

Assignment 7013

**An Independent Study on The Role of the Tongue
in the Training of First-Year Conservatoire Students**

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PART 1	3
INTRODUCTION	3
RATIONALE	4
PROGRAMME OF STUDY	8
OBJECTIVES	9
GANTT CHART	9
THE LITERATURE REVIEW PROCESS	10
DEVELOPING A RESEARCH QUESTION	11
THE REVIEW TYPE	12
THE LITERATURE SEARCH	13
SAMPLING	14
INCLUSION CRITERIA	15
BIAS	16
CRITICAL REFLECTION	17
INTRODUCTION	17
TACIT AND EXPLICIT KNOWLEDGE	18
THE SELECTION OF THE TOPIC	18
SEARCHING THE LITERATURE	20
INFORMATION MANAGEMENT	20
NEXT STEPS	22
PART 2	24
AN INDEPENDENT STUDY ON THE ROLE OF THE TONGUE IN THE TRAINING OF FIRST-YEAR	
CONSERVATOIRE STUDENTS	24
INTRODUCTION	24
RATIONALE	25
METHODOLOGY	26
TOWARDS A COMMON UNDERSTANDING	28
SEPARATING THE STRUCTURES OF THE TONGUE, JAW AND LARYNX	29
ALIGNMENT	31
THE TONGUE'S ROLE IN VOICE QUALITY AND VOWELS	33
THE ROLE OF COARTICULATION	35
ADDRESSING ISSUES OF PERCEPTION OF THE TONGUE	36
THE MANAGEMENT OF VOCAL RANGE	38
DISCUSSION	40
CONCLUSION	42
APPENDIX A	44
REFERENCE LIST	47

Part 1

Introduction

My background as a singer is in Western lyric singing, where I trained as a countertenor. The need to conduct research in aspects of musical theatre training reflects that I have developed my professional practice to become a cross-genre vocal trainer. Working outside of my primary genre has always made me conscious of the need to impart appropriate and accurate vocal training to the singers that I work with.

I have been a singing teacher for twenty-three years, fourteen of which have been spent working with dance, acting and musical theatre students on Level 6 diplomas and at degree level. Although coming from grey literature, several of these colleges are considered to be leading providers of musical theatre training (Backstage, 2023; Spotlight, 2024). I am currently a visiting lecturer at a conservatoire in the United Kingdom (UK), delivering vocal training on various courses in acting and musical theatre at both undergraduate and postgraduate levels. My duties at the conservatoire include the teaching of individual singing lessons, as well as the delivery of a series of lectures on musical theatre vocal technique. My professional practice also involves assisting a leading voice consultancy in delivering continuing professional development for singing teachers. I also run a private studio specialising in musical theatre singing to a clientele of student and professional singers.

The development plan of my workplace makes explicit the need to develop technical proficiency in the student's principal study. Given the profession's demands, where musical theatre performers would be singing up to eight weekly shows, creating efficient voice use is essential (Hernandez, 2021). The much-vaunted 'triple-threat' performer is highly prized within musical theatre, requiring a high level of attainment in singing, dance, and acting (Hall, 2014). A feature of this tripartite system of training is the high number of contact hours, which is mandated by accrediting bodies such as Trinity College for the Level 6 Diploma in Musical Theatre and Spotlight for those institutions seeking to be eligible for inclusion within the industry casting directory (Spotlight, 2024). Students face the additional challenge of learning to sing a vast repertoire that forms the musical theatre canon, most of which has been composed in the last hundred and fifty years (Fisher, Kayes, and Popeil, 2014; Green et al., 2013; Hall, 2014). Green's (2013) influential survey of audition requirements suggests that flexibility of vocal production is essential to sing the wide variety of musical styles that form the musical theatre canon. The location of the tongue, being based partly in the mouth and partly in the throat, can influence voice production, either for good or for ill (Steinhauer and McDonald Klimek, 2015; Chapman, 2016). This makes the tongue the subject of interest in this study.

Rationale

In recent continuing professional development, I was introduced to the concept of nocebic language in vocal pedagogy, suggesting that language can negatively affect the

beliefs that singers hold about their singing. Within my professional practice, it is not unusual for new students to be concerned for their voices, having been informed that they have tension in their tongues in their prior training. To ascertain the information that potential students may be receiving, I conducted a general Google search for the term 'tongue root tension'. This subject alone produced over two and a half thousand results, suggesting that the issues of tongue management are commonplace within the teaching studio. The use of language about tongue use is of interest, being framed as the 'the enemy of the singer' (Kaywin, 2019), or Jones (2002) describing a flat tongue position as being 'dangerous', even being described as the 'unruly evil' of vocal pedagogy (James 3:7,8; Miller and Shutte, 1981, p.25). Yet the practical strategies employed in the studios are controversial, with Edwards (2019) recounting his experiences of being instructed to flatten the tongue using a lollipop stick to produce a forward but warm tone. Nair's (2023) experience mirrors my own, highlighting the often-contradictory instructions received in training, such as to sing with the tongue low in the mouth or, conversely, to allow the tongue to be closer to the roof of the mouth. Introspection upon these experiences reminded me of the uncertainty about managing my tongue and the criteria for success when adopting these strategies. By reviewing the literature, I intend to develop accurate, objective-focused interventions for my students to remove the potential for confusion and concern.

The singing teacher has to understand vocal function, given that most of the anatomy is not visible without medical imaging equipment. The source of the voice, the true vocal folds located within the larynx, are responsible for pitch, volume, and vocal registration

(Sundberg, 1988). The vocal tract, which Sundberg (1988, p.12) defines as ‘the cavity system constituted by the pharynx and mouth cavities’. Adopting an informed approach to tongue management may cause the practitioner some discomfort if previously held beliefs and knowledge are erroneous; however, investigating the tongue and its relationship with the vocal mechanism may inform the singer’s singing and pedagogy (Nair, 203). LeFevre (2011, p.162) suggests that the tongue should even be the ‘point of investigation’ when attending to technical difficulties, as its connections to the whole mechanism may impinge on the singer’s vocal function.

