

# The Relevance of Metaphor to Effective Voice Teaching Strategies

Roslyn Dunbar-Wells

This article is an overview of a completed doctoral thesis, and follows a ‘research-in-progress’ paper – *The use of metaphor in voice teaching: A comparative study of Sinus Tone Production and vocal cord theories* – published in *Australian Voice* Vol. 1, (1995). Two scholarships – the Ernest George White Society Studentship and University of Reading Post-graduate Overseas Scholarship – called for an historical and critical account of the theory and practice of English voice teacher Ernest George White (1863-1940), placed within the context of musical and pedagogical thinking of the period. A clear documentation was also required of the interrelationship between the historical context of White’s theory and practices (known as Sinus Tone Production) and current theory and orthodox voice production strategies. Consequently, this study focused on identifying and comparing the strategies of two opposing pedagogical approaches: (a) Sinus Tone Production, where White taught that tone was created in the cranial sinuses, but current teachers ask students to sing *as if* the voice was created in the sinuses, and (b) orthodox practices (named Vocal Cord Theory for the purposes of this thesis), where it was maintained that the vocal cords were instrumental in tone creation. An assessment was also undertaken of the relevance of contemporary STP teaching when compared with current VCT approaches.

## Introduction

My inquiry into safe teaching and effective communication strategies began when my own singing skills improved under the guidance of four eminent teachers and deteriorated alarmingly under three others – just as eminent. When colleagues developed vocal fold nodules, it was impossible to ignore the compelling questions raised by some teaching methods. However, teaching procedures are not the only cause of dysfunction. Years of working with students revealed that it was self-defeating to concentrate on scales and exercises to improve vocal tone when the cause of the problem was a lack of effective teacher/pupil communication, or the students had psychological blocks.

As a result, my research endeavoured to identify effective voice teaching practices that would not cause harm, coupled with the most effective communication strategies.

The historical development was studied of the two groups identified for comparison – Sinus Tone Production (STP) and Vocal Cord Theory (VCT) to

provide a platform for informed decisions when fulfilling the research requirements.

[As quotes and information in this thesis spanned from the 1600s to the present, the obsolete term ‘vocal cords’ was retained throughout the thesis for ease of reference.]

## Sinus Tone Production

In 1909 Ernest George White published *Science and Singing*, in which he maintained that the vocal cords were not the creators of vocal tone. Instead, vocal tone was purportedly created by air passing through the frontal cranial sinuses for high notes, the sphenoid sinuses for middle notes, and the ethmoid sinuses for low notes – rather in the manner of a wind instrument. He called this process Sinus Tone Production.

White developed his theory after losing his voice through what he perceived to be the faulty techniques of his singing teachers. Medical treatment was undertaken unsuccessfully for three years, until voice teacher Hugo Beyer advised him to ignore the vocal cords and ‘sing above the tongue’. When his voice speedily returned, he began experimenting, and discovered that his new technique would also restore voice to others. One man came to White because he had swallowed acid as a child and could not speak above a whisper. Only months later, he sang a simple song at a White student concert (Correllus, 1989). This convinced White that the vocal cords were not the seat of sound, but merely breath governors.

There are over a hundred testimonials contained in the Ernest George White Society Archives at the University of Reading, thanking White for restoring damaged voices and enhancing healthy ones. Despite this, White’s work was totally rejected not only by most of his peers, but also by orthodox teachers until and including the present time.

Nevertheless, White’s successes gained recognition from medical practitioners, some of whose voice problems he had cured, and they often referred patients to him. Other practitioners declared his theory in error, but did not try to discover which aspects of his work were effective, preferring to reject the method altogether.

In addition to his sinus tone focus, White maintained that it was imperative to avoid any excess mental and physical striving while singing. In his experience, a relaxed mind and flexible body allowed natural physical

responses to occur, and led to unhindered tone creation (White, 1909).

### White's teaching

Correllus (1989) maintained that White's teaching procedures were highly organized. He began his lessons by showing students a segmented human skull that could be taken apart to demonstrate and clarify his ideas, which left no room for misunderstanding. Students were then asked to imagine each tone being created horizontally in the sinuses as they sang, and White (1938) found that took away the anxiety and muscle tension created when reaching 'up' or 'down' for difficult notes. He also played an ocarina so that they could hear the effect of air passing through a wind instrument, and described where tone vibrations should be felt in the sinuses. The students sat in a relaxed but upright position to hum simple exercises, so that they could experience the position of the vibrations for themselves. They also sat to sing songs, to learn that no effort was required to sing. A former pupil recalled that in sixteen years, White never deviated from these procedures (Hewlett, 1995). But White's theory was in direct opposition to orthodox theories.

### Vocal Cord Theory

The vocal cord theory was formulated by the physician Galen (AD 130 - 200) when he announced that air rising from the lungs caused the vocal cords to vibrate and create vocal tone.

From that time until the most famous teaching approach – *bel canto* (beautiful singing) – dominated Western singing from about 1650 until 1850, very little was known of voice teaching techniques. *Bel canto* was based on the regulation of intensity of sound by the breath as well as knowledge of use of the vocal registers. However, details of the early procedures were deliberately kept a closely-guarded secret. The approach was modified when Jean de Reszke (1850-1925) and Manuel García (1805-1906) introduced new techniques to train the voice to fill the larger concert halls that were being built at the time (Manén, 1981).

