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Module BMPF7013

How can mind-body awareness be used to affect the well-being and technical advancement of amateur choral singers?

Part 1: A. Rationale and Historical Framework.

As a singing teacher, I spend most of my time teaching amateur choirs. All of my choirs exist to promote a sense of well-being through community and musical engagement. It is my goal to create an atmosphere of safety for my Women's Choir, where members are known, and accepted, but also where the common goal of achieving a unified sound can provide a tremendous sense of achievement and pride. Our goal is not necessarily in the result of a good performance but is the experienced journey together towards a shared sense of achievement and development (Mollica, 2008; Wilson and Coan, 2021).

When teaching my choir, I am faced with the task of considering how to successfully facilitate the inferred learning of the complex motor skill of singing (Ohrenstein, 2003) in a group setting, where functional experience through applied pedagogy may be more efficacious than scientific subject-based teaching (Verdolini, 2000; Tillotson Bauer, 2016).

My singers do not wish to be professional performers, but equally have a desire to improve vocally each week. Most have no prior knowledge of vocal technique and have enjoyed singing purely for fun. Many come to choir with years of habitual vocal behaviour for which they are very much in what Merleau-Ponty describes at the second stage of awareness called 'primary consciousness' (Shusterman, 2012, p.198). Some are aware of negative outcomes from their technique, such as tension, or hoarseness post rehearsal, but could not accurately identify or remedy the issue. I am often asked to give sound bites of advice and quick fixes for vocal issues but find that addressing these things in a generalised way can be anecdotal and at worst can be misleading. Tying together a sequence of discreet motor tasks, involving postural, respiratory, phonatory and articulatory systems (Tillotson Bauer, 2016), coupled with dynamic and expressive processes connected to the sensory, auditory, and vestibular systems (Leigh-Post, 2017), is for any singer a complex process, and for the amateur, gross motor recruitment and correct cognitive concepts present great challenge (Ohrenstein, 2003).

Avoiding the use of instructional anatomical language which may well be misconstrued due to a lack of assimilation in the singer's body (Allen et al., 2020), I have aimed to teach technique implicitly using perceptual strategies (Verdolini, 2000; Lee et al., 2019). This has involved giving emotional cues to illicit a more primally responsive vocal configuration, as promoted by Kenneth Bozeman (2018). I may ask attendees to invoke a feeling of excitement in order to energise a passage or imagine feeling woeful in order to illicit a sob quality to lower the larynx. My second tactic has been to use the long-standing pedagogical strategy of imagery (Greschner, 2012). Although imagery is considered a form of external focus of attention (Mornell and Wulf, 2019) facilitating anatomical configuration of the vocal tract (Greschner, 2018), Verdolini argues that the missing component of 'attention' renders imagery ineffective (Verdolini, 2000, p.4).

This I believe relates to a lack of accurate proprioceptive awareness meaning that for singers, imagery must trigger a vivid enough stimulus (Pfordresher and Halpern, 2013) to recall and retrieve the sensory experience of the desired action (Verdolini-Marston and Balota, 1994; Titze and Verdolini-Abbott, 2012). In the case of conditions such as 'aphantasia' (Arcangeli, 2023), sensory imagery or recall is unattainable, and therefore the use of mental imagery is necessary. This involves the recall of mental content which does not involve the 're-creating of perception' (Arcangeli, 2023, p.30). Distinguishing between sensory imagery and mental imagery helpfully shows what occurs in early-stage learning where sensory imagery often fails due to a lack of somatic experience with which to 'map' the body (Helding, 2008; Leigh-Post, 2020, pp.93, 212) and apply perceptual recall. Therefore, mental imagery is used to focus on the end result often using mimicry or external prompts, to bridge the gap between intangible image and 'concrete application' (Tillotson Bauer, 2016, p.130). This is what Feldenkrais referred to as 'end -gaining' (Hensel, 2020, p.21).

As Paparo (2016, p.494) states, the necessary 'understanding in action' needed to self-organise is dependent on knowledge. Even emotional cues can be unreliable if a singer is not connected to their body. Emotional stimuli which trigger an anatomical response may well be inhibited by a myriad of disconnected neurological processes (Leigh-Post, 2017). Retrospectively, if a singer has inhibited mobility, then kinesthetic and perceptual psychological awareness is subsequently inhibited (Sillick, 1996). Both imagery and emotive cues may fail to illicit the correct motor response due to the same issue, which is a missing or incomplete 'perceptual trace' (Leigh-Post, 2017, p.61). The perceptual trace is formed by

recognition of enough sensory information to assign the correct most accurate neural pathway for the task. If the pathway has not been built then alternative inaccurate means are used, contrariwise the more successfully consolidated memory available, the speedier and more accurate the action (Verdolini-Marston and Balota, 1994; Holding, 2020).

Most importantly to this study, the perceptual trace for motor learning is found to be in the somatosensory areas of the brain and is finally stored as memory in the cortex as a perceptual image of how the moving parts should 'feel' to carry out the given task (Ohrenstein, 2003; Leigh-Post, 2020, p.202). For the amateur singer, the complex issue of perception of sensory information, is as Leigh-Post writes, the 'stuff of which learning and mental imagery is made' (Leigh-Post, 2017, p.52). She goes as far as to say this is the 'source of all knowledge' (p.52). In essence, 'know how' for a singer must be encoded into the body through accurate sensorimotor perception (Verdolini, 2000, p.1).

In her book 'The Functional Utility of the Singing Voice' leading pedagogue and professor emerita, Barbara Doscher (1922-1996) proposed that the kinesthetic sense' is the 'subtle regulator' of complex motor patterns and that 'kinesthetic awareness' is the key to gaining mastery of the voice (Doscher, 1993, p.69). Kinesthesia is a term that refers to the perception of our body (Tillotson Bauer, 2016) which is gathered by mechano-receptors in the skin, joints, muscles, and tendons (Leigh-Post, 2017). To expand on this awareness, Howard Gardner's (1983, p.205-236) definition of 'Bodily-Kinesthetic Intelligence' involved 'The ability to use one's mental abilities to coordinate one's own bodily movement.' This relies on the ability to perceive the body and cognitively find a solution to motor output problems (Holding, 2009; Leigh-Post, 2017). The term 'proprioception' coined by Sir Charles Sherrington in 1906 has become synonymous with 'kinesthesia' in most recent history and defines the cumulative systems of 'one's own' (proprios) 'contractile' sense of the body. This is required to identify, move, and utilise information for 'maintenance of a stable posture' (Kröger and Watkins, 2021, p.1).

It is the subject of 'mind-body awareness' that I would like to explore for this study.

Awareness appears to be key to the learner's advancement in accurate association of sensory input, which must then be integrated with goals and planning for motor behaviour. Mary Jean Allen (2020) suggests that anatomical facts will do nothing to help refine the singing voice until we can assimilate anatomical information to the body. For many years kinesthesia has been omitted from leading guidance for singing teachers (Tillotson Bauer, 2016) despite voices such as Dora Ohrenstein (2000; 2003) hailing kinesthesia as a singer's

sixth sense more than 20 years ago. However, advances in cognitive neuroscience and its relation to singing have led to a recent surge in pedagogical commentary, research, and writing.

