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**Reconstructing the Tenor ‘Pharyngeal Voice’:
a Historical and Practical Investigation**

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Abstract

One of the defining moments of operatic history occurred in April 1837 when upon returning to Paris from study in Italy, **Gilbert Duprez** (1806–1896) performed the first ‘*do di petto*’, or high c’’ ‘from the chest’, in Rossini’s *Guillaume Tell*. However, according to the great pedagogue **Manuel Garcia (jr.)** (1805–1906) tenors like **Giovanni Battista Rubini** (1794–1854) and Garcia’s own father, tenor **Manuel Garcia (sr.)** (1775–1832), had been singing the ‘*do di petto*’ for some time. A great deal of research has already been done to quantify this great ‘moment’, but I wanted to see if it is possible to define the vocal qualities of the tenor voices other than Duprez’, and to see if perhaps there is a general misunderstanding of their vocal qualities. That investigation led me to the ‘pharyngeal voice’ concept, what the Italians call *falsettone*. I then wondered if I could not only discover the techniques which allowed them to have such wide ranges, *fioritura*, pianissimi, superb *legato*, and what seemed like a ‘*do di petto*’, but also to reconstruct what amounts to a ‘lost technique’. To accomplish this, I bring my lifelong training as a bel canto tenor and eighteen years of experience as a classical singing teacher to bear in a partially autoethnographic study in which I analyse the most important vocal treatises from **Pier Francesco Tosi’s** (c. 1653–1732) treatise ‘*Opinioni de’ cantori antichi e moderni*’ (1723) to ‘Garcia’s Treatise on the Art of Singing’ (1924). I analysed the treatises for concepts of registration, timbre, breathing and resonance tuning. Subsequently, I researched contemporary accounts of several tenors to develop a ‘picture’ of their individual voices and to distinguish voice types, and then analysed multiple extracts from operas to determine range, *tessitura*, dynamic ability, and melodic contour markers for each singer. Using performance practice methodologies in the teaching studio, I was able combine all these elements to produce a valid and effective historically informed reconstruction of the historical tenor ‘pharyngeal voice’ and pedagogy.

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Introduction

On 7 April 1828 a thirty-eight-year-old tenor named Giovanni David would première the role of Fernando in Bellini's *Bianca e Fernando* on the stage of Teatro Carlo Felice in Genoa.¹ This was not the first time he had been promised the role. A year and a half before in 1826 Giovanni Battista Rubini had replaced him in the first version of the opera, *Bianca e Gernando*, at the Teatro San Carlo in Naples, but this was not the same opera. The role had been completely changed for David's voice. This time, Bellini made sure to push his tenor to the limits, giving him multiple high f'' naturals to sing. This was a moment of supreme virtuosity in opera history. Bellini would eventually write a high f'' for Rubini as well, but not until *I puritani* in 1835.

According to the comprehensive online performance directory, *Opera base*, neither version of the *Bianca e Fernando (Gernando)* is scheduled to be performed in 2019 and the most recent production of *Bianca e Gernando* (the version that does not include the high f'' naturals) is a single joint-production by Peter George d'Angelino Tap with Opera Basel and Opera St. Maritz in 2016/7.² Bellini's opera *I puritani* is far more popular, but tenors normally sing d'' instead of f'' natural. If they attempt the f'' they resort to singing the note in pure falsetto or attempt a mixed voice sound. *I puritani* has only a single note written to challenge the tenor's range at this pitch, whereas operas like *Bianca e Fernando* or *Anna Bolena* by Donizetti, written for Rubini, are nearly completely outside the ability of the vast majority of tenors. The role of Lord Riccardo Percy in *Anna Bolena* is so difficult that it has never been published in the original Rubini keys.³ Singers make sometimes major cuts to the arias on account of their demands and still have difficulties even in the transposed versions. These transpositions allow singers with a post-Verismo technique to attempt a performance, but this must, without doubt, change both the sound quality and aesthetic intention of the original score.

The operas investigated in this dissertation received many performances in multiple cities throughout Europe and beyond in the early nineteenth century. Therefore, there must

¹ Maguire, S. and Forbes, E. 'Bianca e Fernando ('Bianca and Fernando')' (Grove Music Online, 2002), accessed 30 Sept. 2019.

² www.operabase.com is an online repository for theatres, festivals, singers and other opera artists and provides reliable up-to-date information on productions around the world.

³ The transposed keys can be found in Vol. 2.

have been sufficient tenors capable of singing the music as it was notated and to an acceptable standard. What has changed? The fundamental mechanics of the human voice remain the same as they were two hundred years ago, so it must be something to do with the techniques of vocal production. As will be discussed in what follows, I do not believe that these tenors simply sang in pure falsetto. Nor do I believe that they were a group of ‘freakish’ singers who somehow emerged at a particular time and were able to sing in a chest-voice like sound sufficient to carry over a large orchestra by nature alone. Rather I argue that they used the techniques they had learned by way of a prevalent pedagogical tradition from the *castrati* to produce a sound that was typical, rather than exceptional, for singers of the tenor voice part. This belief prompts the following questions:

- o What are the techniques that enabled the tenors to sing across a range stretching from bass to what is essentially soprano, with phenomenally elaborate fioriture, power, and the projection of the high tenor without recourse to post-Verismo vocal pedagogy?
- o Is it possible, given that this singing style died out before the advent of the age of recording, to recover the techniques based on the evidence we have: effectively, scores of surviving repertoire and pedagogical treatises?
- o How might one begin to reconstruct the elements of this ‘lost technique’ in a contemporary teaching practice?

In order to be able to answer these questions, it has been important to work within the historically informed performance practice (HIP) framework that, over the past 50 or so years, has developed methodologies to analyse extant sources.⁴ Historically informed performance practice seeks to use a combination of source studies and practical experimentation to discover ‘composers’ intentions’, and the sounds, interpretations and styles they might have expected performers of their music to exercise. This body of knowledge is then applied to ‘reconstructing’ such performance parameters in the present

⁴ Important recent overviews and considerations of the implications (and pitfalls) of this trend in musicology, are provided by Lawson, C. and Stowell, R. (eds.) *The Cambridge Encyclopedia of Historical Performance in Music* (Cambridge Univ. Press, 2012); Lawson, C. and Stowell, R. *The Historical Performance of Music: An Introduction* (Cambridge Univ. Press, 1999); Haynes, B. *The End of Early Music: A Period Performer’s History of Music for the Twenty-First Century* (Oxford Univ. Press, 2007); Butt, J. *Playing with History: The Historical Approach to Musical Performance* (Cambridge Univ. Press, 2002); Brown, C. *Classical and Romantic Performing Practice 1750–1900* (Oxford Univ. Press, 1999); Dreyfus, L. ‘Early music defended against its devotees: a theory of historical performance in the twentieth century’, *Musical Quarterly*, 49 (1983): 297–322; Brown, H. and Sadie, S. (eds.), *Performance Practice: Music after 1600* (London, Macmillan, 1989).

time. It also relies on public and critical response to further refine the fundamental characteristics of the historical music performance in order to inform contemporary performance practice. This is not to say that it is possible, or even considered desirable by most practitioners today, to attempt to reproduce historical aesthetics with anything that approaches some kind of 'authoritative authenticity', because, as is now accepted, this is fundamentally impossible. All the musical sounds made before recording was invented disappeared the moment they were made and can never be recovered. It is only possible to suggest what the music may have sounded like, or how it might have been performed. Instead, the goal of this dissertation is to offer 'sonic possibilities' for a historically informed contemporary performance practice of early nineteenth-century high-tenor operatic singing.

To this end, the objective of this research is to attempt a plausible reconstruction of the historical singing technique of the high tenors who performed in Italian opera in the period between approximately 1770 and 1850. As what follows will demonstrate, singers effectively began with the falsetto register, typically considered a weak 'effeminate' sound, and modified its production into a more powerful 'tenor sound', one homogenous with that of the lower, chest register of the tenor voice. The resulting vocal production is referred to throughout this dissertation as the 'pharyngeal voice'. The 'pharyngeal voice' added several notes to a tenor's normal range and offered a level of agility and projection that was otherwise unavailable to male singers.⁵

To answer these questions, the dissertation is divided into three sections: Historical Treatises and Terms, Singers and Repertoire, and Historical Reconstruction.

Section I looks at the historical context for 'pharyngeal voice' through an investigation of historical vocal treatises and other contemporary literature such as diary and press reports of singers' performances. The literature is analysed to bring clarity to terminology and pedagogical concepts, as well as trying to understand how they developed over time, in an attempt to create a foundation for the 'pharyngeal voice'. While no

⁵ 'Pharyngeal voice' currently remains without a concise universal definition, but represents a term explored by the work of Alexander Mayr and Randy Buescher; this is further discussed below. See: Buescher, R. and Sims, S. 'The Female Pharyngeal Voice and Theories of Low Vocal Fold Damping', *Journal of Singing*, 68(1) (2011): 23–8; Riggs, R. *Singing for the Stars* (Van Nuys, CA: Alfred Publishing, 1998), p. 46; See below FN 10 also.

treatises of the period considered deal with the ‘pharyngeal voice’ specifically, most present generalised techniques which were intended to be used for training most voices. Concepts of registration, vocal timbre, and resonance are brought together with historical pedagogical exercises such as the *coup de la glotte*, *messa di voce* and the *portamento* and these have been used to define potential exercises for use in the reconstruction of ‘pharyngeal voice’, which forms the subject of Section III.

Section II is divided into two parts. Part I includes performance histories of leading outstanding singers who employed the ‘pharyngeal voice’, which was critical to their ability to sing the roles created for them by the generation of operatic composers that included Rossini, Donizetti and Bellini. Critical reception and contemporary descriptions of their voices is used to help define the vocal quality of the ‘pharyngeal voice’. Part II of the section focusses on case studies drawn from repertoire that demonstrate the specific abilities of each of these tenors. The studies clarify precise details of range, tessitura and other parameters, and offers a sort of ‘fingerprint’ for each of the singers and their abilities.⁶

Section III sets out several techniques and pedagogical exercises which have been identified through my own practical research in the teaching studio over the past seven years that establish the practical reconstruction of the ‘pharyngeal voice’. Although I draw on historical pedagogical information for the dissertation, contemporary vocal terminology is quite often used in the demonstrations to define the vocal acoustics of the ‘pharyngeal voice’ where this provides clarity.⁷ I have the good fortune to work with singers with no previous hard and fast conceptions of how to achieve ‘classical’ singing technique or style. This has provided me with what is effectively a clean slate where the singer has no muscle memory or imposed vocal identity, on which to inscribe a way of using the voice. Visual and audio media have been employed to help demonstrate the techniques described in the text.

⁶ Because the careers of the key singers, and also the performances of most operas discussed, were not restricted to a single region, conclusions relate to the Italian peninsula as a whole, rather than to the regional nature of what was pre-unification Italy. Subsequently, questions of local pitch will have less impact on the larger discussion; where local pitch has had a significant impact on a particular opera, or singer, this is noted.

