, taste, balance, musical instruments
- 7.22 Age and maturation
- 7.23 Colour and light
- 7.24 'Ideas' of colour and timbre
- 7.25 Dynamics
- 7.26 Texture, shape & form
- 7.27 Comfort
- 7.28 Energy
- 7.29 Expression

7.3 Matching student & teacher use of metaphorical language
- 7.31 The changing dynamic of the teaching studio
- 7.32 The teacher's ear
- 7.33 Teacher/student personality

7.4 The role of the ear

7.5 The listening study
- 7.51 Triangulation
- 7.52 Examining the audience response
- 7.53 Implications for singing teachers and singers

7.6 Summary

7. Use of Metaphor: evidence for and an explanation of auditory vocal perception

7.1 Introduction

This chapter explores the role of language, in particular, the types of metaphor used by singers, as they describe the experience of singing and listening to singing. The introduction examines the linguistic style and choice of vocabulary found within the data and it also compares the language used in the diaries to that of the interviews. The second section is a discussion of the particular metaphors employed by individual singers and what these might imply about the levels of auditory perception taking place. The third section looks at the possible mismatch between teacher and student understanding of vocal terms as found in the data. The fourth section re-examines the role of the ear in this process and the listening study provides examples of the variety of auditory response that can take place to the same acoustic experience. After examining these audience responses there follows a discussion about the implications the use of metaphor has for singers and teachers.

Voice and vocal identity are complex phenomena and it is helpful to look at the language singers use to describe timbre, for more specific references to the singing experience and clues as to how the sound of the voice is conceptualised by the singer. This evidence helps to answer the question of how singers think, hear and feel their singing voice.

If at the end of each interview they had not referred to their vocal timbre in any specific way, the singers were asked a direct question, 'How would you describe your voice?' Some singers found it difficult to verbalise this and suggestions were given such as colour or texture. While this prompted some elucidation the singers were quite categorical if they did not 'hear' their voice in such a way; all the singers were very clear in their own concept of 'their sound'. From the list of possible metaphors gleaned from Phase I, the Phase II data were analysed: each diary and interview was searched for references to particular metaphors.

7.11 Linguistic style and choice of vocabulary

The style of language used by singers can be a good indication of the quality of perceptual experience. When analysing the data it became clear that some singers were very fond of using 'feeling' words whereas others reported vocal perceptions in a more matter-of-fact style (see also chapter six). The use of metaphors appeared to be a fruitful source of insight into how each singer viewed the vocal experience.

For example, this singer wants a certain quality in her voice that she describes as 'warm';

> *Actually what I like is to try and get a warmer sound, to me that sounds rather bright and to me that's a disappointment.* [PIIS16i]

The next singer, by way of contrast, produces a complex picture of the vocal process;

> *I suddenly had a mental picture of cycling on a pennyfarthing; as long as one keeps putting in the effort, low down, the whole things bowls along nicely; but it is held on a knife edge!* [PIIS19d]

This singer links the musical aspects of singing with the need for maintaining a full tone:

> *I can hear that in the voice, as I get up to the ends of the phrase the fullness goes completely.* [PIIS15i]

This singer links the tone quality to a physical image;

> *Very thin and strained, no body to it.* [PIIS21]

However some singers searched for accurate descriptions and resorted to words like 'good' 'fine' and 'okay', illustrating a different kind of linguistic style that may not necessarily indicate vocal ability.

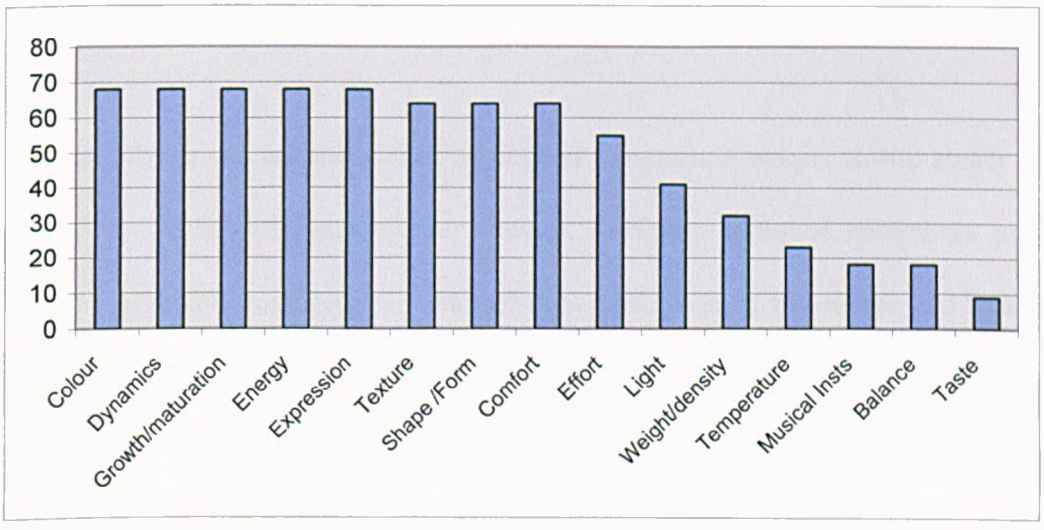
> *I don't know what to say apart from it is good and fine and things like that, so my voice is easy and okay.* [PIIS22d]

The proportion of metaphors distributed over the data can be seen in the following table and chart. The metaphors were the same as those identified in the Phase I listening questionnaires but it must be noted that in that study the listeners were responding to the sound of singing voices that were not their own. In this table and chart the singers are responding to hearing their voice as they prepare for a recording and their reaction after hearing the recording from the CD given in the subsequent interview.

Table 7.1 showing the number of singers who used particular types of metaphor in the diary and interview narratives

Metaphor	No. of singers	% of Phase II singers
Colour	15	68
Dynamics	15	68
Growth/maturation	15	68
Energy	15	68
Expression	15	68
Texture	14	64
Shape /Form	14	64
Comfort	14	64
Effort	12	55
Light	9	41
Weight/density	7	32
Temperature	5	23
Musical Insts	4	18
Balance	4	18
Taste	2	9

Chart 7.1 showing the use of metaphors as a percentage of responses found in the twenty-two Phase II singers' narratives



Further discussion of these findings follows after a brief review of the difficulties in articulating sound.

7.12 The description of sound

Sound is a phenomenon that is often impossible to put directly into words.

> At its best, the act of describing vocal sound is an inexact science; at its worst, it is a mishmash of flowery phrases, illogical terminology, and apocryphal statements that contain scattered elements of truth - a veritable semantic maze. (McKinney, 1982:32)

For centuries singers have been using metaphors to describe the singing sound. When exploring the literature it is possible to see the wide variety of language employed by the different academic disciplines that concern themselves with the voice. Unfortunately these terms are not always shared or understood by teachers, singers and researchers. While this dilemma continues to be acknowledged, the language itself is worth exploring within the context of the individual singer's narrative.

Words may reveal an underlying perceptual experience unique to the singer or shared by others who use similar images. Different types of metaphors may reveal a particular emphasis in the auditory perception of the singer and this is examined in more detail in the following section. Words can also be used to describe the same singer that seem to be contradictory and the audience listening study will provide evidence of this and prompt further questions about the psychology of hearing.

In terms of classifying individual words related to singing, various models have been identified in the literature. Over the course of the literature review the coding and classification of words describing the singing voice were collected.

The approaches shown in Table 7.2 are not tabulated in any hierarchical order of auditory perception, but have simply been listed for ease of comparison.

The first two rows show the terms that came out of the Phase I investigations and from Titze's (1994) work. These terms were divided into words that covered technical sounds and those that described timbre. Thurman and Welch (2000) suggested terms that were more style specific. Juslin and Sloboda (2001:80) looked at emotion words and following an earlier model by Shaver *et al.* (1987) this template was used to sort the words that appeared in the discourse of Phase I (see Table 3.7). Coding the data according to all these available models helped to identify different layers of auditory perception taking place amongst the participants. The re-examination of the data uncovered aspects that may have remained hidden if these different approaches had not been adopted.

Thurman and Welch (2000) also described the borrowed metaphors that are used to articulate vocal timbre and this approach prompted an investigation into the work of Arnheim (1974) and the world of visual perception. The words used in the visual arts are often the same as those used to describe auditory perception and consequently there are many useful parallels. The symbolic meaning of colours and sounds also needs to be recognised as so much of what is implied in the discourse of people involves these types of response. In chapter six of his book *Speech, Music, Sound,* Van Leeuwen (1999) gives a semiotician's perspective on vocal timbre. All these perspectives from the literature will be explored in more detail as the Phase II data are discussed in this chapter.

Table 7.2 showing a comparison of possible approaches to the analysis of the singing sound found in the literature

Phase I word analysis	Musical	Technical	Timbre	Diction	Personal
Titze 1994: 48		Effort Comfort Energy	Colour Sensory		
Thurman *et al.* 2000: 19	Style/specific Twang Opera Speech quality Belt quality				
Juslin & Sloboda 2001: 80		Effort - positive - negative Comfort - calm -easy Energy - agility -dynamic	Colour - gender - colour - character Sensory - quality - affective - effective		
Borrowed metaphors Thurman *et al.* 2000: 517	Musical instrument quality	Density/pressure Weight Growth/maturation	Colour/Light Temperature Shape/texture Taste Space		
Arnheim 1974:v-vii Visual Perception	Movement Dynamics Form	Balance Growth	Shape Light Colour Space		Expression
Van Leeuwen 1999: 129-141 Semiotics	Loud/soft High/low	Tense/Lax Breathy/non-breathy	Rough/smooth Vibrato/plain Nasal/non-nasal Frontal/back		

The use of metaphorical language within the Phase II data was diverse which could be due to the influence of the personality and age of the individual singers and also their teachers' methods and style when using descriptions of voice qualities.

Word lists have their uses but the value of these data is really to compare the different approaches singers take to describing the making of sound and the

implications for vocal production. If a singer is using effort words to describe the vocal sound, for instance, does that imply a particular learning style or teaching method, and will this have positive or negative effects on the final voice quality?

As seen in Table 7.1 and Chart 7.1 taken from the Phase II data, Effort, Energy, Comfort, Maturation, Shape/Form, Texture, Dynamics and Colour all featured in the discourse of the majority of singers (over 65%). Balance, Musical Instruments, Taste and Temperature metaphors, on the other hand, were only mentioned by a minority of singers and words relating to Weight and Light by about half of the singers (Chart 7.1).

Throughout this chapter specific references are made to Arnheim's seminal book *Art and Visual Perception* (expanded and revised in 1974) because his ideas concerning the 'psychology of the creative eye' suggest parallel images for the creative ear of the singer. He says in his introduction,

> It often happens that we see and feel certain qualities in a work of art but cannot express them in words. The reason for our failure is not that we use language, but that we have not yet succeeded in casting those perceived qualities into suitable categories. Language cannot do the job directly because it is no direct avenue for sensory contact with reality; it serves only to name what we have seen or heard or thought. (Arnheim, 1974: 2)

Singers as well as other musicians are working in a non-linguistic field of communication and need to experience and conceptualise the sounds before putting them into language. Bregman also refers to visual perception and in particular to the work of Gestalt psychologists in his book *Auditory Scene Analysis* (1990). He concludes that the coherence of a single voice is perceived through a process of grouping and that the

> ...processes of audition that can accomplish the grouping and use it to derive these experiences must be doing so in time periods that we have to measure in milliseconds. (Bregman, 1990: 705)

The process of grouping the sound experience can be seen in the use of metaphors; the singers, articulating their singing experience and their sense of their own vocal timbre, are trying to put into words a tiny fraction of time. It would appear that some metaphorical images suit some singers and not others and this can indicate the different perceptual approaches the singers adopt as well as the conceptual understanding they have absorbed. Analysis of the data also suggests that aspects of a singer's vocal identity may orientate their auditory perception.

7.2 The metaphors used in the Phase II diary and interview narratives

7.21 The rarely used metaphors: temperature, weight, taste, balance and musical instruments

Across the data several metaphors appear to be popular while some hardly get a mention; for instance, only four singers referred to their voice in comparison to a possible instrumental sound. Singer 4 was a clarinettist and also played the treble recorder and she used those instrumental sounds as a way into describing her own voice. Singer 12 made a rather nice dynamic comparison and used orchestral analogies.

> *I find it very hard to do soft, it feels, maybe because I've got quite a lot of voice anyway... and also I don't think playing the tuba helps because it's a powerful instrument and that's difficult to get lower and quieter on, whereas if I played a delicate instrument like a flute I might be able to do...*[PIIS12i]

Singer 18 described her voice as 'reedy' and singer 21 described his voice as 'tinny' but apart from these references; instrumental sounds were not obviously compatible with vocal colours in these data. However, it is very common to find references to instrumentalists making a singing tone (Rosen, 2002: 24); this suggests that the comparison works more easily the other way around.

Temperature as a means of measuring the quality of a voice is a curious metaphor as it could imply a rising of bodily temperature on hearing the voice or it could be associated with a colour, as in warm colours rather than cold. Certainly warmth gets used to describe voices quite readily, it also implies a '*warm*' personality so perhaps it is even more difficult to tie down than would at first appear. Singers 1, 11, 12 and 18 all used warmth to describe either their own sound or the sound they wanted to achieve but one singer was obviously confused by the concept, '*warmth is something I have discussed with my teacher and I find this difficult to grasp*' [PIIS16i]. This highlights the communication difficulties when a teacher uses a metaphor that is not understood by the student (see 7.53).

Taste featured in one of the Phase I singers, and it only featured in two of the Phase II singers, with '*caramel, and honeycomb*' [PIIS14i] and '*chocolatey*' [PIIS19i] being used by singers with perhaps a sweet tooth. This suggests that taste is not easily associated with vocal sound by the majority of singers.

Weight often appears in the conversations of singing teachers as a way of describing voices e.g. light or heavy, but this can refer to the use of the vocal

mechanism as well as the actual sound quality and therefore can lead to confusion. Thin and thick also have a physical interpretation, referring to the actual thickness of the vocal folds or the sound made, as the thickness of the folds does tend to have a thickening effect on the sound. Lighter and fuller can be used as opposites of a spectrum and also 'thin and full'. All of these imply some vague sensing of what might be happening at the sound source, although there are no means of actually feeling that physical sensation. The aural experience of what a thin, thick, heavy, light or full sound might be has already been discussed in chapter six; it would be appear from the small sample in this study that weight as a metaphor is used by older singers, implying that age rather than vocal identity is the orientation for this use of metaphor.

Five out of six of the middle age category [C: over 25 and under 50 years] were singers who used these kinds of words the most. Only one out of the twelve younger singers used any of these words related to weight at all. This could imply an instinctive awareness of the nature of the vocal mechanism. Younger singers do not have a fully-grown larynx and the five layers of the vocal folds are not yet fully formed. They should not have a sense of weight in the larynx, if they have been taught well, as weight on the larynx can produce serious vocal dysphonia (Mathieson, 2001). Older singers, on the other hand, have a voice that has matured and possibly darkened with age and weight may be something that the older singers are subconsciously aware of.

Balance is an interesting description of a voice and implies a sense of stability and security in the production of the sound. Only four singers used this as a

concept: *'not quite stable'* [PIIS1i], *'Tone settling, better balance'* [PIIS4d], *'wobbly'* [PIIS5i], and *'wobble, wobble'* [PIIS16i]. Three out of the four singers who mentioned balance had had periods of poor health and this could explain their sensitivity to the voice's instability, and the use of 'balance' words.

Theo van Leeuwen (1999: 130) points out that, very often, adjectives mix the evaluative and descriptive; women should have a soft and sweet sound, while a tense female voice might be described as 'shrill'. The singers themselves often imply some kind of judgement of their own sound, depending on their confidence levels and sense of vocal identity.

I thought it was a bit rigid, a bit hard. [PIIS20i]

If I let it go sloppy the sound definitely suffers. [PIIS17d]

These evaluative dimensions of sound are often used without being aware of them both by teacher and student; nevertheless sensitive personalities will pick them up, consciously or unconsciously.

7.22 Use of metaphor: age and maturation

This area was explored in some detail in chapter six with reference to the mismatch of internal and external sound, and there are also links with the apparent feeling of weight in the voice. Metaphors that reflect age and maturity may indicate some concern on the part of the singer and 15 singers out of the 22 made some mention of this in their narratives. As can be seen in the singers' reactions to hearing their voice on CD they often felt the recorded sound was much younger than they expected. The maturity aspect also implied some sense of progress or development with the younger singers but conversely deterioration

in the older singers. These two singers, one from the Phase II and the other from Phase I illustrate this: '*You can see how far you've progressed*' [PIIS2i], '*I was worried about getting older and the voice getting that tinny quality*' [PSIDi].