I intend to explore how sensory processing could be aided and enhanced to help an amateur more accurately assign 'meaningful and recognizable experiences with clear locations in space and time' (Leigh-Post, 2017, p.51). To understand this, I need to examine each part of the 'sensorimotor processing loop' (Leigh-Post, 2017, p.50) which includes researching how we intercept sensory information, how we 'invert' (P.97) perception to create a feedforward planning process, and how to use feedback from action to increase acuity of motor output. It is hoped that this study will contribute significantly to my own implementation of teaching strategies for amateurs but also contribute to a wider discussion in the pedagogical community regarding the impact of functional learning in group settings.

My aim is to use this desktop study to understand the following questions:

- How does the brain process somatosensory information?
- How do we heighten our awareness of sensory information?
- How do we use perception to help plan for a motor behaviour such as singing?
- How can this be directly applied to the amateur singer?

The outcome of this study is as follows:

- To understand from literature how an amateur singer may interpret and perceive sensory information.
- To explicate neurological processes and their pedagogical implications concerning a more accurate perceptual process.
- To understand pedagogical strategies that incorporate findings from this study to increase acuity of motor related tasks and therefore improve vocal performance quality.
- To begin to compile or create teaching material that is informed by these findings.

Part 1: B. Planned Programme of Study.

The following timeline of study has been agreed with a tutor.

Module 4 Timeline of study

	16th Jan	23rd Jan	30th Jan	6th Feb	13th Feb	20th Feb	27th Feb	6th March	13th March	20th March	27th March	3rd April	10th April	17th April	1st May	8th May	16th May	22nd May	29th May	6th June
Reading																				
Agree topic/research question with tutor	20th Jan																			
Establish timeline plan for module																				
Write rationale, research methodology and research strategies																				
Write main literature review																				
Write reflective essay																				
Submit draft to VSC																				
Make amendments/edit																				
Submit final module to UWTSD																				

Narrative Literature review process and time scales.

I wish to carry out this narrative review with a hermeneutic approach to literature (Boell and Cecez-Kecmanovic, 2010). Much of the subject matter that I will critically assess will be found in the field of neuroscience, which remains within the post-positivist realm of 'realism' (Huttunen and Kakkori, 2020, p.600) and to which generalisable, objective, and measurable assertions can be deduced as empirical truth (Walliman, 2005). However, this is a multidisciplinary study which will explore findings from the fields of psychology, physiology, pedagogy, and health and well-being. As Walliman succinctly states, 'activities which surround scientific research are much more complicated than the simplistic examples and models used to illustrate the approaches to scientific enquiry' (Walliman, 2005, p.197). Hermeneutics is concerned with a non-dualistic, constructivist epistemology where the process of 'uncovering' the 'atheltica' meaning of truth involves the object and subject engaging together and being seen or revealed in their totality (Huttunen and Kakkori, 2020, pp.601–602). By this I take to understand that the 'object' of scientific fact must become 'ready to hand' (Huttunen and Kakkori, 2020, p.606) within the totality of human development, pedagogical application, and psychological interpretation.

It is in the attempt to assign meaning for my own pedagogical advancement that I will critically assess literature (Crotty, 1998, p.105). Ultimately a singer's task is to transform a motor leaning skill into an art form through the 'highest of cognitive functions...the imagination' (Leigh-Post, 2017, p.46). Through a dialectical interaction with text, I hope to uncover meaning and new horizons, which will lead to new questions, thinking, and ways of seeing (Rennie, 2012).

The Hermeneutic inner circle first introduced by Schleiermacher (1838|1998) of 'search and acquisition' will be used to aid the initial stages of my engagement with literature. I will enter this circle with the focus of what Cooper (1998, p.108) categorises as 'theories' pertaining to kinesthetic intelligence and singing. The goal of this review is to 'identify central issues' surrounding this theory and therefore I need to remain in the initial circle until I have identified and refined the most significant categories relevant to my initial question. Figure 1 by Boell and CecezKecmanovic (2010) demonstrates my initial 'search and acquisition' process, which later interconnects with the second 'analysis and interpretation' circle.

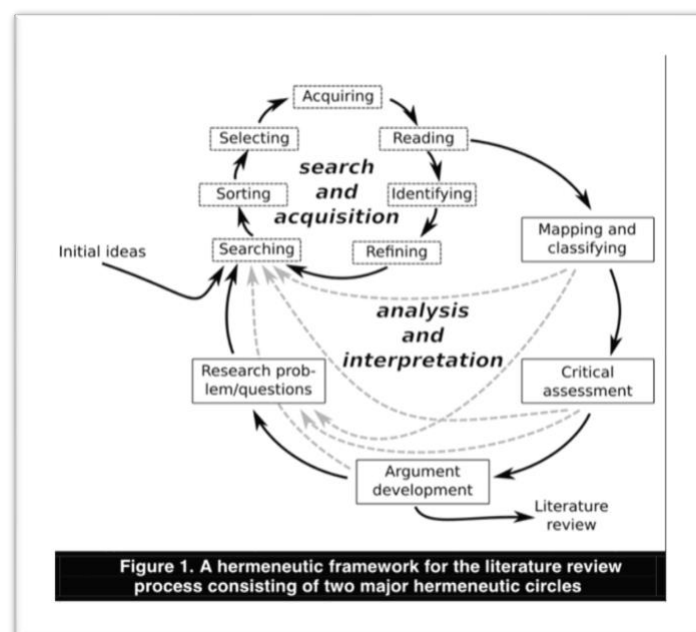


Figure 1 Boell and CecezKecmanovic (2010, p.269)

I intend to begin my search of literature by using online search engines such as google scholar as well as electronic media obtained from UWTSD library and VSC database of resources. I will also read significant and relevant printed publications by leading vocal pedagogies. My intention is to use key words and phrases, names and publication titles with

Boolean, brackets, wildcards, and truncations to increase the chances of successful configurations (Forrester, 2018).

I intend to use a numbers database to keep a literature trail (Randolph, 2009) (See appendix 1). This will contain the date found, key search words used, back chain and forward chain. This will help me utilise a pearl growing strategy from the backward and forward chain of literature and serves a functional way to retrieve large amounts of information.

Using the timescale effectively, I will employ a purposeful sampling strategy to select 'information-rich cases' (Patton, 2002, p.273) which may include the use of both grey and white literature. I widen the inclusion criteria to white literature due to believing that central and pivotal pieces of literature specific to singing may involve insights from leading pedagogues found in books, lectures, and conference papers (Hart, 2018). To sort literature into potential relevance as well as meeting critical and accurate standards for qualitative research I shall be using a Critical Appraisal Skills Programme checklist (2018) (See appendix 2). By reading abstracts, key chapters, and conclusions, assessing dates and examining supporting citations I will then enter details into the CASP checklist and exclude literature that does not hold significant applicability. Singing could be defined as an 'audio-motor art' (Leigh-Post, 2021, p.253) and therefore I wish to direct my attention to singing specific research and exclude research based on general motor skills. I also wish literature to be up to date and therefore the most recent publications possible shall be selected unless a paper of resource proves historically most reliable.

After the initial reading, mapping, and classifying of information relevant to study, I will then identify key themes, central terms, debates, and commentary from voices of authority (Rhoades, 2011). I will then refine 'successive fractions' (Boell and Cecez-Kecmanovic, 2010, p.139) until I have enough information to critically assess and develop sufficient representation of current understanding to begin writing my review. This will involve linking of ideas and arguments towards presenting meaningful findings (Hart, 2018) relevant to my own personal practice as well as the wider 'audience' (Cooper, 1998, p.105) of vocal practitioner and pedagogues.