⁷ Bozeman, K. *Practical Vocal Acoustics* (Hillsdale, NY: Pendragon Press, 2013), p. 2–3 – ‘Voice acoustics are comprised primarily of two factors: a voice source or vibrator, which produces a set of harmonics, and a vocal tract filter or resonator, which selectively strengthens or weakens frequencies that are introduced into it by the voice source.’ Computer programs such as *VoceVista* can be used to analyse the acoustics of the voice in order to produce verifiable data.

Defining the ‘Pharyngeal Voice’

Neither historical nor modern sources have produced consensus about the vocal quality of the tenors of the first half of the nineteenth century, which leads to important questions about definitions.⁸ I have chosen ‘pharyngeal voice’ as both a modern and historical term because it has been in use, even if infrequently, throughout the relevant period and in modern times.⁹ While there is almost no way of knowing if nineteenth-century singers or pedagogues would have thought of the ‘pharyngeal voice’ as a term relating to a distinct phenomenon, the term has significant traction in contemporary vocal pedagogy (to warrant its use throughout this dissertation). Just as the term ‘bel canto’ was not used until the so-called bel canto period was nearly over, ‘pharyngeal voice’ acts as a descriptor for a historical phenomenon for contemporary use. The term does not describe a single sound or phenomenon but rather encompasses a range of acoustic and mechanical possibilities for which I adopt the term ‘pharyngeal voice’.

Because there is no standard definition of the term ‘pharyngeal voice’, it has been necessary for me to create a workable definition that simultaneously arises from its historical context and understood relative to the ‘modern’ tenor voice. Other terms have been used to describe how tenor singers of the period may have sung their highest notes. These include *falsesttone*, used by some singing teachers in Italy such as Sherman Lowe, and by musicologists including Rodolfo Celletti, as well as performers including Gregory Kunde and Lawrence Brownlee.¹⁰ Meanwhile, the tenor and musicologist John Potter has used the

⁸ A difficulty arises when deciding what the principal quality of the ‘pharyngeal voice’ is. As will be demonstrated in the second part of this dissertation, there is little doubt that the mechanism is *falsestto* based; however, that does not indicate the overall vocal quality being *falsestto*-like in sound, which would preclude a distinctive high tenor quality. There is indeed a distinction between the term *falsestto* as a vocal mechanism, and the contralto quality normally associated with the vocal production used by modern ‘counter-tenors’. While it is not the intention of the research to defend the tenor vocal quality, it is predicated thereupon, and will demonstrate how tenor vocal quality may be produced by a *falsestto* mechanism.

⁹ Paneron, A. *Méthode de vocalisation* (Munich: Eck & Comp., 1845) pp. 7–8. Paneron describes the *voix féringienne* (*voce faringea* / ‘pharyngeal voice’) as the *falsestto* being modified by the resonances of the pharynx. Herbert-Caesari published an article called ‘The Pharyngeal Voice’, *The Musical Times*, 91(1287) (1950), p. 178 and a chapter entitled ‘The Pharyngeal Voice’ in his book *The Voice of the Mind* (London: R. Hulbert Hale Ltd., 1951), in which he posits that the voice is composed of three layers, the first of which is the *falsestto*, the middle being the ‘pharyngeal voice’ and the lower layer the chest voice. Buescher, ‘Pharyngeal Voice’, 2011; Riggs, *Singing*, 1998, p. 46; Clippinger, D. *The Head Voice and Other Problems: Practical Talks on Singing* (Boston: Oliver Ditson Co., 1917).

¹⁰ Sherman Lowe (b. 1953) is an American teacher of singing based in Venice who studied at the Manhattan School of Music. He teaches and adjudicates throughout Italy. Celletti uses this coinage throughout his

term ‘pure falsetto’ to describe how tenors produced their highest notes in the period, suggesting that these singers sounded more like modern countertenors than high lyric tenors.¹¹ My own research has however led me to conclude that while the two voices (*falsettone* and ‘pure falsetto’) may share similar registration, they are essentially dissimilar and represent distinctly different vocal qualities. *Falsettone* represents the ‘high’ or pharyngeal tenor voice and ‘pure falsetto’ is fundamentally a misunderstanding of the high tenor vocal quality. This misunderstanding is discussed further in the section entitled ‘Vocal Quality’, below. Because of this, I sometime use ‘pharyngeal voice’ as an equivalent for different Terms that were used during the nineteenth century, such as *falsettone*, ‘feigned voice’, *voce finta*, etc. This allows for disparate terms to be together under an overarching concept and allow me to show that each is a permutation of the same phenomenon, which I term ‘pharyngeal voice’.

The term ‘pharyngeal voice’ has been chosen over the term *falsettone* to reflect the movement in contemporary singing practice toward the use of the former term in English, that is equivalent to the Italian terms *voce faringea* and *falsettone*. Pharyngeal voice is currently in use by a variety of specialist teachers and singers to describe an as yet undefined vocal phenomenon across musical genres and voice types that occurs when the normally ‘alto’ sound of the male falsetto voice, or, indeed, the natural (soprano) sound of the female head voice is produced in such a way as to resemble chest voice, regardless of gender. There are, however, very few scholarly references to the ‘pharyngeal voice’ as a direct translation of *falsettone*, as it is used by Celletti.

Edgar Herbert-Caesari was possibly the first to coin the term ‘pharyngeal voice’ in his 1950 *Musical Times* article ‘The Pharyngeal Voice,’ and a subsequent chapter in his book *The Voice of the Mind*. Herbert-Caesari says that the term is translated from the Italian *voce faringea* and ‘was used by exponents of the old school merely to describe a peculiar tonal quality produced by a distinctive mechanism’.¹² He states that the tenors of the Rossini,

writings. See Celletti, R. *Voce di tenore* (Milano: Idealibri, 1989); Celletti, R. *A History of Bel Canto* (Oxford: Clarendon, 1991); Celletti, R. *Storia del Belcanto* (La Nuova Italia, 1986).

¹¹ Potter, J. *Tenor, History of a voice* (London: Yale Univ. Press, 2009) and Potter, J. ‘The tenor–castrato connection, 1760–1860’, *Early Music*, 35(1) (2007) p. 97, Potter goes on to suggest that the French *haute-contre* was the equivalent of the high tenor, where the Italian counterpart the *contraltino* was more like a modern countertenor.

¹² Herbert-Caesari, *Voice*, 1951; Herbert-Caesari, ‘Pharyngeal’, 1950, p. 178; See also, Herbert-Caesari, E. *Tradition and Gigli, 1600-1955: a panegyric* (London: R. Hale, 1963); Herbert-Caesari, E. *Vocal Truth. Some of the Things I Teach* (London: R. Hale, 1969).

Bellini, Donizetti were taught to sing with the ‘pharyngeal voice’ which was ‘mixed very carefully with both the falsetto and chest voices,’ and that this is the method by which the ‘tenors, in particular, were able to produce perfect *messa di voce* even on the highest notes.’¹³ Unfortunately, the term *voce faringea* was not found in any other historical literature and is not mentioned by researchers besides Herbert-Caesari, except for a recent book by a research colleague working in this area, Alexander Mayr.¹⁴

The French writer Auguste-Mathieu Panseron referred in 1845 to the French equivalent, *voix féringienne*, but uses the term to refer to ‘head voice’ because he considers the pharynx to be the ‘principal modifier’ of the head voice, as opposed to chest voice or ‘laryngeal tones’.¹⁵ My conclusion is that he was not referring to the ‘pharyngeal voice’ as defined in this dissertation. In his 1856 book *Human Physiology* Robley Duglison described the ‘pharyngeal voice’ as presenting ‘only modifications’ of the standard voice types of baritone, tenor, and soprano, and that ‘it is met with in but few persons in its finest development’.¹⁶ He further indicates that it is produced by the baritenor, contraltino tenor, and the *soprano sfogato*. He suggests that it is ‘formed at the guttural aperture, circumscribed by the base of the tongue, *velum palati*, its pillars, and the tonsils’.¹⁷ This definition will come full circle later in the dissertation. Duglison’s use of term ‘pharyngeal voice’ would suggest a familiarity or common understanding of it, but there is no further reference to it in his work. Aside from these references, there is scant evidence for the terms and their usage.

I have chosen to maintain the use of the English term because my interest is in the ‘pharyngeal voice’ phenomenon continuing to develop as a concept in singing pedagogy. Questions regularly asked of me about this voice refer to the term ‘pharyngeal voice’ rather than *voce faringea* or any other. In fact, even when inquiries come from Italian sources none have used the term *voce faringea*; the more common term is *falsettone*. Randy Buescher and Seth Riggs are two contemporary singing teachers who use the term ‘pharyngeal voice’ to describe the same vocal phenomenon which I have been working to establish.¹⁸ Non-

¹³ Ibid.

¹⁴ Mayr, A. *Voce faringea: Eine Kunst der Belcanto-Tenöre Geschichte - Physiologie und Akustik – Übungen* (Kassel: Bärenreiter, 2018).

¹⁵ Panseron, *Méthode*, 1845, pp. 7–8.

¹⁶ Duglison, R. *Human Physiology*, 2 (Philadelphia: Blanchard & Lea, 1856), p. 340.

¹⁷ Ibid.

¹⁸ Buescher, ‘Pharyngeal Voice’, 2011; Riggs, *Singing*, 1998, p. 46.

academic materials and anecdotal evidence have indicated that perhaps the term *voce faringea* was originally translated from English into Italian (rather than the reverse) to give it more validity as a historical pedagogical concept. Much of what is available in terms of research regarding the term *voce faringea* is directly associated with the recent work of Alexander Mayr.¹⁹ Because interest in the ‘pharyngeal voice’ is not limited to classical music, I think it would be unfortunate to contribute to the research area while using a term inconsistent with current research broader interests and terminology. I propose that as there is no consistent nineteenth-century terminology for what I plan to show was a singular phenomenon, that ‘pharyngeal voice’ be adopted as a working term. This work is an organic outgrowth of my own vocal development as a tenor and my practice as a singing teacher. It arises from my conviction, based on experience as a teacher, that the ‘pharyngeal voice’ concept can be reconstructed. Second, it offers an exciting and legitimate approach to tenor singing that is appropriate to a remarkable and unjustly neglected repertoire. This is partly because it simply fell out of fashion in the nineteenth century, but also because the technical demands it makes on tenor singers are no longer matched by contemporary teaching and singing styles.

There is a prevailing assumption that only the ‘modern’ tenor voice is valid for singing classically in the upper register, and it is almost impossible to find a voice teacher either willing or capable of training a tenor in the ‘pharyngeal voice’ method. Singers with the potential to achieve this technique are usually treated as either in need of the correction of a vocal fault or advised to sing as a baritone. However, based on my own research and practice as a singer and teacher, I am convinced that the concept of the ‘pharyngeal voice’ represents a vital part of singing that has an important contribution to make to the historical performance moment – especially because of its relative lack of progress in terms of reconstructing singing relative to advances in instrumental practice. Furthermore it is essential to understanding a significant part of the *bel canto* tradition. The musicologist and singer John Potter points out a parallel between the reconstruction of historical instruments and the reconstruction of historical singing techniques.