There is a sense that the voice is growing almost independently of the age of the singer but developing with experience: '*I've learnt a lot over the last year and a half...it's very much a grown voice*' [PIIS15i]. This singer acknowledges this too, '*it still sounds as if it's in its infancy to me...it sounds better, more grown up in a way*' [PIIS19i].

The listening study (see 7.5) adds another dimension to this as the majority of comments about age were accurate with just a few discrepancies: two middle-aged singers were described as young and adolescent, and an older singer in her sixties was described as being 20-30 years of age. This suggests that vocal quality alone will not necessarily give clues to the chronological age of a singer.

It is curious that the age of instrumentalists is rarely considered important. Indeed, it would be unusual to find references to age in a description of a purely instrumental sound, though there are references to a mature interpretation or a youthful prodigy. Age-descriptors relating to sound quality seem to be more prevalent in singers. The voice does age and Mathieson (2001:108) suggests the possible changes taking place in the musculature, skeleton, cardiovascular system, respiration and hormone balance. She describes the perceptual acoustic characteristics of the normal elderly voice as, altered pitch, roughness, breathiness, weakness, hoarseness, tremulousness/instability. She makes the

point that not all elderly people exhibit these qualities and indeed, the same list could apply to adolescent voices, both phases of life experiencing significant physical and psychological changes (Cooksey, 1992: Kahane, 1978).

Certainly vocal health and exercise can delay the onset of any age-related changes in timbre and there are many fine singers still performing to great acclaim having preserved their vocal sound through technical proficiency and imaginative performance (Miller, 2004: 185).

7.23 Use of metaphor: colour and light

While it might be assumed that the visual world has a relatively easy time identifying colours and labelling them, the following quote from a fascinating book *Colour and Meaning* shows how, even in the visual arts, definitions are hard to come by.

> What the history of the spectrum suggests is that there are real difficulties in perceiving and identifying colours in complex arrays, especially when their edges are undefined, and that the relative poverty of colour-vocabularies reflects these difficulties and encourages representations to be far more concerned with ideas about colours than with colour-perceptions themselves. (Gage, 1999: 26)

It is interesting that he notes the relative poverty of colour vocabularies, sound vocabularies, it could be argued, are even smaller even though the sound spectrum is nine times larger than the colour spectrum (Rossing, 2002: 79). The distinction between ideas of colour and colour perceptions could also be applied to vocal timbre. Much of the problem of communication in singing teaching is due to the lack of precise definitions of timbre.

7.24 'Ideas' of colour: 'ideas' of timbre

Arnheim (1974: 362) says that the identity of a colour does not 'reside in the colour itself but is established by relation'. This would appear to be the case in vocal colour too. Not only do we compare our internal memory of sound with the actual sung sound but vowel colour changes depending on the consonant preceding or following it, hence the difference between vowels sung in English or Italian (Fourcin, 2006: 235-237). When singers start to explore singing in different languages this becomes more apparent but even the International Phonetic Alphabet (IPA) does not convey all the nuances of vocal colours in vowels and consonants, across the world's languages, though it does assist the task of learning greatly (Miller, 2004: 66).

Rorschach's famous inkblot tests suggest that the preference of colour or shape for identification is linked to personality; colour dominance indicating openness to external stimuli, while shape reactions indicate a more introverted disposition. Arnheim also points to the work of Witkin (cited in Arnheim, 1974: 101) who suggested that people varied in how much their spatial orientation relied on visual or kinaesthetic sense, with the visually responsive people being more outward looking and the kinaesthetic more inward looking. This supports the idea that vocal identity might 'orientate' a singer's use of metaphor, with some preferring colour and others different metaphors like shape and texture.

Certain singers are more likely to shape the voice using vowels and musical phrasing while other singers colour the voice with particular qualities. These different approaches to singing are illustrated in the contrast between more recent

developments in vocal teaching such as Jo Estill (Kayes, 2000: 153) and others who work on voice qualities such as belt and sob and sigh and the 'bel canto' tradition which has tended to create 'colour' through vowel shape and articulation. These different methods may suit certain personality types and this means that teachers should be aware of a variety of approaches to accommodate the needs of individual singers.

The singers who used colour words did so quite specifically. When prompted, some singers described their voice as a colour, but others were quite adamant that they did not 'hear' it in that way. The first singer discusses the use of a '*bare, colourless*' sound for her Hugo Wolf song and describes it as a '*white*' sound but then in her jazz song she hears it as '*red, pinky red*'. One of the young music theatre singers was quite happy to describe her three songs as, '*a light pink colour, purple and fluorescent yellow*' [PIIS2i].

Yet another singer is rather devastated to perceive a lack of colour in her recording, '*on the CD I didn't put any colours in but in the lessons we've been working on putting lots of colours in*' [PIIS3i]. This singer is very aware of the perceived differences in her voice between the recording and then subsequent listening to it. Her ears are already, at 13 years, aware of the vocal colours available to her if she could use them. Singer 15 was also surprised that the colours she thought she was putting in were not coming through, '*I aimed at giving some colour and interest to the music. It's so monotone, I think I am putting lots of colours in but that's all coming from my face*' [PIIS15i]. She suggests that perhaps her efforts were all going into facial expressions that were

having little effect on the actual colours in her voice. One of the values of using just sound recordings rather than video recordings in this study has been to get the singers to really focus on what they can hear. Though there is also much potential in researching the impact of visual perceptions of performance (cf. Davidson, 2002).

An older singer was highly specific about his colour '*Certainly very rich colour, deep sort of golden colour, not as deep as terracotta but deep golden.* [PIIS21i]'He also played his CD to his wife when he got home; he then emailed immediately to say she thought his voice was a deep blue!

One of the young singers colour coded her diary with a key showing different colours for the sounds she associated with her voice, '*spiky, smooth, soft* 'etc., even though these were not particularly colour words. At the end of each diary entry she put the codes in to describe her voice on that day: it was interesting to note that while her narrative contained few colour words, she did use colours to illustrate them in her diary but there was no obvious correlation between the colours she chose for each quality.

Some singers associated colour with the different areas of the range, '*I changed colour from high to low'* [PIIS4d], and this links up with the voice qualities associated with different registers (see 6.32).

7.25 Use of metaphor: dynamics

Some of the singers mentioned being profoundly affected by the volume of the singers they experienced sitting next to them in choral situations, '*the girl next to me had such a booming voice; I had to compete with her*' [PIIS1d]. This was something the choral singers mentioned in Phase I and has been briefly discussed in the previous chapter (see 6.48). It would suggest that many singers feel affected vocally by the quality of singing next to them. Lawrence Parsons (2006) is currently looking at the brain patterns that occur when singers sing with others or by themselves (personal correspondence). This interaction between the ear and the voice and the perceptual processes taking place, gives a more prominent role to the ear, especially the importance of being able to hear oneself when singing.

An ability to sing loudly is seen as something important with music theatre singers, '*My voice is usually music theatre, quite loud and expressive*' [PIIS3d] and also with lieder singers, *'I realise I do not use my voice to maximum effect, volume wise'* [PIIS16d]. Some singers are very aware of their own dynamic levels, '*I mean I never do it here because it would be too loud*' [PIIS9i]: '*I find it very hard to do soft*' [PIIS12i]: '*I lose all volume*' [PIIS8i]: '*I have trouble with the marking très calme, pp*' [PIIS17d]. It is worth reiterating that the perceived volume of the voice may be different from the singer and the audience perspective. Even the conventional language of music can be confusing: *forte* is strong, *piano*, soft, though they are often equated with loud and quiet, which are not accurate translations.

Colour also links up with dynamics, '*It's actually louder and more colourful*' [PIIS9i]. This is not an unusual phenomenon; Rossing states that it is a characteristic of nearly all musical instruments that raising the dynamic level increases the levels of the higher harmonics more readily than that of the fundamental and that the same is true of singing (Rossing, 2002: 388), previously discussed in chapter six (6.33). The link between colour, dynamics and resonance finds echoes in the work of visual artists and they also connect light and shade to shape and form.

7.26 Use of metaphor: texture, shape and form

Metaphors of texture were found in the responses from fourteen out of twenty two of the singers, which suggests that they are popular metaphors that many singers could equate with vocal timbre.

> *I suppose I think about the lower part of my voice almost like being a thicker texture, um, sort of velvety's not quite the right word, but that sort of thing or if I'm thinking in terms of a viscosity, so that it's a fuller sound. It might be something you could manipulate, more pliable and the higher it is, it's lighter and more ephemeral, difficult to get hold of.* [PIIS4i]

This singer is experiencing thicker texture at the lower end of her range, something which maybe parallel to the physical mechanisms taking place. She goes on to describe the sound as a viscosity that can be manipulated, but feels her voice to be less pliable in the higher range where the sound more difficult to control. The next singer claims to think in textures but she also goes on to describe these, using words like bright and warm, which do not match up with a textural description but are more associated with colours.

> *I think textures, I think the first thing that made me slightly unhappy, in my own head my voice is much more um blended, you know, whereas in*

> *that there are almost two textures, the bright and the warmer and the warmer tends to be unsupported, you know what I mean. I think I had convinced myself, I had a much more co-ordinated sound, but then that comes again, it's practice isn't it?* [PIIS16i]

Singers used words like, '*velvet, rough, smooth, gravelly, scratchy, gruff, harsh, spiky, bumpy, creamy* and *threadbare'* which all share qualities of texture. This aspect can also been seen as having physiological connotations as Sundberg (1999) has suggested. The sensations when hearing the sound created in the larynx could be prompting this kind of metaphor, even though the body is unaware or unconscious of much of the muscle changes taking place (Miller, 2004: 57).

Shape and form are both concepts common to visual perception but also feature in the auditory descriptions of vocal sound; words such as 'depth, height, hollow, blocked, shallower' were used by the singers in this study. These can also link up with metaphors of space in singing that will be explored further in chapter eight. As can be seen here, some singers try and place the voice, '*I know when something is in the right place'* [PIIS16i]: '*This opens up at the back more...I've got the space above it very clear...the space gets clogged up.'* [PIIS17d]

All these singers are struggling to articulate a physical experience that is a natural, some might say primitive (Mithen, 2005), unconscious process which sets up aural and kinaesthetic responses during the acoustic event relayed back through a myriad of sensory pathways not necessarily connected to the source of the sound at all. The emphasis on 'placing' the voice, found in so many singing teaching books, is perhaps a response to the lack of ability to feel any sense of 'place' in the larynx.

7.27 Use of metaphor: comfort

Singers and audiences want to feel comfortable for the vast majority of the time; the 'comfort zone' is a common term in popular culture. If the singer is making an unpleasant sound the audience can feel it and sense the discomfort of the singer. This probably takes place in the brain as an activity of the 'mirror neurons' (Winston, 2003: 143) where spectators of an activity apparently experience some kind of mirroring experience as registered by the similar brain patterns observed in the brain between observer and performer. One of the teachers in the Phase I explained that adjudicating could be vocally uncomfortable if she was listening to singers straining their voices: '*well, it's physically right, when you listen your throat goes in the same way, that's what I worry about when I adjudicate actually.*' [PISKi].

Equally singing can be seen as a form of therapy, this singer actually speaks of the music '*nursing*' her along.

> *...there was a lot of different ideas in there you could play with but also in the lie of the music, it nursed me along, it wasn't as if it was going up step wise, it just seemed much easier than the others that were the same but obviously higher.* [PIIS4i]

> *When I'm singing in the lower register and I'm really enjoying it, it's almost like, lying back and relaxing, you've got to support it of course, but it's not like that in the higher register.* [PIIS4i]

Singer 4 worked in the medical profession and had also been personally involved with medical terminology as she suffered from a debilitating nervous disease affecting her motor abilities. She found singing to be a positive therapeutic experience when it was all going well. Her language is full of comfort words and she mentions '*relaxing*' into the sound. Her working life was involved with this kind of vocabulary and this seemed to come through in the words she used about

singing. This was rather similar to singer I in Phase I who had been undergoing long periods of counselling. Her language was idiosyncratic and very different in style to the other interviewees; she used words like '*tight, release, suppression*' [PISIi]. Again this evidence suggests that vocal identity is affecting the use of metaphor.

This study was not intended to be an investigation into vocal problems and disorders; all the singers had healthy voices (as far as the researcher could ascertain) but some did experience the usual coughs and colds during the course of the project and some like singer 4 had medical conditions that could on occasion affect her vocal experience. It was, however, not unusual to find singers complaining when things were not going right:

> *My voice is all scratchy and I can't seem to hit the right notes. Horrible!* [PIIS8d]

Speech therapists and voice clinics use the language of Comfort, Effort and Energy words as indicators of someone's vocal health and this has tended to dominate much of the literature in voice science, coming from the research into pathological speech disorders. It is important to note that these highly specific and functional meanings are not always used in the same way when singers apply them to their own healthy singing voices.

7.28 Use of metaphor: energy

Energy words that featured in the data were all linked to the need for a singer to have life in the sound. In fact *'lifeless', 'tired', 'exhausted'* seemed to be damning phrases when the singers responded to the recordings. Generally the

singers used words like, '*spark, enthusiasm, exciting, vibrant, energized*' for the sounds they wanted or had achieved and some spoke of '*getting high!*' [PIIS2d]. Six singers recognised that the recording did not reflect their best performance and they could hear the lack of energy in the voice. Some also spoke of the '*flow*' and this aspect of energy, relating to the movement of the voice, will be looked at in greater depth in chapter eight.

7.29 Use of metaphor: expression

Everyone used some kind of expressive language but not everyone was specific in terms of feelings. Expression is not a metaphor in itself but was used metaphorically to illustrate a vocal quality the singer was trying to describe.

> *You're one with the music.* [PIIS16i]
>
> *The flow of the piece affecting the feeling of sound.* [PIIS17d]
>
> *It is interesting the different feel I get when I have got a piece properly under my skin.* [PIIS19d]

In the last example the singer alludes to the feel of the sound but links it with a physical expression of a psychological response, *'under the skin'*. Evidence, once again, of the holistic nature of vocal experience. If students find discussing vocal timbre confusing and difficult, how much more complex is the educational situation if teacher and student do not share the same understanding or are confused themselves about the way they refer to timbre.

7.3 Matching student and teacher use of metaphorical language: the possible mismatch in student/teacher understanding

In the teaching studio, the student and teacher have to rely on shared aural experiences for communication. Teachers and students are not always compatible; there are instances when the student feels the teacher is too busy with the accompaniment to take notice of the vocal sound.

> *I'm always a bit depressed because I never think he's listening to me because he is concentrating on the piano and you think, because he's always playing the accompaniment and I like the accompaniments but sometimes I think 'Is he really listening to me or concentrating on the piano part?'* [PIIS20i]

Sometimes musical requirements can have an effect on the aural demands in a lesson and a change in the musical language between teacher and student can bring about unexpected transformations.

This singer went to the same teacher for both classical and jazz singing, but it was in the jazz lesson that she produced an exciting vocal sound. Cultural and musical expectations of vocal timbre can preclude or stimulate this kind of vocal freedom and experimentation.

> *Interestingly I remember the first jazz lesson, I haven't been doing it for very long, and um, it was one thing she said and I sang one note and it wasn't very exciting and then she did it and I copied her and the difference was... amazing and I said 'What's happening?' the first time ever I've had that extraordinary experience and I'm trying to work on that and I find it really exciting... thinking it wasn't me, because that's what I'm aiming for.* [PIIS19i]

It is worth noting that in the instance above, the teacher demonstrated and the student imitated, a wordless experience that bypassed metaphor and label. It also seemed to be as physical as it was auditory, something that will be referred to in

the following chapter. She also mentions that she thought it wasn't herself, another indication of vocal identity having to adjust to new timbres, and requiring a change in orientation.

The following points that arose from the data have been included here as illustrations of the lack of a shared aural understanding that can sometimes take place,

- The changing dynamic of the teaching studio
- The teacher's ear
- Teacher/student personality.

7.31 The changing dynamic of the teaching studio

The teacher's perspective on the learning environment is important and the following extract reveals how one teacher (Phase II singer 18) comes to terms with a musical and cultural expectation in her student. The young singer is aiming for a more mature and richer sound, similar to the sound she can make on her clarinet and tries to match the feel she has when playing the clarinet by lowering her larynx when she sings. It is a good example of a teacher discussing with the student what the singer 'feels' or 'hears' inside and then trying to find a positive solution.