Manén recounted that when García renounced his singing career because of a bad tremolo, he attributed this to the *bel canto* bellows-like focus of air pressure from the lungs to the vocal cords. Consequently, he developed a method based on exercises that used intervals and scales (rather than breath pressure) to build vocal stamina. He also experimented with the excised larynxes of animals and blew air through the vocal cords with bellows, but although this produced sound, it did not have the tone or harmonics of the human voice. García then constructed a double mirror to study his own living cords. His invention of the laryngoscope and his books about his teaching brought him world renown. Consequently, *bel canto* fell out of fashion until Alessandro Busti broke with tradition and published the first book of vocal exercises in 1865, causing the method to experience a revival.

By the turn of the 20th century it was agreed that the trial-and-error methods of teaching had caused many vocal problems for singers (Melba, 1907), and teachers began to study vocal tract structure and the physical activities occurring during speech and singing. Researchers of the early 1900s came to the conclusion that dynamic tension of opposing muscles in the abdomen and diaphragm controlled the airflow, but fine tuning of the vocal sound was determined by the vocal fold position and the configuration of their contact.

### Voice teaching and research procedures

The history of singing teaching became inextricably linked with voice research when teachers began to write books from their own experiences, which included explanatory diagrams and drawings (for example: White, 1909; Husler and Rodd-Marling, 1976; Manén, 1981; Miller, 1986; Sundberg, 1987). By 1975, writers were able to include photographs of the vocal cords (Reid, 1975) due to the development of fiberoptics. Increasingly sophisticated inventions like the flexible fiberscope, rigid telescope, rhino larynx stroboscope and video-x-radiography were able to observe the behaviours of the vocal cords and vocal tract. However, controversy arose concerning a description of the vocal apparatus. Some maintained the vocal tract was the air space beginning at the larynx and extending to the lips (Austin, 1995). Others found this too limiting, and perceived the vocal mechanism to include the muscles of the abdomen and back, the rib cage and lungs, the pharynx, oral cavity and the nose (Sataloff, 1995). Whilst pointing out that no sound could be created in the spongy, moist cranial sinus cavities, Sundberg (1995a) and Watson (1995) agreed that neuro-feedback from the mechano-receptors may help tone placement.

Andrews (1995) further explained that the vocal cords were covered by mucus membrane, or mucosa. During phonation, the mucosa set up a series of mucosal waves that governed the emission of air into the vocal tract. This was supported by additional evidence of the complex structure and vocal cord gestures that led to tone creation (Gray, Hirano & Kiminori, 1993). [This is very much a thumb-nail explanation. A large chapter of the thesis is devoted to this subject.]

### Which theory was correct?

We now know that not only White but also orthodox teachers were in error when they claimed that voice was created in one discrete area. Not only did a number of experiments reveal that vocal tone was still created when the sinuses were occluded, but there was evidence that the sound at the vocal cords was only a buzz (Austin, 1995). For audible tone to occur, a complex interaction was necessary between sub- and supra-glottal breath pressures, the movements of the larynx, vocal fold configuration and gestures, and the harmonics that developed in the mobile vocal tract.

Because of these findings, modern teaching procedures changed. Leading contemporary VCT teachers

advocated the explanation of research findings when teaching, and STP teachers advised students to sing as if the tone was created in the sinuses.

### The research questions

Four research questions emerged from the literature and informal interviews that occurred during the review:

Is metaphor a valid teaching strategy?

When opposing metaphors are employed in voice teaching, is there any difference between the teaching strategies?

Does any relationship exist between VCT, STP and recommended voice rehabilitation strategies?

Is Sinus Tone Production a valid singing method when compared with current orthodox voice teaching procedures?

When attempting to examine the validity of STP, it was discovered that the deliberations relied on whether or not metaphor was a valid teaching strategy.

### The metaphor debate

The role of metaphor became pivotal when many influential VCT teachers strenuously claimed that STP was not a valid teaching technique. In their opinion, STP had no scientific foundation and did not use accurate physical descriptions, because it was based purely on metaphor (sing as if the tone is created in the sinuses). They also maintained that the use of metaphor – perceived to be ineffectual fantasy – was obsolete, because science had provided accurate descriptions of the processes occurring during tone creation.

Conversely, other leading VCT teachers were equally convinced that information could not be clarified, transmitted and assimilated without the use of metaphors, and contended that their use could not be avoided (Günter, May/June and September/October, 1992). The VCT fraternity were united in condemning STP, but deeply divided about the use of metaphor. This meant that if metaphor was an invalid form of teaching, then any method based on the metaphor ‘sing as if . . .’ could well be invalid. Furthermore, there was a great deal of controversy about the interpretation of the term ‘metaphor’. As classifications like ‘metaphor’, ‘simile’ and ‘analogy’ had been hotly debated since the 17th century, a decision had to be made regarding the interpretation of the term for the purposes of this thesis.