The most pervasive example of this notion is embodied in the concept of ‘bel canto’, a style of singing lost forever except to those who possess its secrets. One might expect, therefore, that singers in search of this vocal el dorado

¹⁹ Mayr, *Voce faringea*.

would look for clues in historical sources with a view to improving the present state of things. This does indeed happen: there has been no revolution in singing techniques to compare with the reconstruction of historical instruments, but singers and conductors involved in early music are much more familiar with written sources than they used to be.²⁰

This research is directed towards understanding what pharyngeal singing might have been in the past and the inspiration of its reconstruction as an element of contemporary singing; or as Stephen Preston has put it, 'to explore the possibilities of the creative present, not to recreate the sounds of history.'²¹ My research provides evidence of the existence and historical validity of this voice type and argues that it has inherent viability as a contemporary classical instrument. And, through the continued instruction of the technique, a foundation in its development and use can be forged.

²⁰ Potter, J. 'Beggar at the Door: The Rise and Fall of Portamento in Singing', *Music & Letters*, 87(4) (2006) p. 523.

²¹ Preston, S. 'Sounding Aporia: navigating via historical impossibility to a new sonic world', Conference presentation from *The Construction of Musical Performance Norms* (London: King's College, 24 May 2014)

Section I – Historical Treatises and Terms

Introduction

The historically-based analysis presented here is focused solely on the practical application and realization of theoretical techniques for developing the ‘pharyngeal voice’, which I have extrapolated from treatises. How these techniques apply to vocal training in general is beyond the scope of this dissertation, but the implications of reconstructing ‘pharyngeal voice’ as part of contemporary pedagogy are referred to when relevant. While a wide range of treatises have been analysed, those chosen for discussion in this chapter are those which specifically shed light on the ‘pharyngeal voice’ or provide other directly contextual relevant information.²² Investigation of how leading eighteenth- and nineteenth-century pedagogues developed vocal theory (from one based on two registers to one that

²² Important discussions of key historical vocal treatises can be found in the following: Agricola, J. *Anleitung zur Singekunst* (1757), *Introduction to the Art of Singing by Johann Friedrich Agricola*, Baird, J. (ed. and trans.), (Cambridge Univ. Press, 1995); Barbier, P. *The World of the Castrati* (London: Souvenir Press, 1998); Beicken, S. *Treatise on Vocal Performance and Ornamentation by Johann Adam Hiller* (Cambridge Univ. Press, 2001); Brown, *Performance Practice 1750–1900*, 1999; Burney, C. *The Present State of Music in France and Italy* (London, 1771, facs. Elibron Classics, 2005); Burney, C. *A General History of Music, From the Earliest Ages to the Present Period* (London, 1789); Caruselli, S. (ed.), *Grande enciclopedia della musica lirica*, 4 (Rome: Longanesi & C. Periodici S.p.A., 1980); Coffin, B. *Historical Vocal Pedagogy Classics* (Boston: Scarecrow Press, 1989); Duey, P. *Bel Canto in its Golden Age: A Study of its Teaching Concepts* (Columbia, NY: King’s Crown Press, 1951, facs. Read Books, 2007); Elliott, M. *Singing in Style: A Guide to Vocal Performance Practices* (New Haven: Yale Univ. Press, 2006); Foreman, E. *A bel canto Method: or How to Sing Italian Baroque Music Correctly, Based on the Primary Sources* (Minneapolis, MN: Pro Musica Press, 2006); Tosi, P. *Opinioni de’ cantori antichi, e moderni o sieno osservazioni sopra il canto figurato* (Bologna, 1723); Tosi, P. *Observations on Florid Song*, Galliard, J. (trans.), (London, 1743, facs. London: William Reeves Bookseller Ltd., 1967); Hawkins, J. *A General History of the Science and Practice of Music* (London, 1776, repr 1875, facs. Graz: Akademische Druck, 1969); Howard, P. *A Critical Translation from the Italian of Vincenzo Manfredini’s ‘Difesa Della Musica Moderna/in Defence of Modern Music (1788)’* (New York: Edwin Mellen Press, 2002); Mason, D. ‘The teaching and learning of singing’, in Potter, J. (ed.), *The Cambridge Companion to Singing* (Cambridge Univ. Press, 2000); Monahan, B. *The Art of Singing* (Metuchen, NJ: Scarecrow Press, 1978); Mount Edgcumbe, R. *The Musical Reminiscences of the Earl of Mount Edgcumbe* (London, 1834, facs. Boston: Da Capo Press Inc, 1973); Potter, J. and Sorrell, N. (eds.) *A History of Singing* (Cambridge Univ. Press, 2012), esp. Ch. 4; Potter, ‘Beggar’, 2006; Stark, J. *Bel Canto: A History of Vocal Pedagogy* (Univ. of Toronto Press, 2006); ‘Garcia in Perspective: His *Traité* After 150 Years’, *Journal of Research in Singing* 15(1): pp. 2-55; Toft, R. *Bel Canto: A Performer’s Guide* (Oxford Univ. Press, 2013); Wistreich, R. ‘Reconstructing pre-Romantic Singing Technique’ in *The Cambridge Companion to Singing*, Potter, J. (ed.), (Cambridge Univ. Press, 2000): 178–91; ‘Lost voices’, *Early Music*, 35(3) (2007): 456–458; ‘Teaching and Practising Historically Informed Singing: Who Cares?’ *Basler Jahrbuch für Historische Musikpraxis*, 26 (2002): 17–30; Coffin, B. *Coffin’s Overtones of Bel Canto: Phonetic Basis of Artistic Singing: with 100 Chromatic Vowel-Chart Exercises* (Boston: Scarecrow Press, 1980); *Coffin’s Sounds of Singing: Principles and Applications of Vocal Techniques with Chromatic Vowel Chart* (Boston: Scarecrow Press, 1987); Reid, C. L. *A Dictionary of Vocal Terminology - An Analysis* (New York: J. Patelson Music House, 1984); *Bel Canto: Principles and Practices* (London: Coleman-Ross Co. Inc., 1950); ‘Eighteenth Century Registrational Concepts’, *Journal of Singing*, 56(4) (2000): 31–38; *Essays on the nature of singing* (Huntsville, TX: Recital Publications, 1992).

describes as many as four) shows some influence of a 'scientific' approach to vocal pedagogy during the period. This coincided with major developments in the demands being made on operatic voices in general during the period. Important to this pedagogical development is the emergence of the concept of a 'feigned voice', which then develops into the idea of a 'mixed voice' and becomes the basic register upon which the 'pharyngeal voice' can be built.

Though not all are quoted at length, the principal works to which I will be referring are:

Pier Francesco Tosi (c. 1653–1732)

Opinioni de' cantori antichi e moderni (1723)
Observations on the Florid Song (1742/3)

Johann Friedrich Agricola (1720–1774))

Anleitung zur Singkunst (1757) / *Introduction to the Art of Singing* (2009)

Giovanni Battista Mancini (1714–1800)

Riflessioni pratiche (1774)
Practical Reflexions on the Figurative Art of Singing (1776)
Réflexions pratiques sur le chant figuré: Avec 4 planches (1795)

Domenico Corri (1746–1825)

The Singer's Preceptor (1810/11)

Isaac Nathan (1790–1864)

Musurgia Vocalis (1836)

Manuel Garcia (snr.) (1775–1832)

Exercises and Method for Singing (1824)

Manuel Garcia (jnr.) (1805–1906)

Mémoire sur la voix humaine (1840 & 1847)
École de Garcia: traité complet de l'art du chant (1840 and 1847)
Scuola di Garcia: Trattato completo dell'arte del canto (1842)
École de Garcia: Traité complet de l'art du chant (1847 and 1985)
Garcias Schule oder Die Kunst des Gesanges (1843 and 1847)
Nouveau traité sommaire de l'art du chant (1856)
Garcia's New Treatise on the Art of Singing (1870)
Garcia's Treatise on the Art of Singing (1924)
A Complete Treatise on the Art of Singing (1841 & 1872 – Paschke 1984)

Francesco Lamperti (1813–1892)*L'Arte del Canto (1883)**Guida teorico-pratica-elementare per lo studio del canto (1864)**The Art of Singing (1884), English version of L'Arte del canto (1883)**The Art of Singing (1890)***G. B. Lamperti (1839–1910)***Techniques of Bel Canto (1905)**Vocal Wisdom (Brown 1931)***Salvatore Marchesi (1822–1908)***A Vademecum (1902)*

I have chosen to examine treatises that help to demonstrate the relationships between their authors' methods, and to establish the continuity of the concept of the 'pharyngeal voice', rather than choosing works which are not explicitly relevant and then attempt to establish relevance by conjecture. The chosen treatises have been analysed for what each has to say about three principal concepts: registration, resonance, and breath management, but only insofar as how each of these concepts specifically affects the development of the 'pharyngeal voice'. Section I establishes the concepts that are elaborated upon in Section II, which is a set of studies of the repertoire of a series of leading tenors who during the late eighteenth and early nineteenth centuries employed the technique to clearly extraordinary success. Mostly, the techniques described in the treatises are generalised and historically were not designed to develop the 'pharyngeal voice'; so to be relevant to this dissertation, a great deal of practical experimentation has been employed to test out hypotheses and assumptions (see Section III). Therefore the general concepts described in many of the treatises have needed to be modified in the light of practical experimentation based on the needs specific to the development of a modern 'pharyngeal voice'.

In this dissertation, the first three treatise writers (and to some extent Domenico Corri, a student of Nicola Porpora (1686—1768) provide a set of foundational texts upon which my historical understanding of the importance and nature of the registers relevant to the 'pharyngeal voice' is based. Beyond concepts of registration and register blending, including the specific technical elements of *messa di voce* and the *portamento*, these early

texts do not provide detailed descriptions directly relevant to the ‘pharyngeal voice’. Rather as the foundational texts of eighteenth-century vocal pedagogy writing, they frame the subsequent discussion, further developed by reference to the work of their students and disciples.

In considering these treatises, it is important to note that what can be gleaned from them is naturally limited. The principal reason for this is that singing is essentially the performance of sound and despite their best intents or efforts, writing is inherently incapable of conveying accurately the authors’ ideas, regardless of eloquence or detail. This is intrinsically bound up in, and compounded by, the second problem: the lack of readers’ ability to interpret accurately what was written. The authors would first have been pupils of singing and then singing teachers themselves, all of them would have understood the process of learning to sing as something done in person, the master teaching the pupil by example, just as today. Reasons for publishing treatises vary over history and for each author: – ranging from the establishment of professional credentials, competition for attention from influential employers and patrons, to plainly commercial reasons. But it is unlikely that any of them expected (or indeed would have wanted) anyone to think that they would be able to learn to sing or to teach singing simply by reading a book. Therefore, the explanations of many elements in any treatise would presumably have been taken for granted as already understood by the reader, or to be supplemented with verbal explanations and demonstrations by a teacher. Therefore the ‘technical elements’ are very often inadequately discussed to be of straightforward use to a modern reader. Or they are overlooked entirely. For example, many authors do not discuss the inherent qualities of the registers, particularly *falsetto*, most likely because its qualities as a vocal sound might have been commonly understood. Writers such as Tosi, Mancini and Corri did not discuss vocal timbre in depth or offer specific directions on how to accomplish many of their techniques.

