I think, therefore I sing… or do I?

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I am at the very start of my M.Phil PhD journey, my research title is "The learning outcomes and experiences of undergraduate classical singers using voice analysis spectrographic software". I would very much welcome your comments and suggestions. This paper is an exploration of some of the ideas that will inform the content of my research.

When I think about *thinking and singing* I am immediately struck by the breadth of the topic. To me as a singer and teacher there are two key areas: technique, and text and communication, and three ways I see that thinking and singing arises. The first is thinking about the physical neuro-muscular actions involved in singing, the second is the use by singers and teachers of metaphor to anchor those actions and sensations and the third is the metaphor as a vehicle used to refine expressing text and music. In this paper, I will concentrate mainly on the first area: technique, starting with a very brief overview of the changes in voice research during the 20th Century.
The exponential growth in voice research over the last twenty years as a result of better laryngoscopy, x-ray tomography, magnetic resonance imaging, research into brain function, the understanding of the singers formant (Josef Sundberg), and the work by Inigo Titze and Hirano (to mention a few pioneers) following on from the founding work of Mario Marafiotti in the early 20th century, has led to a change in the teaching approach and informed the pedagogy of a great many teachers. There is an opinion held by some singing teachers that an understanding of the anatomy and physiology of the voice is unnecessary and a hindrance, or that it is knowledge that the student has no need. As singing teachers, we need an arsenal of tools, a flexible language and library of metaphors to be able to understand what is happening to our students and to steer them on an appropriate, safe and effective technical path that will provide our students with technical security, musicality, artistry, communication and understanding. From my experience, there is a tendency by some singing teachers to view new ideas and especially the scientific based research as a threat to existing modes of teaching. This, I believe, is born out of a lack of understanding, fear, and the worry that all that is good about older styles of teaching may be lost (the "throwing the baby out with the bathwater" syndrome).

An early pedagogic model of the teaching of singing, for example, would comprise of some physical instructions and demonstrations by the teacher on posture, possibly breathing, and sequences of vocal exercises aimed at developing an effective tonal quality. A great reliance on visual imagery (smell the roses, think of the space etc.) was necessary, this is still a recognisable model and equally relevant today. This development of visual imagery was essential as prior, to the beginning of the 20th century, voice science was unheard of and there were competing theories about breathing, resonance and the mechanics of voice production.

So what does all this scientific knowledge have to do with thinking and singing? How does it inform how the singer thinks and the teacher thinks?

Technique

In the teaching of technique, imagery is still a key pedagogic tool, however I would suggest that for imagery to be effective, the images used should fit the images that the student finds relevant, appealing and can respond to. I have to ask myself the question "what is my student thinking about when they produce an appropriate, good sound?" What I do is ask the student what they are thinking when they are singing. An example from one of my students when talking about a particular point of technique: I asked him "what does that remind you of?" and he replied "orange, the colour" (this was not synaesthesia). By experimenting with shades of light, dark, intensity and the qualities of the colour it was easy to make adjustments to his technique. Had I, on the other hand, suggested an image of my own, it may not have been effective, he probably would not have been thinking about my image when he was singing, indeed if I made the same colour suggestion to another student it will more than likely be meaningless. The use of language and the descriptors teachers use need to be understood clearly by the student. Asking the student for their own descriptors may result in quicker and more memorable learning. Part of the ground work we do as singing teachers is establishing a commonly understood vocabulary with our students. Luisa Tetrazzini said:

> "Around the art of singing there has been formed a cult which includes an entire jargon of words meaning one thing to the singer and another thing to the rest of the world and which very often doesn't mean the same thing to two singers of different schools."9

I would add that to that and say it is entirely probable that some jargon may even mean different things to different singers within the same school.

From my experience as a teacher and as a student images have to be based on shared understanding and experience. The teacher and student need to have a congruent understanding of the thinking behind the concept or, as in the example above, the colour orange. Some students are more responsive to images; others respond more to precise anatomical and physiological instructions or a combination of these teaching modes.

Recently I have been using spectrographic software in my teaching which provides an objective visual display of the singer's voice. Spectrography has previously been used more-or-less exclusively by voice scientists and is not commonly found in the singing studio. Whilst in Slovenia earlier this year, at a practical exploratory conference using spectrographic software in the singing studio, an independent (non-singing) observer made the point that the use of words like "red is better" may not be constructive. In fact, it is possible to set the software to display in a variety of colours, what she misunderstood is that the question from one of the teachers was "is red better", to which the answer was "no, we are looking for the strength of the signal – in this case a strong red as opposed to orange, but red is not better". It is important that we temper our language so as to not misguide or direct attention from the function of the tools we are using. Would this have been a useful tool with the student who benefited from the colour orange? How would he have thought about his singing whilst looking at a spectrographic display? I suspect that he would have found his own appropriate answer and imagery.