Part 1: C. Reflective Essay

I wish to organise and frame this reflective process within the Johns (1994) (see appendix 3a) model based on 5 cue questions. 1: Description 2: Reflection 3: Influencing factors 4: How could I have dealt with it better? 5: Learning. These questions remain simple but provide flexibility for in depth exploration. Further I have given consideration within these questions for Johns later model (Johns, 2006) (see appendix 3b) which allows for more reflexive, mindful approach to reflection (Finlay, 2008, p.9,27).

Description

This study began for me with reflective considerations from previous work. For myself the purpose of starting with reflection was twofold. As Finlay (2008, p.16) suggests one must find a way to be motivated to engage in reflective practice avoiding 'dry academic exercise' by engaging more thoroughly in contextualisation. Context for myself begins as an academic student and continues as a teacher. Secondly, reflective, and reflexive practice is considered by Schön to be artistry, and a more reliable and accurate guide through uncharted terrain (Bolton, 2010). My previous studies had brought to light a slight disconnect between theory and practice, which considering that this Master's programme is one of Professional Practice, demanded some consideration. I therefore felt that this module must lead to a more integrated subject matter, with application for myself as an artist, teacher and student, and my daily teaching practice.

Phillion and Connelly (2004, p.468) state that certainty and knowledge are 'inversely related.' As an academic, the awareness of how far ahead other practitioners are in the field, and how wide the field is, can result in the felt sense of uncertainty, and could lead to a sense of despondency, placing me outside of myself rather than engaging in a transitional process of engagement with an inquisitive spirit (Bolton, 2010). I therefore felt determined to find an authentic area of research that would ignite passion within me to learn, explore and most importantly go and teach.

The catalyst for this subject area began when taking a break from study for personal reasons. I took the opportunity to begin a daily yoga practice, with the explicit aim of relieving stress, allowing the body to unite with the mind in an embodied practice (Iyengar, 1965). I began to contemplate the somewhat unchallenged Western hierarchy of cognition being elevated as the most trustworthy source of knowledge (Latta and Buck, 2008; Caldwell, 2018) and how

bringing awareness to the body can inform a more united approach to learning through perceptual somatic experience (Smears, 2009; Leigh and Bailey, 2013). When embarking on my last study of 'motor learning theory' (Wulf and Lewthwaite, 2016; Crocco and Meyer, 2021), it became more apparent that inferred learning which bypasses cognitive and linguistic processes is highly beneficial to the singer (Mornell and Wulf, 2019), but a large amount of contention existed in my mind regarding the complexity of awareness and attention and their somewhat conflated definitions and uses, not to mention the dichotomy of negotiating processes where awareness can hinder skill acquisition (Ives, 2003; Montero, 2010; Holding, 2016). I concluded from previous study that dependent upon the stage of learning, demands on sensory information processing for singers likely differ from those of other motor skills (Sutton et al., 2011) suggesting a more dual cognitive process (Sutton et al., 2011).

Importantly I began to observe choir members, noticing their gaits, posture and vocal habits and became vigilant as to how I delivered instruction or used language to aid a more connected mind-body way of learning. I felt that my delivery was often speedy, very general, or that I minimised mind-body awareness due to being unsure of my ability to teach well and my student's ability to cope with such a focus.

This sense of intrepidation prompted me to explore the connection between mind-body awareness and vocal development whilst still considering the heart of my practice (Bolton, 2010) as being one of enhancing eudaimonic wellbeing. It felt as though my own genuine search for knowledge matched my desire to engage in study for the purposes of my teaching practice.

Reflection

In previous studies I have tried to define a question before reading broadly to establish a solid base of understanding (Boell and Cecez-Kecmanovic, 2010), however, I felt that identifying the nature of the problem of mind-body connection would present many possible factors, and that I would have to use the 'equipment' I have to navigate to a clearly defined question (Bolton, 2010, p.4). Schön referred to equipment as maps which are 'theories in use' (Argyris and Schon, 1974, p.76).

My first reliable piece of equipment was to employ a hermeneutic approach to study using Boell and Cecez-Kecmanovic's (2010, p269) 'search and acquisition' and wider 'analysis and

interpretation circles.’ I particularly appreciate this system as it allows for the ‘refining’ of literature and ‘research problem questions’ as part of a coherent reductive process which is particularly helpful when refining or clarifying a problem (p.269).

There were also some clear lessons gained from previous study which were important to consider. Before beginning a search and acquisition process, I put in place a literature audit trail (see appendix 1) as this has previously helped when finding, organising and justifying supportive literature (Randolph, 2009). I also decided to create a stronger inclusion and exclusion criterion, as the breadth of potential contributing areas of study could prove far too wide to cover. Therefore, I decided that as closely as possible, all literature must be singing related or have been cited within vocal academic texts from which I would map and classify related factors for consideration.

I also decided that using the Critical Appraisal Skills Programme (CASP, 2018) checklist would help both in the organization, synthesis, and validation of a qualitative purposeful sample of literature (Palinkas et al., 2015). I had previously used Blooms Taxonomy (Bloom et al., 2001) and although the list of taxonomic elements are highly useful, they relate more strongly to the appraisal of quantitative literature. I also appreciate Long et al’s (2020) suggestion, that CASP is highly useful to the more inexperienced researcher.

I began by searching vocal texts relating to several terms used under the umbrella of mindfulness and cognition. This proved to be an overwhelming process. Terminology, definitions, established methodologies for practice, and areas of cognitive neuroscience caused me to quickly realise that each component part could easily occupy a study of its own. Fortunately, I came across Leigh-Posts (2017) book ‘Mind-Body Awareness for Singers’ and believed that this text would help to ascertain the neuroscientific underpinnings of mind-body awareness more clearly. This, I believed would provide a reliable basis for any further study of mind-body practice. In effect I decided that this text would be my ‘pearl’ (Boell and Cecez-Kecmanovic, 2010, p.139) from which to gain understanding and expand and broaden my references. At times the subject matter felt very much outside of my academic capacity, and I had to use the hermeneutic circle to stay on track, especially asking ‘why’ each thing I learned was relevant to my practice (Hart, 1998).

Fortunately, I began to piece together a more coherent and researchable ‘problem’ of audio-motor sensory processing (Hart, 1998) once I understood each component of what Leigh-Post describes as the ‘Sensorimotor Processing Loop’ (2017, p47) and its direct relation to

singing. I then widened the circle of literature, which I attempted to link directly to questions related to singing, or for which I must ascertain relevance.

Influencing factors

Time appeared to be the largest influencing factor of this study. I clearly mapped out a time scale which I was keen to stay close to as I really understand that the end stages of study can become pressurised, and detail can be easily missed in my writing. The depth of reading necessary to really grasp the science behind mind-body awareness did present me with some challenge. Initially I unearthed a lot of books rather than academic papers which although written by leading respected pedagogues, did mean that huge quantities of time were needed to read. Finding academic papers from the same authors at times proved fruitful and time saving but was not always possible. I had come to this study with some knowledge of motor learning theory which helped inform reading, however, the neuroscience involved in audio-motor sensory processing was far more involved.