Within the treatises, details concerning the potential vocal qualities of ‘pharyngeal voice’ tenors or how precisely such singers achieved their higher notes is absent. One assumption is that because the tenors used a non-standard technique, ‘explaining’ their voices was not an objective of treatises. The ‘pharyngeal voice’ is unlikely to have been of much interest to the main market of purchasers of singing treatises, because amateur singing was primarily an activity for women; some of them clearly achieved a very high level, but most bourgeois and upper-class women had no option but to exercise their love of

singing at home, although the wealthiest of them provided the greatest means of support for famous Italian singing teachers, especially in Britain in the 18th and early 19th centuries. Such treatises were presumably used either in combination with lessons or as substitutes for those not able to afford a famous teacher. Some treatises, such as Tosi's, appear to be aimed also at teachers themselves. Additionally, perhaps the precise mechanics of art singing were generally unknown to begin with, leaving solid explanation of its techniques shrouded in a certain amount of mystery.

Because the techniques discussed in these treatises are essentially 'universal' and were used to develop all voice types, it seems reasonable to conclude that through analysis and modification they could apply equally to the 'pharyngeal voice'. I have discovered no extant historical exercises which were incontrovertibly used for the development of the 'pharyngeal voice'. However, through analysis and synthesis of what information is available, I believe that I have reliably identified enough to develop functional exercises, which are described in Section III which demonstrates these exercises and techniques and shows how the historical exercises can be modified for the development of the 'pharyngeal voice'.

Pier Francesco Tosi's *Opinioni de' cantori antichi e moderni* (1723) was the first widely distributed singing treatise of the eighteenth century and was therefore one of the most important. The methods it describes provided a model for future writers.²³ Agricola's *Anleitung zur Singkunst* (1757) is effectively an extended translation of Tosi's work into German with a running commentary.²⁴ According to Julianne Baird, by 1757 Tosi's *Opinioni* was already considered outdated and Agricola was attempting to update the work by adding his commentary that would both bring it up to date, by referring to contemporary singers, make it more relevant to a German audience and to address what he perceived to be 'a serious lack in the musical life of Agricola's countrymen'.²⁵

In the same year that Tosi's *Opinioni* was published, Giovanni Battista (Giambattista) Mancini (1714–1800) became the singing master at the Imperial Court of Vienna, where he

²³ Stark, *Bel Canto*, 2006, p. 157.

²⁴ Agricola, *Anleitung*, 1995, p. 1.

²⁵ *Ibid.*

lived until his death.²⁶ Mancini was a student of the castrato Antonio Bernacchi (1685–1756) who had himself been a student of Francesco Antonio Pistocchi (1659–1726).²⁷ I have chosen Mancini not just because his treatise was also widely known, but also because he represents an important link in the tradition associated with Francesco Lamperti. Although published more than half a century later, Mancini's work *Riflessioni pratiche* (1774) is similar in scope to Tosi's *Pensieri e riflessioni*.

In his *Riflessioni pratiche* (1774), Mancini focuses on breath support, registers, register blending, acoustic balance, mouth shape, *portamento*, and *messa di voce*.²⁸ While representing an important step in the development in pedagogy as described in treatises, treatment of each element of singing is generalized; he has, however, a tacit awareness of the interactions of the vocal organs, breath control, and balanced harmonics. Mancini is usually referenced as a model of the 'two-register theory' of eighteenth-century vocal pedagogues. He represents the starting point for this research not in as much as it completely proves the concept of the 'pharyngeal voice', but because it is a foundational scientific advance that contextualises more complex theories found in subsequent treatises. Like Tosi, Mancini was a castrato, and whether teaching castrati or 'intact' voices including tenors, his registration theory and demonstrations would have been influenced by his own vocal experience. It is my working theory that the vocal quality produced by the castrati was significantly similar to, or a form of, the 'pharyngeal voice'. For example, leading 'pharyngeal voice' tenors including Ansani and Garcia (snr.), discussed below, studied with castrati and would certainly have modelled both their techniques and their sounds on castrato singing.²⁹

²⁶ Mancini, G. *Pensieri e riflessioni pratiche sopra il canto figurato* (Vienna: Ghelen, 1774); Mancini, G. *Practical Relections on the Figurative Art of Singing* (Milan, 1776, facs. Boston: The Gorham Press, 1912), p. 4; Rosselli, J. 'Mancini, Giovanni Battista [Giambattista]', *Grove Music Online*, accessed 14 Jan 2019.

²⁷ Mancini, *Practical*, 1776, p. 30; Winton, D. 'Bernacchi, Antonio Maria', *Grove Music Online*, accessed 14 Jan 2019

²⁸ Celletti, *History*, 1991; Coffin, *Historical*, 2002; Duey, *Bel Canto*, 1951; Pleasants, H. *The Great Singers: From the Dawn of Opera to Our Own Time* (New York: Simon and Schuster, 1966); Rosselli, J. *Singers of Italian Opera* (Cambridge Uni. Press, 1992); Stark, *Bel Canto*, 2006.

²⁹ This can bring into consideration the vocal quality of the castrati, which I will investigate in subsequent research. For more information on castrati see: Clapton, N. *Moreschi and the Voice of the Castrato* (London: Haus Books, 2008), particularly ch. 3 acoustics of the castrato voice; Bowman, H. *A Study of the Castrati Singers and their Music* (Dissertation: Indiana Univ., 1952); Bragaglia, A. 'Degli "evirati cantori": contributo alla storia del teatro', *Amor di libro*, 5 (1957): 67–76, 163–72, 229–36; vi (1958), 41–8, 103–8, 155–62, 237–44; vii (1959), 45–50, 78–83; Freitas, R. 'The Eroticism of Emasculation: Confronting the Baroque Body of the Castrato', *Journal of Musicology*, 20(2) (2003): 196–249; *Portrait of a Castrato: Politics, Patronage, and Music in the Life of Atto Melani* (Cambridge Univ. Press, 2009); 'Sex without Sex: An Erotic Image of the Castrato Singer', in Findlen, P., Wassying Roworth, W., and Sama, C. (eds.), *Italy's Eighteenth Century: Gender and*

Domenico Corri was a student of the composer and singing teacher Nicola Porpora.³⁰ There is no extant full singing treatise by Porpora, though there are a few published works of dubious attribution, one of which is still in print by Ricordi.³¹ Hence the treatise *The Singer's Preceptor* (1810/11) by his student Corri and subsequently that of Corri's own student Isaac Nathan are key links in providing an understanding of the concepts that Porpora probably taught.³² According to Kurt Markstrom's and Michael F. Robinson's article on Porpora, his teaching influenced not only Corri, but also many other singers through the nineteenth century.³³ Corri's work, while clearly inspired by Tosi's book (published almost 200 years before his own), was primarily aimed at amateur singers rather than budding professionals, although it may well have been used by its purchasers in conjunction with practical lessons from professional teachers. It focuses on the traditional elements of 'good singing', including registration, the *messa di voce* and *portamento*.³⁴ It is not until *Musurgia Vocalis* (1836) by Isaac Nathan that the first glimpse of a scientific explanation of a register mechanism is seen that may help to explain the 'pharyngeal voice' in detail.³⁵

Isaac Nathan was educated at Cambridge and was then apprenticed by his father to Domenico Corri in London (1809) for training in singing and composition. He later became Corri's assistant and then an independent singing teacher in his own right.³⁶ His *Musurgia*

Culture in the Age of the Grand Tour (Stanford, CA: Stanford Univ. Press, 2009); Heriot, A. *The Castrati in Opera* (London: Secker & Warburg, 1956); d'Ollincan, C. [C. Ancillon] *Traité des eunuques* (Berlin, 1707; Eng. trans., as *Eunuchism Displayed*, 1709); Pampaloni, C. 'Giovani castrati nell' Assisi del settecento', *Musica/Realtà*, 8 (1987): 133–53; Rosselli, J. 'The Castrati as a Professional Group and a Social Phenomenon, 1550–1850', *AcM*, 60 (1988): 143–79; Strohm, R. 'Aspetti sociali dell'opera italiana del primo settecento', *Musica/Realtà*, 2 (1981): 117–41.

³⁰ Corri, D. *Singers' Preceptor* (London: Chappell & Co., c. 1810) p. 8; Potter, J. 'Vocal Performance in the 'Long Eighteenth Century'', in Lawson, C. and Stowell, R. (eds.), *The Cambridge History of Music Performance* (Cambridge Uni. Press, 2012); Lawson, *Historical Performance*, 2018); Jones, P 'Domenico Corri', *Grove Music Online*, revised by Cowgill, R. (Oxford: Oxford Univ. Press 2001) accessed 14 April 2019; Potter, *History of Singing*, 2012.

³¹ Porpora, N. *Porpora's Elements of Singing*, Harris, M. (ed.), (London: Addison, Hollier & Lucas, 1858); Porpora, N. *Sofeggi Fugati*, Nava, G. (ed.), (Leipzig: Breitkopf & Härtel, ND); Porpora, N. *25 Vocalizzi ad una voce e a due voci (fugate): con accompagnamento di cembalo o pianoforte* (Milano: Ricordi, 1957 & 2009).

³² The *Singers' Preceptor* is one of several 'treatise-like' books published by Corri for the mass market which include: *A Complete Musical Grammar 1787*, *A Musical Dictionary 1798*, *The Art of Fingering 1799*, but also operas, sonatas and a book of songs. Corri, *Singers' Preceptor*, 1810; Maunder, R. 'Domenico Corri's Treatise on Singing' (New York: Garland, 1995); See also: Potter, *History of Singing*, 2012, esp. ch. 4; Toft, *Bel Canto*, 2013; Wistreich, R. 'Corri, Domenico', in Lawson, *Cambridge Encyclopedia*, 2018.

³³ Markstrom, K. and Robinson, M. 'Porpora, Nicola', *Grove Music Online*, accessed 16 Dec. 2018.

³⁴ Wistreich, 'Corri', 2018, p. 154.

³⁵ Nathan, I. *Musurgia Vocalis* (London: Fenton, 1836).

³⁶ Ogdon B. 'Bel canto training in Niccolò Porpora's England with a twentieth century rationale', *The Phenomenon of Singing*, 2 (2013), p. 170.