> *Just a little anecdote! I don't know whether it is relevant but I teach someone with a lovely voice, it has still got some way to go and she works, like mad and she said "I don't like listening to myself at all," and I said "But you don't sound 'baby' to me!" It doesn't really sound baby, anyway the following year when she had got into her singing a bit and I was a very new teacher at the time, I thought I think she's trying to deepen her sound, but I didn't quite know what to do and my teacher said "Does she play the clarinet or a low instrument?" and she was an intelligent girl, so she was doing a bit of larynx depression to try and*

> *deepen the sound instead. And I mentioned this to her and said "Is this what you are trying to do by any chance?" I went straight for the jugular, I didn't know any better and she said...yes, and so I suggested that there were better ways of approaching it. To her the laryngeal depression made it a more satisfying sound inside; inside her, she was feeling good.* [PIIS18i]

Teachers do not always get it right and in the following extract the teacher has a clear idea of where she herself, experiences the sound, but this is not matched by the student's experience.

> *My teacher is very keen on the idea of the sound coming from above. This personally does not work for me. I know when something is in the right place.* [PIIS16d]

The aural abilities of the teacher to detect subtle changes in timbre are vital for picking up clues as to the singer's auditory self-perception, these must not be confused with sympathetic resonances the teacher feels is taking place within their own voice. Teachers must not be 'misled into giving the various sinus cavities of the head undue credit for resonance' (Bunch, 1995: 108, Rubin, 2006: 208).

7.32 The teacher's ear

Another teacher found it necessary to dissuade a singer from listening too critically to the internal sound. This can often be the only way to free some singers from a self-critical loop while performing. With inexperienced singers an emphasis on the physical and kinaesthetic sensations may be the best initial training and encouragement to listen objectively may have to follow after technical skills have been established.

> *I have worked with my teacher to concentrate on not listening to myself when I sing and focus more on the sensations, breathing and positioning of the mouth and tongue in order to achieve the correct sound.* [PIIS15d]

Individuals respond in hugely diverse ways and young voices can be unstable in tonal quality during puberty. A teacher has to give confidence and discuss the timbre in positive ways to encourage the singer to experiment. Here the teacher has to modify the student's perception of *'thin and weedy'* to *'musical and smooth-grained'*. This is an example of negotiating the teaching and learning with shared metaphors.

> *When I lift her voice into mid to high, she complains that it sounds thin and weedy. I agree that it occasionally sounds breathy, but "thin and weedy" it ain't! In fact, her upper voice is musical, smooth-grained and really rather attractive. She does trust me, bless her, but I can see she is still confused.*
> *Another pupil sang like a drain...she actually thinks she sounded fine!*
> [PIIS18d]

This teacher finishes with the contrasting example of a student who is confident about her singing though the teacher is unimpressed. The shared experience of one to one teaching is full of such potential mismatches in aural perception. Discussion and negotiation would seem the most practical solution to resolving misunderstandings. However it does involve a certain amount of understanding of personalities and compatibility between teacher and singer.

7.33 Teacher/student personality

Links with personality have already been noted in the field of visual perception (Arnheim, 1974) and, in the field of music, Kemp observes:

> Singing students may well find themselves moving from teacher to teacher in constant search for a 'guru' who, by use of a particular form of metaphor, somehow manages to 'speak their language'. (Kemp 1996: 174)

Kemp approaches musical temperament using the *Myers-Briggs Type Indicator* (Kemp, 1996: 10) that looks at the two ways of perceiving information by

sensing or intuition, and the two ways of judging this information by thinking or feeling. These tendencies result in four types; sensing plus thinking; sensing plus feeling; intuition plus feeling and intuition plus thinking.

In the beginning of this chapter, it was revealed how some singers were more analytical in their responses while others used 'feeling' phrases. For example, this singer could be a 'sensing plus thinking' singer:

> *Through playing the clarinet, that's how I was trained to listen to tone, think of what kind of sound you're producing and whether you want to produce a really bright sound. When I'm listening to myself I find myself anticipating what's to come, with the Italian it was more like singing along in my head, with the German it was more like feeling it. I mean I know what it means but it's on a different level and with German It's just like...there are lots of memories associated with that song.* [PIIS4i]

However another singer seems to fit a mixture of types, sensing, feeling and thinking:

> *Chose to sing* [PIIS1Rs-two] *first in lesson today. Feel this song suits my voice-made me more confident and when I'm more confident my voice is more controlled. Feeling good about voice at the present because I'm practising a lot and I know I'm singing well in lessons. Also enjoying working on the* [PIIS1Rs-three], *although still don't feel it suits my voice, and I feel I force my voice on the lower end of range. Would feel better to have more power with this type of song.* [PIIS1d]

Yet another singer could be a 'sensing plus feeling' type or could be 'intuition plus thinking' type: '*I feel the sensations out there...it's better that I don't feel it inside.*' [PIIS9i] It is worth noting that Kemp believes that while singers might be regarded as extroverts they also need some kind of introverted attention to themselves. He goes on to suggest that:

> Singers may also require a special kind of sensitivity that allows them to perceive the interrelationships between their body sensations and the desirable qualities of their vocal tone. (Kemp, 1996:174)

This fundamental relationship between physical sensations, aural perception and vocal tone quality needs to be examined and having looked at the metaphors singers use, the role of the ear is now discussed.

7.4 The role of the ear

Although the ear is receiving the acoustic data it would appear that some singers [PIIS19i] almost feel the singing sound physically, *'tends to sound quite puny'*. Effort, comfort and energy words relate to easily identified and understandably sensory perceptions. These are metaphors used by the speech therapy profession. Metaphors relating to maturity and ageing are likely to be used by singers striving for personal and vocal maturity. Style specific metaphors like twang, opera, belt etc. are also identifiable concepts, used as 'hooks' for teaching specific vocal genres and as such are useful as are the various 'fachs' or voice types used within the professional world to typify singers for certain roles, dramatic soprano, coloratura, helden tenor etc. The ear can be trained to hear these sounds and conceptualise and match the physical sensations to the auditory transmission, as seen in the discussion on use of registers in chapter seven.

Colour metaphors, on the other hand, are more intangible. The ear is required to match the auditory feedback with a psychological and visual concept. The ear has to adopt the sensory perceptions of the eye and relate them to a different sensory mode, that of acoustics. Perception of colour is different from perception of sound:

> If lights of two different frequencies (or wavelengths) are mixed, we see a single colour corresponding to the mixture, rather than seeing two component hues. (Moore, 1997: 4)

Our perception of sound enables us to hear two different instruments played at the same time, so drawing parallels between sound and colour perception needs to be treated with caution. However the visual world is an attractive and compelling medium and colour metaphors are an attractive if rather unsubstantial way of describing vocal timbre. Noë does see convincing parallels between colour and sound worlds.

> Sounds are color-like, and sound perception is like color perception. The distinctive feature of color perception ...is that colors (apparent and real) are a kind of appearance. Colors are visually salient ways objects affect their environment. Sounds, in comparison are audibly salient ways in which events affect their environment. (Noë, 2004: 161)

Equally, texture metaphors offer a tangible and graphic means of description that can help singer distinguish and conceptualise a particular vocal quality from another. Dynamics of loud and soft are measurable along a comparable axis but it would be more accurate to describe vocal sound in terms of louder and softer depending on the singer's own aural template of 'loudness'.

Space and movement metaphors seem to offer a special place for analysis. For the singer they are sensory but unseen. In Arnheim's visual world (1974) they form a more tangible perceptual experience but in a sonic landscape they are difficult to identify. In chapter eight these ideas will be explored in greater depth because of the importance professional singers seem to give to space and movement when describing the act of vocal performance.

Perception can be seen as divisible into different layers; useful as models for sound engineers to create, in order to investigate speech/song discrimination and speech/music discrimination (van Besouw *et al.*, 2006) but difficult to relate to

the holistic auditory perception in this study. Any attempt to separate out auditory skills, as a sound engineer might separate different tracks in a recording, implies a loss of any interaction that might be taking place in normal auditory processing. However, the concept of layers of auditory perception is a valid one, as long as an aspect of dynamic interaction is built in. In chapter nine there is a figure illustrating the different kinds of auditory perception found in this study with the interactive elements of vocal identity and experience uncovered in the data (Figure 9.1).

Closed and open types of metaphor

Reviewing the types of metaphorical language used by the singers, it appears that some metaphors, while convenient, could be limiting. Some uses of metaphor appear to be 'closed' and others 'open' to a wider variety of interpretations and thus offer more flexible vocal responses and a broader range of possible timbres. A singer could say "I use 'opera' quality or 'belt' quality" but this implies a specific and bounded notion. Other metaphors like colour and texture can be seen as open ended and exploratory as they are more complex. When a singer has identified a particular metaphor for a sound an auditory memory is established as part of the perceptual process but auditory memory can confuse and sometimes 'cheat' the brain. These next two singers illustrate how the vocal memory of a performance still influences, how they sing, how they hear and how they perform the song subsequently. The first singer recalls the happy memories of singing at her friend's wedding, though she is unsure of whether her inner feelings are expressed so clearly in the recording. She refers to the second take during the recording process. She describes it as a *'picture'* of how she felt, a visual image

rather than an auditory one but she also describes it as *'calling'* on a past memory. The second singer however has more negative feelings roused in the auditory memory having sung the same song for an exam, and this brings out the importance of performance success in maintaining positive feelings when singing the same repertoire again.

> *But I know how it was 'cos I sang as the bride came in towards me and I can still picture how I felt, it didn't come out... I think it came out more in the second version. It's calling on something isn't it*? [PIIS15i]

> *It's funny if you do it for an exam it always gets tarred with that brush.* [PIIS19i]

This feature of vocal perception, where the song is inextricably linked with the strength of feelings in previous performances, was looked at briefly in chapter three with reference to vocal identity; for example, the young boy who sang his solo from *Les Misérables* for his friend's funeral. The link between vocal identity, performance experience and aural memory again emphasizes the interactive and holistic nature of singing and the importance of strong emotional involvement in cementing these impressions. The power of strong emotional musical experiences to alter our aural perceptions is currently under investigation (Gabrielsson, 2001: 433) and it would seem to be an important feature in understanding a singer's aural memory.

Whether this 'internally remembered sonic' experience is identified by the listener, who may be unaware of the significance of the song to the singer, is explored in the following section as the listening study reveals an audience response to vocal timbre.

7.5 The listening study: how audiences articulate vocal timbre

7.51 Triangulation

It was felt that some kind of audience reaction to the singing voice would be a useful means of increasing the validity and scope of the study and so a small scale listening study was set up.

Ten tracks taken from the twenty-two singers' recordings in Phase II were collated onto CD and played to a listening panel of three men and two women They were judged to have eclectic musical tastes as frequent ticket holders for a wide variety of musical events taking place at various Bath International Music Festivals over the past ten years. They also had collections of several hundred CDs from classical, folk, jazz, world and rock genres. All were professionals aged 50 or over, and the two women had performing expertise: one a piano teacher and accompanist, the other a recorder player. They were asked to listen to the recorded performances in a concentrated fashion and to note the descriptive words that came to mind. Before beginning the listening task, they were briefed about the nature of the recordings, the mixture of ages and the amateur status of the singers, and asked to give their responses as if listening to a newly purchased CD. The singers and songs were chosen by the researcher to represent a range of auditory and musical experiences to include male/female and young/older voices with contrasting vocal timbres.

This added another dimension to the study and enabled comparisons to be made between singer as listener and performer, and a possible audience reaction (a CD

used in the listening study is enclosed and the relevant track numbers identified in the text to allow readers to make their own comparisons between the singers).

Table 7.3 showing CD tracks for the listening study

Track	Singer	Song
1	2	*Nothing* from Chorus Line
2	18	*Widmung* Schumann
3	13	*A Thousand Miles* Vanessa Carlton
4	4	*Going to heaven* Copland
5	20	*Ich grolle nicht* Schumann
6	5	*Maria Weigenlied* Reger
7	6	*Tell me on a Sunday* Lloyd Webber
8	1	*The Nearness of You* Hoagy Carmichael/Norah Jones
9	21	*Linden Lea* Vaughan Williams
10	19	*Ye banks and braes* (unaccompanied folk song)

These data were analysed by comparing the different responses of the 5 participants. A comparison was also made between the singer's self-description and the 5 listeners. The language used was grouped and the musical, technical, timbre, diction and personal comments were compared. The following table is a reminder of the codes mentioned in chapter two and used in this part of Phase II.

Table 7.4 showing codes used in the Phase II listening study

Listener study 5 amateur non-singing musicians [La-PII1rs-one] i.e. Listener a with Phase II singer 1 with recording song one	L: *Listener* a: *individual listener code* PII: *Phase II* S: *Singer* 1: *individual singer code* R: *recording* s: *song* *one: two: three*

The listening study illustrates the diversity of responses that can be perceived by an audience to the same singing sound. Bearing in mind that the listeners could have been experiencing different auditory sensations due to their own hearing abilities, it is interesting to note that some singers provoked more subjective responses, while others prompted more comments on diction, technical or

musical aspects of the performance. Timbre also seems to be more obvious when hearing some singers than others. Perhaps the timbre of a particular singer was non-descript, or too difficult to put into words or was masked by technical, musical or diction problems. The range of responses suggests that singers stimulate an individual response from an audience and that the audience identity orientates the response in much the same way as vocal identity in the singer.

7.52 Examining the audience response

Looking at the different responses in the listening study it is possible to identify features of auditory perception each participant is experiencing from the recording. The first track [PIIS2r-three] provoked the response, '*hard, penetrating tone*' from listener a but '*vibrant*' from listener c. Listener e heard the '*poignant*' feelings expressed by the singer, whereas others [a, b] were just '*annoyed*' and found it '*wearing*'. The second track [PIIS18r-three] also produced some divergent responses, four out of the five listeners [b, c, d, e,] thought that it was a '*mature*' voice but listener a agreed with the singer herself when they said it sounded '*youngish*'. The third track [PIIS13r-one] two listeners [b, e,] identified a '*breathy, gasping*' quality but listener a spoke in more technical terms about '*shallow voice*' production, while listener d equated the sound with a '*black boy pop voice*' and indicated that he '*should do well*', a reference to the commercial nature of the style of music. This shows how the attitude of the listener is governed by many factors, perceiving a voice from a technical point of view or a musically influenced response.

Track four [PIIS4r-three] produced some agreement about the '*diffuse, husky, foggy'* [a, d, e,] quality in the sound. While Listener c noted a '*good feeling for the words'*, others noted the technical problems of '*intonation, lack of support'* and the difficulties in the register. Track five [PIIS20r-three] produced some discrepancies in the communication of the text, listener a said there was '*good feeling for the text'* whereas listeners c and e felt there was '*no sense of meaning'* conveyed. The problem of communicating meaning to an audience is not just the singer's: the listener can be tuned into a performance or not, and the complexities of shared understanding, particularly in a song recital in a foreign language are immense. An audience can bring so many different previous experiences to the interactive mixture.

Track six [PIIS5r-one] produced some agreement as to the age and experience of the singer and most of the comments were positive but some responses focussed on the technical aspects, '*thin at the top and no bottom, not a rich sound, little dynamics'* [e] and others spoke equated the sound with another singer '*bell like, good German, a touch of Elisabeth Schumann'*. Track seven [PIIS6r-three] and track eight [PIIS1r-three] produced very similar responses, they were both young female singers singing popular music theatre songs, but the listening panel were generally unmoved by the performances. In some cases the power of the music overcame any negative feeling, '*relaxing to listen to, intimate'* [c] but on the whole the sentiments expressed were that the singers were '*boring* and *insincere'*.

Track nine [PIIS21r-three] illustrated once again a difference between communication of feeling and the words, listeners a, b, d and e all spoke about '*pronunciation problems*' and lack of feeling in the interpretation. Listener c on the other hand, said '*very clear words, thoughtful and caught the style*' of the song. Track ten [PIIS10r-three] produced general agreement with three listeners [b, d, e,] using the word '*good*' in their descriptions.

If the individual singer's comments are compared with the listeners' perceptions of the vocal timbre on the recording some interesting results emerge. The following table (Table 7.5) highlights some of the timbre words from the data of each singer and compares them with the words used by the listening panel in the data.