My literature chain, and CASP list also proved very time consuming even if I attempted to do it as I went along. Chasing ideas and referencing meant that I often got carried away and missed it out. I decided at a certain point that I would have to compromise on some of this, which felt disappointing. I did however return to CASP later in the study as I will later discuss. I appreciated that even without a thorough log, CASP served as an important reminder to apply critical thinking to each piece of literature, and to stay close to my inclusion and exclusion criteria.

Another challenge was that I made a decision at the start of study that no matter how busy I was, I would break every day for yoga practice. I found this invaluable. Firstly, this showed me that the brain continues to work to consolidate memory during constructive rest (Yamazakia et al., 2015) as well as potentially during post learning exercise (Thomas et al., 2016). But most importantly, the 'opportunity to pause' (Smears, 2009, p.101) and engage in an embodied process of reflection, meant that rather than self-ruminating and remaining purely cognitive in reflection (Bolton, 2010; Leigh and Bailey, 2013), I experienced what Bleakey (1999, p.319) referred to as 'holistic reflexivity.' This where awareness is extended beyond the internal self, or the intellectual self, and instead brought to the body and the world around it, creating a more phenomenological 'mindful body' (Leigh and Bailey, 2013, p.169) supporting Merleau-Ponty's (2002) argument that perception is enhanced when we allow the body and mind to be the source of knowledge. Remmel (1993) argues that mindfulness and

the ability to observe mental processes whilst being in the present moment is the basis for greater reflective practice. Quite often I would return to study refreshed, more productive and more 'sensitive...to context' (Leigh and Bailey, 2013, p.165). I felt that this practice enhanced my learning process, facilitated productivity, and increased reflexive thinking.

Could I have dealt with it better?

This study highlights a few areas of continued learning and adaptation. My literature review process although improving, was significantly affected by time scale. I returned to my CASP check list towards the end of study to re visit papers that I had not scrutinised. This proved both helpful and highlighted that the CASP process places much more rigorous demands on literature validation than I had awarded. I had to go back to my writing and change references, add significant missed detail, and take out some citations. I added two categories to my CASP list, as I felt that some literature reviews, for instance from journals, did not fit CASP criteria. Also, as I was using books in my research, these did not always follow CASP categories for consideration. I decided therefore to check that each paper was peer reviewed or was written by or cited by peer reviewed academics. This refining process shows that I still have not quite landed on a succinct process or criteria for literature validity and inclusion and that improving my process could improve rigour.

Critical thinking as a researcher, does in many ways demand prior knowledge. We are not asking 'what' so much as 'why' (Boell and Cecez-Kecmanovic, 2014, p.268) research is relevant and important. This study sought to inform my personal knowledge gaps, whilst being relevant to a broader context of group pedagogy. Both contexts demanded a good level of understanding of the subject area in order to explicate relevant implications for practice. I hope that this study provides a bed rock for further practice strategies research, resulting in an artifact such as a guide for amateur choir leaders.

Learning

This study has greatly enhanced and enriched my scientific knowledge and ability to approach further scientific study with more confidence. Although I remain 'green around the gills' so to speak, I believe that if the interest and motivation is high enough, then there are writers who make complex science available to students like me.

I have since embarking on this study, run several workshops for choirs where time permits me to employ some of the mind-body awareness strategies such as 'buzzing bones,' (Leigh-Post, 2017, p.68) basic body mapping (Allen et al, 2020), mindful listening (Andersen, 2011; Hurley, 2020) and 'inner singing' as mental rehearsal (Leigh-Post, 2021, p.65). I am also training as a yoga teacher and so part of my training involves working with others on breath exploration, and mindful movement. The response from participants has been largely positive. The challenge is to facilitate self-discovery for others, rather than guide people to exact destinations, and I feel at times very unsure of myself, however, I do understand that diversifying practice demands a 'reflexive habit' (Bolton, 2010, p.1) and that growth really cannot come without the risks involved in 'trial and error' (Bolton, 2010, p.4). I am however cautious that ethical risk is considered and does not impact upon others, this means staying within my level of expertise as Finlay (2008) cautions.

Ethically I have become aware of the responsibility of the teacher to protect students by being trauma informed when working with any aspect of bodily informed pedagogy. This is an area I have begun to educate myself about by watching VSC (Voice Study Centre) trauma informed lectures (Monti, 2023) and finding resources for trauma informed practice (Widdershoven and Molewijk, 2010; Emerson and Hopper, 2012; Marino, 2017; Monti et al., 2017; Van Der Kolk et al., 2019; Lowman, 2020).

I feel that this study has taught me a great deal about myself. One positive experience throughout this study was being encouraged to begin writing even when I did not feel ready. It was as though a skeleton had been drawn to which I could assign the correct 'anatomy' so to speak. I have never struggled so much with the order of an essay as I have with this module. This is in part because of the issue of circular causality, where one could potentially enter the 'sensorimotor processing loop' at several points, all of which contribute to the whole (Leigh-Post, 2017, p.50). I also felt that because this is a new area of study for myself, I must remain vigilant to descriptive writing. Asking 'why' of everything (Bolton, 2010, p.4), I hoped, would help to stay loyal to relevance to practice. Importantly I began to see that giving myself some trust as to what I had learned meant writing more freely than I have previously, before going to references to support my writing. This felt vulnerable, seeing as the content was intellectually challenging. I was also aware of the multiple different aspects of mind-body awareness I could have chosen to write about and that many elements are missing. Deciding which information was most relevant to this study was a challenging, but I do feel that I am personally more informed by this study, taking from it direct implications for practice. Being inside the research in the 'swampy lowland's' can mean that 'maps' used (Argyris and Schon,

1974, p.76) were simply the ones I had to hand and by no means did they help me exhaust the area of study. I do however hope to be able to build on this study by observing these gaps, and learning from oversights and mistakes (Schön, 1987). I hope I can take from this study the “courage to work competently and ethically at the edge of order and chaos” (Ghaye, 2000, p.7).

Part 2: Desk Top Study

How can mind-body awareness be used to affect the well-being and technical advancement of amateur choral singers?

My teaching practice is focused upon amateur singers both within the context of one-to-one voice lessons, and within amateur community choirs. Unlike professional singers, amateur singers may not be able to rely upon accurate automated behaviours, which allow cognitive attention to be directed to higher order processing such as emotional interpretation, creativity, and expression (Ohrenstein, 2000). The reason for Bauer (2016, p.129) stating that singing is primarily a 'motor skill, before an art' is rooted in the understanding that the ability to perform creatively and freely is tethered to one's ability to accurately perceive, process, associate, execute and monitor vocal output (Zarate, 2013; Leigh-Post, 2020) so that eventually as automaticity increases at lower level skills, the highest cognitive function of 'imagination' can be freed (Leigh-Post, 2017, p.46).

My primary focus when teaching choirs is to draw upon the psychosocial and physiological benefits of singing so as to enhance a sense of well-being for my participants (Fancourt and Finn, 2019). For most of my members, singing is a joy and not a serious pursuit. My previous research (Currie, 2019) explored human development driven by the need to develop a sense of self (Ryan and Deci, 2000) which according to Self Determination Theory (SDT) (Ryan and Deci, 2000) is determined and met by the three factors of 'autonomy, competence, and relatedness' (Vansteenkiste and Ryan, 2013, p.263). The element of competence referring to a 'felt sense' of achievement through activity that optimally challenges and maintains capacity (Ryan and Deci, 2002, p.7) is an area of my practice that is often usurped by a focus upon 'relatedness.' Joint ventures, performances, and a culture of friendship has to this point taken priority over standard of performance. It has however become apparent that although improvement through repetition has been achieved, a greater sense of vocal competency is observably lacking in comparison to my private students. Many of my choir members would like to understand how to sing better, and find optimal efficiency in their body, but are aware that they currently sing and hope for the best. My line of inquiry for this study involves finding a juncture between cognitive and functional learning and achievement in both mind and body.