The review will examine recent contributions to the corpus about tongue management and voice production in general. However, the context of this study would be incomplete without considering the contributions of notable writers from the field of vocal pedagogy in the context of a piece of work-placed learning, although this is intended to make the connection between research and pedagogy rather than to appeal to authority. For example, whilst Titze (in Estill Voice Training, 2024) describes Estill as ‘pioneering’, her investigations into voice quality and the classification of vocal structures into source and filter components are of interest. The tongue’s role as a filter structure in the pedagogical delivery of the Estill Model (Estill et al., 2019) makes her contribution worthy of inclusion. Other writers, such as Richard Miller (1996) and Janice Chapman (2016), are notable due to their adoption of evidence-based pedagogy. Miller’s (1996) assertion that the tongue can affect the management of the pitch range or cause vocal strain is highly pertinent to the training needs of first-year conservatoire students. Although a classical pedagogy pedagogue, Chapman (2016) addresses

general articulatory deficits caused by inefficiencies in the tongue, which may have applications in musical theatre as a text-driven art form (Kayes, 2004).

A further justification for the choice and focus of my topic is the tongue's role in the production of both consonants and vowels (Nair, 2013). Miller (1996, p.20) stresses the importance of articulation, stating that 'vocalisation is essentially vowelisation, it is the vowel that is the carrier of the tone'. Miller's comments are made in the context of Western Lyric singing, where the beauty of tone is the preferred aesthetic (Fisher, Kayes, and Popeil, 2015), while musical theatre also sustains pitch and, therefore, vowels. Addressing issues that may affect the pronunciation of the lyrics is essential in a text-driven art form (Kayes, 2004).

I perceive a contradiction between my background in Estill Voice Training (Steinhauer and Klimek, 2017) and more recent information from the field of acoustic vocal pedagogy. Steinhauer and Klimek (2017, p.205) state that 'modifying vowels to control voice quality is a shortcut that bypasses the magnificent capacity of voice'; Bozeman (2013) suggests several definitions for vowel modification that singers employ. Given the disparity between these two perspectives, interrogating the literature about physiology and acoustics may provide insight into how these disciplines can be developed into practical studio applications for the musical theatre singer.

My experience of managing tongue issues in the voice studio provides the most compelling reason to conduct a review of the literature. Aural perception suggests that

some sung text appears to positively affect tone production, either adding brightness or removing breath from the tone. I have had some success in the studio by exploring these with my students. Having piqued my interest in the topic, I explored the concept of phonemic prompts during a study period with Tom Burke (2023), a fellow Estill practitioner and speech and language pathologist. Burke's approach uses phonemes, the smallest unit of articulation (Gick, Wilson and Derrick, 2013, p.338), to create the perception of voice quality. Whilst I see some parallels with my practice, I wish to understand the underlying function of the tongue in relation to the tonal properties of the sound we hear.

This study will likely lead to the development of new strategies that could be considered best practices in the field of tongue management. For my students, this work will provide effective and efficient solutions to their technical issues. The potential of presenting at a forthcoming conference and sharing examples of best practices at a forthcoming voice conference has the potential to raise my professional profile within the voice community.

Programme of Study

Aims

- To acquire knowledge of the tongue's functions beyond voice production and consider any implications for vocal pedagogy.

- To develop a greater understanding of the tongue's relationship with other vocal tract structures and vocal fold function.
- To better understand how issues with the tongue may impact voice use for conservatoire-level singing singers.
- To understand more fully the tongue's role in articulating text whilst singing.
- To develop my abilities in acquiring and selecting relevant source materials in a manner that is consistent with academic practice.
- To develop my authorial voice in academic writing.

Objectives

- Develop a deeper understanding of the tongue's physiological functions to consider how these may affect the singer.
- Gain a greater understanding of how the tongue may affect voice quality.
- Develop an educational approach to articulating vowels and consonants to ensure the efficiency of vocal production.
- Develop my expertise to a level that enables me to present effectively in staff training in my workplace.

Gantt Chart

The following is a predicted timeline for the completion of the literature review:

Task	February				March				April				May				June			
Decide topic and agree with tutor																				
Preliminary reading																				
Literature search																				
Begin to write first draft of paper																				
Submit first draft to (part 1) and review with tutor																				
Submit first draft (part 2) and review with tutor																				
Rewrite paper																				
Submit to Moodle																				

The Literature Review Process

As a singing teacher, I identify with the value of 'maximising learning experiences and exploring factors that may contribute to 'success' in education' (El-Faragy, 2012, p.1).

To facilitate this development in my practice is a written appraisal of what is already known- existing knowledge on a topic (Jesson, Matheson, and Lacey, p. 2011). This definition outlines that I must utilise prior work as the evidence base rather than

attempting to generate new primary source material to answer my research question (Gregory and Denniss, 2018). It is hoped that avenues that warrant further enquiry will be revealed by documenting and analysing prior research into tongue management in musical theatre (Denney & Tewkesbury, 2013).

As an inexperienced researcher, I am apprehensive about conducting a literature review. However, there are many links to be made between my existing practice, which already includes observation, evidence gathering, questioning, and decision making and that of the literature reviewer (El-Faragy, 2012, p. 1). However, it is essential to note that the lack of uniformity is a common criticism of the literature review process (Cooper, 1998). Minimising the potential of such criticism will require understanding a range of perspectives from experts in the research field.

Developing a Research Question

Inspiration for a research study can be drawn from issues the teacher faces within the teaching studio and the reflection and professional discourse that arise from such experiences (Cummings, Browner, and Hulley, 2007, p. 19). Developing these experiences into a viable research question cannot be overstated, as this will affect the structure and focus of the study and the selection of source materials (Aveyard, 2010, p. 24; Forrester, 2010, p. 1; Onwuegbuzie and Freis, 2016, p. 5).

Introspection upon my experience of attending to the issue of tongue management has raised the following questions:

1. What is the tongue, and what are its functions?
2. How does the tongue influence the other structures around it?
3. How does the tongue position affect vocal tone and comfort?
4. How can this information be applied to the training of musical theatre singers at the beginning of their conservatoire training?

To focus these broad questions on a research question, gaining theoretical insights into the topic and understanding previous work will be necessary (Rhoades, 2011, p. 62; Forrester, 2010, p. 1). An awareness of the iterative nature of this process will need to be maintained, facilitating the evolution of the question as a more informed perspective of the topic is acquired (Cummings, Browner, and Hulley, 2007, p. 25).