### The definition of ‘metaphor’

After studying the literature, it was decided that ‘metaphor’ would mean:

the term used for any symbolic language that instigates a metaphor process (subsuming categories like simile and analogy). The ‘metaphor process’ is that which transforms understanding by comparing known information with unknown concepts, in order to create new comprehension, with resultant new beliefs influencing behaviour. (Dunbar-Wells, 1997, p. 88)

### The nature of metaphor

It was generally accepted by educationalists and researchers that metaphor was central to language and essential to comprehension, because individuals constructed their own reality by the comparison of the known with the unknown. The metaphor process enabled a deeper comprehension of any new experience. For example, teachers said ‘the lungs inflate like a balloon’. Balloons and lungs have little in common in their composition, therefore the use of the word ‘balloon’ is not an accurate description of the lungs. But the imagery that was inspired by comparing the old knowledge (inflating a balloon) with the new (inflating lungs) made the process of inflation comprehensible.

Metaphor was also known to aid interpretation and clarify literal language (Gallagher, 1978; Petrie, 1979; Lakoff & Johnson, 1980; Pope & Gilbert, 1981; Pearson, 1990). For instance, a child may say ‘Look! A pussy’, to which the parent would respond ‘No. A tiger’ (Morgan, 1993). Through the comparison of the old knowledge (‘pussy’ – a metaphor, because the animal was not a pussy) and new information (‘tiger’), links were formed between the child’s understanding of what it already knew, and the new animal it was observing. In that way the child learned the individual characteristics that belonged to both the old and new images.

In addition, metaphor was found to be deeply rooted in language (Lakoff & Johnson, 1980; Morgan, 1993). For instance: deeply rooted, the eye of a potato, the tongue of a shoe, the wings of an aeroplane, the mouth of a river. Many researchers maintained that the names of all objects were metaphors, because language was merely a vehicle for identification purposes.

Although researchers and educationalists agreed that metaphor was an indispensable process, they also cautioned that metaphors could be confusing if they were ambiguous, or lay outside the life-experience of the students. Denicolo (1985) found that it was important for teachers to explain when metaphors were not to be taken literally, whilst Dalton (1989) recommended eliciting feedback in order to verify that students had really fully understood the new concepts. When these precautions were taken, metaphor was known to be a very powerful teaching tool.

### Metaphor and memory

Metaphor was also perceived to be a pivotal element in the memory process (Lakoff & Johnson, 1980). It is generally agreed that knowledge is acquired through responses to stimulation of the five senses: visual (V) to do with sight; auditory (A) to do with hearing; kinaesthetic (K) to do with sensations; olfactory (O) to do with smell; and gustatory (G) to do with taste. The experiments of Hernegger (1995) took comprehension a step further when they revealed that sensory data were gathered from the external environment and unconsciously analysed before perception occurred. A sense quality was then projected onto the physical

stimulus in order to understand its function, and a cognitive structure was developed by which to comprehend the perceptions being transferred through the senses to the brain. By this process a cortical representation ('pattern' or 'blueprint') was created, stored and then consulted for recognition pattern-matching purposes whenever the stimulus was met again.

Bandler and Grinder (1979) claimed that when the stimulus was recognized it was converted to a code system (encoded), which Ashcraft (1989) maintained was then stored in sensory memory. The perception was then matched with the same or similar patterns stored in long-term memory, for identification purposes (i.e. a fish shape was recognized as a fish). The information then passed throughout a sifting process (personal construct filters), which involved constructing current reality by comparing present sensory perceptions with past experiences. Psychological and physical reactions were then interpreted, organized and stored briefly in short-term memory, where any notions perceived to be unimportant were discarded. The information that was retained was then rehearsed, and when there was adequate rehearsal – or if impressions were especially vivid – a cognitive blueprint was

created in the cerebral cortex and stored in long-term memory. Patterns that were not continually refreshed were discarded.

According to Gleitman (1986), each repetition of the stimulus strengthened the organizational patterns in the cerebral cortex until the diminishing amount of processing that was needed eventually made the resultant behaviour automatic. It was therefore vital for adequate, accurate repetition of information and learning patterns to occur if cortical blueprints were to be refined and then remembered (decoded) accurately. There was a very strong link between metaphor and imagery throughout the literature, and Gleitman stressed that although the language that triggered the responses was a metaphor, the outcome was nevertheless very real.

Kemp (1996) perceived the memory process to comprise three stages: the stimuli (in the case of the singer, the metaphors that trigger sensory encoding), the sensory response (the cognitive-ownership-enactment response), and the internalizing processes (see Figure 1).

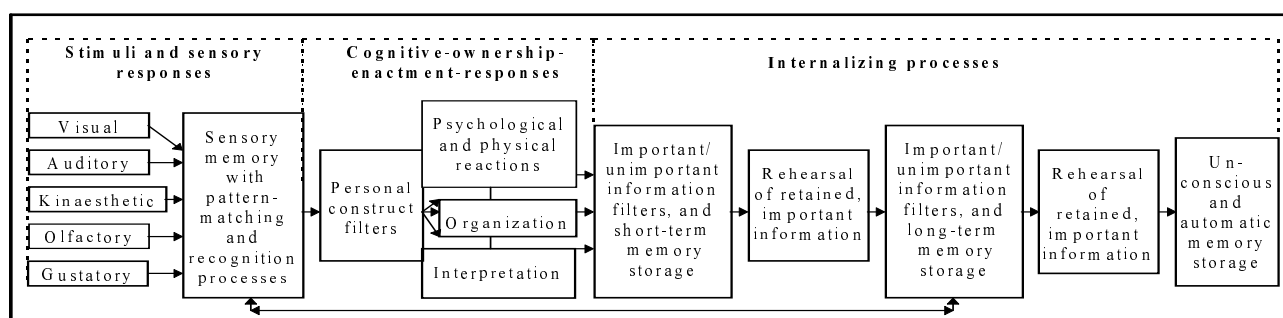


Figure 1. A blueprint for the collection, organization and storage of sensory and cognitive information.