I have asked students what they think about using the software during their lessons when they are singing: is it useful and how? The general reply has been that seeing the display whilst they sing and

being able to see what happens to the visual feedback if they change the physical set up of their vocal tract, enables them to strengthen the technical proprioceptive memory. I should say that I do not use the software all the time, only when the need arises, and to anyone who has not used it before it is very simple to use, and a useful tool, but can never replace the ear of the teacher.

> "Voice data are often used to corroborate objectively perceptual judgements regarding voice pitch and/or voice quality. The results may be represented on a computer screen in the form of visual feedback, or as part of a scientific investigation of some aspect of voice. A wide variety of signals can be measured to give insights into the dynamic processes that occur during normal, pathological and professional voice production as well as a number of sounds produced by the normal voice, such as coughing, snoring, laughing and crying. All are analysed using essentially the principles outlined here, but even the most objective data requires subjective interpretation that is informed by both the circumstances surrounding the origin of the data and the analysis techniques that have been employed. Informed practical voice measurement, therefore, requires knowledge of the human speech production process before the nature of commonly employed analysis techniques can be introduced…"1 David Howard

Thinking about technical instructions whilst singing will present a challenge: Think back to the first time you rode a bike or drove a car. At the start of our learning, there was a time when we had to think very precisely about the actions involved and the order of events or instructions in order to cycle or drive. The same is true for singers, but the aim, as with driving and cycling, is to not think about the technical processes but arriving at a point where the control over the technical process is automatic, unconscious or unthinking. We strive for the art of artlessness in our doing.

As a singer, we need to be aware of posture, our breathing, the vowel and consonant we are singing, the pitch, the dynamic and the dramatic intention we want to convey. Do we think of all of this as a string of ideas? In reality there is not time. What we do is think about all of this before, in our practise and our lessons and rehearsals. The thinking that we do as preparation prepares us much as a dancer learning a new choreography, prepares with meticulous detail every movement and gesture; as singers we are doing the same: we are choreographers of the muscles of vocalisation from the breathing mechanism to the muscles of the vocal folds, vocal tract and muscles of facial expression. The foundations for the thinking therefore are laid in our learning at every level until we achieve automatic response, the art of artlessness.

The Italian tenor Beniamino Gigli describes what he thinks when he forms vowels in the introduction to Herbert Caesari's book "The Voice of the Mind"

> "Now as regards the formation of these vowels in relation to singing I must bring into sharp focus a highly important factor, viz: the absolute necessity for *mentally* conceiving beforehand the vowel sound and its colour or timbre, whether in pure or modified form, that one wishes, or is about, to produce. In other words, *every vowel sound must be, mentally shaped and mentally given the requisite colour,* according to circumstances, *before* being physically produced on a natural and spontaneous basis, fluid and untrammelled." 1

Gigli goes on to say

> "Inversely, the very fact of *mentally* conceiving, and *mentally shaping* and colouring *each vowel sound* to be sung (in pure or modified form according to what one has to express) *before* producing it, induces simple and spontaneous (natural) movements of the parts concerned. *This is what I have always done myself, and this is what I advise every singer to do.* And if he or she is not used to this mental work or preparation, not having been taught it, I would sincerely advise him to start right away to cultivate this vitally important habit. It merely demands concentrated vigilance over a certain period of time. With patient and persevering practice (sic) the thinking and doing merge as one, a flash split-second action."2

Caesari describes a lesson given to him by his teacher, the Italian baritone Antonio Cotogni, who said:

> "*Remember* that always you *must* mentally shape each vowel *and impart to it the right colour, timbre, and expression* before *actually producing it"*3

My instructions to students are very similar. I stress that singing is mostly about preparation. We learn to prepare everything: consonants, vowels, resonant space, pitch, intention etc., all much more in advance than we would intuitively do without the rigours of this specific form of training. For example, everything needs to be prepared on or even before inspiration ready for the onset of singing rather than a rush to co-ordinate and prepare at the moment of onset. This is a very specific discipline in the thinking and singing process that, I believe, cannot be taken for granted and needs to be precisely taught and re-enforced in lessons until it becomes automatic. This is thinking and singing in action.

In his earlier book "The Science and Sensations of Vocal Tone", Caesari states:

> "One of the grossest errors characterizing modern methods is the teaching and the exercise of singing on purely physical grounds. Physique appears to be the order of the day where vocal mechanism is concerned…. By physique is meant mere muscles. The heterogeneous sounds which, in the main, pass for singing are almost entirely muscular in cause and effect. Hence the sharp clevage [sic] between the factorial precepts of the old Italian *School* and the oft chimeric tenets adduced in support of so many modern methods; singular and a oneness of purpose in the first case, plural and aggressively contradictory in the second, the very plurality indicative of chaos and error.