The Review Type

The need to summarise and evaluate the literature about tongue management in musical theatre parallels the narrative review (Rhoades, 2011). The decision to undertake a narrative review is one of exclusion, given the time and resources necessary to conduct a systematic review (Kitely and Stogdon, 2014). However, the ability to draw from a range of sources to address an issue of professional practice to address a broad question makes the narrative review positive. It is also worth noting

that conducting a review does not preclude a 'systematic, rigorous and deliberate' approach to the review. (El-Farargy, 2012, p.2). Whilst I acknowledge that a systematic review would be beyond my current skillset and resources, utilising elements would help to provide structure and may help to promote confidence in the report (Kitley and Stogdon, 2014, p.; Rhoades, 2011).

This report will focus on research outcomes (Cooper, 1998), as I aim to make conclusions about the practical management of the tongue within the teaching studio. Introspection from a singer's perspective suggests that some critical examination of research methods may be necessary to assess for variables that could impact the habitual tongue. Given the project's timescale, dual foci may prove unmanageable; however, as this review may provide the basis for further investigation, identifying potential flaws in research methods may require some consideration (Randolph, 2009).

The Literature Search

The range of journals available via the University's library search engine has facilitated information gathering across several disciplines. An initial search for the tongue produced over ten thousand results across such disciplines as literature, medicine, anatomy and physiology (both human and non-human), acoustics, religious studies, and vocal pedagogy. Although this search was unfocused, the number of results about the tongue's physiological function across many bodily systems. Some of these, such as the tongue's role in posture (Bordoni et al. 2018), were unfamiliar. However, given the

centrality of balanced postural alignment in singing (Chapman, 2016), it was of interest to develop the young performer. However, the implication of many search results will necessitate formulating a 'consistent, realisable, and methodical' approach to searching the literature (Forrester, 2010, p.5).

To ensure relevance and coverage, it will be essential to maintain a flexible approach in developing the research question and search terms (Arimataris and Ritano, 2014, p.49). To facilitate this narrowing of focus, I will adopt the use of Boolean operators (AND, NOT, OR) (Denney and Tewkesbury, 2013; Forrester, 2005; Cooper, 1998; Grewal, Kataria, Dhawan, 2016; Kiteley and Stogdon, 2014). My initial searches using this approach reduced the number of results to four hundred and twenty, allowing the identification of appropriate journals, such as the Journal of Singing and the Journal of Voice. However, given that this study is designed to inform pedagogy, the work of eminent pedagogues will also be essential to connect source material to practice.

Sampling

As a 'voice practitioner-researcher' (Winter, 2023), relevance to practice is a crucial incentive to conduct the review. Whilst the evidence will be drawn mainly from primary source material, it is anticipated that further evidence will be gleaned from the writings of noted practitioners for contextualisation. I have chosen to purposively sample the literature, which will require judgments on the degree to which the selected paper could be representative based on my existing knowledge base and experience (Holosko and

Thyer, 2011). Clearly outlining the selection criteria and demonstrating objectivity through critiquing the selected studies equally may act as a foil against the perception of bias (Saidin and Jacob, 2016; Rhoades, 2011).

Inclusion Criteria

There is an argument for including historical evidence based on its continued usage in current pedagogy (Nair, 2023, pp. 617-618). The findings of a study conducted by Weekly and Lovetri (2003, p. 210) reported that only a fifth of the singing teachers who were teaching musical theatre reported having received any training in musical theatre. Furthermore, a percentage of the students of these teachers believed that only style separated Western lyric singing and musical theatre (Weekly, Lovetri, 2003). Given Nair's (2023) anecdotal evidence of her early vocal pedagogy influencing her early training and its influence on musical theatre, I have decided that including earlier pedagogical material is justified.

The inclusion of literature relating to different musical genres may be helpful. Bourgeault, Benoit, and Hirschhorn (2009, p.476) argue that comparative studies are 'uniquely placed to advance scientific knowledge about human societies.'. If the same principle is applied in the context of comparisons of musical genres, a comparative approach may highlight areas of convergence and divergence of tongue management between two genres. Singing in different genres requires different physiological strategies to be employed if the tonal aesthetic of the genre is to be

maintained (Lovetri, 2013; Titze, Maxfield, and Walker, 2016). Benson (2018) argues the merits of a functional approach to voice training, allowing students of different genres of singing to study together to address those aspects of function that are independent of musical style. This would appear logical in preparing the aspiring musical theatre performer due to the wide-ranging audition requirements of musical theatre. Given the similarity between 'legit' musical theatre and classical singing (Balog, 2005) and the range of subsets from Commercial Contemporary Music (Green et al., 2013, p. 325), including singing studies from this genre's subsets would be appropriate.

Bias

The conducting of research is a profoundly ethical act and, as such, will require objectivity to facilitate a 'search for the unvarnished truth' (Machi and McEvoy, 2002, p.11). Collins and Fauser (2005, p.103) state that 'the reader is better served when the choices made in the review, regardless of whether they are strict or open, should be explicit, transparent, clearly stated and reproducible by interested readers. To maintain the review's validity, I must remain mindful that the potential for bias is always present in studies, which is an essential step in assessing the degree to which it is present (Green, Johnson and Adams, 2006). Transparency is an essential feature of all good narrative reviews, and to ensure that this is evident, I will ensure that the selection of materials is based upon some criteria which will be outlined in the report's methodology (Rhoades, 2011, p.62). In the reporting stage, I must focus on the objectives to ensure my authorial voice is not

perceived as biased. However, a judicious use of critical analysis of the source material is expected (Green, Johnson, and Adams, 2006, p.110). To promote confidence in the validity of the paper, it will be necessary to consider my role as an insider researcher to remain 'objective focused' (Rhoades, p. 62) to ensure that conclusions relate to my research question and the documents under consideration (Green, Johnson and Adams, 2006).

Critical Reflection

Introduction

This assignment reflects my recent experience conducting a literature review on the crucial role of the tongue in conservatoire-level musical theatre training. It's important to note that this journey was challenging. As Ghaye (2011) points out, the motivation to effect change can only be improved if we manage the positive and negative aspects of our experiences. These difficulties during the review were valuable learning opportunities, fostering resilience and determination in my research journey.

As a novice researcher, I am committed to making the process of reflective practice straightforward and actionable. To this end, I have adopted the Experience, Reflection, Action cycle (Jasper, 2013, p.2) as a reflection framework. This will guide my reflection and ensure that I learn from my experiences and apply those learnings effectively in singing and vocal training.