Carlson (1986) found that when physical action was called for, the recall of patterns stored in the cerebral cortex produced muscular movements that included the lips, tongue and throat. According to McElroy (1997) the variations in the shape of the vocal tract, tongue and mouth, along with the varying state of the vocal cords, produced what we recognize as speech or singing. Several other experiments revealed that when musicians thought of playing, their unconscious physical responses corresponded with the actual act.

When Sundberg (1997) conducted informal laboratory tests the teacher used metaphors (such as 'place the tone more forward') to enable singers to deliberately focus tone into different areas of the vocal tract. Changes were found in the source characteristics and also in the formant frequencies that led to the conclusion that each metaphor-inspired placement 'seemed to be a makro type of adjustment affecting the entire tone production mechanism'. He also observed that different people reacted differently to the same directions, and cautioned about the use of language in general. In his experience,

words like 'pressure' were best avoided because they could be misleading and cause the student to develop inaccurately defined sensory perceptions.

### Sensory perception strategies

Another aspect of communication that needed to be taken into consideration was expounded by Bandler and Grinder (1979). They maintained that each person had a preferred way of acquiring and encoding sensory perceptions, and that comprehension was more complete when the speaker's language matched the preferred sensory encoding mode of the hearer. For instance, some individuals favoured visual, some auditory and others kinaesthetic strategies to take in information and to make sense of their world. In their experience, people tended to miss details when the speaker's preferred system differed from their own. For example, when a highly visual person ('it looks like a perfect day, with blue sky, white clouds and the trees swaying in the breeze') talks to a highly kinaesthetic person ('what a sleepy day. The breeze feels warm and

velvety and soft on my skin'), they will understand each other at one level. But experiments have revealed that there is a deeper level of rapport, comprehension and response when visual language is spoken between visual people, auditory between auditory, and kinaesthetic between kinaesthetic.

Bandler and Grinder also found that when an object was shown (a diagram or model) or recalled (V), the accompanying sound was played or recalled (A), and the listener experienced the relevant kinaesthetic response (K), the combination of the three major sensory encoding approaches made learning more indelible.

### The research hypothesis

When the currently recommended communication strategies were examined, information concerning cognitive and sensory encoding, storing and decoding processes led to the research hypothesis (see Figure 2):

**that voice teachers use metaphor to generate the visual, auditory and kinaesthetic imagery that triggers the neural responses needed to adjust the physical environment to that appropriate for the creation of the desired tone outcome.** (Dunbar-Wells, 1997, p. 152)

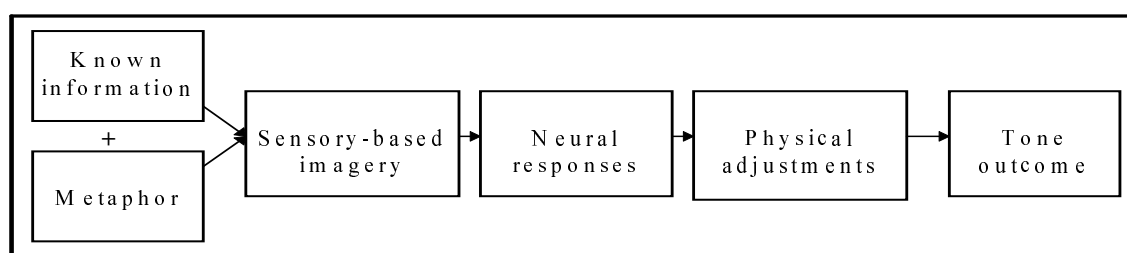


Figure 2. The metaphor process between the teacher's instructions and the student's tone outcome.

### The medical model

Although communication strategies were highly important aspects of voice teaching – even the most golden information may be useless if imparted incorrectly – an equally important topic was that of 'safe' teaching procedures. It was therefore decided to compare voice teaching strategies with recommended medical restoration practices, on the assumption that the latter would not harm voices.

The voice restoration criteria were developed from the literature and interviews with otolaryngologists, pathologists and voice therapists.

Elements that created vocal problems were:

- emotional stress;
- feelings of anxiety connected with the desire to talk or sing;
- prolonged or habitual shouting;
- poor posture;
- dehydration from not drinking enough water;
- smoking and the use of drugs –including some prescription drugs – and alcohol abuse;
- any practice that inhibited muscular freedom for extended periods of time, and unnaturally imposed manipulation of the face or throat muscles;
- psychological and physical problems, including poor muscle tone due to lack of exercise and inadequate diet;
- gastric reflux (a regurgitation of acid from the stomach into the oesophagus).
- allergies and pollution

Consequently, the restoration criteria by which STP and VCT voice teaching strategies were measured (as

opposed to health subjects like drug use and gastric reflux) were those that allowed:

- freedom from stress or striving when speaking and singing;
- freedom from any consciously-imposed muscular restrictions;
- a breathing technique that relaxed the abdominal muscles to allow the diaphragm to descend while the lungs and rib-cage expanded during inhalation, then allowed the reverse muscular activity to remain flexible during exhalation;
- an imaging technique that directed energy away from the intrinsic muscles of the larynx, vocal cords and vocal tract and focused it on stronger extrinsic muscles and bone structures, leaving the larynx, vocal cords and vocal tract free to respond in an uninhibited and flexible manner.