And he continues, but note his use of the word 'vibrational' as a metaphor when he describes the transmission of nerve impulses more in keeping with late 19th and early 20th century popular idiomatic ideas on the function of the nervous system.

> Inversely, true singing is two-thirds mental-nervous in cause and effect. This requires elaboration: A thought takes temporary lodgement in the brain through the mind. Thought is a form of vibration and a vibrational form; it is transmitted as vibration down the nerve channels of the cerebro-spinal system into and through the sympathetic nervous system… The travel of this vibrational form we call thought, is silent unless nerves and muscles of the vocal machinery are engaged for the purposes of audible expression."4

The clamour for science in the teaching of singing in the early part of the 20th century gave rise to a plethora of theories and techniques and I can quite see why Caesari was concerned. The rigour

applied to voice by contemporary science was often absent and some of the work by the early pioneers was misinterpreted and misapplied. In the foreword to Caesari's book Science and Sensations of Vocal Technique, the acoustician Noel A. Bonavia-Hunt says:

> "Singing is partly a conscious and partly a subconscious act, and it is sometimes difficult to draw a clear line between the two functions. A singer is not expected to know all that is happening in his throat and head during phonation, and it is the office of the teacher to attend to those conscious and deliberate functions of voice production which ensure the artistic results aimed at. The subconscious exercise of motor nerves can only be translated into the realm of conscious in terms of subjective physical sensations and it is also here that the teacher may find abundant opportunities of helping the student of vocal mechanics… Although the teacher does not wholly depend on scientific knowledge of his subject for his successful handling of pupils, it can never be unwise for him to keep in touch with scientific principles, since it is at least comforting to find that Nature is not frowning on his efforts to guide the student to the promised land."5

So, Caesari was aware that sciences as well as all of the other approaches to the teaching of singing are equally important. Indeed, he was an advocate for voice science (hence the title of the book). In particular Caesari refers to acoustics. However both of Caesari's books I refer to talk in terms of images, thoughts and ideas: the "thinking of singing" and less about the anatomical and physiological aspects.

The relationship between the mind and body is an essential part of singing. Understanding this relationship is key to effective teaching. The ultimate aim of teaching technique is to enable the student to gain complete control and mastery over their instrument and demonstrate the art of artlessness. A standard model for learning describes the student moving through the following stages: unconsciously incompetent, consciously incompetent, consciously competent, unconsciously competent. This cycle is often referred to as a circle. I believe that it is better described as an ever ascending spiral, striving for perfection: the ever moving goal. The better we get the more attention to detail we place on smaller and smaller aspects of our singing. So our thinking is that we are consciously incompetent about a new and specific detail in our singing. Through this spiral process of learning, our thinking about singing becomes increasingly refined. This, I believe is true for all aspects of singing from technique to interpretation and in each and every performance.

Oren Brown in his book "Discover your voice" says:

> "There is a two way communication between mind and body. If the mind is completely at ease, the message goes to the body that everything is OK, so there is no need for tension. Likewise if the body is relaxed, a message goes to the mind to stop worrying. Free easy breathing, as we breathe in sleep, is part of a relaxed body. Breathing easily is the key to bringing release".6

His attention to "the mind being completely at ease" is critical for effective performance but this requires a considerable amount of training; years of engaging in the spiral of learning and the mind set to start again with each new piece of repertoire. The learning and repetition moves from the conscious mind to the unconscious – the memory of actions (pitch relationships, text, interpretation etc.) become automatic. He describes the process analogous to an instrumentalist thus:

> "When you have seen and played a series of notes frequently, it is no longer necessary to work out the fingering because the neuron has made the connection so many times that it has relegated the task to an assistant as a routine action no longer needing special attention. The lower level of response is known as a *reflex arc* or a *conditioned reflex*. This is the level of activity that you should strive to bring about in your study of singing."7

Caruso and Tetrazzini writing "On the art of singing" comment:

> "There is only one way to sing correctly, and that is to sing naturally, easily, comfortably. The height of vocal art is to have no apparent method, but to be able to sing with perfect facility from one end of the voice to the other, emitting all the notes clearly and yet with power and having each note of the scale sound the same in quality and tonal beauty as the ones before and after.
>
> There are many methods which lead to the goal of natural singing – that is to say, the production of the voice with ease, beauty and with perfect control.
>
> Some of the greatest teachers in the world reach this point apparently by diverging roads."8

Text and Communication

I have talked about the teaching of technique in relation to thinking and singing, but there is another level to thinking and singing: the text. Where does the thinking and singing come in relation to text?