Loui (2015, p.1) suggests that singing 'requires the effortless and efficient use of auditory and motor systems that centre around the perception and production of the human voice.' For the adept performer the complex neural circuits needed to accurately plan, execute and evaluate the voice are available primarily due to a rich store of information available through connection to past, present, and future perceptual representation (Conable and Conable, 2000, p.37; Zarate, 2013). In other words, a rich supply of contextually experienced knowledge allows a singer to trust that resources are available to create something that works now and may creatively be adapted in a new scenario. Emmons and Thomas (1998, p. 11) suggest that an 'ideal performing state is characterised by heightened awareness, vigilant attention, and autonomic balance or 'calm,' absent of anxiety' which Leigh-Post calls the 'happy body' (Leigh-Post, 2020, p.19). However, for a beginner the unfamiliar terrain of vocal apparatus often results in engaging extra musculature, due to gross and extraneous motor recruitment which will not refine until one can 'identify and selectively attend' to... perceptual cues most directly related to achieving the goal' (Ohrenstein, 2000, p.29). It is, I believe, in understanding the nature and process of perception and how the conscious mind can interface with unconscious sensorimotor processes through mind-body awareness, that an amateur may experience both homeostasis and enhance motor development (Leigh-Post, 2017, p.19). Before I can look at the application of mind-body practices, I need to understand the neural processes involved in perceptual sensory awareness for singing. Therefore, this desktop study will provide the bedrock for further research targeting application of mind-body practices.

Terminology and Mechanisms of Cognition and Awareness.

Within vocal academia mind-body awareness has become increasingly elevated as cognitive neuroscience develops and meets applied pedagogy (Tillotson Bauer, 2016). If the complexity of both sensory and cognitive perceptual processes are themselves a challenge to understand, then the conflated use of terminology and semantic chaos found within a wealth of literature is no less perplexing. This may well be due to reductive terminology used throughout the years to describe what is essentially a multi component sensory system (Smith and Gasser, 2005), depending on multi modalities (Ribeiro and Oliveira, 2011) within the cognitive and non-cognitive neural and motor system (Leigh-Post, 2020).

Leading papers in the field describe elements of this mind-body awareness system using terms such as 'embodiment' (Walker, 2000; Latta and Buck, 2008; Paparo, 2016), 'whole-body' (Dayme and Sataloff, 2006), 'inclusive awareness' (Conable and

Conable, 2000; Allen et al., 2020) 'somatic' (Hanna, 1988; Gilman, 2014; Alison, 2018; Mingle, 2018) and 'kinesthetic' (Ohrenstein, 2003; Bauer, 2013; Tillotson Bauer, 2016; Greschner, 2018). On occasions several terms flow together with seemingly little distinction (Shusterman, 2012). The title of Bauer's 2013 book included the term 'kinesthetic,' subsequently mentioning kinesthetic sense over 70 times, but gave no actual definition for clarity.

Added to this, there are numerous papers discussing the importance of mindfulness in motor learning (Oyan, 2006; Elliot, 2010; Farb et al, 2013; Helding, 2014; Czajkowski and Greasley, 2015; Maxfield, 2018; Czajkowski et al., 2021a; Blyskal, 2022b; 2022a). Writers are on these occasions discussing the role of 'perception' which Leigh-Post (2017, p47) assigns as an essential junction between sensory input and motor planning.

As such it is pertinent to begin with how sensory input is received by the human sensory system.

Sensory Processing Terminology.

The terms kinesthesia and proprioception have become synonymous terms used in the functional application of bodily awareness. Some research still suggests differences in meaning, for example that Kinesthesia, first coined by Henry Charlton Bastian in 1880, relates to the sensation of movement within the body, specifically to the discernment of the rates of movement (Johnson et al., 2008), and that proprioception (Sherrington, 1906) relates to how we use sensory input to orientate and position our body in space and time (Vega and Cobo, 2021). Vocal related texts appear less clear when it comes to this issue, with some writers simply opting for kinesthesia as an all-inclusive term, and others painstakingly separating the two terms and then using one to include all senses, undermining their rational and adding to confusion (Bauer, 2013; Prokop, 2020). Stillman (2002, p.668) cautions that separating the two terms into the perception of 'movement' and 'position' excludes the full range of musculoskeletal sensors which he suggests can comprehensively be combined under the term 'proprioception.' I appreciate the use of the term 'proprio-kinesthesia' used by Leigh-post (2020, p.205) as it clarifies differing components whilst acknowledging the unity of the functions in the sensing body. In summary the term 'proprio-kinesthesia' defines the sensory processes that determine limb relative position, body/joint movement, force, tension, mass, effort, pressure, vibration, and size and shape of body part (Johnson et al., 2008; Ribeiro and Oliveira, 2011).

Sensory Input Receptors within the Systems of Singing.

Sensory neurons called mechanoreceptors within tissues and joints of the body convert mechanical information regarding displacement and force, as frequency, carrying neural signals via afferent or inward moving sensory pathways to the Central Nervous System (CNS) (Grigg, 1994). For the singer, significant information conveyed to the CNS is provided by muscle spindles (stretch receptors) and golgi tendon organs (Leigh-Post, 2017). Myotatic mechanoreceptors trigger reflexive action in the intrinsic laryngeal muscles that regulate pitch (Zarate, 2013), the articulatory muscles and somatosensory receptors in the lip tongue and jaw contribute to vocal tract configurations, effecting formant frequencies and vowel shaping (Sundberg, 1987) and thoracic, abdominal, and diaphragmatic muscles determine respiratory and phonatory control (Zarate, 2013). Fundamental to the singer are the auditory and vestibular systems located in the inner ear (Hurley, 2020). Cells within the cochlea and vestibular play the role of mechanoreceptors to transmit information via the vestibulocochlear nerve where eventually they are transduced to the brain to be perceived as sound and motion, providing information for pitch and postural control (Leigh-Post, 2017). Research has shown a complex set of neural connections across and between auditory-motor pathways, for instance in the case of rhythm which entrains or locks into a centralised pattern with central motor processors (Thaut and Abiru, 2010).

The complex role of the vestibular system is one of dynamic, automatic, reflexive response to our moving body in relation to gravity (Hurley et al., 2012; Leigh-Post, 2017), and 'reciprocally influencing sequencing, timing, and behavioural response selection' (Thaut and Abiru, 2010, p.263). This has been evidenced in the use of Rhythmic Auditory Stimulation (RAS) to influence greater postural and muscular control in neurological conditions than rehabilitation therapy (Thaut and Abiru, 2010). For the choir leader, it is helpful to understand that this system is both one of audio-motor connectivity, as well as the system that most influences the regulation of the autonomic nervous system, by optimising breath capacity and respiratory control and regulating heart rate and blood pressure (Mathias and Bannister, 2013). Once received by the body, sensory information must make a complex journey towards cognition.

Pathways to Cognition.