(Posture was not mentioned by teachers at interviews from which the criteria for teaching strategy tests were formed, and as a result it was not included in the above criteria.

It was mentioned in the survey by teachers who felt that it should have been included. However, they recommended 'good posture' – language which could be interpreted in many ways. The medical fraternity and prominent teachers at conferences also emphasized the importance of posture, which they said should be relaxed with the spinal cord elongated, with the head well balanced, neither tilting forwards nor backwards, so that the larynx was not distorted or restricted in any way.)

STP and VCT communication strategies were also compared with medical communication practices (show models or representations to demonstrate; play tapes of healthy and unhealthy voices to make clear the difference; describe sensations relating to desirable tone production).

## Methodology

As there were only fourteen STP teachers in the United Kingdom, any samples to be tested could only be small. This presented a problem, as acknowledged research usually involves greater numbers of subjects. Consequently, it was decided to use case study, and to strengthen the methodology by triangulating. In this way, the tests would be conducted from three different perspectives: (a) interviews, (b) a survey, and (c) the observation of demonstration lessons\*. The rationale for this choice was that case study is now a recognized research procedure for small studies, and when triangulation takes place, if each test produces the same or similar results, it can be assumed that the results are reliable.

\*It was originally intended to use digital recordings subjected to spectrographic analysis to identify any differences when comparing VCT and STP tone outcomes. However Titze (1995), Welch (1995), and Sundberg (1995b) advised that as there was no standardization of instruments, there was great controversy about procedures. As a result, any research could easily be confounded by objections to, say, the use of a particular microphone. In view of this, it was decided to observe 3 VCT and 3 STP demonstration lessons instead.

**Scoring:** A format requiring only Yes/No answers was used for the interviews and survey. Each 'yes' and 'no' was given a score of 1, and the individual scores were then totalled. For example, Do you teach relaxation exercises? VCT Yes = 14, No = 0; STP Yes = 8, No = 6.

In some cases the request 'please describe' (not scored) served to provide insights into teaching strategies and aided the interpretation of results. To illustrate: when teachers from both groups explained research findings, the descriptions were invariably cryptic and unable to be put into practice. However, most used metaphors to clarify their descriptions. This further strengthened the evidence indicating that metaphor is essential in voice teaching.

The demonstration lessons and 'safe' teaching procedures were scored by marking each incidence against the appropriate category for each teacher as the incidence occurred during the lesson. The number of incidences was then totalled for each category. For example, Use of trigger metaphors (where VCT 1 is the code for the first teacher): VCT 1 = 19; VCT 2 = 17; VCT 3 = 1; STP 1 = 8; STP 2 = 4; STP 3 = 3. (The above examples are quoted from actual results.)

## Interview, survey and observation procedures

(a) Attendance at thirteen conferences in the United Kingdom and one in Portugal led to over thirty interviews with leading VCT and STP voice teachers, otolaryngologists, pathologists and therapists. From these interviews the voice-enhancing strategies used by each group were identified. Criteria were then formed for comparisons and analyses of the data collected. Pilot questionnaires were administered to two VCT University of Reading (UK) colleagues, two VCT Queensland Conservatorium of Music, Griffith University colleagues, and four English STP teachers. All were respected in their own field. One VCT teacher did not respond.

(b) A survey was administered to the total United Kingdom STP teaching population (14) – all members of the Ernest George White Society – and 14 Association of Teachers of Singing (UK) VCT teachers. The average age-groups and teaching backgrounds of both groups were similar, and as they were all active members of teaching societies it was assumed that the groups were fairly compatible for testing. The only real difference was that there were 7 female and 7 male STP teachers, whereas the 14 VCT teachers were female, as no males volunteered. The results of the survey were subsequently analysed and compared.

(c) Six demonstration lessons of acclaimed voice teachers (3 STP and 3 VCT) were observed, analysed and the results compared. The VCT teachers were observed during conferences, while 2 STP teachers were observed teaching in their studios, and one was on videotape. All lessons were audiotaped and transcribed for analysis and comparison.

At this point, the research had divided into three investigations:

- identifying, comparing and analysing voice teaching strategies in order to differentiate between similarities and differences in teaching procedures;
- identifying, comparing and analysing communication procedures in order to gauge the use of metaphors and sensory perception encoding/decoding strategies;
- identifying voice restorative practices and comparing these with voice teaching techniques in order to discern the teaching practices considered to be 'safe' – that is, not to cause harm.

## Results

### 1. Is metaphor a valid teaching strategy?

#### 1.1 Do teachers rely only on metaphor to instruct?

Results revealed that descriptions of physical behaviours provided by teachers of both groups during the interviews, survey and demonstration lessons, were invariably accepted, accurate descriptions (for example, the lungs expand on inhalation). Four VCT teachers mentioned research findings, but the descriptions were

cryptic, confusing and unable to be put into practice. The teachers then used metaphors to clarify their information.