Tacit and Explicit Knowledge

Throughout this process, I questioned the baseline level of knowledge that the audience for the study can be expected to know without definition and explanation. The Cambridge Dictionary online (2024) defines tacit knowledge as 'knowledge that you do not get from being taught, or from books, etc. but get from personal experience, for example when working in a particular organisation'. I soon realised that not only was the consideration of the audience needed, but my thinking was mired in the tacit knowledge I had acquired experientially. This led me to regress the topic to its very core: what is the structure and function of the tongue? Whilst I was concerned about such a question being perceived as potentially insulting to the intelligence of the reader, I was reassured that Nair (2023) had considered the same line of inquiry from the perspective of a classical pedagogue but could not assume that her conclusions on how the tongue moves would apply to the training of musical theatre singers. To engage with the learning process via the means of a literature review would provide the means to convert my experiences into knowledge (Astorga-Vargas et al., 2017, p.1)

The Selection of the Topic

Macchi and McEvoy (2022, p.3) state that 'the narrative review begins by selecting and identifying a research interest for inquiry'. The process of translating what was a personal interest or concern into a preliminary topic was problematic due to the broad

scope of my interests in the matter. However, the decision to select the tongue as a topic was undoubtedly pertinent to my professional practice, addressing what I felt needed to be added within my conservatoire training- an evidence-driven approach to articulation- and I concluded that a study in this field would address what I felt was a pedagogical weakness. A few years before conducting the review, I had begun to study articulatory phonetics, particularly the work of Gick, Wilson, and Derrick (2013), and this began to inform my knowledge of the production of consonants. I have had some success in the teaching studio by applying some of the principles to vocalises and songs, but I wanted to develop a more organised approach. However, competing priorities in the studio made me reconsider my priorities.

After some consideration of the topic, the concept of acoustic register transitions, as outlined in Bozeman (2013), piqued my interest in managing vowels over the pitch range. As a practitioner of Estill Voice Training, I was aware of the statement that modifying the vowels was not necessary (Steinhauer and McDonald Klimek (2017). Whilst Kayes (2017) had cited my previous work on managing range in her critique of Estill's work, I still experienced cognitive dissonance (Festinger, 1957 in de Vries, Byrne, and Kehoe, 2014) when faced with such an apparent contradiction in a piece of work that I was authoring. However, as a practitioner who regularly assists in delivering continuing development courses with singing teachers, I felt it essential to impart information that aligns with current evidence. Ensuring that the values I espouse correspond to my 'values-in-practice' is vital in protecting my sense of professional

integrity (Bolton and Delderfield, 2017, p.27). Still, it was also essential in protecting the validity of the study.

Searching the Literature

A preliminary search to ascertain the tongue's function revealed several fascinating unknown functions, such as its role in maintaining balance and lower limb strength (Bordoni et al., 2018). The potential of this information was of particular interest and led me to question whether faulty alignment could be addressed by remapping awareness of the tongue's position within the mouth. Exploring new lines of inquiry was an essential part of my research journey, highlighting the potential for future lines of investigation.

Information Management

This literature review was undertaken at a time when the management of a long-term health condition was proving to be problematic, with issues of short-term memory and fatigue affecting my ability to engage in personal study. Given the circumstances, information management would be central to my ability to undertake the literature review. In previous assignments, I had explored moving beyond a standard word processing package to a more complete information management system. However, this required more time to familiarise myself with the options than the topic allowed. I decided to keep my sources and writing organised to facilitate a more organised

approach to my studies. My adoption of Scrivener 3 was helpful. Utilising the split-screen functionality to be highly beneficial for notetaking and viewing these notes while writing the report allowed for a smoother workflow than in previous projects.

While conducting this review, I explored using artificial intelligence (AI), adopting SciSummary for its purported ability to analyse primary research. I carefully considered my motivation for adopting such a controversial approach, balancing the necessity to maintain an ethical stance in research with the need to manage large amounts of data. The use of AI in this context was permitted without reference to an ethics committee due to the work not analysing personal data (UWTSD, 2022). As I progress through my studies, where primary research will be necessary, an awareness of these guidelines will be an essential part of my research proposal and must be reported.

The difference between generative AI and those forms that collect data (Protopapa, Kazouris and Damodare, 2023) was a key consideration in my deliberations, as I was concerned about the potential for the perception of plagiarism and the accuracy of my study. Explainability 'refers to the ability to offer human-understandable justifications for the AI's output of procedures' (Seo et al., 2021, p.13). In this context, scrutiny was needed to verify SciSummary's findings, as placing trust in the algorithm to produce accurate responses would have been unwise. This approach had several unintended benefits surrounding the clarity of my thinking, the first being the necessity to familiarise myself with the findings of the source material. A second benefit was the careful consideration needed to phrase the questions I posed to the AI accurately. This was a

further example of the need to maintain the iterative approach, which moved beyond the focus of the research question and the search terms I used. There were other notable advantages to using SciSummary, such as the ability to search by keywords in the literature and the ability to compare multiple studies.

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On balance, using AI in my studies proved to be more advantageous than not. While I was fearful that the technology would affect the validity of my research, I found that I became more ethical in my approach. As I progress to the next assignment, I will continue to adopt this approach for those ethically appropriate areas.

Next Steps

Conducting a literature review has been challenging, and my health has influenced my perception of this matter. My exploration of emerging and existing technologies has proven beneficial to me as I manage these issues and will feature in my future studies, although with an awareness of the caveats that I have outlined.

The project has provided me with new lines of inquiry, which I wish to take forward in future work. Of particular interest to me is the teaching of articulation as a way of exploring vocal function. Whilst this study has focused specifically on the tongue, it is clear to me that the structures of the vocal tract now need further examination in relation to the tongue to gain a more complete understanding of the mechanisms of articulation.

Part 2

An Independent Study on The Role of the Tongue in the Training of First-Year Conservatoire Students

Introduction

As a singing teacher with over twenty-three years of teaching experience, I have worked with students of all ages. My early career was working with children as a peripatetic teacher for a local education authority music service; the last fourteen years have been spent working in dance and drama schools. My current role is as a visiting lecturer in singing at a United Kingdom (UK) conservatoire, where I teach several undergraduate and postgraduate acting and musical theatre MT courses.