Table 7.5 showing the use of timbre words by the individual singers and the listening panel

Singer	Singer's words	Similar responses from panel	Different responses from panel
2	Big	Hard, penetrating, confident, very wearing, penetrating, strained, not very lyrical, strong, theatrical	Vibrant, lively Poignant at the end
18	Young, bumpy	Youngish, a little bland, pleasant	Mature, full sound, liquid smooth tone Plummy, indistinct, mature
13	Loud, nice, white	Speech sound	'black' pop boy asexual, nasal, tight, shallow, light breathy, indistinct
4	My voice wasn't shaking any more Lack support Enjoyed lower range	Diffuse, woolly, slightly stretched No support, flat foggy, booming, thin, swooping upwards, slower deeper bits more appealing	Strong, needs to develop lower register
20	No flow, rigid, hard, bored, not warm as it should have been	Needs more resonance, lacks complexity, poor line, constrained	Pleasant, fresh, young,
5	Quite good, too much swooping	Needs to watch vibrato, good sense of style, mature experienced	Smooth, restful, bell like, thin at top, no bottom, not a rich sound
6	Brighter, gravelly, clear	Pure sound	Needs more passion, breathy foggy, light
1	More comfortable, bit more depth	Relaxing, intimate, good depth	Weak, no feeling, flat delivery
21	Very rich golden colour	Light tenor	Very restricted, inconsistent, struggling, no feeling
19	Threadbare not brassy enough	Bird – like, pure	Good strong voice

It is possible to see some layers of auditory vocal perception similar to those found in the singers. There are initial reactions to the quality of timbre; sometimes reflecting the comfort the audience intuitively feels within their own

larynx, *'hard, penetrating, weak, or woolly'*. There is a tendency to comment about age and maturity of voice, but also to reflect musical and stylistic features, *'theatrical, pop voice'*. Singers who seem to have more technical control and experience tend to be described in more specific timbre terms, with references to, *'vibrato, resonance, depth and smooth'* qualities. The one thing that emerges most consistently is the importance of feeling and expression coming through the voice and a sense of communication. This professional singer's comment in Phase I illustrates both the appeal and the challenge of vocal music:

> *I want to hear the person. I want to be able to identify the voice, feel the emotion.* [PISN]

The panel of listeners were reacting to the sound critically, but they may have given very different comments if the singers were in the room and were asking for feedback. In the teaching situation, the teacher's ear may pick up on a variety of sound qualities to comment on but may have to process these in a constructive way. This can mean more potential confusion within the mind of the singer if it is not done carefully. The listening study does, however, accentuate the wide variety of auditory feedback people experience and the implicit aspects of both singer and audience personality involved.

7.53 Implications for singing teachers and singers

There is a need for singers to be focussed as they develop their unique vocal timbre, to have specific aural concepts to be striving for and to build up a descriptive vocabulary in order to bind these sound pictures into their auditory memory. The dilemma for the teacher (the examples given are from the Phase I interviews), is that individual vocal qualities may not, at first, be apparent in an

emerging voice; the teacher's task is to uncover this individual sound, make the singer aware of this quality and then aim to develop it throughout the range with different styles and genres of music.

> *One of the things I find frightening when I'm teaching, I'm trying to bring out the essence of what everybody's voice is, especially as you go through adolescence, you come to later adolescence and you begin to hear just a couple of notes on a voice and you say, "that's going to be your voice! That's the voice we're looking for. Can you feel that's you? That could only be you!" And it's almost like undoing a chrysalis and letting the butterfly fly.* [PISK]

The use of metaphor can be helpful or not as has been discussed earlier.

> *If that image doesn't work, I've got another one...it'll be sometime later that they'll say that image of so and so, that was the biggest moment I've had.* [PISJ]

The need to clarify the terms used when describing timbre has been illustrated in the diversity of responses found in the data. While it is important to seek for some unity of description, inevitably it is the individual's personality and experience that will contribute or not to a shared understanding in the one-to-one lesson situation. Constructive criticism will demand careful use of terminology; the listening study illustrates the diversity of response to singing sound. Appropriate language for the variety of assessment procedures a singer undergoes is obvious; adjudication at competitive festivals, examinations, auditions, newspaper criticism, all require subtle differences in descriptions of timbre apart from other factors such as visual appearance and general musicianship. The proliferation of language can be seen as a positive outcome, broadening the conceptual resources available, just as the wine masters have developed a large vocabulary for describing wine, and the paint manufacturers, similarly, for paint. Sharing the meanings of such terms is still fundamental for progress.

7.6 Summary

This chapter has explored the role of metaphorical language in shaping the concept of vocal timbre in singer and listener. By examining the kind of language used by the singers and listeners in the data it is possible to identify certain patterns. In chapter three over 250 words were analysed from the Phase I data (Tables 3.5, 3.6, 3.7); the classifications relating to vocal timbre were used to analyse the discourse in Phase II (Table 7.1). In this chapter the focus has been on the types of metaphors and what their use might reveal about auditory perception taking place within individual singers.

The use of terms such as comfort, energy, weight, expression, taste, balance and temperature, all seem to refer to some of the physical sensations experienced by the singer and associating the singing sound with bodily sensations and reactions is confirmation of the 'bodymind', holistic nature of the voice. Ideas about shape, colour, light, texture, form and references to musical instruments, suggest a further layer of auditory perception with the singer using images in a cognitive conception of vocal processes. As discussed in the previous chapter the experience of high/low, thin/thick, weak/strong, seems to involve deeper kinaesthetic responses to acoustic feedback both internally and externally. The laryngeal muscle movement and the resulting vocalisation and auditory response is an intuitive process that seems to be shared by singers and audience. High, thin and weak sounds imply a softer dynamic and can be associated with very young

or very old voices and low, thick and strong sounds imply a louder dynamic and a more mature sound.[5]

There also appears to be some kind of orientation taking place with the use of metaphorical language being dictated by some aspects of vocal identity. However, there are two aspects of the metaphorical language that have still not been fully explored in the data, space and movement. These two aspects emerged as being particularly interesting as they featured prominently in the data from the professional singers in Phase I but did not appear in the data from the amateur singers. In Phase II only a few of the amateur singers used these ideas to talk about the vocal experience.

The four research questions posed at the start of this thesis asked how singers think, hear and feel their singing voice and how others experience the voice. This chapter has examined the different ways metaphors illustrate the perceptual experiences described in the data. The listening study compared the aural experiences of non-singers to those of the singers themselves and found that there was not always agreement.

[5] Figure 9.1 in the last chapter links these layers with the dynamic of vocal identity and experience.

8. Concepts of Space and Movement: the distinguishing features between amateur and professional singers

8.1 Introduction
- 8.11 Linking the Phase I and Phase II data
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8.5 Summary

8. Concepts of Space and Movement: the distinguishing features between amateur and professional singers

8.1 Introduction

In this chapter the sensations of space and movement that singers experience when singing, will be examined in more detail. It begins by linking the results from Phase I to those of Phase II with particular reference to the analysis of the discourse into four themes: feeling, sound, space and movement. These were the four themes that emerged from the data in the diaries of the three professional singers. A table (8.2) illustrates the references to these four themes in the Phase II data.

The next section examines the concepts of space and movement more closely by including a further literature review linked with the data concerned with these two aspects. The middle section of the chapter discusses auditory vocal perception in more detail, seeking explanations within the discourse of the singers, looking for any sense of awareness of muscle movement in the vocal tract, plus an examination of the sense of flow in performance. This section also links the data from the professional singers' diaries from Phase I and four singers from the initial interviews of Phase I with the Phase II findings.

The fourth section of the chapter looks at the factors which influence auditory vocal perception; namely, the importance of vocal experience or chronological

age, the value of performing in large spaces, the physical and psychological aspects that can cause problems and the way hearing contributes to a sense of space and movement. The chapter concludes with the implications of these findings for singers and teachers before a final summary.

Table 8.1 showing the coding used in this chapter taken from Table 2.1

Phase I	
Interviews with solo and choral singers [PISAi] [PISBi]	PI: *Phase I* S: *Singer* A: *individual singer code* i: *interview*
Diaries from professional singers [PIpsd-one]	P: *Phase I* ps: *professional singer* d: *diary* *one: two: three*
Phase II	
Diaries from amateur solo singers [PIIS1d] [PIIS2d]	PII: *Phase II* S: *Singer* 1: *individual singer code* d: *diary*
Recordings of 3 songs [PIIS1Rs-one]	PII: *Phase II* S: *Singer* 1: *individual singer code* R: *recording* s: *song* *one: two: three*
Interviews post recording after play back [PIIS1i] [PIIS2i]	PII: *Phase II* S: *Singer* 1: *individual singer code* i: *interview*

8.11 Linking Phase II and Phase I data

As the study progressed it became clear that in addition to providing a structure for Phase II, Phase I produced worthwhile data on the use of space and movement metaphors to describe singing.

In particular the diaries of the professional singers provides a valuable addition to the discourse of the Phase II amateur singers. Data from four singers from the initial interviews (J, K, M, N, who were also professional singers) are included in this chapter.

Here one of the professional singers, also a teacher, describes the sense of space in physical and emotional terms, linking the body with the mind in the act of singing. Singer 2, though much younger also expresses this in her own way.

> *I think it frightens them, how much you are plunging deep into their...the physical act of going down there, is going to plumb all sorts of depths, psychological and physical.* [PISJi]

> *If you're going to hit a big note you take a big breath to make room for that big sound and you let it out and you think Phew there's nowhere else to go now, what's the next note? You do feel it inside.* [PIIS2d]

For some the sense of space is achieved by a simple physical and technical skill; '*The tongue worked and the space was there,*' [PIIS17i] but even professional singers do not always achieve this.

> '*It is a very easy voice by and large. It varies from having too much breath flowing and not enough.*' [PISN]

Technical skill does seem to be a pre-requisite for vocal freedom.

> *Voice feels fuller and more flowing today.* [PIIS4d]

> *I am trying to listen to the sound and make sure I have the space and breath control to feel comfortable.* [PIIS16d]

> *My sense of rhythm, or lack of it, is certainly affecting my ability and then dragging in places, preventing a clean flow.* [PIIS17d]

However, for some, the use of '*jargon*' can be obstructive:

> *The nub of it all for me is that unique vocal personality and ability to communicate freely the music and the text...hampered considerably by the vocal jargon and ideas communicated 90% or more of the time.* [PISM]

Another professional singer agrees with this:

> *I know when I was a student I started, I thought I ought to know what I was doing, so I read books and in fact by the end I couldn't sing, I was so conscious of what each muscle was supposed to be doing.* [PISK]

The contrasting responses in the professional singers' discourse (Phase I) and the amateurs' discourse (Phase II) highlight the subtleties of auditory vocal experience and in particular, argue the case, that expressions of space and movement are found in higher levels of vocal perception.

8.12 The expression of space and movement with reference to the voice

As highlighted in previous discussions on the Phase I data, two themes emerged within the diaries of the three professional singers that had not appeared in the analysis of the initial interviews with solo and choral amateur singers. In Phase II the data were further examined using the same themes found in the professional singers diaries, feeling, sound, space and movement (Table 8.2).

The majority of singers referred to aspects of feeling and also referred to the sound they experienced while singing. There were some gaps in the data with reference to space and movement and this resulted in a closer examination of the discourse for possible explanations. As with previous analysis, the singers were cross-referenced to see if there were any indications that age, gender, type of music in repertoire or teacher, produced any significant patterns but there were none. The only factor that emerged was that of vocal experience, the amount of time spent singing each week and the level of vocal identity that had developed as a result of performing and studying the voice. *'A full self-ness, the*

'individuation' of the voice only comes with maturity' (Hilary Finch, music critic, personal correspondence). The evidence suggests that with vocal experience comes the ability to perceive the voice in terms of space and movement. The following table (8.2) illustrates this; the taxonomy level (taken from Table 2.2) is put in brackets below each singer's number code.

Table 8.2 showing some of the references to Feeling, Sound, Space and Movement in Phase II singers

Singer Taxonomy level	Feeling	Sound	Space	Movement
1 (2.2)	Voice felt comfortable, don't feel it suits my voice	Raspy, husky sound		I didn't realise how much there was a natural vibrato If you're doing scales and runs- it just doesn't want to flow
2 (2.3)	My voice is very rough	And then I put the odd crack or cry/whimper in my voice which is very not me	It was a nightmare, it was just this little tiny room, I practised as if I was in a small space, but the room was so small etc. The bathroom, different rooms, on stage, I love big, big places	
3 (2.2)	I now know where to place the emotions	More of a pure sound rather than a bit shaky		
4 (3.1)	I really enjoyed the way at different points, you really get going in the higher register		Less depth of sound	Music flowed more The movement of the song helped
5 (3.7)	I've got to make it sound as if it doesn't matter	It needs to be richer	I've still got to work at that depth	It kind of floats along, it mustn't sound like separate notes
6 (2.3)	It lifts	It sounds a lot clearer	In church because of the acoustics, I prefer that kind of acoustic to the studio	
7 (2.3)	It doesn't feel like how I sound at all	It sounded thin, just not interesting		
8 (2.1)	It feels a lot stronger	It sounded breathy and hollow		
9 (2.2)	I feel the sensation out	A sound of innocence		
10 (2.2)		I don't get the sounds in my head		
11 (2.3)		It's quite nasal isn't it	I want to do a recording with the big band in a huge studio	
12 (2.2)	I feel like I'm about to collapse	A warmish sound		
13 (2.1)	I sing songs that make me feel good	I made quite a nice sound		
14 (2.3)		They all sound the same		

15 (3.5)		This quality is still very much developing	It has some fantastic acoustics and they colour it –it makes a difference and it falls into place	
16 (4.1)	I feel exposed	I am trying to listen to the sound	I've been working on getting a more open space at the back	
17 (3.4)	The song feels hard work at the moment	Sounds too wide	The gorgeous acoustics played a big part in this I've got the space above it very clear	
18 (3.7)	I get the feeling that I'm not going to like this song very much	The sound should be creamy and relaxed		I could feel the voice swelling with the ebb and flow of the melody
19 (3.4)	I felt more secure re sound and clarity I feel quite positive now	Sounds a bit tinny to me	I spent a good ¾ hour doing my singing in a large space with the most glorious acoustic	I was loving it and it was like being given a fast motorbike after having a push bike
20 (3.4)	It gives you a feeling when it's good	I sound really bored on it	When you practice in a little room and then go into a bigger room, it makes you feel so much better	It didn't flow it was in bits
21 (2.3)	The music gives you more of an opportunity to express emotions	There must be a way of singing that final major sound which would give it a more finished sound	My voice seems to be more resonant	
22 (2.1)	I feel really bad today so when I sing it hurts a lot	It is sore, dry, angry and spiky again and a bit rough I sound a bit scrambled		

It was interesting to note, from a triangulation perspective, whether any of the listening panel, who were all together to hear the CD playback used terms referring to space and movement of the voice; however, only listener e used these types of metaphor consistently. This suggests that it is often the singers themselves that are aware of these perceptual experiences, rather than the audience.[6]

[6] This has important implications for teachers and coaches who are not performing singers and who may not have experienced these sensations, and it suggests that vocal teachers and coaches should be encouraged to have some performing experience.

It might seem curious to devote a whole chapter to just two of the metaphorical concepts found in the data, but this was a striking finding, whereby concepts of space and movement appeared to distinguish singers who had achieved a certain level of performance from those who were beginners. Whether this perceptual understanding of the voice has come about as a result of training or whether the experience of singing at an advanced level has developed these skills will be examined in the following discussions.

It is not clear from the data whether the singers themselves were aware of this on a perceptual or a more concrete, conceptual level. In other words was it a skill they adopted consciously or was it at a perceptual level more instinctive?

8.2 Concepts of space and movement

8.21 Evidence from the literature

Musicological perspectives

Noë argues the case for a sensorimotor or enactive approach to perception; he argues that to perceive 'we need to keep track of our movements relative to the world' (Noë, 2004: 34). Clarke discusses Scruton's (1999) arguments for space and movement metaphors as integral to the notion of music and while the metaphysical argument explores these metaphors from a philosophical perspective, it also confirms their existence as musical concepts (Clarke, 2005: 67). There is however a difference between the combination of tones in music producing a sense of space and movement within the structure of a composition and the timbre and tone quality within one note or phrase, that a singer perceives

as having space and movement. The first example is where perceptions of space and movement are created between the combination of notes of different pitches, timbres and rhythmic values, the second example is the sensation of space and movement felt by a singer often within one note and as part of the vocalising process.[7]

Neurological perspectives

Cognitive neuroscience has helped to identify certain areas in the brain as having links with these sensations of space and movement. The area of the brain most closely linked with speech production, Broca's area, is essentially a 'movement' area, triggering activity in the lips, tongue and throat to produce speech (Carter, 2002:189). This supports the claim that we are only conscious of those things that offer opportunities for action.

> Although the action schema pathway is unconscious it may help select objects for consciousness. The region of the brain where action schemas are created is also concerned with attention, and it is possible that schemas which are particularly strong nudge nearby attention mechanisms and cause the brain to zoom in on (orient) the perception as it emerges from the lower processing line. (Carter, 2002: 193)

This illustrates the links between the physiology of the ear and a sensorimotor element; a suggestion which finds agreement with the findings of Noë and which is also echoed in the work of Alfred Tomatis.