Vocalis is not so much a treatise on the art of singing as much as it is a dissertation essay on the nature of voice and sound, taking in a multitude of topics including the voices of animals, ancient music and the development of the voice through history. In his practical pedagogical writing, Nathan is consistent with Corri on the use of the *messa di voce*, breath control and the blending of registers from chest to head. He develops upon his teacher's concept of blending registers by introducing reference to an 'intermediary register', which he calls the 'feigned voice.' Although this term is already found in the work of Corri, Nathan distinguished the feigned voice from the *falsetto* and indicated that it was a distinct register which could be further refined and given an independent use.³⁷ Taken together Nathan and Corri are important sources for this research because of their detailed definitions of registers, clarifications in the use of the *messa di voce*, and provision for a solid basis for future investigation. Other than what has been presented above, Nathan's work does not present a significant departure from the principles laid out by Corri, either in terms of breath control, intonation or articulation.

Giovanni Ansani (1744–1826), as well as being one of the most successful tenors of the eighteenth century, became a renowned teacher and was the principal teacher of Manuel Garcia (snr.) in Naples. Fétis remarked that Ansani 'affectionately took Garcia and revealed to him the secrets of that teaching which had been for so long the glory of Italy'; this is thought to refer to the immense influence the prominent eighteenth-century Neapolitan teacher Nicola Porpora, famously the teacher of Carlo Broschi (1705–1782) otherwise known as Farinelli, had on vocal pedagogy and almost certainly Ansani.³⁸ Ansani not only taught Garcia (snr.) but he also gave 'informal lessons' to Garcia (jnr.) at the age of

³⁷ Nathan, *Musurgia*, 1836, p. 117.

³⁸ From Fétis, F. *Revue Musicale*, 12 (1832), p. 158, 'Ansani, l'un des derniers rejetons de cette grande école qui jeta un si grand éclat dans les dix-septième et dix-huitième siècles, Ansani dont les plus fameux castrats redoutaient le trop dangereux voisinage, prit Garcia en affection et lui révéla les secrets de cet enseignement qui avait fait si longtemps la gloire de l'Italie.'; quoted in - Radomski, J. *Manuel Garcia (1775–1832): Chronicle of the Life of a bel canto tenor at the Dawn of Romanticism* (New York: Oxford Univ. Press 2000), p. 289: In his speech at Garcia's funeral, Paulin Richard said: 'Ansani, the last of the offspring of that great school which shone so brightly in the seventeenth and eighteenth centuries; Ansani, whose dangerous presence the most famous castrati dreaded, affectionately took Garcia and revealed to him the secrets of that teaching which had been for so long the glory of Italy.'; See also: Celletti, *History*, 1991; Celletti, *Voce*, 1989; Potter, *Tenor*, 2009. Though there is no historical evidence, historians such as James Stark and Teresa Radomski suggest that Ansani may have been a student of Porpora, but even if he were not, he was certainly a disciple of his work.; Stark, *Bel Canto*, 2006, p. 4; Radomski, T. 'Manuel Garcia (1805–1906), A Bicentenary Reflection.' *Australian Voice* 11 (2005): 25–41, p. 4.

ten, but like Porpora, Ansani did not leave any written record of his teaching methods.³⁹ If Ansani was at least a disciple of Porpora, the treatises by Corri and Nathan may help to clarify the style of singing that provided the foundations to both Garcias, father and son.

Corri's *The Singer's Preceptor* (1810/11) represents a significant landmark in the development of the pedagogical narrative discussed in this dissertation. In his book Corri offers simple exercises that could easily be used for training in general musicianship, reflecting its intended market of amateur singers. As Ogdon points out, 'he deals with intonation, ornaments, cadenzas, rhythmic patterns, and solfeggio, as if these things alone would produce cascades of effortless fioritura and the long breath lines and brilliant tone that made Farinelli' such a brilliant performer.⁴⁰ The interpretation and ear of the *maestro* is thus indispensable in discerning the correctness of any given technical exercise. While far less 'scientific' than Garcia's treatises, Corri nevertheless provides a key source for understanding the historical basis of important aspects of this research, including 'feigned' voice (i.e., *false*) and methods for defining the 'natural voice' or chest voice.⁴¹

Manuel Garcia (snr.) was a renowned tenor, especially known for his work with Rossini but also for his singing of Mozart baritone roles, particularly *Don Giovanni*, something which is discussed in Section II. Garcia (snr.) produced his vocal treatise *Exercises and Method for Singing* in 1824 after opening his school of singing at his home at 21 Dover St. Piccadilly, London.⁴² His work consists of 339 exercises for the voice and comes with scant information on how to perform them. The lack of explanation is likely to be that Garcia had recently founded his school and wished for paying students to purchase his exercises and regularly attend his lessons, where technical matters would be explained and taught. His treatise offers eight individually numbered 'rules' for use of the treatise: in terms of technique, he advises students to use clean distinct vowels without aspiration and offers some minor suggestions on posture.⁴³ He begins his treatise with multiple versions of the *messa di voce* and the *portamento*.⁴⁴ He spends a considerable amount of time developing

³⁹ On Garcia's lessons with Ansani, Radomski, T., 'Manuel Garcia (1805–1906)', 2005, p. 4.

⁴⁰ Ogdon, 'Bel canto', 2013, p. 170.

⁴¹ Corri, *Singers' Preceptor*, 1810, p. 66.

⁴² *The London Times*, (30 Jan. 1824), p. 1; Garcia, M. *Exercises and Method for Singing* (London: T. Boosey & Co., 1824). This book, like those by Corri, was intended for amateur singers such as the pupils he would have taught at his fashionable Piccadilly, London singing school.

⁴³ Garcia, *Exercises and Method*, 1824, pp. 1–2.

⁴⁴ *Ibid.*, 4.

ever more difficult *fioritura* and dedicates at least half of the treatise to the art of improvisation. Exercises 337–9 are three accompanied pieces, in which he makes use of much of what has been covered in the rest of the treatise.⁴⁵

The singing treaty by Manuel Garcia (snr.) is included in my discussion primarily because he is one of the important exponents whose technique is analysed in detail in Section II and is in fact the only singer whose technique is analysed in this dissertation who produced his own vocal treatise.⁴⁶ His son, Manuel Garcia (jnr.), studied with his father but never succeeded as a singer, although he would become one of the most influential vocal pedagogues of the nineteenth century. His works are highly detailed in their discussion of registers, timbres, *mesa di voce*, *portamento*, and a seminal description of the *tenore contraltino* relevant to the ‘pharyngeal voice’. Although Garcia (jnr) only discusses concepts related to the ‘pharyngeal voice’ indirectly, his works provide the most significant single resource for a reconstruction of the voice.

Although Manuel Garcia (jnr.) did not have a successful career as a singer, he became possibly the most influential vocal pedagogue of the nineteenth century, and his influence is still felt today.⁴⁷ He was born in Spain and accompanied his father to Italy, France, England and as far as America. He aided in the vocal instruction of his sisters, Maria Malibran (1808–1836) and Pauline Viardot (1821–1910), two of the most successful singers of the nineteenth century. Garcia (jnr.) taught singing at the Paris Conservatory (1830–48), succeeding Alexis de Garaudé, who published *Méthode complète de chant*, and then for fifty years at the Royal Academy of Music (1848–95) in London where would die at 101 years of age.⁴⁸ His work, *Mémoire sur la voix humaine* was presented to the French Academy of Science in 1840. It was subsequently included in his seminal work, the *Traité Complet de l'Art du Chant* published later that year with a second volume appearing in 1847, a work which is still used in vocal pedagogy to this day, not least through its English translation, *Garcia's New Treatise on the Art of Singing*, first published in 1870.

⁴⁵ Ibid., 40–9.

⁴⁶ Giovanni Rubini produced a series of 12 Vocalises but not a vocal treatise; Rubini, G. *12 Lessons in Modern Singing for Tenor or Soprano* (Milan: F. Luca approx. 1850). The work by Manuel Garcia (snr.) is considered a treatise for this dissertation because he offers some rule by which the singers should abide rather than just offering vocalises with no comment.

⁴⁷ Wistreich, R. ‘Singing’, in Lawson, *Cambridge Encyclopedia*, 2018, pp. 579-80.

⁴⁸ Garaudé, A. *Méthode complète de chant*, 2nd augmented and improved edition (Paris: Chez l’auteur, 1841).

In the preface to the 1840 *Traité* Garcia discusses his commitment to continuing the methods taught to him by his father.

The son of an artist generally appreciated as a singer ... I have collected his instructions, fruits of a long experience and of a most cultivated musical taste. It is his method which I have wanted to reproduce by trying to reduce it to a more theoretical form and by attaching the results to the causes.⁴⁹

Whether Garcia is humble about his own contribution to the vocal tradition, using his father's greatness to forward his reputation, or honestly portraying his act as scribe, his father was clearly a tremendous influence on the development of this great teacher.

The most important elements in the works of Garcia (jnr.) for this research are his development of the concepts of three registers (chest, falsetto or medium, and head voice); the 'vocal onset' method or *coup de la glotte* (stroke of the glottis); timbres; the *chiaroscuro* (light and dark vocal quality); the 'pinching' [*pincement*] of the glottis; and what has become known as 'anterior phonation'.⁵⁰ Unlike the father and son Lamperti, Garcia did not, however, particularly concern himself in his treatises with breathing and vocal support.

Francesco Lamperti and Giovanni Battista Lamperti were father and son pedagogues, neither of whom had singing careers of their own. They both taught at the Milan Conservatory, although G. B. Lamperti also taught in Dresden and Berlin.⁵¹ They each had several pupils of repute, including Marcella Sembrich (1858–1935), who studied with both father and son.⁵² The treatises written by both Francesco and G. B. Lamperti have been

⁴⁹ Garcia, M. *A Complete Treatise on the Art of Singing, Part 1*, Paschke, D. (ed. and trans.), (New York: Da Capo Press, 1984), p. xvii.

⁵⁰ On registers in Garcia see, M. *Garcia's New treatise on the art of singing. A compendious method of instruction, with examples and exercises for the cultivation of the voice* (Boston: Oliver Ditson, c. 1870), p. 6; On the *coup de la glotte* see, Garcia, M. *École de Garcia: traite complet de l'art du chant* (Paris: E. Troupenas et Cie: L'auteur, 1847) p. 25; On the 'pinch of the glottis' see Garcia, *Nouveau traite sommaire du l'art du chant* (Paris: M. Richard, 1856) pp. 6, 10, 12 ; For 'anterior phonation' see Garcia, *New*, c. 1870, p. 7, and Stark, *Bel Canto*, 2006, p. 25; According to John Catford, 'In anterior phonation the arytenoid cartilages are apparently clamped tightly together and only the front, ligamental part of the glottis participates in phonation. In the five-fifths setting, 'the entire length of the glottis – both the arteries (ligamental) and the posterior (arytenoidal) parts – can be regarded as (potentially) functioning as a single unit.' Catford, J. *Fundamental Problems in Phoniatrics* (Bloomington: Indiana Univ., 1977), p. 102; Castellengo, M., 'Garcia Manuel Jr: A clear-sighted observer of human voice production', *Logopedics Phoniatrics Vocology*, 30(3-4) (2005): 163-170.