As my career path transitioned from Western lyric (WL) singing to MT vocal training, the range of non-classical musical styles I encountered revealed a deficit in my knowledge and skills. To understand how singers produced these sounds, I studied in Estill Voice Training (Estill Voice Training, 2024) and qualified as an Estill Master Trainer in 2009. Means Weekly and LoVetri's (2003) survey of MT teachers highlighted that many are teaching in a genre in which they are not trained. Fisher, Kayes, and Popeil (2016, p. 1) state that the 'the role of vocal pedagogy is to explore, to learn, and ultimately be able to impart the intricacies of each vocal genre to the next generation while honouring traditions and values', later linking genre and the underlying vocal function that underpins it. It is ethical practice to develop my pedagogy (Association of

Teachers of Singing, 2024) to ensure that my training reflects my students' developmental needs within the industry context.

Hopefully, this desktop study will positively contribute to my professional practice, the settings in which I practice, and the profession more broadly. If the findings can be used to form a basis for my debut as a presenter at a forthcoming voice conference (Austin, 2016), the study has the potential to raise my professional profile.

Rationale

This independent study will focus on tongue management in training first-year conservatoire students. The competitive nature of the conservatoire audition process means that it is the norm for students to have had prior experience in vocal training, establishing and developing patterns of behaviour that may or may not be helpful (Trollinger, 2005). What constitutes best practice in tongue management is essential, as singers often receive contradictory instructions to remedy perceived deficits or strive towards tonal expectations of the chosen genre (Nair, 2023).

The tongue is considered problematic in singing, being described as an 'unruly evil' (Miller and Shutte, 1983), being one of the 'terrible triplets of the vocal tract', accompanied by its siblings, the hyoid bone, and jaw (Miller, 1999). In a presentation for the Voice Study Centre, Morris (2023) described the tongue, jaw, and larynx as

being in a 'sick ménage à trois' in the context that these structures can lose their independence from each other and adversely affect range. Discussions of tongue tension can be found in pedagogical literature and medical literature (Chapman, 2016; Harris, S in Harris and Howard, 2018), whilst a cursory Google search for the words 'tongue' and 'singing' generates a plethora of search results, many of which are from teachers advocating an approach to managing the tongue. Identifying factors that impact the tongue's efficient function during singing may inform the development of teaching strategies to promote student development.

Methodology

Choosing a sampling method that balances the breadth and depth of the information to understand further the tongue has been an important consideration (Aveyard, 2010). Exhaustive sampling can generate data that would likely prove to be unwieldy (Benoot, Hannes, and Bilsen, 2016). As a solo researcher traversing many fields beyond the scope of my professional practice, adopting purposive sampling would be more likely to ensure that sources would be 'information-rich cases for the most effective use of limited resources' (Palinkas et al., 2015).

My preliminary searches using the University of Wales Trinity Saint David's (UWTSD) library search facility, as well as Google Scholar, identified several peer-reviewed journals, which included The Journal of Voice, The Journal of Singing, The Acoustical

Society of America, and *Folia Phoniatica et Logopaedia*, amongst others. Other sources were acquired using sites such as ResearchGate and Academia. As this review considers pedagogy and professional practice issues, a combination of pedagogical and research-based literature review has been explored to provide a comprehensive understanding of the role of the tongue in musical theatre vocal training.

Musical theatre is a commercial contemporary music genre (CCM), a term coined by Means Weekly and LoVetri (2003) to discuss non-classical genres without referencing Western lyric singing. MT, however, employs some aspects of classical technique (Balog, 2005), such as EXAMPLE. To include literature about WL singing comparatively to that of musical theatre may reveal insights into tongue management; however, to include comparative studies may

This study focuses on the needs of students on a musical theatre performer's course to prepare them for entry into the profession. As such, Green et al.'s (2013) study on the audition requirements of musical theatre singers has been used as a basis for professional relevance. However, it is recognised that the publication pre-dates the pandemic and focuses on the needs of Broadway and touring productions in the United States (US). In the UK, the financial viability of touring MT productions in this post-pandemic period is precarious (Smith, 2022), with less demand leading to fewer opportunities for performers (Walmsley, 2022; Greffe, 2023). In such a challenging

environment, vocally flexible musical theatre performers, as Green et al. (2013) outlined, are likely to be more employable.

Towards a Common Understanding

Whilst the principal study is central to conservatoire training, it is common for undergraduates to undergo training in vocal technique in a class setting (Benson, 2018). To understand that oscillation of the true vocal folds is the source of the vocal tone, and the vocal tract, the cavity that courses from the larynx to the lips or nose, is responsible for producing changes in timbre (Howard and Angus, 2017) may help clarify what exactly is being trained. For the informed vocal teacher, there is a distinction to be made between the vocal tract, which is the air-filled space, and the structures that surround it, such as the tongue, jaw, lips, velum (soft palate), and the vertical height of the larynx within the neck (Sundberg, 1987, Steinhauer in Harris and Howard, 2018). For the student, who may be unfamiliar with such terminology, the substitution of the word 'channel' (Shewell, 2009, p.144) may be a more accessible introduction to vocal tract shaping,

The tongue is a muscular hydrostat (Bailey and Fregosi, 2003; Mills et al., 2019; Nair, 2023). A muscular hydrostat can' change its shape and contours without changing its volume and without skeletal support' (Mills et al., 2019, 440). To reinforce the tongue's flexibility, a comparison with other muscular hydrostats found in nature, such as the elephant's trunk (Schultz et al. 2022), may be helpful for those who hold the tongue rigid

whilst singing. Nair (2023) describes the movement of the tongue as resembling squeezing a water balloon, which may be a helpful image in understanding its movement and promoting this concept of flexibility; however, squeezing may have intended consequences, particularly for those students whose understanding of language is literal. The knowledge that these changes in tongue shape result from its structure, which mainly consists of muscles and 'aqueous liquid' (Mills et al., 2019, p.440), may provide mitigation against such difficulties. Four pairs of intrinsic muscles are contained within the tongue: the superior longitudinal, the inferior longitudinal, the transverse, and the vertical muscles (Sakamoto, 2017).

Whilst the intrinsic musculature of the tongue is attributed to its shaping, an awareness position of the tongue within the vocal tract is controlled by extrinsic muscles that originate in the jaw (genioglossus), the hyoid bone (hyoglossus), the soft palate (hyoglossus) and at the styloid process of the skull (styloglossus) (Sakamoto, 2017). For the singing teacher, this origin-first nomenclature may help prevent the adoption of strategies that are not physically possible (Trollinger, 2005). It also suggests that alignment issues may impede the tongue's ability to carry out its roles unimpeded.