[7] There are differing examples where the space/movement metaphor can be seen working as an analytical tool: one is explored by musicological analysis as in Clarke's (2005) discussion of an excerpt from *Wozzeck*, and another can be seen in this study examining the auditory perception of singers. It is important to note the differences between the musicological use of such terms and the psycho-acoustic perspective.

Tomatis (1987/2005) places the ear firmly at the centre of all vocal training. He suggests that the vestibule of the ear demands a certain posture of the body in order to enhance listening, he describes the 'conversation' that takes place between the cochlea and the vestibule simultaneously with the cortex and the body. His work is beginning to be verified by other research studies (Leeds, 2001) but his emphasis on the optimum listening posture for singers and the twelve audio loops that take place within the singer is still largely unknown within the singing profession in spite of some high profile success stories. Indeed many books on teaching singing refer to the hearing experience hardly at all. The eminent American teacher Richard Miller in a recent book (2004) *Solutions for Singers* mentions hearing briefly and he advocates a tri-partite approach to the vocal instrument, breath/phonation/resonation with only auditory control implied. Recent studies into right ear and left ear hearing of babies (Sininger *et al.*, 2004: 1581) also suggest that the right/left orientation of the ear itself, as well as the brain hemisphere plays a part in auditory perception. While these findings are not always in agreement with Tomatis, (the left ear is more 'tuned' to musical and prosodic features according to the latest research with babies) the view that the ear plays a more significant part in the perception and production of sound appears to confirm the view that a listening posture can be beneficial for singing (Tomatis 1987/2005: 85).

Spatial location

In acoustic terms spatial location refers to identifying the location of a sound source, but this is not quite the same experience a singer talks about when describing space within the voice. The singer knows that they and the internal

vocal mechanism are the sound source but they build up a sound-map of their timbre from the internal auditory experience and the multiple acoustic feedback sensations that surrounds the body. Bregman, whose work on auditory scene analysis is still fundamental to our understanding (Howard, 2005), seems to suggest that spatial location is a useful tool in enhancing changes of timbre (Bregman, 1993: 26). A singer uses spatial concepts to hear, adjust, enhance and develop vocal timbre.

> *The voice actually felt fine, despite the fact that we were singing outside (which is always a bit more difficult). As I sing the tenor line in the group, the sensations had while singing are always slightly different to those experienced while singing baritone as so much of the singing seems to be on the edge, so to speak, of my voice. This means that the internal sound is much less resonant, and feels a lot less thinner and less substantial than usual.* [PIsd-three]

Here the singer speaks about the difficulties of singing outside in an open-air concert; the different sense of space when singing in the tenor line and the sense of being at the *edge* of his voice. Similarly this singer speaks about the space inside the head.

> *Thus when reaching the first top A flat I always sounded strained. I would feel that I was singing this piece with no overtones and no space inside my head.* [PIIS17d]

At a neurological level it would appear that information relating to movement is processed in a spatial form in the auditory cortex.

> Temporal information, coded at the sub cortical level as spikes synchronized to the periodicity of the acoustic signal, is subsequently converted to spatial information coded in the form of tonotopic maps in the auditory cortex. (Liégeois-Chauvel *et al.*, 2003: 153

The area associated with speech in the brain is also linked with movement, which again points to the validity of a holistic approach to hearing and singing.

The singer has to use whatever concepts of the auditory experience they can gather during performance and then link them up to the physical sensations they experience at that moment in time. Bearing in mind that at the sound source, the vocal folds, *there are no means for a singer to be aware of sensations* (Chapman, 2006: 219) they have to use other physical experiences to tie in with the auditory knowledge they have in the memory and the auditory feedback that is ongoing. It could be that the ideas of space and movement reflect a three dimensional aspect of singing that only comes with experience. The ear sets in motion a psycho-sensorimotor loop that includes receiving information from the auditory memory, the real-time acoustic feedback and the physical and psychological sensations of singing.

8.22 Evidence from the data

The three dimensional features of space and movement suggests a higher level of auditory perception in singers and there is evidence for this in the data. Some singers resorted to physically demonstrating with their hands. Here the singer uses her hands to demonstrate one of the dimensions she experiences (the pillar box) while explaining the technical things she is trying not to think about and the difficulties of finding the space for her voice.

> *I know when there isn't enough space, you know, when it's not right but when it's going so well you don't actually stop and think about the technicalities do you? And I have a tendency to get bogged down to make my notes clear, bring the sound forward and then all of a sudden I'm like a pillar box* [holding mouth and jaw] *and that's bad, yes, I can tell you what the space isn't but when it works it's just fantastic.* [PIIS16i]

Understanding the dimension of scale when singing is a point that Hilary Finch, the music critic, alluded to.

> *I do think that students of song tend to underestimate the scale they have to work in. They tend to understand the intellectual and subtle points but don't actually project them. They don't seem to have busted a gut imaginatively, it hurts, that's the paradox of working in the small scale.* [personal correspondence]

One of the singers talked about what she was trying to achieve in singing by reference to the breath, the pharyngeal space (the vowel) and the pitch of the note, thought she does not mention movement specifically at this point.

> *Well, it's to do with the vowel you're singing and the note that you're singing on, you know the breath control that you have at that point in the song...* [PIIS15i]

However, she goes on to say more about her psychological change and the need for the voice to go out:

> *It's the letting go and the breathing it, though it is very much part of it, the focus is in here but the voice has to go really out, I've had to change a lot.* [PIIS15i]

This singer talks about the tone quality *'weak'*, and the physical implications *lacking in body'* and the need for the voice to travel, *'direction'*, even though her frustration is that she has not achieved what she would like.

> *The sound I produced was weak and lacking in body and direction.* [PIIS17d]

Whereas this singer seems to be only able to think on two dimensions:

> *I've got a decent tone but it can be very weak.* [PIIS8i]

One of the other professional singers in the Phase I spoke about the size of his voice in relation to the kind of roles that he was being asked to sing:

> *I needed a teacher in the UK who could allow my voice to grow to meet the demands of my career. It has gotten stronger and clearer, and this does not mean 'bigger'. It IS bigger, but that is the correct result of patience and muscle building, having a big voice is out of our hands.* [PISN]

The impact of the musical demands also affected another of the Phase I professional singers:

> *I've always felt a vessel, um, ok, I've got a pair of vocal cords that make a good sound, and the desire to make them make a good sound but apart from that I've felt that I am completely nothing to do with it... I've always felt it to be an enormous privilege to be working with people like Bach and Handel and there are not many walks of life where you can do that...I do feel strongly that you are the instrument for the greats, who've done it all and you're just putting it out and I've always felt that right from the start, so I don't get a feeling that it's me.* [PISJi]

The sense of personal involvement can conflict with the role of taking the composer's intentions, and not all singers experience the division so clearly. The psychological commitment to performance is still acknowledged to be integral, this singer also makes much of this point.

> *As a singer I never did <u>feel</u> all these complications, I mean, I was a desperately self-conscious person, so it was, but it nevertheless never affected the fact that I wanted to sing, but these people* [TV reality show for singers] *are thinking all the time of the results and the effects, they're just not letting go. There's a brain working behind it, um, which is going, I don't understand this. Do I want this, which I think goes against singing? It is just getting undressed in public, I mean you are bearing your soul, um and these people <u>aren't</u>.* [PISJi]

This suggests that the third dimension in the use of space and movement metaphors is a psychological one.

8.3 Auditory vocal perception: how do singers talk about space and movement?

8.31 Space

This singer was asked;

> ***Do you get a sense of space when you are preparing a note?***
> *That's not something I find easy to do, but it's kind of thinking about the interval and what it feels like to move up and down and that actually I am*

> *finding more difficult now because my voice has changed again a bit.* [PIIS4i]

Not all singers found it easy to talk about a sense of space: this singer thinks in terms of intervals and pitch.

> *The feel of the line was always lovely, comfortable and creamy with a full feel to the notes. However, now I have started trying to work it through properly, the sound has gone thin again. I'm always telling my students...that if after some work, their sound seems quieter in their own perception, that it is probably because I'm hearing more of it now.* [PIIS18d]

This singer describes quite effectively some of the learning processes singers are involved with; there is an initial feeling for the sound that is wanted and perhaps the ear is somehow leading the singer to explore that timbre. The singer says '*I'm hearing more of it now*' which suggests a more personal commitment.

Has the singer heard a recording, or heard their teacher singing the song, or has their imagination created an aural picture of the sound they want? The sense in which the singer themselves takes on the auditory responsibility for the sound is an important development. However, after working at the technical aspects, getting the memory fixed, and adding nuances of tone and feeling, that initial sound can sometimes disappear, '*now I have started to work it through properly, the sound has gone thin again,*' [PIIS16d]. Has it really disappeared, is all the 'working' of the voice counterproductive or is it part of the process? When the ear starts to listen for the fine details it can stop looking at the whole and then it becomes difficult to retrieve whole picture. This could be evidence of a switch between right ear and left ear hearing (Sininger *et al.*, 2004). And yet, an audience, or a teacher can say, '*yes it's okay, you've got it there*'.

> *Perception of one's own sound is a very peculiar thing, I believe. I'm not sure how much my perception is an acquired thing and how much is instinctive.* [PIIS18d]

The singer's sense of vocal identity can strengthen the psychological commitment to the sound, even when it is being tested.

Here the singer has a clear idea of the sound he wants to create, it is associated with opera, filling a big space, being larger than life and yet he knows that it isn't quite what he wants, as yet.

> *Um, it doesn't feel big yet, I want it to get bigger, especially when you do operatic songs it doesn't feel big enough, especially 'cos I am doing one with the orchestra at school and it doesn't feel big enough.* [PIIS20i]

8.32 Movement

The sense of the voice 'going', 'moving along', conveys a movement; the airflow from breath is moving as well as the musculature within the singer's physical frame but not all singers experience the sense of 'flow', of travelling.

> *It kind of floats along, I've got to make it sound as if it doesn't matter too much, it mustn't sound like separate notes but I know where I'm going...* [PIIS5i]

When it does not feel right, it gets 'stuck' and the singer has to make more space in the back of the throat to get it moving again. This could be a purely acoustic phenomenon, however the pattern of the formants resonating in a conducive or a non-resonant space appears to affect vocal perception.

8.33 Vibrato

Motion perception can be seen as being very similar to that of the perception of a stroboscopic light. The brain perceives the bird in flight as being continuous but

the eye is in fact seeing a sequence of receptive fields in the retina. The experience of vibrato can offer a similar experience, as of hearing a moving sound due to the pattern of 'beats', the slight changes in pitch indicating a sense of flow and movement. Vibrato was discussed in chapter five with reference to vocal identity, some singers said they preferred not to have vibrato, though it was not always clear that they understood the meaning of the term. The sense of resonance or ring in the voice appeared in the data of one of the Phase I professional singers.

> *I've always had a ring on my voice, the same ring as S* [her son] *actually has, We were talking about it the other day, it never had to be put there.* [PSKi]

This sense of ring or resonance is to do with the tuning of the formants in the vocal tract, and was discussed in chapter six. This singer feels it is inherent as a natural part of the voice, inherited down the family line.

There are, however, sensations that the singer experiences physically when singing with full resonance. This singer says she feels she resonates; it is not just the voice but her whole body resonating.

> *I feel it very much in my head and my face* [around sinus area] *when I'm singing well, I feel I resonate* [demonstrates with hands]. *I suppose it's round the sinuses but hearing that,* [the CD recording] *it makes me feel that perhaps it's a little too much on the face and a bit too bright. I have been working on getting a more open space at the back.* [PIIS16i]

A classical instrumentalist brings out an interesting point about the freedom she feels in jazz singing and the comparison with the classical singing where she wants to '*get off*' the note but has to make it last; a static '*beating out*' the pulse rather than free expression of pure vocal emotion.

> *Something else popped in my mind just then, related to jazz singing, but that's very much in my mind when I think about my voice in a song like that or the Mozart. If I've got a long note I try to get off it as soon as possible but that's because it's classical and if it's got 5 beats it's got to last 5 beats you know, and with jazz you can do what you like and make it up but also in jazz I'm actually starting to enjoy singing the long notes like in 'Cry me a River', just go for it or in 'Big Spender' with that lovely A flat suddenly, I really enjoy it and I know what to do with it and I whoop it up and make the most of it and I honestly relish the long notes in the jazz songs. So that's funny, in the classical I feel I can't handle them properly, it's like, so what do I do with this. That's the first time I've thought about it.* [PIIS19i]

Singer 17 also finds that the body is more involved as she sings in a different style, the song was another Kurt Weill cabaret style song. She said in her diary '*I felt as if I learned more about my whole body through this concert than ever before,*' and then reiterates this in the interview, '*it's right down to your fingertips and your toenails, it's right down inside you...I just opened my throat and almost shoved my hand down and pulled it out.*' [PIIS17i] The physical and the psychological responses seem to be strongly interacting here.

8.34 Awareness of pharyngeal muscle movement

It is almost impossible to separate out specific features in the discourse of the singers; so often a quotation includes several facets and evidence once again of the holistic nature of singing. However for analytical purposes these different facets can be examined, though the quotations from the data may sometimes require repetition.

It is when the singers are describing the vowel sounds that the data reveals clues as to the awareness or not, of pharyngeal muscle movement in the singer. The formation of vowels requires some awareness of pharyngeal space and muscle

movement created by the placing of the tongue and the position of the soft palate. Singer 7 mentioned vowels several times throughout the recording; but this is an example of a singer who did not mention aspects of space and movement when talking about her voice. There is some indication in the data that she was unaware of the vowel shapes she was forming while singing that suggests that her concept of making 'space' in the pharynx was underdeveloped.

> *I don't know, it just doesn't feel like how I sound at all when I sing...my vowels sound a bit different...I'm not liking the vowels I'm making...I think it's my vowels, they're really squeaky.* [PIIS7i]

In the third song she sang which was in a different style to her usual music theatre repertoire she said that she has put '*more effort*' into the song and that her vowels were '*not as bad*'. Indicating perhaps that more thought had taken place in the production of them. Singing in different languages as well as different styles can extend a singers understanding of the muscle control available to produce accents. This was one reason why the singers were asked to learn a song in an unfamiliar language. Singer N speaks about his experience as a professional learning to adapt to his physical limits and strengths.

> *We have this thing called "fach" which is a vocal pigeon hole. It can be misleading and the dividing lines move about a bit, but it helps us to discuss voice types. There are examples of 5 or 6 tenor types, tenorino, character tenor, light tenor, lyric tenor, dramatic tenor and helden tenor. You can be somewhere between one or the other, or grow from a lighter sound to a stronger sound, or vice versa. Languages are an important feature too. In my experience I've learned that my voice is more suited to French or German music. I can and do sing Italian repertoire, but generally lighter rep...As musicians our ears are vital and we must train ourselves to listen to the nuances of language, the rhythms, the stresses and make them as natural as possible.* [PISN]

This aspect of the language helping to develop nuances in the tone is a factor in any awareness of pharyngeal space. Not all the singers in Phase II were able to sing one of the songs in a foreign language for the recording, and of those who

did little mention was made of any awareness of new muscle patterns. This could be due to the fact that they were already more familiar with singing in the language than they admitted. The singers were given the freedom to choose the three songs and it is quite possible that they chose songs that they felt would do them justice on the recording.

Of course there are many inter-related muscle movements happening subconsciously when singing, and the singer can often be unaware of a tightening in the right shoulder, a clench of fist, or a bracing at the knee joint. Singing in an unfamiliar language can create tension and the energy and effort that goes into producing a sound can temporarily 'switch off' the parts of the brain that are monitoring physical changes. A singer needs to acquire some degree of monitoring the body muscle dynamics as well as thinking imaginatively about the text and music.

> *I am aware that even minute changes to the vowel sound and the position of my mouth and jaw alters the tone.* [PIIS16d]

Pharyngeal muscle movements are not the same thing as a sense of movement within the sound of the singing voice, but certain muscle co-ordination may give the sensation of this movement and be associated by the singer as being key to achieving this particular vocal quality.

8.35 Sense of 'flow' in performance

Returning to the notion of a sense of flow in performance in more detail, several singers used the term '*flow*' to describe their performance and they knew when it was flowing and when not; these were the more experienced singers.

> *The phrasing was a bit rubbish, it didn't flow, it was in bits and it wasn't successful.* [PIIS20i]

> *I don't normally sound that static, normally it seems to flow a lot better and that affects the phrases because you run out of breath.* [PIIS20i]

With encouragement from her husband this singer gets flowing and then cannot stop.