Two STP teachers referred to scientific evidence – in an equally confused, cryptic fashion – but when they advised students to sing *as if* the sinuses were the source of sound, it was clear that this was a metaphor. The conclusion was that few teachers imparted ‘scientific’ information, none relied on metaphor alone to instruct, and that STP was not based entirely on metaphor.

### 1.2 To what degree do teachers use metaphor to instruct?

Four categories were identified for analysis and comparison purposes. They were given the names: Trigger metaphors, Descriptive metaphors, General explanation and Physiological explanations.

**Trigger metaphors:** Teachers would use a word (the metaphor that triggered the metaphor process) to represent and instigate a complex series of actions. For instance, the teacher would ask the student to ‘slowly draw the abdominal muscles towards the spine’. Once the concept was understood by the students, the teacher ceased repeating the details, and merely said ‘tuck’ whenever it was appropriate. The word ‘tuck’ became the metaphor that triggered the appropriate response.

**Descriptive metaphors** were words used to describe a certain aspect of singing (‘he’s using a very *plummy* tone’).

**General explanations** had no metaphors contained within, or attached. (‘Put your finger on your jaw. The jaw was jutting very, very much forward.’)

**Physiological explanations** also had no metaphors contained within, or attached. They purely explained something physical: (‘These ribs are fixed here. You cannot move them’).

All teachers of both groups during interviews and the survey used metaphors to either trigger responses, or to

clarify a particular concept or activity. Surprisingly, VCT Demonstration Lesson teachers used considerably more metaphors than did STP. This strongly indicated that voice teachers did not teach by describing research findings without the use of metaphor, as some claimed.

### 1.3 Do teachers intentionally use and teach students to use sensory perception encoding/decoding strategies?

(Only visual (V), auditory (A) and kinaesthetic (K) modes were analysed and compared, as gustatory and olfactory senses were not mentioned in the data collected for the purposes of identifying criteria.)

For this test, teachers were asked to report on their personal and teaching practices when learning, when vocalizing and when singing songs.

Teachers of both groups tended to relate to singing primarily through the kinaesthetic mode. In other words, the teachers were most conscious of how sensations felt when they themselves were singing, and were not aware of using V or A strategies to any degree. When they taught, the VCT group taught students to access the K mode, but omitted bringing into awareness the V and A modes.

On the other hand, most of the STP group learned works with a preference for K, visualized (V) when vocalizing, and relied on A when singing songs. The preference was to teach students to use K when learning and vocalizing, with A for singing songs. Although most teachers used VAK strategies at some stage, none of them used or taught all three modes (VAK) for each new task.

### 2. When opposing metaphors are employed in voice teaching procedures, is there any difference between the teaching strategies?

Although there was a high degree of consensus within the groups, there was no total agreement amongst all teachers at any point (see Table 1).

**Table 1.** The number of VCT and STP teachers adopting particular strategies as identified in the survey and demonstration lessons.

	VCT		STP	
	Survey (n = 14)	Demon. (n = 3)	Survey (n = 14)	Demon. (n = 3)
1. Sit to sing exercises	0	0	10	3
2. Stand to sing exercises	11	3	1	0
3. Sit to sing songs	0	0	4	0
4. Stand to sing songs	11	3	7	3
5. A mixture of sitting and standing for exercises	0	0	3	0
6. A mixture of sitting and standing for songs	3	0	3	0
7. Always begin by humming exercises	1	0	10	3
8. Hum and open to a vowel	5	0	11	3
9. Teach relaxation exercises	14	0	8	0
10. Teach breathing techniques	13	2	10	1
11. Smile during singing	10	1	3	0
12. Lower larynx when singing	8	0	2	0
13. Yawn and sing with an open throat	10	0	1	0
14. Raise soft palate and/or uvula	9	0	1	0
15. Reference to tone creation in the sinuses	0	0	14	3
16. Touch the student to monitor activity	13	3	4	0
17. Refer to registers	0	1	0	0

There was a degree of consensus between-groups for six of the strategies (3, 4, 5, 6, 10, 17), opposing strategies were used for eight categories (1, 2, 7, 11, 13, 14, 15, 16) and differing strategies were used for the remaining three (8, 9, 12). The results therefore revealed that although there were several similarities between the groups, there were distinct differences between the STP and VCT approaches. Cross-validation of the teaching and communication strategies of the two groups revealed that the strongest link between them was that both groups used metaphors to facilitate teaching.

The strategies of White and present STP teachers were also compared. Although 11 teachers adhered to White's strategies, 3 introduced strategies that were in direct opposition to White's instructions (for instance, lowering the larynx whilst singing).

### **3. Does any relationship exist between VCT, STP and recommended voice rehabilitation strategies?**

There were 12 categories, with 7 (50% of 14 teachers) being the mid-point score. Seven VCT Survey teachers scored above 7, as opposed to 10 STP scores above 7, indicating that STP Survey strategies were closer to the medical model than VCT. There was fairly strong consensus between the 3 VCT and 3 STP Demonstration teachers, with STP being closest to the medical model.