One of the most influential early champions of cognitive awareness for singing, Dora Ohrenstein (2003), helpfully identified the need for a systematic approach to training aural and kinesthetic awareness in singers. However, in her early writing, Ohrenstein stated that proprioception is an entirely unconscious process of 'Monitoring movement and effort' (p.30). Later research has shown that proprio-kinesthesia is a complex interplay of conscious and unconscious perceptual functions (Ribeiro and Oliveira, 2011; Zarate, 2013; Loui, 2015) and that by understanding this we can find ways to interface with unconscious processes.

Emmons and Thomas (Emmons and Thomas, 1998, pp.5–10) suggest that singing is 'essentially non cognitive in nature but that coordination of the skills involved is achieved by a singer's 'judgement.' Leigh-post (2017) explains that motor output i.e., the action of releasing the voice is for a moment unconscious, and as Bel Canto's founder Manuel Garcia states 'all control of the tone is lost once the vocal cords become vibratile' (Ried, 1975, p.1 as cited by Leigh-Post, 2017). I cannot recall the number of times I have asked choir members if they know the plan and are ready to sing, and they respond with 'I'll just open my mouth and see what comes out.' This response highlights to me that significant 'judgement' talked of by Emmons and Thomas (1998) is missing for the beginner who often has no clue as to exactly what might emerge as they sing. To understand 'judgement' we must first consider the two separate pathways that sensory information takes.

The Unconscious Pathway.

Neuroscience shows that sensory information takes one of two pathways the first of which is an unconscious pathway via the spinocerebellar tracts to the cerebellum (Vega and Cobo, 2021). The cerebellum is responsible for aspects of organisation, memory, and self-monitoring and plays an unconscious correcting role in identifying discrepancies between the conscious motor plan of action and the resulting movement (Leigh-Post, 2017; Vega and Cobo, 2021). Corrective movements are then made in real time and reciprocal information is then sent to the upper motor neurons in the motor cortex relating to a 'trial-and-error' learning process (Leigh-Post, 2017, p.168). Increased activity in the cerebellum has been found in highly trained singers (Kleber et al., 2010), and musicians (Hutchinson et al., 2003), suggesting higher sensorimotor coordination. However, Hutchinson et al (2003) propose that these changes may have occurred at key developmental stages during intense training. Although it appears that no studies show increased cerebral activity for novice singers, there

is evidence that multisensory musical training ‘enhances multisensory processing in the human auditory cortex’ which is involved in lower-level processing in both novice and highly trained musicians (Pantev et al., 2015, p714; Paraskevopoulos et al., 2014). I return to the relevance of multimodal teaching strategies in later sections. Having explored the unconscious sensory pathway, I now wish to consider the second.

The Conscious Pathway.

The frontal cortices sometimes called the ‘association cortex’ contain the prefrontal lobe responsible for executive functions, planning, self-expression, and willed intentions (Leigh-Post, 2017, pp.34–35). Vital to the issue of attention, the prefrontal cortex is where the internal representation of experience is stored as knowledge (D’Ardenne et al., 2012). When we encounter enough sensory stimulation over time, we can then contextually recognise, organise and interpret sensory information (Culham and Valyear, 2006) forming a perceptual neural trace (Ohrenstein, 2003). Crucially, supplementary and pre-motor (SMA) areas must have a first-person representation of a movement to diversify and develop multiple neural traces called ‘schemas’ which are in effect ‘options’ for the intended action (Leigh-Post, 2017, p.94; Whitlock, 2017). This knowledge is the difference between a reliable perceptual process, and what we experience as ‘master class syndrome’ where we may achieve something once but fail to encode that experience into our long-term memory as learning (Helding, 2010). Eventually willed intentions are transformed into a general motor plan of action which is carried out by the primary motor area (Leigh-Post, 2017).

The general motor plan which travels from the cortex to the body, is also joined by a complex parallel processing system (LeighPost, 2017, p.35) which is ascending from the body to the cortex in the form of ‘Sensorimotor intentions’ (Pockett et al, 2006, p.125). Little is known about the neural basis for sensorimotor intentions but the integration of sensory information for planning though monitored unconsciously in ongoing motor behaviour is received prior to action (Pockett et al., 2006, p.18). Crucially, this means that the finer detail of movement becomes part of the overall pre-plan directly connected to goal state imagery (Leigh-Post, 2017). What we would like to express as we sing, how we affect timbre to express sentiment and all that makes a performance unique and dynamic is contained within this sensorimotor intention (Leigh-Post, 2017) in the form of ‘auditory-imagery’ (Pfordresher and Halpern, 2013). It cannot be stressed highly enough that auditory imagery is responsible for successful feedforward planning and our ability to transform input into planned output (Leigh-Post, 2017). This is entirely dependent on somatic perception (Pfordresher and Halpern,

2013). It is important to briefly look at the role of reflexes in automatic movement before returning to how we can enhance perception.

Reflexes.

Some reflexive adjustments are made before we are even aware of the incoming stimulus, narrowing our only means of control to be gained from proprio-kinesthetic feedback after the completion of the move (Stillman, 2002; Vega and Cobo, 2021). However, In the case of reflexively mediated circuitry such as sustained pitch or when considering the oscillatory nature of vibrato, we as singers have the advantage sustained activity. In essence we are repeatedly 'letting go' and throwing again and our ability to take aim again is dependent upon the speed at which our feedforward and feedback systems fire (Leigh-Post, 2017, p.205). Amateurs may struggle to override reflexive controls resulting in the desire to breath too early (Zarate, 2013; Tillotson Bauer, 2016; Kleber and Zarate, 2019), the ability to sustain a pitch when external conflicting stimuli is introduced (Kleber et al., 2010; Zarate, Wood and Zatorre, 2010; Finkel et al., 2019; Kleber and Zarate, 2019; Angelakis et al., 2021) control of amplitude from audible feedback (Lombard, 1911), and even the extent of vibrato (Titze et al., 2002; Dromey et al., 2015). The question now remains as to how we begin to access control of the unconscious. This is the subject of the following sections.

The Conscious Junction – The Thalamus.

The thalamus is the last stop and gatekeeper for unconscious somatosensory messaging before projecting information to the cortex. Anything that is deemed pleasurable, novel, interesting or important is allowed through the 'gating' system (Leigh-post 2021 p255). The thalamus sleeps though familiarity and responds primarily to stimulation from the ascending reticular activating system (ARAS) (Leigh-Post, 2017). Activation of the ARAS towards stimulation of the thalamus can be achieved by conscious heightened awareness, and mindfully elevating our perceptual plan of action (LaBerge, 1995, pp.221–222) however, Perkins and Kent (1986, p.406) state that 'without arousal perceptual awareness and learning, to say nothing of attentional focus and mindfulness, are not possible.' Arousal therefore must be considered a primary issue for helping singers awake to their sensational experiences for learning, especially when dealing with repetitive, or well established lower-level activities (O'Connell et al., 2008).

Awakening Sensation.