⁵¹ Forbes, E. 'Lamperti, Francesco', in *Sadie, S. (ed.), The New Grove Dictionary of Opera* (Oxford Univ. Press, 1997).

⁵² Marcella Sembrich was a famous Polish soprano who trained with the Lampertis and debuted as Elvira in Bellini's *I puritani* in Athens in 1877. She would go on to sing internationally including Lucia in Donizetti's *Lucia di Lammermoor* at Dresden (1878), Covent Garden (1880) and the Metropolitan Opera (1883). Phillip Miller says of her, 'her success in New York was immediate' and she remained a prima soprano until 1909. She had a 'perfectly matched scale' with a range from c' to f''' and her prominent roles were Violetta and Gilda (Verdi),

influential in the development of my understanding of the experience of vibration in the vocal tract. Experiments performed during the practical research for this dissertation which were inspired by their treatises have helped to define what has become the foundation for ‘pharyngeal voice’ in this reconstruction.

The final treatise writer I have drawn upon is Salvatore Marchesi, the husband of the singing teacher Mathilde Marchesi. While mostly upholding the theories of his teachers (both the Lampertis and Garcia (jnr.)), some of Salvatore Marchesi’s comments contribute to a clearer understanding of the vocal quality of the ‘pharyngeal voice’.⁵³

Francesco Lamperti was an Italian singing teacher and contemporary of Manuel Garcia (jnr).⁵⁴ In 1864 he published his *Guida teorico per lo studio del canto* which is a short work that represents the general principles and practical application of his technical tradition.⁵⁵ Lamperti said that the only singers able adequately to perform roles by Rossini or other old masters were ‘those whose voices have been trained in the old school’, implying that even in his own day, the style of singing which is the focus of this study may have been in decline, or at least, out of fashion.⁵⁶ The techniques he describes, particularly those passed on to his son G. B. Lamperti, are central to the reconstruction ‘pharyngeal voice’. Lamperti (snr.) focuses predominantly on breath control, vocal timbre and registers

Rosina (Rossini), Zerlina, Susanna and the Queen of the Night (Mozart), as well as Elsa in *Lohengrin* and Eva in *Die Meistersinger* (Wagner). She went on to teach at the Curtis Institute of Music in Philadelphia where her students included Dusolina Giannini, sister of Eufemia Giannini Gregory, and Queena Mario. Millier, P. ‘Sembrich, Marcella’ (Grove Music Online, 2001) accessed 13 Sept. 2019; Somerset-Ward, R. *Angels and Monsters: Male and Female Sopranos in the Story of Opera, 1600–1900* (New Haven: Yale Univ. Press 2004) p. 271, discusses how Sembrich worked with Francesco Lamperti; he also mentions that as a young man, Francesco Lamperti had studied with Giuditta Pasta at her academy in Como; Forbes, ‘Lamperti’, 2002, Forbes mentions Sembrich in her brief discussion of G. B. Lamperti in the biography of his father, Francesco Lamperti. See also: Arnim, G. *Marcella Sembrich und Herr Prof Julius Hey* (Leipzig, 1898); Goddard, H. *A Recollection of Marcella Sembrich* (New York: Da Capo Press, 1950 repr. 1982).

⁵³ Macy, L. (ed.) ‘Marchesi, Mathilde’, *The Grove Book of Opera Singers* (Oxford univ. Press, 2008), p. 302. See also Joiner, J. ‘The Vocal Principles of Garcia as Represented by His Pupils: Bataille, Marchesi, and Stockhausen’ (Dissertation: Louisiana State Univ., 1979); Stockhausen, J. *A Method of Singing* (London: Novello, 1884); Shakespeare, W. *The art of singing* (Oliver Ditson: 1910).

⁵⁴ Radomski J. and Fitzlyon, A. ‘Garcia’ (Grove Music Online, 2001) accessed 25 Mar. 2014.

⁵⁵ The title of the work *Guida teorico per lo studio del canto* seems to suggest that it’s intended as a theoretical explanation of the practical principles of singing teaching – i.e., acknowledging that singing teaching is something that is all done in the studio, but that in a scientific age, in which teachers want to be taken seriously as professionals, it is useful to be able to provide a pedagogical theory to back up what the teacher does. The subsequent English translation *The Art of Singing* from 1890 is a mostly faithful if partially incomplete translation of his work; See also Lamperti, F. *L’arte del canto in ordine alle tradizioni classiche ed a particolare esperienza: norme tecniche e consigli agli allievi ed agli artisti* (Milan: Ricordi, 1883).

⁵⁶ Lamperti, F. *The Art of Singing*, Griffith, J. (ed.), (New York: G. Schirmer, 1890) p. 23.

(mainly registration of the middle voice), but also demonstrates a concern for agility and evenness of vocal production.

Giovanni Battista Lamperti (jnr.) provided clarification of some of the techniques in his father's *Guida teorico*. One of the most important matters he discusses concerns pharyngeal resonance, or in his terms, the focus of the tone 'in the centre of the skull.'⁵⁷ While the only work published by G. B. Lamperti (jnr.) is *The Technics of Bel Canto* (1905), his personal notebooks, bequeathed to his student W. E. Brown (1839–1910) were subsequently published posthumously as *Vocal Wisdom: Maxims of Giovanni Battista Lamperti* (1931). Like his father Francesco, Giovanni Battista concerned himself predominantly with breath control, abdominal / diaphragmatic support, open vowels, registers and what he calls 'resonance'.⁵⁸ I originally derived the concept of 'pharyngeal voice' as it is used in this dissertation from G. B. Lamperti's concept of 'resonation', or as he puts it 'the place where the vibration of "ng" [as pronounced in the word "England" with a 'sensation' of a slightly narrowed pharynx not a relaxed dull one] is located'.⁵⁹ I have come to understand and subsequently to explain this concept in my own teaching as 'vibration in the pharynx'.

Salvatore Marchesi studied with both Lamperti (snr.) in Milan and then with Garcia (jnr.) in London, where he met his wife, the mezzo-soprano, Mathilde Marchesi (1821–1913).⁶⁰ She herself had been a student of Garcia (jnr.) and became a famous voice teacher in her own right. Salvatore Marchesi represents a unique fusion of the Lamperti and Garcia traditions in that he uses many of the Lamperti techniques, including his concepts of diaphragmatic breathing and the backwards-tilting larynx for the upper registers.⁶¹

⁵⁷ Lamperti, G. B. *Vocal Wisdom: Maxims of Giovanni Battista Lamperti*, Strongin, L. (ed.), Brown, W. (trans.) (New York: Taplinger Publishing Co., 1931) p. 39.

⁵⁸ Lamperti, F. *Art*, 1890, p. 20

⁵⁹ Lamperti, G. *Vocal*, 1931, p. 56; In English, some accents pronounce the 'ng' in a dull and non-resonant way. The 'ng' in this instance is a vibrant sound with a distinct vibration felt behind the soft palate, and without 'tongue backing' (withdrawing the tongue into the pharynx). In conversation with Ken Bozeman, he questioned whether the sensation of narrowing in the pharynx 'is actual or just perceptual—an ng, depending upon its production and palatal location, might rather open the pharynx, but feels narrowed there.' This suggests the kinesthetic perception of the singer could lead them to feel as if the pharynx is narrowed but is in fact opening, and vice versa. Bozeman, K. 'Personal Interview', 26 August 2020.

⁶⁰ Forbes, E. 'Salvatore Marchesi', in Macy, W. (ed.), *The Grove Book of Opera Singers* (Oxford Univ. Press, 2008), p. 302.

⁶¹ On diaphragmatic breathing Marchesi, S. *A Vademecum* (New York: G. Schirmer, 1902) p. 17; On the tilting larynx see Marchesi, S., *A Vademecum*, 1902, p. 39.

It is also possible to trace the influence of Mancini's work through to Marchesi. While there is a gap of nearly 130 years between the publication of their respective treatises, their similar concern for breath control is pervasive, and the way in which Mancini speaks about the resonance balances of the 'mouth and *fauces*' (the small hollows on the sides of the pharynx in the back of the mouth near the adenoids) could arguably be the origin of Lamperti's form of resonance tuning.⁶² Their shared concepts of breath control and resonance in the pharynx are guiding forces in the development of the performance practice central to this dissertation.

Pedagogical Concepts

The first vocal pedagogical concept to be discussed in this study is 'registration', which includes both physiological and acoustical mechanisms.⁶³ Through analysis of what the treatise writers each had to say on the subject, concepts of registration are historically established and discussed in respect of the development of the 'pharyngeal voice'. The second concept is 'resonation'. Principles of vocal acoustics will be used in Section III to describe how the how the 'natural' resonances of the vocal tract interact to produce the distinctive sounds of the 'pharyngeal voice' and to explain how such resonations as described by different pedagogues relate to the registers. 'Acoustic balance' (another way of characterising resonance) is represented in *bel canto* pedagogy by the learning of technical elements including *portamento*, *messa di voce*, blending of registers and managing changes in vocal timbres.⁶⁴ Thirdly, the pedagogical approach to breath control is investigated in order to understand how it affects the other two categories. In none of my chosen treatise are exercises or concepts presented that are specific to the development of

⁶² On Mancini 'mouth and fauces', Mancini, *Practical*, 1776, p. 96.

⁶³ The treatise writers offer two basic ways of understanding registers: those like Garcia (snr.) who describe registers as being exclusively produced by the mechanics of the vocal mechanism, and on the other hand those like Lamperti, both father and son, who taught that registers are products of where the sensation of the voice is experienced, not a product of the vocal mechanism. This dissertation makes use of both concepts and through the use of laryngeal setting and tuning of the resonances of the vocal tract describes pedagogical methods that aim to harness and reconcile the use of mechanical and acoustic registers. For more on vocal acoustics see Appendix 1: A brief introduction to vocal acoustics.

⁶⁴ Pharyngeal resonance, or the focus of the tone 'in the centre of the skull,' becomes a fundamental technique in Lamperti's works which describe the methods for the blending of registers and attainment of the tenor vocal quality in the *mixed* and *head voice*. Garcia defines timbres as different 'modes of vibration' that can be modified by the height of the larynx, width of the pharynx, shape of the mouth and other factors, and are associated with vocal colouring.

the 'pharyngeal voice'; rather, the exercises are relevant to all types of voices, and it was up to the teacher to determine how they should be applied respectively to different singers. For this reason, establishing a specific curriculum for the 'pharyngeal voice' is largely an exercise in extrapolation, personal experimentation, and further investigation based on teaching students over the period of a decade.