Separating the Structures of the Tongue, Jaw and Larynx

Lefevre (2011, p.157) states that it is commonplace for singers to engage in 'extraneous muscular recruitment' when attempting to find the resting position of the tongue, mainly where the singers manipulate the tongue as part of a strategy to make space for the

sound. Considering the tongue and the extrinsic musculature may help remediate this unnecessary movement. It is important to remember that as a non-medical voice professional, the scope of practice is limited when considering speech and language therapy evidence. However, intersections between speech and language therapy and vocal pedagogy may provide new insight.

Practising pitch gliding on 'ng's while mouthing words, a technique that isolates the tongue's front and back from the jaw and allows for the free movement of the larynx, has a long history in vocal pedagogy (Kayes, 2004). In speech and language therapy, nasalised vowels are sometimes used to isolate the tongue from the movement of the soft palate. However, it's crucial to be cautious when using nasality, as warned by McCoy (2008), to prevent the student from becoming overly reliant on the vibratory sensations in the face that nasality produces. Instead, McCoy advocates using orally produced consonants, such as fricatives, to address the issue.

It's essential for singing teachers to understand the power of the chewing muscles, which are 'the most powerful muscles of the head (Bunch, 2009) and that the students may have difficulties with the temporomandibular joint. Froeshels' (Froeschels in Meerschman et al., 2015) observation that speakers can chew and vocalise simultaneously has valuable insight into voice therapy (Behrman and Haskell, 2020). Chewing can also separate the functions of the tongue, jaw, and larynx (Harris, S. in Harris and Howard, 2018). Meerschman et al.'s (2015) findings that voice quality

improved when participants used a programme of chewing over months after training in alignment and breathing suggests the efficacy of the strategy and a hierarchy of skills that could be applied to the training of first-year musical theatre students.

Alignment

Developing efficient alignment at the onset of formal training is essential, given the compromises that may be required to meet the challenges some costumes and dance styles may provide (Hall, 2014). Postural alignment is widely acknowledged as instrumental in promoting efficient vocal function (Doscher, 1994; Bunch, 2009; Arboleda and Frederick, 2006; Hall, 2014; Cole, 2019). The tongue, with its muscular connections to the soft palate, the jaw, and the hyoid bone, makes the tongue of interest when establishing balanced alignment with students in their first year of vocal training.

Cole (2019, p.12) states that 'even if, as voice specialists, we can't expect to be masters of every aspect of human functioning, we can still look for some simple things in students to rule out the postural cause of tension in jaw and tongue'. As many head and neck muscles are present bilaterally, a more prominent presentation on one side may indicate postural asymmetry (Arboleda and Frederick, 2008). Chapman (2016) advocates using a mirror to allow the singer to gain an awareness of their asymmetries. However, the widespread access to recording facilities on students' mobile devices would allow them to analyse their alignment after they have sung. This approach would free the singer to focus on the act of singing and, when placed to obtain a sagittal view, to do so without compromising head and neck alignment.

Chapman (2021, p.26) identifies that there are issues of peer pressure that may affect the alignment of teenage students and young adults, referring to collapsed posture as 'the street-cred slump'. Shorter and taller students may unconsciously adapt their alignment to compensate for their height by looking up or stooping (Rubin, Matthieson, and Blake, 2004). For first-year undergraduates, the pressures of independent living for the first time, combined with beginning training on an intensive course of study, could cause feelings of insecurity and anxiety. Insecurity may manifest in slumping the shoulders and lowering the head and gaze (Bunch, 2009). Addressing these issues is a priority if long-term muscular adaptations are to be avoided, as this can cause discomfort in the muscles connected to the hyoid bone, which includes those of the tongue (Rubin, Mathieson, and Blake, 2004). Where a student is affected by such issues, it may be a matter of policy development for the conservatoire to ensure that they can be referred to appropriate information and support, such as the British Association of Performing Arts Medicine (BAPAM, 2024).

The flexibility of the vocal mechanism, both at the level of the larynx and throughout the vocal tract, depends upon the musculature's availability, which requires balanced postural alignment (Chapman, 2016). Changes in the alignment of the head, neck and jaw position cause changes in the positioning of the hyoid bone, reflecting 'the position of the tongue relative to the upper and lower jaw (Johnson and Skinner (2008, p.567). The connection between the larynx and the hyoid bone means that such changes adjust the shape of the vocal tract, affecting the acoustic outcome.

An awareness of the student's general health history may inform the teacher's professional practice. A case study on a patient presenting with neck pain, swallowing issues, and difficulties with mouth opening revealed a loss of the natural curvature (lordosis) of the neck following a whiplash injury (Bordoni, 2016). Whilst this case study is not focused on singing, the determination that abnormal tension was present in the musculature of the tongue and the resolution of symptoms following tongue-focused osteopathic treatment (Bordoni, 2016) is of interest. However, the teacher must consider their scope of practice, as invasive medical procedures were employed on the hyoid bone and tongue to achieve a successful outcome. Discussions with the student at the onset of their studies may be advisable to discover any such general health issues; however, record keeping of such information is a broader conservatoire issue to ensure that such data is stored in compliance with the current General Data Protection Regulations (Information Commissioner's Office, 2024).

The Tongue's Role in Voice Quality and Vowels

For the musical theatre singing teacher, it is essential to consider the physiological strategies that may influence the listener's perception of voice quality, as the perception of this can communicate the character's 'identity, health, and emotional state' (Story, Titze, Hoffman, 2001, p.1651). When considering voice quality, the singer controls individual components, such as intrinsic and extrinsic musculature of the tongue (Garellek, 2022; Lovetri, Lesh and Woo, 1999).