One important result was that although a notable number of VCT and 3 STP Survey teachers asked students to consciously inhibit muscles (for example, yawn and sing with an 'open throat'; 'use wide Cheshire cat grin'), all of the demonstration lesson teachers advised against the practice.

### **4. Is Sinus Tone Production a valid singing method when compared with current orthodox voice teaching procedures?**

Considering that White's sinuses-as-a-wind-instrument theory was deemed by medical carers to be an effective voice strategy; that most current STP teachers – like the majority of VCT teachers – used accurate physical descriptions to instruct; that STP was not a purely metaphoric approach; that the use of metaphor was considered to be a vital element in teaching; and that most STP teachers used strategies that were close to the medical model, Sinus Tone Production is considered to be a valid, safe voice teaching strategy when compared with other contemporary approaches.

## **Discussion and conclusions**

### **Was White right or wrong?**

White's sinuses-as-a-wind-instrument theory was found to be in error, as tone could still be created even when the sinuses were occluded. Nevertheless, his use of metaphor to clarify instruction, and his teaching procedures, systematically using VAK encoding

strategies, seem to have induced or preserved vocal health. When White insisted that the vocal cords were merely breath governors, he was partially correct, but it is now known that the highly complex structure and gestures of the vocal cords are part of the equally complex interaction that must take place within the vocal mechanism in order for tone creation to occur.

### **If White's theory was in error, how could his practice be effective?**

When asked to explain how Ernest George White's teaching could be successful if his theory was in error, speech pathologists and therapists concluded that White's sinuses-as-a-wind instrument was an effective metaphor that produced imagery which focused attention away from the larynx and vocal cords, leaving those areas free to respond in a spontaneous, flexible and uninhibited manner – a pre-requisite for healthy tone creation. (Bagnall, 1994; Baldock, 1994; Cazzolato, 1994; Clarke, 1994; Menezes, 1994; Hazlett, 1995).

In addition to using the sinuses-as-a-wind-instrument metaphor, White insisted that healthy, vibrant tone arose when:

- there was no sense of emotional or physical stress or striving during singing;
- there was no inhibiting manipulation of any muscular response (such as holding the larynx in a lowered position while singing);
- singers were aware of the best position for tone vibration sensations (in White's case, in the cranial sinuses).

As these were the tenets upon which the current medical model was based, it seems that White's method was a precursor to the voice restoration practices now used by medical professionals.

White's method of communication was also before it's time, and seemed very effective. He used a combination of visual (V), auditory (A) and kinaesthetic (K) examples to create unambiguous instruction. He showed and accurately described the internal structure of the skull (V/A)\*, showed and played the ocarina (V/A) and helped students to become physically aware of their own sound and the desired position of the vibrations created by the hum within the cranium (A/K). A combination of VAK instruction is now recommended practice, because it provides information from three perspectives that cover the major preferred encoding strategies of most people.

\*White's physical descriptions were accurate, despite his erroneous conclusions regarding tone creation.

Conclusions were reached for the research questions:

### **1. Is metaphor a valid teaching strategy?**

The results of this research indicated that the use of metaphors and the resultant imagery were vital



elements in the metamorphosis that occurs between the teachers' instructions and the students' tone outcomes. Nevertheless, to avoid confusion, students should be told that the metaphor is not to be taken literally, the metaphor should lie within the students experience, and precautions should be taken to avoid ambiguity. Eliciting feedback from the student was also recommended, to confirm that the student had fully comprehended the new concept. Observing these constraints renders the use of metaphor a powerful and probably indispensable teaching strategy.

### **2. When opposing metaphors are employed in voice teaching procedures, is there any difference between the teaching strategies?**

Both STP and VCT teachers had strategies that were common to both groups, but more were diametrically opposed. It was therefore deduced that opposing metaphors employ different teaching strategies.

### **3. Does any relationship exist between VCT, STP and recommended voice rehabilitation strategies?**

STP Survey and Demonstration Lesson scores showed a high degree of consensus and were closer to the medical model than VCT scores. As VCT Demonstration Lesson scores were closer to the medical model than the VCT Survey scores, it would seem that rank and file teachers may need to know more about the strategies recommended by VCT experts, and the medical model.

### **4. Is Sinus Tone Production a valid singing method when compared with current orthodox voice teaching procedures?**

White's communication techniques were more comprehensive than those of the current STP and VCT teachers who were tested, and Sinus Tone Production teaching strategies should be safe and effective, when teachers adhered to White's teaching procedures. It would seem to be an ideal way for school teachers to teach children, and also to provide a safe foundation upon which more stylized techniques could be based.

### **Further research**

Unfortunately, voice research is fraught with problems, and many potentially confounding factors need to be overcome. For example, how does one find subjects and measure them for variables like intelligence and capabilities? Nevertheless, a teacher could instruct one half of their students by an orthodox method and the other by White's (for example), and compare the results. Or one class of school children could be taught by orthodox methods, with that teacher instructing another by STP, to compare the outcomes. If, after singing by specific techniques, throat conditions were monitored and compared, we could learn a great deal more about 'safe' singing. Dedicated researchers using modern technology are beginning to make all of this possible.