In her book 'Body and Voice' Gilman (2014, p46) states 'we can't change what we don't know,' suggesting as does Mary Jean Allen (2020) that applying anatomical fact does not necessarily mean we have assimilated anatomical information to the body. A perfect example of this is found in Paparo's (2016, p.494) study of awareness for singers, when a participant asked, 'If I didn't feel it, then how do I know?' For the early stages of singing, learning can be stunted by what we are able to feel. The inexperienced or habituated singer may need to elevate more sensory information than the accomplished singer, as acceptance of information to be elevated to the cortex happens during the early stages of the perceptual process (Leigh-Post, 2017). When coming to singing at a later stage in life, many habits relating to vocal use, postural control, and breath use, have been established for years (Elliot, 2010). They are automated, outside of our attentional awareness and therefore are outside of our perceptual knowledge (Leigh-Post, 2017). Added to this is the fact that we tend to feel what we expect to feel (Ohrenstein, 2003; Leigh-Post, 2017) and more importantly what we are willing to feel.

Here it is important to acknowledge the role trauma can play in somatic dysregulation (Monti et al., 2017). For some, response to trauma results in disruption to interoception, rendering senses inaccessible, or creating an aversion to sensory input (Van Der Kolk et al., 2019). The impact of trauma cannot be misinformed or ignored in the choral setting. With many of my choral members being middle aged and older, years of life experience, and 'imperfect practice' have perfected errors, increasing the chance of permanent injury (Blades and Nelson, 2020) and compounding what Alexander referred to as 'debauched kinesthesia' (Sentianin, 2015, p.10). For the singer, subglottal pressure, vocal folds, the extrinsic and intrinsic laryngeal muscles, and cricothyroid/cricoarytenoid joints, are all located or functioning more deeply in the body structure making the ability to accurately perceive from 'sensation' much more of a challenge (Stillman, 2002). Faulty perception may involve inaccurate imagery which evoke inefficient usage (Bowman, 2000; Greschner, 2018). Ohrenstein (2003, p.30) asserts that the integration of correct anatomical information through perceptual awareness is key to differentiating, accessing, and strengthening the voice and that science must follow sensation. Accordingly, we must consider how to attend to sensation.

If we should like to become aware of existing patterns, sensitive to unhelpful behaviour, as well as open to new experiences (Leigh-Post, 2017) then we must arouse the ARAS by

means of 'vigilant attention' which is defined as 'the ability to self-sustain mindful, conscious processing of stimuli whose repetitive, non-arousing qualities, would otherwise lead to habituation and distraction by other stimuli' (Robertson et al., 2010, p.80). I would posit that the reason many singers do now know how to feel, is connected to a lack of mindful stimulation and sustained attention. Although the temptation is to increase external stimuli, the long-term solution may be to increase ones self-alerting capability (O'Connell et al., 2008). Just as engineers build curves in straight roads to help stimulate attention (Robertson et al., 2010), the mind can be trained to self-alert through present moment mindfulness training. Self-regulated arousal achieved through vigilant attention has two-fold benefit to the singer. The first being a fundamental proponent of homeostatic equilibrium, and the second being the catalyst for perceptual acuity (Dayme and Sataloff, 2006; Leigh-Post, 2017). Though mindful attention, we use our 'executive influence' to deactivate inappropriate or distracting areas of the brain and turn up the volume on others, which leads to smarter, more efficient use of the body and its energy (Leigh-Post, 2017, p.58). This executive influence is the subject of what I consider to be the second part of pedagogical priority – recurring vestibular stimulation.

Recurrent Vestibular Stimulation.

In every case of conscious intervention, anticipation is the key. In reflexive controls the anticipation of displacement is often enough to alter the gamma neuron activity involved in flexor response (Titze et al., 2002). In essence anticipating involves both the request of, and the receipt of mindfully elevated information in sustained reciprocal mind-body communication (Leigh-Post, 2017). This is known as 'recurrent vestibular stimulation' and is theorised to illicit an ideal performance state and sensory-motor integration (Leigh-Post, 2021).

In summary a store house of sensory experience must be built and given meaningful association so that we can elevate select information, access the auditory imagery needed for giving us a feedforward plan of action which is then reciprocally sustained by a two-way mind-body conversation.

Mindfully Experiencing Sensory Information for Singing.

How then does this apply to the amateur singer? A common problem for any untrained singer is maintaining a fundamental pitch when external stimuli (i.e., harmonies) begin to fight for

attention or when acoustic conditions are challenging (Ternström and Sundberg, 1982). Most untrained singers will reflexively adjust pitch to the external stimuli rather than maintaining the intended pitch (Zarate, 2013) attributed to an over reliance on external feedback of the voice (Ternström and Sundberg, 1982; Mürbe et al., 2002). Research shows that trained singers recruit somatosensory association areas of the brain more heavily than non-trained singers, thus overriding reflexive mind brain controls (Larson et al., 2000; Zarate, 2013) resulting in 'neuromuscular memory of pitch' (Mürbe et al., 2004, p.240). However, it is stated by researchers such as Sielska-Badurek et al (2017) and Angelakis et al (2021, p.6) that even professional singers primarily use mimicry and auditory feedback to attain function, and often lack physiologically informed pedagogy, resulting in 'less-than-ideal' technique. It is key to note that auditory imagery and mindful listening (Hurley et al., 2012; Hurley, 2020) has been shown to enhance pitch recognition and activate audio-vestibular activity (Zatorre et al., 1994; Zarate et al., 2010; Mürbe et al., 2002), however even for trained singers the laryngeal activity for pitch accuracy must hold neuromuscular memory (Pfordresher and Halpern, 2013). So, in the case of professionals and amateurs alike research suggests that the combination of audio-visual and proprio-kinesthetic feedback increases acuity for pitch control (Mürbe et al., 2004) as well as generating more accurate physiological association (Angelakis et al., 2021). Multi-modal sensory monitoring, appears to increase neuroplasticity in associative brain regions, meaning that networks synergise to problem solve (Paraskevopoulos et al., 2014; Pantev et al., 2015; Erickson, 2021). The more applicable use of combined modalities should be considered for choirs using movement and gesture (Wis, 1993; Greschner, 2012; Briggs, 2011), sight reading (Leigh-Post, 2017), and tactile biofeedback (Greschner, 2012; Paraskevopoulos et al., 2014; Pantev et al., 2015; Angelakis et al., 2021). Although technology may be difficult to implement in a choral setting, visual feedback from voice software aids a speedier more accurate motor coordination (Erickson, 2021).

Researcher Alfred Tomatis (1920-2001) otolaryngologist (ENT) to classical singers, attributed aligned posture with the ability to feel the vibrational feedback of the larynx through the spine (Hurley, 2020), which he proposed gave the brain a speedier feed forward prompt for hearing (Andersen, 2011). This has been critiqued by researchers who have found no supporting evidence (Andersen, 2011) however he may have tapped into the role of the vestibular system in entraining rhythmic sound and postural mechanical response (Thaut and Abiru, 2010; Leigh-Post, 2017).

The role of bone conducted vibration as proprio-kinesthetic feedback has been shown to result in more accurate sound association and therefore greater anticipatory accuracy of

sound production (Leigh-Post, 2017). Leigh-Post (2020, p.68) talks of 'buzzing bones' as the most accurate source of vocal feedback, with mouth to ear conducted sound and room acoustics feedback failing to exact a true representation of sound. Exploring the sense of the body throughout sound production is an easy way to begin to associate sense and sound before then associating the necessary auditory imagery needed to anticipate and execute accurate vocalisation (Pfordresher and Halpern, 2013). Although existing methods for somatic exploration of movement exist, it appears few exist purely for the singer. However, many have been contextualised for voice pedagogy and hold considerable interest for exploitation (Sentianin, 2015; Blades and Nelson, 2020; Hensel, 2020; Paparo, 2022).