Understanding Registers

To understand the ‘pharyngeal voice’ a discussion of the basic qualities of vocal registers is essential and includes knowing how registers interact with one another and what muscular coordination and acoustic differences there are between them.⁶⁵ The relevant registers of the adult voice are listed in most modern art-singing treatises from the mid-nineteenth century onwards by relative pitch range from lowest to highest: chest register, feigned ‘voice’, mixed ‘voice’, *falsetto* register, and head register.⁶⁶ This section discusses how concepts of registration and blending evolve into a genuinely ‘mixed voice’ called the feigned voice by Isaac Nathan.⁶⁷ The feigned voice and its effect on the head voice are shown in Section III to be essential to the reconstruction of the ‘pharyngeal voice’

The discussion of what constitutes a register and its particular vocal quality is complex and can be confusing to singers. In the discussion of registers and vocal qualities a distinction is made between what is a register and what is a ‘voice’, i.e., chest *voice* versus chest *register*. The definition of register is based on the description by Garcia as being a mechanical process at the level of the larynx, and a ‘voice’ is understood as the resulting sound, which is affected by the acoustics of the vocal tract and heard by the listener; it may sound similar or different to the ‘normally accepted’ qualities of the respective register, depending on the acoustic effects of vocal tract shape. ‘High chest voice’ sound is understood as a modification of the normally accepted quality of the higher-register *falsetto*, feigned voice, head voice etc., towards a vocal quality normally associate with that of the chest voice. I propose that the modification creates a ‘mixed’ quality of two registers precisely as discussed by Garcia regarding the *contraltino* voice found in Section II, part ii of this dissertation. The remainder of this chapter is concerned with how the mixed register

⁶⁵ Kitzing P. ‘Photo- and Electroglottographical Recording of the Laryngeal Vibratory Pattern During Different Registers’, *Folia Phoniatica*, 34(5) (1982): 234-41; Reid, C. ‘The Intensity Factor in Vocal Registration’ *The Journal of Research in Singing*, 9(1) (1985): 43-60; Van den Berg, J. ‘Vocal Ligaments versus Registers’, *The NATS Bulletin*, 19 (1963): 16–31.

⁶⁶ Where possible the term register is used to denote the basic mechanical register consistent with the description by Garcia. Where the term ‘voice’ is used, it denotes a vocal quality similar to the named register i.e. chest register is the basic mechanism and chest voice is any permutation of registers and acoustical qualities that acoustically resemble chest register. Like the ‘pharyngeal voice’, terms like ‘feigned voice’ and ‘mixed voice’ are not registers in themselves but are complex mixes which denote a unique vocal quality and coordination of registers and acoustics.

⁶⁷ Nathan, *Musurgia*, 1836, p. 117.

developed, both historically and what technical modifications it can undergo; and how that is perceived by both the singer and the listener as having a 'mixed quality.'

The principal eighteenth-century *bel canto* pedagogues (Tosi, Agricola and Mancini) were all proponents of a two-register theory. Effectively echoing Tosi and his German translator and editor Agricola, Mancini believed that 'the voice, for its natural constitution, ordinarily divides itself into two registers, one called chest register and the other head, or *false*.'⁶⁸ He goes on to explain that as the tone rises the muscles contract strongly, and vice versa for descending tones, but not much mention is made of whether the larynx itself rises or falls differently depending on the pitch or register.⁶⁹ The movement of the larynx is, however, described as a necessary factor of pitch change in both Corri and Nathan, and for changing the timbre of the voice by Garcia: according to him, the larynx rises for higher pitches and falls for lower pitches.⁷⁰

The two registers are distinguished primarily by their basic unmodified individual characteristics. Other than indicating that the head voice is shriller than the chest voice, there is little in terms of a description of their distinctive vocal qualities. He writes: 'The medium and low tones are naturally more homogeneous, sonorous and pleasing, because they come from the chest, while the head tones are more difficult to perfect because they are shriller.'⁷¹ Mancini does not ascribe specific qualities to the two registers in order to distinguish them; rather, he says that '[e]very student, whether he is soprano, contralto, bass or tenor, can easily know the difference between these registers. He needs only to sing the scale to test this.'⁷² Any singer needs only sing up (or down) a scale until they reach a point when they can go no further without having to make a physical adjustment: this is changing register. Furthermore it is up to the singer to know 'which is the last note that

⁶⁸ Mancini, *Pensieri*, 1774, p. 43, 'La voce, per costituzione sua naturale, ordinariamente è divisa in due registri, che chiamarsi, l'uno di petto, l'altro di testa, o sia *false*.' See also Mancini, *Practical*, 1776, p. 58.

⁶⁹ Mancini, *Pensieri*, 1774, p. 39, 'la stringono nell'esprimere gli acuti, e la dilatano ne' gravi; Mancini, *Practical*, 1776, p. 54.

⁷⁰ This echoes very similar observations made in treatises published in the seventeenth and eighteenth centuries. See Wistreich, 'Reconstructing', 2000, p. 180.

⁷¹ Mancini, *Practical*, 1776, p. 68; Mancini, *Pensieri*, 1774, p. 53, 'Le corde di mezzo sono per loro natura omogenee, e grate; così pure le corde più profonde perché provenienti dal petto. La voce acuta è più difficile a ridursi, perché in quella situazione è stridente.'

⁷² Mancini, *Practical*, 1776, p. 58; Mancini, *Pensieri*, 1774, p. 44, 'Ogni Scolare, sia egli Soprano, sia Contralto, sia Tenore, sia Baffo, può da per sé con tutta facilità conoscerne la differenza di questi due Sparati registri. Basta, che cominci a cantare la scala...'

summons the force of the chest, and which is of the first note of the head, or falsetto.⁷³

Once the two registers have been established, singers next need to undertake a programme of painstaking and gradual exercises to achieve a blending of the passage between the chest and *falsetto* registers by disguising the natural register 'break' to reach a point where it appears there is a seamless singing voice. This 'union' of chest and head voice occurs only 'through difficult study and the strict application of precepts of the art'.⁷⁴

Mancini indicates however that while the voice ordinarily divides itself into two registers, some singers are gifted with the ability sing entirely in the chest register.⁷⁵ It is fascinating that Mancini believes the ability to sing entirely in the chest register is a 'gift' considering that his primary concern, as well as for the other early writers, is the development of the castrato voice. Richard Wistreich writes that 'evidence suggests that castrati retained the ability to take the chest voice register [upwards to about b' or c'' and even further].'⁷⁶

In his *Storia del bel canto* published in 1983 (translated into English in 1991) Rodolfo Celletti described the vocal quality of castratos as a 'sort of reinforced falsetto' (which he calls *falsettone*) that was 'sufficiently round and bright', and further indicates that the castrati 'adjusted the intensity and strength of the chest notes to bring them to some extent in line with the *falsettone*'.⁷⁷ In a footnote he says that Bernacchi, the teacher of Mancini, was credited with what he considered to be incorrectly called 'chest voice production'.⁷⁸

But with the Bolognese school, and perhaps also the Neapolitan school of Porpora from which Farinelli came, people began to speak of chest voice production even in relation to the higher-register and agility passages. Here, however, the old teaching theories (in particular that of Mancini) went wrong, exactly the same way as the theorists of the nineteenth century likewise went wrong apropos of the tenor's 'top c in chest voice' (*do di petto*). The fact is that the Bolognese school blended into the falsetto register certain characteristics of the chest voice, obtaining full, ringing sounds on

⁷³ Mancini, *Practical*, 1776, p. 108; Mancini, *Pensieri*, 1774, p. 88, 'qual sia l'ultima nota, che gli somministra la forza del suo petto, e qual sia l'altra, che da principio è moda al registro di testa, o sia falsetto.'

⁷⁴ Mancini, *Practical*, 1776, p. 109 ; Mancini, *Pensieri*, 1774, p. 88, 'Questa totale unione dev'esser dunque prodotta generalmente dallo studio, e dagli aiuti dell'arte.'

⁷⁵ Mancini, *Practical*, 1776, p. 58; Mancini, *Pensieri*, 1774, p. 43 'La voce, per costituzione sua naturale, ordinariamente è divisa in due registri, che chiamarsi, l'uno di petto, l'altro di testa, o sia falsetto.'

⁷⁶ Wistreich, 'Reconstructing', 2000, p. 179

⁷⁷ Celletti, *History*, 1991, p. 113; As was discussed previously, *falsettone* is the term used in contemporary Italian pedagogy to describe the vocal characteristics of the 'pharyngeal voice'. 'Pharyngeal voice' was chosen over *falsettone* because of a preference in contemporary English language research and pedagogy. (Buescher, Herbert-Caesari et. al.)

⁷⁸ Celletti, *History*, 1991, p. 113.

high notes. But to achieve this, it had always to use the change of register and always make use of the 'mixed voice' (*voce mista*) [*voix mixte*], since high notes in 'chest voice' do not exist.⁷⁹

Celletti describes the *falsesttone* (which I suggest is a useful Italian synonym for what I call the 'pharyngeal voice') as having been produced in such a way that the singer blended the falsetto register with that of the chest to create a homogenous mixed voice tone capable of producing full ringing chest voice qualities on high notes. His description of the technique is consistent with the findings of my own research as a singer and pedagogue and is clearly demonstrated in the reconstructions shown in the recordings in Section III.⁸⁰

Blending Registers: Complications of registers and their interactions

For Mancini, the art of the singer is to make the blending of registers imperceptible and to have a unified quality throughout the entire vocal range where 'each tone is on the level with the best tone.' He argues that 'the worth of a voice will always depend upon its evenness of quality throughout the whole register and perfect intonation.'⁸¹ He goes on to say that 'it requires [such] management and a careful use of the voice to render it equally sonorous and pleasant, that few students achieve; and it is few teachers who know the principles, and who know how to execute them'.⁸² This evenness of vocal quality is characterized by registration balance, the equivalent strength of the chest and 'medium tones' to that of the head register which is essential to the development of the 'pharyngeal voice'. Mancini does not distinguish the medium tones as a separate register, but one might

⁷⁹ Ibid.

⁸⁰ He goes onto suggest that this technique was passed onto the tenors of the early nineteenth century and further describes how this was regarded among the prevailing schools of singing. Just as Celletti suggests that many have been wrong about the nature of the tenor chest voice high c'' natural perhaps the same goes for the *contraltino* and subsequently the castrato. If the 'pharyngeal voice' did indeed, as could be inferred from this dissertation, sound more like a tenor than a countertenor then perhaps the castrati sang more in a chest voice like sound than that of a countertenor. Considering that if the 'pharyngeal voice' technique produces a chest-voice quality using falsetto and head registers, rather than chest register, origins of the 'pharyngeal voice' as a castrato technique could be legitimated as is suggested by Celletti. Ibid., 112–3.

⁸¹ Mancini, *Practical*, 1776, p. 68.