Honikman (1964, p.73) introduced the term 'articulatory settings', used today (Krivokapić, 2020) to describe the global positioning of the mouth structures in languages and accents. Khatcherian Milo and Néron (2019) argue that singing in a language requires an awareness of the articulatory setting of the new language, affecting both the tip and body of the tongue. In the context of singing, Estill (in Steinhauer and Klimek, 2017) suggests that the back of the tongue is crucial in producing voice qualities independent of the sung vowel. The findings of Lovetri, Lesh, and Woo, p.99) support this in a study to ascertain whether the intrinsic and extrinsic musculature findings that the seven professional musical theatre singers did produce discernible changes in vowels with only minimal movement of the tongue. However, the authors did not discuss whether the results were affected by introducing a rigid endoscope into the oral cavity to conduct the testing protocols. Wood's (1976, p.31) usage of radiography to obtain images of participants producing a range of vowels, whilst not so invasive, relied on the participant's stillness, which is not performance practice in musical theatre. However, Wood's findings are attractive for their scope, covering multiple participants who spoke various languages, producing a 'family' of vowels (Wood, 1976, p.31) at four points of constriction: the hard palate, soft palate, upper pharynx, and lower pharynx (Table 1). The attribution of these points of constriction to the behaviour of the extrinsic musculature Wood (1976, pp.35-56) is highly relevant to professional practice, given that this musculature appears to be under conscious control (Lovetri, Lesh and Woo, 1999), inviting the development of new pedagogical strategies for tongue management.

Point of Constriction	Vowels
Hard palate	i-ε, y-ø
Soft palate	u-ʊ, ɨ
Upper pharynx	o-ɔ, ʁ
Lower pharynx	ɒ-æ

Table 1. Vowel families are produced at four constriction points (after Wood, 1978, p.30).

The Role of Coarticulation

Whilst it is possible to analyse the phonemic content of lyrics to ascertain the sounds appropriate to the accent under consideration, understanding how these sounds relate to each other may help remediate technical issues. The knowledge that speech sounds may be affected by those preceding or following it may be beneficial in planning resonance strategies to develop vocal projection as, despite being an amplified art form in performance, aspiring performers still need to project their voices in the audition room. Kayes (2004) highlights that strategies to equalise volume in those vowels produced towards the rear of the mouth lack the high-frequency energy of those at the front, advocating for an approach which she calls ‘vowel medialisation’ (Kayes, 2004, p.100-101) to produce the vowels more centrally within the vowel space. This approach

would appear to be based upon 'coarticulation', which refers to one phoneme's effect on another (Dutta and Pandey, 2010, p.1700; Mattheyses and Verhelst, 2014, p.197).

Dromey, Heaton, and Hopkin (2010) explored vowel equalisation with amateur singers, utilising rapid alterations between front and back vowels to investigate the effect on brightness. This study is interesting as the subjects were of an age commensurate with the onset of conservatoire training. The findings that the back vowels had higher formant frequencies after the short training session (Dromey, Heaton, and Hopkin, 2010) are of interest for the training of students where singing, dance, and acting classes make efficiency a must.

Addressing Issues of Perception of the Tongue

The informed singing teacher must be aware that the tongue is fraught with perceptual difficulties, sometimes used as an auditory monitor of the singer's voice (Fourcin in Chapman, 2016). Lefevre (2011, p.157) states that it is commonplace for singers to engage in 'extraneous muscular recruitment' when attempting to find the resting position of the tongue, mainly where the singers manipulate the tongue as part of a strategy to make space for the sound. Echternach et al. (2014) observed that the subject of their study produced a smaller vocal tract shape when asked to create a larger space. Whilst this was a single-subject study, which may not be representative of all singers, it suggests some support for Bozeman's (2021) assertion that sensations are subject to faulty kinaesthetic perception. It may be possible to observe visual and auditory

manifestations of this strategy, such as movement on the floor of the mouth or as an audible breath noise on inhalation, which may be heard as an /a/ vowel (Bozeman, 2021). For the singing teacher to compare the vowels produced with this breathing strategy may be contrasted with those made when the tongue has a thick, full presence in the mouth' (LeFevre, 2011, p.15).

Evidence that movements of the tongue and hand are linked (Chieffi, Secchi, and Gentilucci, 2009; Vainio et al., 2018) provides an alternative method of addressing the tongue's role in singing. Vainio et al. (2018) investigated the connection between articulatory movements on the front-back continuum of the tongue and the direction of hand gestures during the production of vowels, finding that the cardinal vowels /i/ and /u/ corresponded with the forward-back movements of the hand. A subsequent investigation (Vainio et al., 2022) suggests a connection between precision grip (made with contact between the first finger and thumb) and power grip (contact between the fingers and palm) in the production of consonants and vowels. Whilst Estill Voice Training uses positions to denote the height of the tongue dorsum (Steinhauer and McDonald, Klimek, 2017; Steinhauer, Obert, McDonald Klimek, 2019), Vainio et al.'s (2022) research could provide the theoretical underpinning a new system that addresses the articulation of vowels and consonants using the hand-tongue connection. This could have implications for vocal pedagogy in all genres.

The International Phonetic Alphabet (IPA), a system for the notation of individual speech sounds (phonemes), is widespread in actor training (Thompson, 2007). The

ability to decode these signs may prove advantageous in understanding the literature of phonology and pronunciation dictionaries (Thompson, 2007), skills valuable to the student and teacher alike, given the range of accents that the musical theatre singer may be required to speak and sing in. However, using the vowel quadrilateral to represent vowel sounds visually is more problematic.

For the evidence-based practitioner, it is worth considering that evidence may depend on the technology available to the researcher and singing teacher at that time. Garcia's investigations into the inner workings of the larynx, conducted in the mid-nineteenth century, are unusual in that the singing teacher and researcher were the same (Mandabach and Dobyys, 2018). Early phoneticians, such as Bell (1867), attempted to chart the location of vowels in the vocal tract, with the International Phonetic Association's (1999) vowel quadrilateral being considered as 'a benchmark for vowel description' (Lindsey, 2017, p,133). However, criticism of the quadrilateral stems from using *front*, *back*, *open*, and *close* to describe the tongue's position in the mouth during the production of vowels. This is an example where perception can be problematic, with medical imaging revealing that the actual tongue positions did not always reflect these purported locations in the mouth (Lindsey, 2017). The classification of vowels at Wood's (1986) four points of constriction may provide an alternative to the IPA's chart.

The Management of Vocal Range

Effective pitch range management is an early training priority if the first-year musical theatre singer is to explore the range of repertoire expected of the musical theatre professional. The opening and closing rate of the vocal folds is the prime determinant of fundamental frequency, which is perceived as the pitch being sung (McCoy, 2016); however, other factors are worth consideration.