Text has many layers. It is important to consider the narrative, if indeed there is one, or the idea or scene that the poet, lyricist or librettist is attempting to convey. We need to ask the questions: How does this relate to the musical phrasing? Are there dynamics or marks of expression that the composer has written into the music that drive or enhance meaning? What is the relationship between the accompaniment, melody and text? What does this evoke in the mind of the singer? How does this affect the thinking of the singer in learning a piece, rehearsing and in performance? In opera what other interactions are taking place between characters, set, lighting, costume and props? There is a further layer of thinking and planning that occupies the mind of the singer. In 1936 Carl Emil Seashore wrote:

> "Between the physical world of vibration as measured by apparatus, and the world of consciously heard music, there is a third area of investigation. Our auditory apparatus and/or mind separates different instruments and tones, hears pleasantness and unpleasantness, establishes sensations of volume, hears some vibrations however not others, adds tones to fill out the sound spectrum, etc. This middle ground is the provinces of the psychology of music, a subject about which even the physical scientists know little."11

Note that Seashore uses the word 'vibration' in its literal meaning. This was in 1936, and despite massive leaps in the knowledge and understanding of how the brain functions we are still only at the very beginning of understanding. This leads inevitably to more questions on the nature of thinking and singing and the role of semiotics to the singer and the listener. Is my thinking as a singer affecting the comprehension of the audience? In classical singing, we have the added complexity of singing in a language other than our mother tongue and singers need to develop a strong sense of meaning and affinity to that language. How do we teach this to our students? An understanding of

the basic concepts of semiotics is important. Think of the word "horse" what image do you think of: nag, steed, charger, Trojan, racer? Another useful device is to break each section of a sentence or musical phrase and describe or assign it a transitive verb – in other words: this is what I am doing to the audience e.g. I love you, I entreat you, I beseech you, I desire you etc. For the performer this helps combine text and music and gives it a specific meaning. As I sing "Im wunderschönen Monat Mai" (In the wondrous beautiful month of May) my thinking to the audience is "I invite you", and so I would go on and assign an appropriate transitive verb (14) for each line of the song. Bruno H. Repp states:

> "The expression and individual character of a musical performance resides in its microstructure, which includes variation in the exact timing and intensities of the tones played. Each performance has a unique microstructure which cannot be reproduced exactly by a human performer, even though repeated performances by the same artist are often highly similar."12

Some singers or teachers may approach text in a philosophical analytical way, delving into hidden, deeper realms of meaning. Others may seek realism or political relevance. Singing liturgical/religious texts requires an understanding of the meaning behind the words and is especially important process to undergo for non-believers. The context of opera and art songs requires thinking and understanding about the whole context of the works. Thinking and singing work on a micro as well as a macro level, encompassing an understanding of the spiritual, metaphysical, realms of the fantastic and real, demanding empathy and comprehension of text and music and the relationship between the social, historical and political climate appropriate to the work. Tetrazinni said:

> "The artist may demand the greatest things of herself, and what may be good enough for others is not good enough for her. As the poet says, "Art is long" though life maybe short, and singing is one of the most fleeting of all arts, since once the note is uttered it leaves only a memory in the hearer's mind and since so many beautiful voices, for one reason or other, go to pieces long before their time.
>
> If the singer's health is good the voice should end only with life itself, provided, of course, it has been used with understanding and with art." 10

When I am singing in a performance, what is my thinking? My hypothesis is that no two singers will have the same answer. My own experience is that after a performance I cannot remember what I was thinking, so to come back to my title, "I think, therefore I sing… or do I?" presents a conundrum. In performance, my aim is to be unconsciously singing – that is to say not thinking about my singing in a manner that is so conscious it intrudes on my work, in the same way that when I am teaching, whilst I may be thinking, for example "what can I do to help make this better?", the thought is more unconscious than conscious as I am an observer of my student (this is because it has become more-or-less automatic with years of practise) as when I am singing I am somehow, probably an observer of the audience. I think, therefore I sing, whether I am conscious or unconscious in my actions, I am still thinking and singing.

End thought

I would like to end with the following extract from D. T. Suzuki's foreword to Eugene Herrigel's book "Zen in the art of Archery" that I think encapsulates the ideas incorporated in the concept of thinking and singing as a subject:

> "Man is a thinking reed but his great works are done when he is not calculating and thinking. 'Childlikeness' has to be restored after long years of training in the art of self-forgetfulness. When this is attained, man thinks yet he does not think. He thinks like the showers coming down from the sky; he thinks like the waves rolling on the ocean; he thinks like the stars illuminating the nightly heavens; he thinks like the green foliage shooting forth in the relaxing spring breeze. Indeed he is the showers, the ocean, the stars, the foliage"13

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