> *He said, that was more my sound and much easier to listen to, so it was great, because it was almost like him giving me permission to do it and he was really interested and commenting on it and I was beginning to take a real pride in it and also I was beginning to do some of the twang she was talking about and I was wandering round the house just doing it and he was saying fine, that's OK* [meaning enough] *but I was loving it and it was like being given a fast motorbike after having a pushbike and you know it's going to be interesting 'cos I shall have to decide where I'm going to do it in the songs and where I don't, I mean it's really exciting.* [PIIS19i]

There is often a sense of the singer having to look in fine detail in preparation for performance and then to see it all again as a whole, a 'gestalt', for it to work successfully.

> *If I have a slack period with little practice sessions I find that after Handel to open me up and get my voice moving again, singing in French helps me to focus on the minutiae of singing. For example, the individual facial muscles, isolating them from each other and forcing me to get away from my mouth in particular my lower jaw.* [PIIS17d]

This singer is struggling to come to terms with the facial movements needed to release her jaw, she also has to think about the song and the way the intensity of communicating the feeling is affecting her vocal sound.

> *The* [PIIS17Rs-one] *by its very meaning and all that it portrays mentally prepares me, think smaller and into the eyes and into the eyes, initially producing a somewhat nasal sound. This opens up at the back more so long as I have sung Handel. However at the beginning it did stay in the nasal region but this is gradually lifting away from the 'muck' and into the cavity behind my eyes and back of head.* [PIIS17d]

Then there are times when the voice is too open, out of control. She associates this as a physical condition but also a mental one of lack of focus. It is a typical diary entry of many of the singers, feeling physically unsure which prompts a psychological uncertainty that exacerbates the physical balance of the voice.

> *I began today too open with no sense of movement and flow, a general feeling of being liable to go in any direction, although tone not altogether horrendous with some areas of freedom eg. last A flat. Just a general sense of insecurity and uncertainty. I'm not very focussed today and I'm sure this affects my ability to let go. On the whole, soft palate low-tongue as usual in my way. Sound too wide without focus (wide not open) uncontrolled.* [PIIS17d]

This next example illustrates the frustrations a singer can experience when they know they have achieved vocal excellence but it does not happen with satisfying regularity.

> *I mean it just keeps getting in the way of the sound, it should just float, it should be completely sublime, that was nice but not sort of... the top, the opening was very disappointing,*
> ***In what way?***
> *It's this idea of suspension perhaps, I think where you're not just floating the sound but your suspending, even as you are going on to the next phrase the previous phrase should somehow still be suspended in the air and I don't think I managed that I think I sang it quite well for me, very well... but not...*
> *I managed it better in one rehearsal, I talked about it in the diary, one day I knew it was right... I must have got so inside the piece that it just, it did have this feeling of being suspended in the air and continuing to just float, almost without moving and yet moving.* [PIIS17i]

This last comment conveys the complexities of talking about sound in the voice as movement. The experience is almost static and yet has motion, a kind of floating of a sound.

8.36 Data from the professional singers' diaries in Phase I

It has already been noted that ideas of space and movement occur in the Phase II data narratives of the experienced singers. Almost every quote used in chapter three from the professional singers' diaries reveals a strong connection between the listening singer and the placing and movement of the voice.

This singer [PIpsd-one] says '*not hearing myself properly, not feeling the usual resonance in my head'* and then searching for *'the correct position for the ring, not centred'* and when he has found it he feels *'totally at one with my feeling and my voice*'. He describes singing when in good spirits as the voice *'flying'*. Knowing where his voice feels right is obviously important and he checks his '*approach and placing'* and works out '*how much space I need to give it'*. When it all goes right 'it *feels like my voice could go up and up'* and he uses acoustic feedback to get a sense of space '*I listen a good deal to the sounds around me to find my orientation'*. On the other hand when things are not so good because of a lack of aural feedback he says '*I don't feel to be making much sound because all I can hear is those around me'* he describes singing as '*wading through treacle'*.

The second singer [PIpsd-two] was suffering from a cold and ill health during his diary write up but he still strives for that freedom and space in the tone that he knows he normally can achieve. His frustrations are obvious; '*cold coming on, bit confused about where the sound resonated', 'voice a bit tight, ears blocked'*. He is very aware of the different acoustics, he sings in a concert in a church where the '*the acoustic was very flattering'* and then it is contrasted with the rehearsal studio '*acoustic seems drier than usual, voice heavy and sluggish'*. The

space where he sings affects his voice considerably, both physically and psychologically; it sounds '*heavy*' but also '*sluggish*' implying a mental heaviness.

The third diary singer [PIpsd-three] was suffering from hearing difficulties due to hay-fever and again he reveals his frustrations because he cannot create the sound he expects from his voice, *'hay-fever, sounds a little whispy'*, *'top was feeling really cut off'*. He talks about singing in the open air and the problems this caused for his internal feedback, '*singing outside, internal sound much less resonant'*. He is very aware of the sounds he normally registers inside *'bunged up, deadens sound in my head'*, *'impression of notes not sounding quite right due to catarrh'*, *'sensation of soaring and travelling is missing'*. Then later in the month his entries change to more positive comments, '*head is clear and ring is clear, sound should be travelling properly'*, *'very giving acoustically and warm feeling'*, *'felt really firm singing outside my body, like being hollow, full of space and hearing the note outside of me'*.

It is interesting that he describes the acoustic as *'giving'* suggesting that the interaction between space and voice can have tangible results in terms of timbre.

These very detailed accounts of vocal perception are rarely matched in the diaries of the amateur singers, though the question remains: is this due to experience or age, natural or learnt vocal skills?

8.4 Factors influencing auditory vocal perception

8.41 Experience or chronological age?

The time singers spend singing and the quality of that experience would appear to be a factor in their vocal development, and it gives singers the opportunity to learn and develop vocal skills regardless of chronological age, as is the case with many young choristers.

> ***How many hours a day were you doing at* [choir school]?**
> *Three and a bit everyday, and then on Sundays three and a half in the morning, and another two later on; about five and half.*
> ***Did you ever get bored?***
> *No you don't get bored it's really good, you would think you would because it is 24 hours but you don't.*
> ***How many hours a day do you do now?***
> *About an hour, you don't have the time; on the course I did last week we did seven hours a day, you do get tired but it strengthens your voice very much and my high notes have come out much nicer just by doing that one week it's strengthened my voice, it was good.* [PIIS20i]

This singer, though only 19 years old, notices the difference in vocal strength and control when he does spend more time singing. The great difficulty amateur singers experience is the lack of time they can spend singing. They often have full time jobs and care for families and their singing time is very limited compared to a full time professional. They can often be aware of what is needed but time constraints do not allow them to resolve the problem, as with some singers who had young families '*yes, life, home, the children have to take priority'.* [PIIS16i]

Of the singers in Phase II who mentioned space and movement (twelve out of twenty-two), the majority (nine out of twelve) were in the older age group though three singers were in age band A (see Table 2.1). In terms of singing experience

i.e. weekly vocalising, four singers were in the least frequent amount code, four were in the middle and four were vocalising very regularly. Because of the small number of participants it is impossible to draw conclusions but the singers who spoke about their voice in terms of space and movement tended to be those with a more secure sense of vocal identity and with more vocal experience, either through years of training or regular vocalising.

8.42 Performing in large spaces

Several singers mentioned the experience of performing in a more flattering acoustic environment; this not only affects the performance at the time but also helps to cement vocal perception into the auditory memory. Arnheim, in talking about a dance or a symphony or a film could equally be referring to the dynamic of a vocal performance,

> Every newly arriving percept finds its place in the spatial structure of memory. In the brain every trace has an address but no date. The structure of a performance derives from the interaction of the traces it leaves within us. (Arnheim, 1974: 375)

He goes on to talk about the space of a theatre, defined by the motor forces that populate it, the actors or dancers, 'expanse becomes real when the dancer runs across it' (Arnheim, 1974: 375).

Can a singer feel the acoustic space when they experience the feedback of their sound hitting a wall and then returning to the ear? The actors can be seen in motion against the immoveable setting of the stage and if the analogy is applied to singers, the sung sound can be heard as if in motion across the stage. When a singer is in a performance the audience are attentive, usually static and this could

help a singer experience a sense of space and movement as they react to the reception of the sung sound in a large acoustic environment. Experiences such as performing in large spaces or with some movement, such as theatre work, are significant and, the importance for young and inexperienced singers to gain this type of understanding with regard to using the voice is relevant to their vocal development.

The experience of performing in a large space can be challenging to some, but this singer feels liberated by singing in a bigger space.

> *Yeah I suppose, but when you practise in a little room and then you go and sing in a bigger room it makes you feel so much better...when you actually go into the bigger room.* [PIIS20i]

Another singer realises that her usual practice space might be giving her a false sense of security, rather like the experience of many 'I only sing in the shower' singers.

> *In my dining room where I normally practise, there is a low ceiling and lots of wooden surfaces. Am wondering if this is giving me benefits, volume and tone, which are not really there...* [PIIS19d]

It may not seem to be immediately obvious to teachers that inexperienced singers need to perform in different spaces; the average practice/teaching room in schools is a small box. This singer who had only just started to have lessons really relishes the feeling of a good acoustic.

> *Wonderful treat today! Was in URC church, having been rehearsing for tonight's piano trio concert. The others left at 5.30 and I spent a good ¾ hour doing my singing practise in a large space with the most glorious acoustic. There was a grand piano on the stage so I stood in the curve of it like a 'proper' singer and did a thorough job; warming up, technical exercises, all my pieces and more besides. Couldn't resist taking the advantage of the lovely acoustic to finish with bits of 'Hear ye' from Elijah! The top A sharps seemed so easy! All the above without my books (because I hadn't brought them) but it was one of the most useful and positive practice sessions I had done for a long time.* [PIIS19d]

Adolescent singers can also notice the change of acoustic in different performance spaces, so it is not just an awareness that comes with age:

> *Yeah, in church because of the acoustics, I prefer singing in that kind of acoustic than the studio, that doesn't have one... when you get a good acoustic it just lifts, yeah* [PIIS6i]

The sense of a voice lifting is really a mixture of both space and movement ideas and is clearly a good feeling for singers to experience. Whether or not the audience get that same feeling is debateable, but it seems important to singers to have that experience and try to nurture it even when conditions are not so conducive.

> *Singing in here is a really hard acoustic, anything from singing in here is fantastic so in some ways, I don't know whether it is a good thing for me or not, 'cos this room is flat, there's no acoustic whatsoever so I can hear everything when I record, so when I've practised in the church with my accompanist, and the course I go on with* [the teacher], *has some fantastic acoustics and they colour it. It makes a difference, it falls into place.* [PIIS15i]

'It falls into place' suggests that the singer's vocal experience when singing in a positive acoustic allows the voice to come into balance with the space of the room and sound right.

The acoustic feedback is really important to develop the potential in the mind of the singer for new colours; the brain has to register the new colours in the auditory memory.

> *The* [PIIS17Rs-three] *I think gave me new colours in my voice, it will be interesting to hear if this is so, the gorgeous acoustics played a big part in this.* [PIIS17d]

Tomatis would suggest, however, that this sense of space can be experienced without reference to a large performing space. He suggests that if the ear is

balanced and listening, so the larynx balances against the spine, the body functions as a sound box and the space and resonance a singer feels is a natural consequence of the body in balance (Tomatis, 1987/2005: 88). There are examples of singers earlier in the data analysis, who hear the sound loud in their heads but who do not transform that experience or adapt it to the changing performing spaces.

Meribeth Bunch Dayme has written several books about performing skills and confidence building for voice users; her workshops and classes demonstrate her experience as a vocal coach. She says 'presence has to do with a sense of space and how to use it' (Bunch Dayme, 2005: 162) and performing to an audience is a critical test for these kinds of skills.

However it is not clear how this takes place and the relationship between the ear, the voice and the physical and psychological aspects of singing are all integral parts of the performing experience.

8.43 Physical problems

The singer's perennial problem of catarrh can actually be a helpful indicator of space. The singer knows what it feels like when it is there and when it is not, as illustrated in the diary data in chapter three [PIpsd one-two-three].

Air pollution is increasingly aggravating the natural mucus the nasal passages need to keep infections under control. The thickening and hardening of this

mucus causing blocked sinuses is a major source of problems for the singer and the medication prescribed can also have a drying and hardening effect, creating a cycle of congestion problems. Advice concerning diet seems to be helpful in certain cases.

> *Once again my vowels clog up the tone and prevent the voice from being freed.* [PIIS17d]

> *I'm almost too scared to try, you know you get this feeling, where I begin, when I could really get my tongue working well, I've got the space above it very clear* [changes speaking tone], *when it's not working of course, the space, everything drops, the space gets clogged up um I'm always really conscious of my nasal problems of allergic rhinitis, I'm always fighting against this muck, now, I, with that song, it's right in the middle of the muck, and you know, I've got to get above it, interestingly, while I did do this concert, by the end it really helped the whole sinus area, ah, if only you did all this every week.*
> ***Your diet?***
> *Yes, I had no alcohol, no chocolate, no milk, and it made a difference, there's no doubt about it, at the moment I'm very clogged up.* [PIIS17i]

The singer here speaks of *'holding'* the sound, the physical sensation in the nose triggering the perception of the sound being caught by the whole body, yet he acknowledges that others may or may not be aware of it.

> *At times it can sound very blocked in my head, however I'm not sure how this comes out to other people.* [PIIS12d]

> *Yes constantly blocked, and which is why whenever I hear myself recorded I feel I've got bungs stuck up my nose and even my head, especially if I've got a cold it emphasizes the fact, your nose is blocked, you sound like you're holding it* [PIIS12i]

The interaction between physiological and psychological sensations is plainly demonstrated in these two quotes. However singer 18 is aware of the current research into sinus resonance (Bunch, 1995: 108) and says:

> *Another time when I had to sing with a cold, it was the Messiah in the Town Hall and I read somewhere that even if the sinuses are blocked it doesn't actually make a difference to the sound and this Bass, bless his cotton socks, went to the back of the Hall and said 'it's fine, it sounds the*

> *same as usual, don't do any more'. So I sang with the maximum twang and just let go and it was fine and you know 'Rejoice' that long, long line, it went just like that and he was right don't change anything ignore your own perception. Get on with what you know is the feeling.* [PIIS18i]

This sense of feeling is what many singers rely on but it does seem to require a successful vocal experience to build this feeling up. This involves psychological well-being in the singer.

8.44 Psychological problems

The most common psychological block for singers is nerves. The young singers in the study spoke poignantly about their experience of stage fright.

> *Well, my nerves take control of what I'm singing and I find myself losing the depth to my voice and it feels more wispy when I'm doing a performance, um yeah it just doesn't sound...* [PIIS1i]

Relaxation is often used as a cure-all for nerves but a singer has to be energised and not 'relaxed' if any sound is to come out at all. This singer actually mentions the difference in her head sound, again re-iterating what has been said in chapter six about the mismatch between internal and external auditory experience.

> *Yes it's strange actually I often try too hard over... In the wrong way I'm compensating and I find it really strange, but when I relax I find it sounds much better but I'm very much a novice, I sang 'Summertime' on the course we went on and it almost takes some of the volume away in my head, it does...but it would be interesting to record, it was noticeably different and it was much nicer to listen to and more evocative...* [PIIS15i]

It would appear that an audio-psycho-sensory-motor loop seems to take place within the singer and coupled with external expectations of socio-cultural-musical dimensions, the opportunities for vocal disasters would seem immense. However the important perceptual skill that emerges from the data involves an auditory dimension; what the singer hears is often the immediate form of

feedback, though the psychological instincts and physical responses can also be very quick. The relationship between space, movement and the ear and the implications for teaching needs to be examined more specifically.

8.45 Hearing through space and movement

Space and movement can be seen as evolved skills used in the distant past of human civilisation for hunting, identifying where animals or dangers are and how fast they might be approaching. These auditory skills could have then been adapted for music making; the ear is very close to the brain, and has neural pathways evolved for survival, these could have been used to develop vocal skills with strong carrying and communicative power (Mithen, 2005: 166 -170). Mithen quotes Otto Jespersen who referred to sound synaesthesia in the 1920's and who suggested that the [i] vowel was associated with small things because the space is small in the mouth with the tongue pushed forward and upward and [u, o, a] sounds were associated with bigger objects.

Michotte (1946, cited in Arnheim, 1974: 407) talks about the body as being a 'kinaesthetic amoeba', the body only being aware of itself, inside itself, in a very simple fashion. As the singer develops an awareness of the environment, of other people, of acting and reacting within a personal space he or she can start to develop more sophisticated skills and an awareness of the voice within the physical body. Teachers of singing will often recommend yoga, dance, Alexander technique and other forms of physical training to help the singer use their body in a dynamic and acoustically optimum way. The body is the case of

the singer's instrument but the sound source, the vocal folds, the larynx, the pharyngeal space, the lung capacity and the flow of air pressure are all fundamental as well. The singer builds up perceptual images of these sensations; sometimes the student responds to physical and metaphorical images, but sometimes a recording can be as helpful.