Existing Methodology.

The Feldenkrais method® created by Moshe Feldenkrais (1904-1984) encourages a somatic exploration of movement allowing the nervous system to teach the mind new more efficient ways to move (Nelson and Blades-Zeller, 2001; Blades and Nelson, 2020), while Alexander Technique (AT) created by Frederick Matthias Alexander (1869-1955) allows for cognitive engagement in the cause and effect of habitual behaviour to restore senses to a more 'trustworthy' status (Peterson, 2008; Sentianin, 2015). Ives (2003) argues for caution in attributing motor learning value to Feldenkrais, suggesting that its positive contribution may be more accurately assigned to psychological 'self-regulation' (Ives, 2003, p.120). Thomas Hanna (Hanna, 1990) critiques both methods as falling short of solutions to the startle reflex as the cause of much tension. He subsequently developed a technique based on 'pandiculation' which uses conscious contractions to releases unconscious contractions, but as an accessible practice Hanna Somatic Education® remains in the hands of the highly skilled practitioner (Hanna, 1990). However much can be taken from each method to help create a more engaged experience for a singer, provided ethical consideration is given to pedagogical limitations. Body mapping, emerging from AT (Conable and Conable, 2000) allows the singer to correctly map the size, structure, and function of component body parts (Prokop, 2020) such as the larynx, tongue and diaphragm as well as structural skeletal structure. Mary Jean Allen (2010) comprehensively maps out the six places of balance and their integral role in supporting the system of singing, which research has shown to affect statistically significant improvement in lumbar alignment and breath control in static and singing posture (Monero, 2022).

Research in mindful awareness training for singers, using Feldenkrais Method saw students reporting increased identification and rectification of habitual patterns and improvement in

the quality, ease and expressivity of singing (Paparo, 2016; 2022). More robust mixed method studies saw singing students experiencing increased body awareness, a significant reduction in performance anxiety (Blyskal, 2022b), and enhanced technique (Czajkowski and Greasley, 2015), which in a later study saw 61% of the participants correctly identified by professional moderators in blind trials (Czajkowski et al, 2021b). Of note is the benefit to ensemble participants who found greater social connection (Czajkowski et al, 2021b), an ability to problem-solve in rehearsals and decreased anxiety in performance (Czajkowski, 2018; Czajkowski et al, 2022).

In my own practice, a tool kit of accessible mindful practice exercises for singing could be easily worked into the first part of choir practice. With researchers such as Czajkowski et al (2022) creating resources such as the '8-week mindfulness for singers' and highly practical guides to enhancing singing with awareness from the likes of Hoch (2020), Gilman (2014), and Nelson and Blades-Zeller (2001), accessibility for the choral leader and vocal pedagogue is increasing.

Imagery and Feed Forward Planning – A Secondary Pedagogical Tool.

The mind is an extremely powerful tool, but a shift in thinking of the body as subordinate to the mind is being called for by somatic researchers (Caldwell, 2014; 2018). Through this study I would advocate Heidegger's premise that 'We do not "have" a body; rather we "are" bodily' (1997, pp.98–99), and that when mind and body work together in equal flow, feed forward planning becomes speedier, automating lower-level activities, releasing the imagination, and enhancing recurrent vestibular stimulation (Leigh-Post, 2017). The mind must first be able to perceive the experience of the body and then the sensory imagery needed to add the details of the creative output desired becomes possible (Pfordresher and Halpern, 2013; Leigh-Post, 2017; 2021). Provided that tonal memory in the form of 'auditory imagery' is available (Pfordresher and Halpern, 2013, p.747) we can 'actively regenerate' these neurological patterns as part of our 'goal state imagery' (Leigh-Post, 2017, p.93) in active singing and through mental rehearsal such as 'inner singing' (Leigh-Post, 2021, p.65). Although research is inconclusive, inner singing when practiced with the intent to sing overtly in order to activate subvocalisation is thought to enhance auditory imagery and perceptual acuity (Hubbard, 2010). In the instance of my own singers, this may result in moving beyond trying to get the sequence of notes right, to imagining and planning how they would like to carry out the task based upon experience and accurate associative goal state imagery.

Conclusion

The purpose of this study was to identify key areas of sensorimotor processing such as cognition, perception, attention and imagery to establish how mind-body awareness could help amateur singers. I believe that research supports somatic mindfulness as an integral teaching practice for the enhancement of both well-being and technical development through perceptual awareness and is applicable for group pedagogy (Paparo, 2022). This study impacts the way I would prepare my singers for learning, as well as the way in which I would encourage attentional focus through implementing mind-body awareness activities. A key principle gained from study is placing equal emphasis on both verbs in the theorem 'doing with attention' (Gilman, 2014, p.6). This study highlights further areas of research concerning pedagogical programmes for amateur choral singers with considerations for inclusivity and trauma informed practice. I also wish to pursue a line of research which includes Eastern mind-body practices such as Yoga and their relevance to vocal pedagogy (Kuhn, 2006; Moliterno, 2008; Lloyd et al., 2017; Özgür, 2020; Mccornack and Thompson, 2021).

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APPENDIX 1

Literature Trail

<https://www.dropbox.com/scl/fo/27b8tyblgy8y34txucmfu/h?dl=0&rlkey=nlhbhwisukorx2lbr1yi6854>

APPENDIX 2

CASP Checklist

<https://www.dropbox.com/scl/fo/a8nkzhw7p7f30n0d7v8em/h?dl=0&rlkey=45ds7ly8zvtz9ergyckebuemw>

APPENDIX 3a

Johns' 1994 Model of Structured Reflection

Adapted from Finlay, 2008, p.26

Core question: What information do I need access to in order to learn through this experience?

Description of experience

Phenomenon – describe the 'here and now' experience.

Causal – What essential factors contributed to this experience?

Context - What are the significant background factors to this experience?

Clarifying - What are the key processes (for reflection) in this experience?

Reflection

What was I trying to achieve?

Why did I intervene as I did?

What were the consequences of my actions for?

- myself?

- the people I work with?

How did I feel about this experience when it was happening?

How do I know how the patient felt about it?

Influencing factors

What internal factors influenced my decision-making?

What external factors influenced my decision-making?

What sources of knowledge did/should have influenced my decision-making?

Could I have dealt better with the situation?

What other choices did I have?

What would be the consequences of those choices?

Learning

How do I now feel about this experience?

How have I made sense of this experience in the light of past experiences and future practice?

How has this experience changed my ways of knowing:

- empirics?
- aesthetics?
- ethics?
- personal?

APPENDIX 3b

Johns' 2006 Model of Structured Reflection

Adapted from Finlay, 2008, p.27

Bring the mind home.

Focus on a description of an experience that seems significant in some way.

What issues are significant to pay attention to?

How was I feeling, and what made me feel that way?

What was I trying to achieve, and did I respond effectively?

What were consequences of my actions on others and myself?

What factors influence the way I was/am feeling, thinking, and responding to this situation?

What knowledge informed me or might have informed me?

To what extent did I act for the best and in tune with my values?

How does this situation connect with previous experiences?

How might I respond more effectively given this situation again?

What would be the consequences of alternative actions for others and myself?

What factors might constrain my responding in new ways?

How do I now feel about this experience?

Am I better able to support myself and others as a consequence?

What insights have I gained through this reflection? (Framing perspectives)