The vertical height of the larynx during high-pitched singing has long been controversial within vocal pedagogy, with practitioners such as Riggs advocating a stable larynx throughout the range (Riggs, 2019). A factor essential to the discussion is that the nature of the larynx is suspended from the hyoid bone (Aljulaih and Menezes, 2024). In a study by Yanagisawa et al. (1991), subjects performed a pitch glide, or siren, an 'ng' sound, as well as a song excerpt in each of the six voice qualities (speech, sob, falsetto, twang, opera and belting) to explore any contributions to pitch raising that occurred above the level of the larynx. The finding that all subjects demonstrated the same patterns of behaviour for a higher pitch, the raising of the larynx and soft palate, (Yanagisawa et al., 1991) is of interest for pedagogical practice. Allowing the larynx to rise for high pitch is suggested to impact the angle between the cricoid and thyroid cartilages to increase the tension upon the vocal folds, thus raising pitch (Brunelle, 2010). The muscles at the back of the tongue are able 'can assist or restrict movement of the larynx for pitch production and voice quality' due to the muscular connections coursing from the rear of the tongue to the hyoid bone (Steinhauer and McDonald Klimek, 2017, pp. 199-200). Promoting a higher tongue position via prompts such as

the 'ng' or close vowels such as /u/ or /i/ may be effective strategies to facilitate easy laryngeal movement.

Discussion

The singing teacher must work holistically when attending to issues of tongue management. When working with a new cohort of students, an immediate priority must be to develop an awareness of any issues that may compromise any aspect of tongue function within the limits of what the student is prepared to disclose. It is essential that the conservatoire has a policy and systems to manage this information to avoid potentially costly breaches of GDPR.

The conservatoire setting attracts students from the UK and beyond, bringing a wide variety of articulatory settings that the singing teacher must consider when addressing issues of tongue management. To change an articulatory setting is to change the singer's timbre or voice quality, facilitating the transition between musical styles, which is a professional necessity for the musical theatre performer. However, it is the ethical responsibility of the practitioner to approach tongue management in a way that respects and values these cultural differences.

Knowledge of anatomy and physiology is essential to the teacher's skill set. Awareness of the tongue's intrinsic and extrinsic musculature is of pedagogical importance. The relationship between posture and tongue placement raises some intriguing questions for professional practice. When faced with a student exhibiting postural deficits, exploring the tongue's position may be beneficial. It is recommended that vocalising, whilst exploring issues of head and neck alignment, may develop an awareness of the relationship between alignment and vocal tone.

The separation of the movement of the tongue from other structures is an early training priority if the student is to develop their whole vocal range, allowing vertical excursion of the larynx for extremes of pitch. However, it may take some time for the student to become familiar with this new perception of the shape. Exercises that utilise phonemes made with a higher tongue body, chewing, and nasalisation, may be more beneficial in achieving this.

Tongue perception is unreliable. Strategies such as silent practice are practical tools for exploring tongue movement when making different vowel shapes. For students concerned about the aesthetic quality of their tone, this may provide a more accurate awareness of tongue movement.

The evidence of a connection between the tongue position and the hands in vowels and consonants is intriguing, but consideration needs to be given to develop this into a

tangible and achievable teaching strategy. However, it may yield benefits extending beyond the training of musical theatre singers and into the broader voice community.

The dynamic nature of voice production means that an individual phoneme is subject to variation depending on what occurs before or after it, which can be either positive or negative. Informed choices about coarticulation may be beneficial in developing exercises that utilise consonants and vowels to elicit more efficient vocal function.

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For the musical theatre student, to develop flexible tongue use is essential if they are to be able to communicate the sung word in a text-driven art form.

Conclusion

Due to its complex structure, the tongue plays a central role in voice production, making it worthy of further study. If general technical issues, such as alignment, are addressed, considering the tongue as the origin of many technical issues is likely to yield positive

results. Knowledge of anatomy and physiology is important, but this must be tempered by an awareness that what the student feels may differ from our understanding of the tongue as it is currently. Voice is movement, and changes of tongue position are essential if the musical theatre singer is to be able to access the range of timbres that are expected of a cross-genre singer. Musical theatre is an art form where communication of the sung text is paramount. Addressing issues of articulation is essential if the singer's artist's intention is to communicate to the audience.

Appendix A

The Pinch and Palm

Rationale

The hand positions, *high*, mid, and low, are used in Estill Voice Training to denote the height of the tongue dorsum within the mouth, but these are not related to vowel locations (Steinhauer and McDonald Klimek, 2019).

The perception of space within the vocal tract is unreliable, leading some singers to employ strategies to make space for the tongue that may compromise clarity of articulation, tone, and vocal range (Bozeman, 2021; Chapman, 2016). The following hand signals are suggested to utilise what appears to be a neurologic connection between anterior-posterior movements between the hand and tongue (Vainio et al., 2022). *Pinch* and *Palme* may be more appropriate to the first-year musical theatre student than 'precision grip' and 'power grip' (Vainio et al., 2022, p.), as gripping may have negative connotations in the context of singing.

The exercises are meant to progress from producing sounds associated with the individual gestures to combining front and back phonemes. These may be used to devise exercises or to focus on the movement between vowels and consonants in song.

The Hand Positions

The Pinch	The Palm
	

Exercise 1: Vowels

1. Assume the pinch position with light contact with the thumb and first finger and sing a single pitch on the vowel /i/ (ee). The back of the hand should be facing towards the singer.
2. Assume the close position with light contact with the fingers and the palm and sing a single pitch on the vowel /a/ (ah).
3. Alternate between the vowels /i/ and /a/, assuming the hand position first.
4. Increase the speed.
5. Replace with other front or back vowel combinations.
6. Repeat on other pitches

Exercise 2: Consonants

1. Assume the pinch position and say the consonant /t/.
2. Assume the close position and say the consonant /k/.
3. Repeat, using the voiced consonants /d/ and /g/.
4. On a single pitch, alternate between the unvoiced sounds /t/ and /k/ using the hand signs.
5. Alternate between the voiced sounds /d/ and /g/ using the hand signs.

Further Development

1. Explore the above using one hand for those vowels and consonants associated with precision gripping and one for those associated with power gripping. The student could perform both with one hand, but it is unlikely to be as rapid as using two.
2. Alternate back vowels (power grip) and front consonants (precision grip) and vice versa.
3. Devise simple melodic patterns using these positions. As the student becomes familiar with the system, explore starting pitch and tempo changes.

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