> *Actually that is useful because in how many minutes that CD has played, that's taken how many hours of my teacher banging on with me going yeah yeah; that's a real revelation.* [PIIS16i]

8.5 Summary

This chapter has assessed the impact of concepts of space and movement on the singer's vocal timbre and their perception of their singing voice. It has examined the possible reasons why these concepts tend to be found in singers with more vocal experience and compared the data of the professional singers and amateurs who took part in this study.

Internal and external feelings of space and movement are important areas for singers to explore; finding the words to articulate the experience involves a more complex and attentive response to vocal timbre. The move to active rather than passive vocal perception can be seen in the singers involved in the day-to-day engagement with performance. The data from singers actively involved in singing reveals the importance of both space and movement concepts and the sensations involved. Having experienced these sensations and discussed them, vocal perception can be seen to develop in more complex ways, leading to an enhancement of vocal technique and an understanding of the demands of

performance. This is noted in the narratives of professional and experienced amateur singers.

Possible explanations for these findings have suggested that both vocal experience and chronological age can be a factor, although some of the younger singers in the study were performers of considerable experience and they also indicated through the language they used, a good understanding of the use of space in creating vocal sound. The opportunity to perform in good acoustic spaces seems to be productive but depends on the ability of singers to use these opportunities and be aware of the difference in auditory perceptions these situations can give. The individual singer's capacity to hear and the quality of left/right ear capabilities were not tested but evidence suggest that this should be an aspect of singing that requires further exploration.

The research questions have been explored further in this chapter by outlining the various factors that affect a singer's vocal perception. In particular the three dimensional aspects of space and movement point to a more refined sense of vocal perception that is perhaps only possible when a singer has experienced performing in large acoustic spaces. There is no conclusive evidence for this and a singer's sense of vocal identity could also play a part in developing a vocal perception that seems to be only found in professional or experienced amateur singers. There were few references to space and movement metaphors in Phase I and the Phase II listening study but this can be explained by the fact that they were describing vocal sound that was not their own.

9. Conclusions

9.1 A review of the study

9.11 The first challenges
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9.14 Healthy singing voices
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9.31 The 'ear' repositioned in vocal education
9.32 Recording singers as a valuable tool
9.33 Defining and sharing technical terms
9.34 The use of space and movement imagery

9.4 Future research

9. Conclusions

This study has sought to explore the perception of vocal timbre from the perspective of individual singers. The grounded theory framework of the thesis enabled a holistic view of vocal perception to take place within a multi-disciplinary perspective using data from performing singers. Qualitative data using diary, interview and questionnaire evidence combined with the critical stimulus of an empirical study using a CD recording of three songs from each singer proved to be valuable data for assessing the interactive processes involved in singing. In this final chapter there is a review of the study and an outline of the main findings relating to a singer's sense of 'vocal identity' and the perception of the singing voice.

The case is made for the re-evaluation of vocal pedagogy, placing the ear and the singer's auditory perception in a more central role, particularly with young or inexperienced singers.

Ideas for future research are given at the end.

9.1 A review of the study

Phase I began with an open-ended enquiry asking singers to talk about their voice and the singing experience. As the data were explored three questions emerged which formed the focus of the thesis.

How do singers think about their voice?

How do singers feel their voice?

How do singers hear their voice?

Another question was prompted by the listening questionnaires of Phase I that set out to examine the vocabulary used to describe vocal timbre.

How do others hear the singing voice?

The final investigation of Phase I explored the experience of three professional singers through diary narratives and this allowed a comparison to be made between the experience of the professional and amateur singers from the first interviews. The Phase I data used narratives from solo, choral, amateur and professional singers.

The data explored aspects of vocal identity and the perception of vocal timbre in a general way, but the analysis revealed three attributes of vocal identity,

- Reflecting on the singing voice
- Constructing the singing voice
- Expression through the singing voice.

The word lists from the Phase I listening questionnaires grouped the metaphors used to describe the singing voice and these were used to compare the responses from the singers in Phase II. The metaphors relating to colour, dynamics, growth and maturation, energy, expression were found in fifteen out of the twenty-two singers. Texture, shape/form and comfort metaphors were found in the data of fourteen of the singers. Effort words were found in the data of twelve of the singers, weight and density in seven, temperature in five, musical instrument analogies and balance in four and taste in just two of the twenty-two singers. Very few references to aspects of space and movement were found in the data of the amateur singers in both Phase I and Phase II whereas the data from the

professional singers in Phase I highlighted the use of space and movement metaphors in more experienced singers.

The literature review explored the research pertaining to the developmental aspects of singing and the different disciplines that illuminate vocal identity and perception. The final section took holistic perspectives from the literature. The lack of research using singers in real-life situations proved to be the main point that resulted from this survey of the literature. The need to design an empirical study, which gave singers a specific stimulus to focus the narrative on vocal identity and perception of timbre in a real world context, became the focus of Phase II.

Although the thesis continued to view the four main research questions initially identified in Phase I as the focus of the thesis, Phase II was primarily an empirical study. A listening study was added to research the fourth question of the thesis.

New focus points emerged relating to the following,

- The mismatch between the internal and external auditory perception for singers
- The importance of a vocal identity as singers developed vocal skills and the ability to articulate clearly their ideas about their own vocal timbre
- The importance of auditory feedback as indicated by the high proportion of responses using auditory and acoustic references to the singing sound in comparison to physical, cognitive and emotional responses

- The emergence of space and movement metaphors as a noticeable difference between the descriptive language of professional and non-professional singers

There follows an overview and evaluation of the thesis.

9.11 The first challenges

Looking at the literature available on singing it became clear that in order to study vocal timbre various aspects would need to be addressed in order to achieve the aims of the thesis to explore the perceptions of vocal timbre. Little research had been conducted using empirical methods to explore vocal timbre and most research has been conducted under laboratory conditions (Titze *et al.*, 2003). The literature review involved examining different disciplinary studies to gain insight into the various perspectives available. Only a few cross-disciplinary studies have been undertaken (Howard *et al.*, 2000, Thurman & Welch, 2000). It became necessary to return to further literature reviews as the data uncovered more aspects of vocal perception and these references were incorporated into the data chapters. This reflected a grounded theory approach to the study.

9.12 Using the evidence of singers

Three major challenges were identified for the study of vocal timbre. The first was gaining access to documentation; evidence that could be scrutinised and evaluated with reference to vocal timbre but which was rooted in the 'real world' experience of singing. It was important to use the evidence of singers themselves because the main focus was on the perception of singing as an active process. Providing a critical stimulus through the recordings of the singers was

fundamental to the articulation of descriptions of vocal timbre and for fruitful discussion in the interviews. Though spectrographic analysis (Nair, 1999) continues to be valuable in monitoring the external manifestation of vocal sound, the internal perspective of the singer is fundamental to an understanding of vocal perception. By focussing on the evidence of singers themselves and collecting evidence through multiple methods, the qualitative data of this project can add valuable insights to the work of voice scientists.

9.13 The multi-disciplinary approach

The second challenge arose from an awareness of the many perspectives that different academic disciplines could offer. The challenge was in keeping the multi-disciplinary approach in order to provide a holistic view of performing singers. Therefore, timbre was examined as an acoustic phenomenon (Rossing *et al.*, 2002), as a philosophical signifier (Barthes, 1977, Van Leeuwen, 1999), as evidence of social, cultural and musical influences, (Burton, 2002, De Nora, 2003, Clarke, 2005), and as a reflection of psychological states (Cameron, 2000, Mathieson, 2001). It was also important to differentiate between the multiple definitions of 'identity' in the literature (MacDonald *et al.*, 2002). The main premise in using the term vocal identity was to emphasize the role of the individual in the process of learning to sing. While outside influences were acknowledged, the singer's own sense of vocal identity was the main focus for investigation.

9.14 Healthy singing voices

The third challenge was to specify the boundaries of vocal timbre that this study could usefully explore. While it is acknowledged that vocal timbres from across the globe are diverse and fascinating, this study has sought to keep within the parameters of Western art and theatre music. While this has meant limiting discussions to the conventional vocal sounds of Western singing, it has located this vocal research in the domain of the healthy singing voice, whereas much of the medical and scientific literature has focussed, understandably, on vocal dysphonia and abnormal vocal situations. The value of empirical research in the area of 'normal, healthy' singing voices cannot be underestimated for its relevance to the singing experience and its importance to a constructive dialogue between practitioners and theoreticians.

9.15 Evaluating qualitative methods

The qualitative methods used proved to be rich in providing evidence of vocal perception and vocal identity within the world of amateur solo singers. The age range of the participants was wide but this enabled the study to address levels of vocal identity outside chronological age expectations.

Interviews produced rich evidence of vocal identity and descriptions of vocal perception and enabled cross-referencing to take place across the data. The opportunity to compare the singer's response before and after the recording of their songs with diary narrative also indicated where the singers showed signs of accommodating their sense of vocal identity with the recording that they heard.

Diary data provided discussion points in the subsequent interviews and gave rich insight into the singer's personal feelings about singing. In particular the diaries of the three professional singers in the Phase I highlighted two features of vocal perception that were later found to be specific to established and performing musicians. These aspects of space and movement and the implications for vocal pedagogy are discussed at the end of this chapter.

The questionnaires established a working model of words used to describe vocal timbre and highlighted the diversity of response to the sung sound. The value of making a close examination of the descriptive words used by singers, teachers and audiences suggests the need for more clarification. In this study, understanding the terms used and shared between student and teacher was identified as fundamental to effective teaching and learning.

The listening study was useful in terms of providing a degree of triangulation to the study as well as confirming the diversity of response an audience may experience when hearing the sung sound. It also highlighted, along with the questionnaire responses, the huge diversity of response that certain singers could engender but equally the close agreement that others provoked. This leads to further questions about hearing and aural discrimination that need to be addressed.

This study has illustrated that qualitative methods and multi-disciplinary approaches are valid tools for researching the holistic nature of singing. The

perception of vocal timbre remains an elusive but important area for empirical investigation.

9.2 Vocal identity

Examining individual vocal identity was the initial focus for investigation. The link between the unique vocal imprint, the 'timbre' or as Barthes (1977) might say the 'grain' of the voice and the individual personality of the singer has been relatively unexplored in the literature. Vocal identity can be discussed in the context of psychological studies of the self but also looked at within the social context of singing. The taxonomy (Table 2.2) created from the Phase I evidence was useful in guiding the later structure of analysis and pinpointed the use of space and movement concepts in the experience of singers with a more established vocal identity. By examining vocal identity from the three characteristics that emerged from Phase I, reflecting, constructing and expressing the voice, various orientations on vocal perception were revealed.

When examining aspects of reflecting on the voice the Phase II singers illustrated the different levels of vocal identity outlined in the taxonomy, again created from data gathered in the Phase I observations. The taxonomy used in this study enables future research to be carried out with reference to levels of vocal identity and places the psychological attributes of the individual singer in vocal development. The taxonomy of Bunch & Chapman (2000) tended to limit the emphasis on the social and cultural status of the singer.

Construction of the voice revealed the singers learning to control the voice and showing a sense of owning the voice, a sense of agency. The use of certain voice quality descriptions was more noticeable in some singers rather than others, though this may reflect the language of the individual teachers of the singers. There was also evidence that different musical genres, opera, popular song, music theatre etc., affected the way singers spoke about constructing the voice.

Self-expression and the voice highlighted the way singers had to come terms with their own vocal timbre that sometimes appeared to be at odds with self-perceptions. This was obvious when it came to playing back the recording of individual singers and this provoked a more detailed analysis into the mismatch of internally and externally perceived sound. The complex role of the ear in vocal perception became more apparent as the data revealed the different experiences that singers reported on hearing back the sound of the voice. Hence the later focus on hearing and the rather fruitless search for more evidence in the research literature on hearing and singing.

Vocal identity was seen to give 'orientation' to the singer's perceptual experiences, influencing not only the cognitive, auditory and physical sensations but the emotional and psychological responses as well. This suggests that a singer needs to develop a psycho-acoustic-sensory motor process: a perceptual and interactive loop that has to work within the cultural and social constraints of the musical environment, in order to develop a full range of vocal timbres capable of expressing subtle and sophisticated musical communication.

Certain patterns were noted within the data with regard to prototypes of singers, some singers were more involved as 'performers', others showed signs of following a 'creator' model, others seemed to adopt an 'explorer' model. The sense that some of the less experienced singers wished to remain immersed in the internal sound world of their singing voice was also noted, and this has implications for vocal pedagogy which will be addressed later.

Most singers spoke about their vocal shortcomings and the diary and interview narratives were an opportunity for this kind of self-criticism. Sometimes this related to technical or health problems, but musical likes and dislikes also seemed to be a factor. Some singers spoke very specifically about their feelings and used 'feel' words more than others. This interaction between voice, personality and external circumstances illustrated the need to view the singer as a whole, while at the same time, trying to identify the different influences on vocal timbre and vocal perception.

9.21 The timbre of the voice

Each voice is like a fingerprint but, unlike a fingerprint, which for most people is an unidentifiable pattern at the end of a digit, the voice becomes part of the inner sound world. The internal musings of the mind are often rehearsed as part of the cognitive process; words are used and used expressively within the internal debate. It is also possible to sing silently to oneself. This very familiar 'person' within a singer is like a mirror, and when the mirror reflects an image that is unexpected, it brings about a re-evaluation of 'Who am I?'

The timbre of a singing voice can be developed over time but the uniquely identifiable quality remains constant, unless the singer has surgery or severe health problems. Describing the unique sound of a voice has resulted in the proliferation of descriptive terms within the literature. Finding agreement on these between professionals speaking the same language is difficult enough but when foreign language translation becomes a factor in communication, further difficulties arise. In terms of vocal pedagogy it would appear that the one to one understanding between teacher and student is the first priority, however, research can play a valuable part in identifying some of the processes implicit in the use of such terms.

9.22 The use of descriptive language

The use of metaphors to explain vocal timbre seems to be a useful and versatile means of expressing the sensations of singing. Evidence was found to suggest the role of vocal identity in the 'orientation' of the sensory experience. The individual singer produces his or her own 'body mapping' (Conable, 1998) to make sense of the vocal production they perceive is taking place. These perceptions are not always accurate but they can be very firmly established within the singer's 'bodymind' concept of their voice (Thurman & Welch, 2000). The role of an external listener in the process of establishing positive and accurate body-mapping techniques is crucial to the development of singing and the value of understanding the use of metaphor is acknowledged as a pedagogical tool for enhancing learning techniques. Bearing in mind the limitations as well as the flexibility of certain metaphors when describing vocal timbre, the importance

of sharing the meanings was highlighted when singers indicated a lack of understanding about vocal terms given in a lesson.

Certain metaphors were found to be more commonly used by the singers and links were made with the literature on auditory and visual perception, particularly where the terms used were the same. Metaphors relating to temperature, weight, balance, taste and referencing to musical instruments were the least used. Concepts of age and maturation were important in shaping singers' self-identities, as the younger singers searched for a more mature sound, while the older singers expressed concerns about the failing voice.

Metaphors relating to colour and light led to a discussion about the different meanings these words have in visual and auditory worlds. These are not the same but the differences provoked further examination of the literature and data. The link between these kinds of metaphor and vocal range and timbre was found in the narratives of both young and old singers and there was also a relationship with the loudness of the sound. The acoustic implications of changing formants (Sundberg, 1987, Rossing *et al.*, 2002) and the changes these create in perceptions of volume are difficult for singers to monitor when inexperienced (Bunch, 1995: 72). Dynamics were mentioned in the Phase II in relation to the problems of singing next to someone who was too loud, preventing the singer from hearing him or herself sufficiently for optimum regulation.

Texture, shape and form were also found to be popular metaphors and these could be seen to link up with the physiological processes taking place within the body. This also applied to comfort, energy and expressive terms.

In the examination of the 'hidden' meanings in the use of words, the highly individual response that vocal timbre can provoke was noted, in particular with the relationship between singer and teacher. As has already been noted, the questionnaire results (Phase I) and the listening study (Phase II) illustrate this further. Even when terms are apparently agreed (often promoted through literature and courses), the individual's interpretation of terminology is often apparent. The notion of layers of different approaches to vocal perception may be a helpful tool for teachers and singers and using the figure (9.1) could provide a starting point for this. Moreover, understanding the implications in the use of certain metaphors may help to clarify some of the terms commonly in use in the field of vocal education. This study has revealed both the descriptive and the evaluative elements in the use of metaphor and it is the often implicit valuation of vocal timbre that singers find difficult to address. Evaluating a voice is fundamentally linked to the personality, being able to see the 'voice' as a vessel, an instrument in an impartial case, is not an easily acquired skill. Even professional singers of many years experience vouch for that (PIpsd-two).