### **References**

- Andrews, M. L. (1995). *Manual of voice treatment*. San Diego: Singular.
- Ashcraft, M. H. (1989). *Human memory and cognition*. USA: HarperCollins.
- Austin, S. F. (1995). Nasal resonance – dispelling the myth. *Australian Voice*, 1, 18-23.
- Bagnall, A. (1994). Personal communication. Voicecraft, North Adelaide, South Australia.
- Baldock, P. (1994). Personal communication. Private speech pathologist and consultant to Princess Alexandra Hospital, Brisbane.
- Bandler, R., & Grinder, J. (1979). *Frogs into princes*. Utah: Real.
- Carlson, N. R. (1986). *Psychology of behavior* (3rd ed.). Boston: Allyn and Bacon.
- Cazzelato, L. (1994). Personal communication. Pathologist, Princess Alexandra Hospital, Brisbane.
- Clarke, K. (1994). Personal communication. Pathologist, Princess Alexandra Hospital, Brisbane.
- Correllus, J. J. (1989). *The life and times of Ernest George White: Founder of the School of Sinus Tone Production: An archival research*. San Francisco: jFc.
- Dalton, J. (1989). *Adventures in thinking*. Melbourne: Nelson.
- Denicolo, P. (1985). *Figurative language: An investigation of its value in the teaching and learning of chemistry*. Unpublished doctoral dissertation, University of Surrey, England.
- Dunbar-Wells, R. (1995). The use of metaphor in voice teaching: A comparative study of Sinus Tone Production and vocal cord theories. *Australian Voice* Vol. 1, 55-63.
- Dunbar-Wells, R. (1997). *The relevance of metaphor in voice teaching: A comparative study of Sinus Tone Production and vocal cord theories*. Unpublished doctoral dissertation, University of Reading, England.
- Gallagher, J. M. (1978). The future of formal thought research: The study of analogy and metaphor. In B. Presseisen, D. Goldstein, & M. H. Appel (Eds.), *Topics in Cognitive Development: Vol. 1. Language and Operational Thought* (pp. 77-98). London: Plenum Press.
- Gleitman, H. (1986). *Psychology*. New York: Norton.
- Gray, S. D., Hirano, M., & Kiminori, S. (1993). Molecular and cellular structure of vocal fold tissue. In I. R. Titze (Ed.), *Vocal fold physiology* (pp. 1-24). San Diego: Singular.
- Günter, H. (May/June, 1992a). Mental concepts in singing: A psychological approach, Part 1. *The NATS Journal*, 4-8 & 46.
- Günter, H. (September/October, 1992b). Mental concepts in singing: A psychological approach, Part 2. *The NATS Journal*, 4-6.
- Hazlett, D. (1995). Personal communication. Pathology Department, School of

- Behavioural and Communication Sciences, University of Ulster, Northern Ireland.
- Hernegger, R. (1995). *Auditory perception*. (Internet document obtainable from [hernegger@success.cubenet.de](mailto:hernegger@success.cubenet.de)).
- Hewlett, A. (1995). Personal communication. Ernest George White Society, England.
- Husler, F., & Rodd-Marling, Y. (1976). *Singing: The physical nature of the vocal organ* (revised 2nd ed.). Great Britain: Anchor.
- Kemp, A. E. (1996). Personal communication. University of Reading, England.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.
- Manén, L. (1981). *The art of singing* (2nd ed.). Great Britain: Faber.
- McElroy, C. (1997). *Speech production and perception*. (Internet document obtainable from [ciaranmc@maxwell.ucd.ie](mailto:ciaranmc@maxwell.ucd.ie)).
- Melba, N. (October, 1907). Melba on the gift of song. *The Triad*. 45-46.
- Menezes, C. (1994). Personal communication. Pathology Department, Princess Alexandra Hospital, Brisbane.
- Miller, R. (1986). *The structure of singing*. New York: Schirmer.
- Morgan, G. (1993). *Imaginization*. California: Sage.
- Pearson, B. Z. (1990). The comprehension of metaphor by preschool children. *The Journal of Child Language*, **17**, 185-203.
- Petrie, H. G. (1979). Metaphor and learning. In A. Ortony (Ed.), *Metaphor and thought*, (pp. 438-461). Cambridge: Cambridge University Press.
- Pope, M. L., & Gilbert, J. K. (1981). *The role of metaphor in explanation: Some empirical questions*. Paper presented at the University of Surrey.
- Reid, C. L. (1975). *Voice: Psyche and soma*. New York: Patelson.
- Sataloff, R. T. (1995). Rational Thought: The impact of voice science upon voice care. *Voice*, **4**, 77-95.
- Sundberg, J. (1987). *The science of the singing voice*. Dekalb: Northern Illinois University Press.
- Sundberg, J. (1995a), (1995b), (1997). Personal communications. Department of Speech, Music & Hearing, KTH, Stockholm.
- Titze, I. (1995). Personal communication. Department of Speech Pathology and Audiology, The University of Iowa, Iowa.
- Welch, G. (1995). Personal communication. Roehampton Institute, London.
- Watson, C. (1997). Personal communication. Development of the Clinical Voice Laboratory at the Edinburgh Royal Infirmary.
- White, E. G. (1909). *Science and singing*. London: Vincent.
- White, E. G. (1938). *Science and singing* (5th ed.). London: Dent.