9.23 Auditory memory

The role of auditory memory plays a strategic part in a singer's experience as vocal identity becomes an integral part of the singer's own personality. However all these dimensions are in constant active interaction with each other, as found

in the evidence from the data. This aspect of vocalisation is not often emphasized in the literature.

It would appear that the perception of vocal timbre as a concept tends to establish itself when the singer has a secure sense of individual auditory memory. While copying other singers is not sufficient in establishing a unique vocal timbre, singers find it helpful to have vocal models to provide a structure. The singer needs to establish a 'frame', a sound world with technical boundaries, in order to be able to identify distinguishing features in their own vocal timbre and to be able to discuss and develop these further. Part of this process may be intuitive and unconscious, but gradually the ability of the singer to articulate this process can help to reinforce the kinaesthetic sensations and link them with auditory feedback.

The role of auditory memory in the establishment of vocal identity and the perception of vocal timbre became apparent as the data were analysed. Examining auditory memory is not an exact science and more research is necessary to investigate what aspects singers consciously perceive.

9.24 Different approaches to auditory vocal perception

Figure 9.1 identifies the different approaches to auditory vocal perception and shows the link with the singer's personality and experience. It is not meant to be value laden, or hierarchical: the singer may experience all, one or just a few of this perceptions at any point in time during rehearsal or performance. It does appear, however, that ideas of space and movement are a pivotal point in the

development of vocal perception and this is illustrated by giving them a three-dimensional cube form. These may be significantly influenced by the singer's personality, their sense of vocal identity, the auditory memory they have acquired and their vocal experience and these are some of the influences on vocal perception identified in the data as illustrated by the arrows outside the circle.

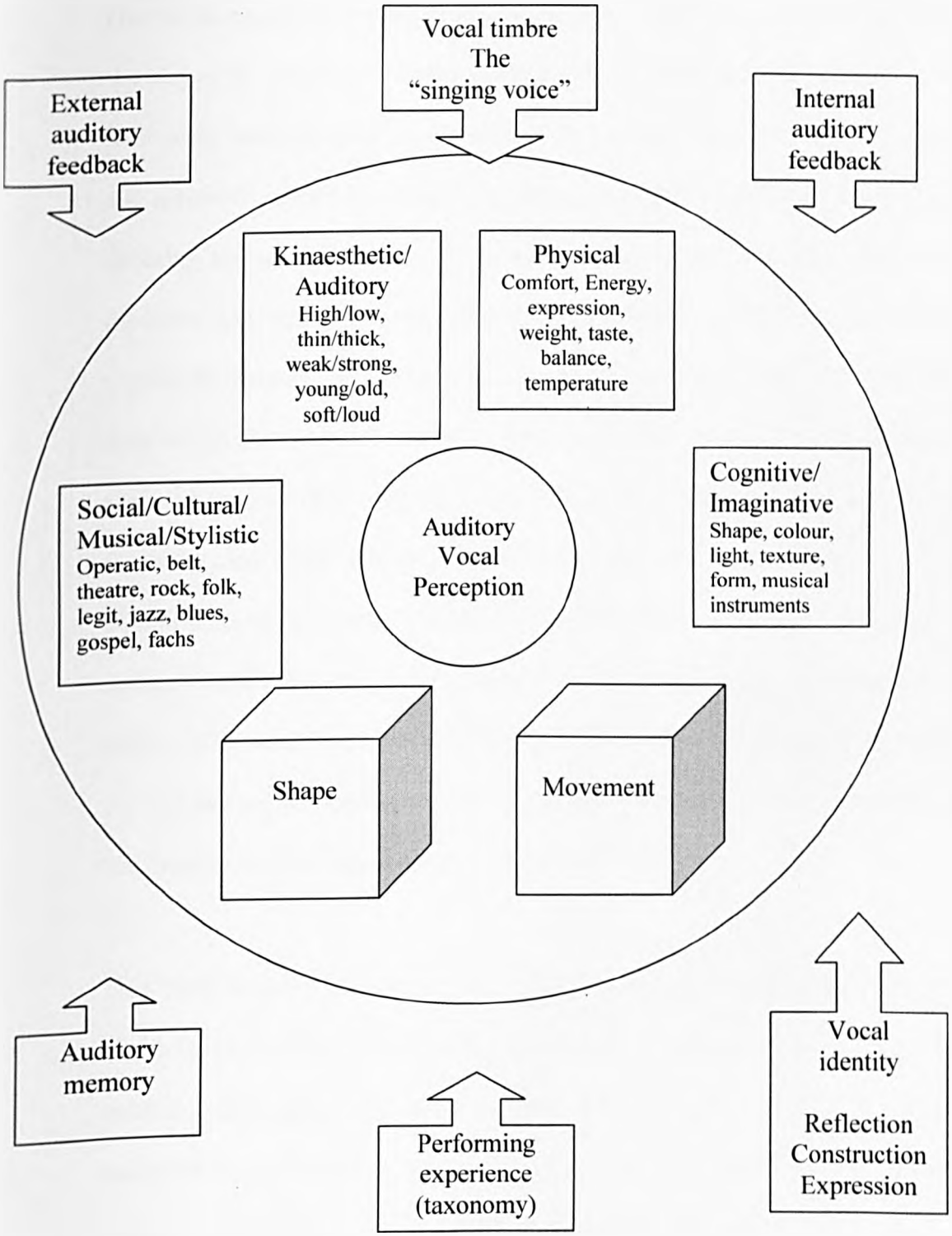
The figure shows auditory vocal perception as a large circle. Inside the circle are the different levels of vocal perception as discussed in chapters 7 plus shape and movement discussed in chapter 8. The arrows pointing to the circle are separate and this does not reflect the holistic approach that has been emphasized within the thesis but it demonstrates the different strands that have emerged from the data in chapters 5 to 8.

The three arrows at the top link the timbre of the voice with the internal and external auditory perceptions of the singer. The three arrows at the bottom link the performing experience with auditory memory and vocal identity.

Vocal identity was the first focus of the thesis with an examination of the data revealing reflection, construction and expression of the voice as fundamental features. The performing experience became the focus of findings relating to space and movement descriptions in the data of professional singers and auditory memory was examined from social, cultural and musical perspectives as well as the overall psychological framework of the thesis.

The figure does not illustrate the interactive nature of all the features identified in the data but it clarifies the different processes and experiences that contribute to the singer's sense of auditory vocal perception as revealed in the Phase I and Phase II data.

Figure 9.1 illustrating the different aspects of auditory vocal perception within a singer emphasizing the 3 dimensional qualities of space and movement and the interactive influences on the development of auditory vocal perception examined in this study



9.25 The auditory mismatch between internally and externally perceived vocal sound

One of the surprising aspects to emerge from the empirical study in Phase II was the degree to which the singers could not immediately recognise the voice as their own, when hearing the CD recording. The mismatch between the internal and externally perceived sound, examined in chapter six, can be explained by the differing acoustic properties of external air and internal bone and brain fluid mediums and these were examined through a further literature review. These aspects of auditory perception have had scant attention in vocal pedagogy and little empirical evidence is available. Sundberg (1987: 60) says 'in phonation, our sense of hearing may offer the brain useful information in terms of auditory feedback', and while he acknowledges that internal auditory feedback is not very reliable he goes on to say it would not be a 'good idea for singers to forget about auditory feedback'. And yet this appears to have been what has happened. In Sell's (2005) recent overview of vocal pedagogy there is hardly a sentence on the ear and hearing in singing and it is only recently that a book devoted to singing has included a whole chapter on the ear (Fourcin, 2006).

This study appears to confirm the earlier findings that Fourcin refers to and which feature in the writings of semioticians like Van Leeuwen (1999). It was noted that there appeared to be some sense of the lower harmonics of the internal sound being comfortable and re-assuring to the singers. The data from the singers implies that the singers feel a sense of security, maturity and strength when they are singing and experiencing the purely internal feedback. Their response on hearing the recording was often the opposite, they expressed concern that the

voice was weak, immature and insecure; they found plenty to criticise on technical points. The main responses were categorised into the following qualities, high/low, thick/thin, strong/weak and old/young, as these were the common features detected. Difference in speech habits and accents also became apparent as the singers discussed the vocal mismatch, highlighting the differences some singers felt between their singing and speaking voice.

This was not the case with every singer and again the question arises as to why some singers found the 'listening back' experience more challenging than others. Familiarity with their recorded sound, the role of the self, and the sense of vocal identity seem to be factors in providing positive vocal feedback and in encouraging confident singing. Poor health and the changes that take place at puberty were also explanations for the mismatch found in the data.

Awareness of the mismatch of sound and adjusting vocal technique to accommodate this would appear to be a valuable skill for singers to acquire. Evidence suggests that this facility contributes to the development of vocal perception. If vocal identity and the interaction with timbre, personality, use of language and auditory memory plays a role in vocal perception, the implications for vocal pedagogy are far reaching.

9.3 Vocal pedagogy and the singer's ear

9.31 The 'ear' repositioned in vocal education

The work of Tomatis (1987/2005) has proved to be almost unique in vocal pedagogy. In spite of the unreliability of much of his anecdotal evidence and the sometimes, questionable explanations he propounded, he did firmly believe in placing the ear at the centre of singing. His work is now being re-examined in the light of recent technical advancements in audiology (Leeds, 2001, Ludlow, 2005, Sininger *et al.* 2004). It is time that vocal pedagogy reassessed its approach to teaching the voice. There has been over the last hundred years a huge increase in our understanding of what takes place at laryngeal level, due to the work of Garcia (Henrich, 2006) and the invention of the laryngoscope. Acoustic engineers are able to analyse the voice for many attributes. The need for a more objective approach to the teaching of singing and the focus on vocology and speech science in the singing literature had led to an emphasis on the physical mechanisms of singing. And yet it is acknowledged that the mechanisms of the larynx have limited innervations and offer the singer and teacher little in the way of conscious feedback during singing. As Titze (1994: 77) suggests there is a need to 'make a connection between the laryngeal, pharyngeal, or oral sensations of airflow and the auditory perception of the sound produced'.

So often the implication (not necessarily intentional but just by the number of chapters devoted to the subject) is that once a singer or teacher has identified every last muscle and cartilage in the larynx that this will result in a beautiful singing voice. The ear that monitors the outcome of the vocal processes taking

place does not seem to be part of the process and yet Sundberg (1987:160) says 'singers may be able to develop a very reliable "timbral translator" so that they can tell what the sound in front of them is like.' This has been the specific focus that this project has sought to address.

9.32 Recording singers as a valuable tool

One of the singers commented that after hearing the three minutes of the recording she had learnt more than in the last six months of lessons. The recording technology available today is easily accessible and can be of huge pedagogical value, if the teacher and singer use the recording to discuss the timbre of the voice, the qualities that need to be enhanced, the clarification of consonants, the opening of vowels, the development of resonance etc. It enables discussion that can take place on a shared experience of vocal sound rather than the teacher hearing one 'voice' and the singer hearing another. Particularly in the early stages of a singer's development, perhaps after a good relationship of trust and confidence has been built, making a good quality recording would be beneficial. One of the reasons for the lack of information in singing pedagogy books on the aural mismatch, may be that the teachers working with professional voices are working with singers who have established a vocal identity and who have, possibly, come to terms with the difference between internal and external sound. The literature on feedback (Welch, 1985, Callaghan, 1999, Howard *et al.*, 2004), tends to be kept in the domain of research rather than being addressed in the wider context of vocal pedagogy though this is beginning to change with the

use of internet to inform as well as inter-disciplinary conferences and research projects.

9.33 Defining and sharing technical and descriptive terms

By using the recordings of students and also the professional recordings of other singers, descriptions of timbre can be clarified. No one hears in the same way, and the listening study revealed that, but it also showed where possible agreement could be reached, using terms that had more universally shared meanings.

It was interesting to discover differences between the experienced singers and those with little performance practice. While no attempt had been made to give the levels of perception a hierarchy, it was clear that two ways of describing the singing experience developed with, or resulted in, the active participation of live performance.

9.34 The use of space and movement imagery and practical experience

Distinguishing between the professional and amateur singer was not the prime concern at the initial stages of the study but it soon became apparent that there were some fundamental differences between the perceptual images that full-time singers used in their narrative and those images used by the inexperienced singer. Metaphors suggesting space and movement in the voice appeared almost

exclusively in the singers who were used to performing live, in large spaces, to an audience, most of these being professional singers or experienced amateurs.

This could be seen as a direct result of performing in resonant spaces or it could be explained by the predisposition for some personalities to achieve professional success. The successful performer communicating and 'moving' singing sound to reach out to an audience could be an outcome of certain personality attributes, a feature of their vocal identity. Wishing to occupy a space on the stage, recital platform or any performing space could be a sign of an extrovert personality. Possible explanations for perceptions of space and movement can be found in the field of acoustics but as yet, no specific parallels have been made between the kinaesthetic observations of singers and the monitoring of vibrato and formant tuning within the naso-pharyngeal area and the wider acoustic space. Neither has there been parallel studies examining hearing abilities of singers at the point of vocalisation, though current work is being undertaken to monitor this (Parsons, 2006, personal correspondence).

The evidence suggests that some singers preferred their own internal feedback and were not necessarily ready to explore the wider horizons; there could be two explanations for this. One, that the singers did not experience any 'need' to develop; their vocal identity was secure and complete at a certain level and two, that the singers were not aware of the possibilities in their voice and the possible expansion of their vocal identity. Both these conditions suggest that the singer's somato-sensory feedback is not yet fully integrated, the singer may still be working on an 'interoceptive' level rather than on both internal and external

feedback combined. They may also feel happier being immersed in their sound, like a 'cocoon', and preferring this state of escapism to standing out in the crowd and making an effort at 'concentrated listening' (Van Leeuwen, 1999: 29).

The small scale of the study means that no conclusions can be made as to the possible differences in vocal perception between amateur and professional singers. However there is enough evidence to suggest that the perception of space and movement with reference to the singing voice should be examined further.

9.4 Future research

Future research would need to include the psychological and social influences of auditory memory within the singer as well as the external and internal measurement of sound while singing. Hearing tests and real-time visual feedback could be useful tools to monitor the auditory processes taking place during singing. So much of the research within audiology has concerned itself with speech perception; it would be very productive if the same procedures for testing could be used in the perception of singing. (It would be interesting to see what would happen if musicians were to undergo the same kind of rigorous testing of ears as aircraft pilots have for their eyes. Musicians are tested for musical features of hearing, pitch, rhythm, etc. but as far as I am aware no conservatoire conducts audiometric testing of students or staff. I presume aircraft pilots are given more rigorous testing than 'Can you see that runway, is it longer than the other runway?')

The use of accurate recording of the voice is pivotal in collecting a body of data. This evidence enables singers to discuss specific aspects of vocal timbre and in a further study it could be used in conjunction with spectrographic analysis to examine vocal perception in more depth.

The link with the physical and kinaesthetic sensations could also be explored, using non-invasive techniques to detect muscle movement at laryngeal level and also around the face, head and torso when singing. And continuing the focus on 'real world' investigation of the singing experience, it would also be productive to examine the different levels of active hearing that occur when the singer is concentrating on the accompaniment, or the words, or the stagecraft.

The evidence presented in this study suggests that;

- Vocal perception is an interaction between auditory, cognitive, emotional, kinaesthetic and physical processes but singers tend to use primarily auditory perception to monitor their singing
- Vocal perception reveals complex layers of auditory memory and it can be selective, analytical or holistic, and depend on environmental and personal conditions. Internal and external acoustic monitoring is problematic for singers and this must be addressed by singing teachers
- Vocal identity is one factor in auditory vocal perception and this consists of three features, reflection, construction and expression of the voice.
- Vocal perception has boundaries that can be extended or diminished and professional singers in particular can be seen to have developed a spatial

awareness and sense of movement in their voice both internally and externally.

- Vocal perception is an active modality and it is important to investigate this in action situations provided by real world contexts.

The connection between hearing and singing has been identified here as complex and multi-layered. Vocal timbre is one of the most difficult aspects of singing to define and it can result in misleading terminology. The need to re-assess an understanding of vocal timbre is linked with the vocal identity of each singer and the levels of perception that take place during singing. The holistic approach includes the kinaesthetic, musical, physical cognitive, expressive aspects of singing but the role of the ear may be more important in the successful monitoring of these processes than has hitherto been acknowledged by the majority of research studies.

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