⁸² Mancini, G. *Réflexions pratiques sur le chant figuré: Avec 4 planches* (Paris: Chez du Pont, 1795) p. 53, 'Le grand art des chanteurs doit être de rendre imperceptible le plus ou moins de difficulté qu'ils ont à rendre les sons des deux registres. Il faut, pour cet effet, les unir finement; mais il n'est pas facile d'y réussir d'une manière naturelle et simple. Il faut de l'application, de la fatigue et de l'adresse pour corriger les défauts provenant plus ou moins de la constitution des organes; cela exige un tel ménagement de la voix, pour la rendre sonore et agréable, que peu d'écoliers peuvent s'en tirer, et qu'il est peu de maîtres qui en connaissent les règles pratiques, et qui sachent les faire exécuter.'

infer that he simply means the tones that occur in the transition area from chest to head voice.

Mancini sees the unification of vocal registers to be of utmost importance, and this is no less true for the 'pharyngeal voice'. His concepts about management of register blending are echoed by subsequent authors. Mancini indicates that the only way to correct imperfections in the voice 'is to follow the natural instinct' unless that instinct is to 'force Nature', which he distinctly warns against.⁸³ He also indicates that the first step is to develop the chest register and then after dedicated study, to begin to 'mingle' the lower notes of the 'second register' into the vocalising and solfeggio practice while never allowing him to push the voice. In Mancini's case by 'second register' he means 'head' register, but the advice is equally relevant to the 'pharyngeal voice'. He goes on to say that singing moderately with a 'lightness of breath', or very little breath pressure, will allow the singer and teacher to detect and correct vocal faults. And, by refraining from over-singing, the student will not exaggerate inherent register differences.⁸⁴ His concept of 'lightness of breath' probably indicates a form of breath management. Regardless of the era, breath management is a physical fact in singing that allows a slow movement of breath and low subglottal pressure to facilitate register blending. Simply put, less pressure on the voice allows for a freer tone with less muscular engagement and therefore a gentler transition. Mancini follows up by suggesting that whichever register is stronger should be held back in order to facilitate the blending of the weaker register with that of the stronger.⁸⁵

In the blending of registers Mancini advises against simply 'pushing through' the upper limit of the chest register and on into the head (*falsetto*), which makes it a reasonable assumption that he advocates a registration concept and resonance strategy that encourages a voice focused in the higher register. This is because his register blending exercise is based on lightening the sound as the singer approaches the upper limit of the chest in order to make a smooth transition to the head, which has the effect of favouring the brightness of the falsetto over the 'body' of the upper chest.⁸⁶ He says, 'the voice, so to

⁸³ Ibid., 60.

⁸⁴ Ibid., 103–5

⁸⁵ Ibid., 105.

⁸⁶ Bozeman, *Practical*, 2013, p. 20, A resonance strategy is the modification of the vocal tube by the singer to selectively tune the first three formants of the voice to available harmonics. See also Appendix 1: A brief introduction to vocal acoustics.

speak, suspends itself in descending from the highest to the lowest tones, and runs diverse modulations according to the varied manner in which the air is compressed by the larynx.⁸⁷ Basically, when blending the chest voice into the *false* or head voice, a sensation of the highest tones of the voice is should be present in all of the lower tones. Therefore, no mechanical action should be undertaken that would preclude the inclusion of sensations of upper register tones or make it difficult to blend easily into the head register from any lower point.⁸⁸

As Mancini indicates, the chest register should be ‘held back’ as head voice is ‘mingled’ with the chest through a ‘lightness of breath.’⁸⁹ Because the power of the chest register is subverted to facilitate release into the *false* and unify the transition it could make the priorities of the entire range subservient to the needs of the head register mechanism, rather than that of the chest, which would serve to exaggerate the transition, emphasising the differences between the vocal qualities inherent to each register. The concept of the entire voice being subservient to the head register mechanism is a core principle for the reconstruction of a ‘lost’ technique as described in this dissertation.

In order to move from one register to another, singers need to understand and learn to control the acoustic and physiological properties of each register and how they interact. The concept of suspending the voice from the highest tone has several mechanical and acoustical advantages, including encouraging low register transitions and aiding ‘resonance tuning’, both of which will be addressed in Section III. My practical research demonstrates that when the *false* register is prioritised and the chest register held back, the registration point between registers is lower than if the chest register is prioritised, which causes this register to be ‘pushed up’. The ‘portamento exercise’ illustrated in Section III (p.338) was developed specifically to exploit this relationship.

Following on from his advice to hold back the force of the chest voice in order to facilitate register blending, Mancini suggests that the first tone of any interval should be slightly adjusted and ‘pressed’ to mimic the qualities of the second tone (usually in head

⁸⁷ Mancini, *Practical*, 1776, p. 54; Mancini, *Pensieri*, 1774, p. 39, ‘Ella si spiega col canto per vari gradi acuti, e gravi; ella di sospende, e tremola per diverte modulazioni, cioè per le varie maniere, con le quali viene l’aria per la laringe espressa.’

⁸⁸ This precise idea will be seen in the discussion of registers by both Lamperti and could add weight to Lamperti’s claim that his technique indeed originated with Bernacchi.

⁸⁹ Mancini, *Practical*, 1776, pp. 103–5.

tone), to anticipate those qualities. This pressing creates a type of bridge between the tones and ‘balances’ the registers.⁹⁰ The ‘pressing’ is not interpreted as a recommendation to sing more heavily or with more force in the chest voice, but rather to increase the amount of glottal closure. It is notable that Mancini indicates that by pinching the glottis the singer will also gain more control of his breath and be able to achieve the *messa di voce*. The stronger glottal closure, with low sub-glottal pressure, is significant in that it produces stronger tunable harmonics and creates a deeper cord vibration in *falsestto* which eases the transition between chest and *falsestto* registers, each of which is explained further in Section III.

Feigned Voice

In terms of registers, what Domenico Corri has to say in *The Singer’s Preceptor*, published a generation after Mancini, is still very much in line with him. Domenico Corri also espouses a two-register theory and regards the voice as being composed primarily of the *chest* and the *falsestto* registers; the *falsestto* is also referred to interchangeably as the ‘feigned voice’.⁹¹ Corri posits that with the correct use of the *falsestto* or feigned voice the vocal range may be stretched as far as four octaves.⁹² He does not mention anything above the *feigned voice*, so an assumption may be made that it functions as the highest register, equivalent – albeit in slightly different terms – to an early understanding of the *falsestto-head* register found in Garcia’s early works discussed below.⁹³ Unlike Mancini, Corri is much clearer as to how the larynx behaves while singing through the registers. He argues that as the pitch rises, so does the larynx, and that when fixing the larynx in any one position it becomes rigid.⁹⁴ There seems to be a genuine interest in understanding the physiology of the larynx and its importance to singing, which reflects a general post-Enlightenment attitude to explaining physical phenomena. Corri quotes the physiological account of a ‘Dr.

⁹⁰ Mancini, *Practical*, 1776, pp. 112–3.

⁹¹ Corri, *Singers’ Preceptor*, 1810, p. 66.

⁹² *Ibid.*

⁹³ Garcia *falsestto-head* register see Garcia, *École*, 1847, p. 4 in ‘Mémoire’; Corri’s two registers see Corri, *Singers’ Preceptor*, p. 66.

⁹⁴ *Ibid.*, 5; Similar observations are found in both seventeenth- and eighteenth-century French singing treatises. See Wistreich, ‘Reconstructing’, 2000, pp. 180–1; This suggests that the possibility of singing with a fixed laryngeal position must have been known but rejected as undesirable.

Kitchiner' at some length, who described the function and behaviour of the larynx.⁹⁵ In the passage, Dr. Kitchiner apparently proposed that over the course of an octave the larynx could move as much as half an inch.⁹⁶ The concept of laryngeal flexibility is upheld throughout the treatise and Corri also affirms that the trill 'is effected by the flexible motion of the larynx'.⁹⁷ He insists that the natural flexibility of the larynx produces a powerful voice and steady tone and demonstrates its ability to ornament and sing *legato* (*portamento*).⁹⁸ For the purposes of the reconstruction described in this dissertation, a flexible larynx which is allowed to rise and fall to a small degree with the pitches was initially a difficult concept to master, because much contemporary teaching of the classical voice typically works actively against such movement; however my further research has indicated that it is necessary for successful production of the 'pharyngeal voice'.

In similar fashion to Mancini, Corri explains that once the singer has discovered the range of his chest voice (natural voice) he should then begin to 'connect' the chest register to the first note of the falsetto and to blend them so evenly that the transition is imperceptible to the ear.⁹⁹ He does not mention that the characteristics native to either

⁹⁵ Corri, *Singers' Preceptor*, 1810, pp. 4–5; William Kitchiner M.D. (1775–1827) was an English doctor, optician, developer of telescopes, amateur musician and student of Corri. His father, also William Kitchiner, amassed a fortune as a coal trader. William junior may be most well known for being an exceptional cook, and his cookbook, *Apicius Redivivus* or 'The Cook's Oracle' published in 1817 went through several editions and was a bestseller in England and the United States. It contains the first extant recipe for the potato crisp! Some of his other numerous works include an *Observations on Vocal Music and Singing* (1821: This date suggests that Corri discussed Kitchiner's ideas a long time before they were published) and, *A Collection of Vocal Music in Shakespeare*, 2 vols. (1864). Other works include an edition of *The Sea Songs of Charles Dibdin* (1850); See: Boase, G. 'Kitchiner, William', *Dictionary of National Biography, 1885-1900*, 31, (London: Smith, Elder & Co., 1900); McConnell, A. 'Kitchiner, William', (*Oxford Dictionary of National Biography* online) accessed 10 Sept. 2019; Bridge, T. *Dr William Kitchiner: Regency Eccentric: Author of The Cook's Oracle* (Lewes: Southover Press, 1992); Davies, E. *Dr Kitchiner and the Cook's Oracle* (Edinburgh: Pentland, 1992).

⁹⁶ Corri, *Singers' Preceptor*, 1810, p. 4.

⁹⁷ *Ibid.*, 7.

⁹⁸ The trill is an important aspect of training the 'pharyngeal voice' because it encourages the flexibility of the larynx and discourages it from being fixed in the low position, otherwise the trill will not occur. The flexibility of the larynx in part allows the 'pharyngeal voice' to demonstrate superior agility, portamento and register blending. This understanding completely changes the conception of vocal technique and manifests in different laryngeal behaviour which will be demonstrated through performance practice. It will further show how the upper register of the relevant tenors is only possible through use of the flexible larynx. 'The Scholar may even when absent from the instrument exercise the shake on any note which will contribute to render the organ of the throat flexible.' The trill and the messa di voce both are integral aspects of Bel Canto training and add to the development of the instrument and are not principally ornaments. Their use as ornaments should be considered as secondary to their use as methods of training the instrument and instructing the singer in laryngeal function and breath control.

⁹⁹ *Ibid.*, 66

register should be altered, but merely that the junction should be blended to provide a smooth transition.

Notably, Corri does not mention any development in, or changes occurring to the feigned voice itself in relation to its use in blending. He indicates only that it should become united to the chest. Because there is very little description of precisely *how* the registers interact, it seems reasonable to conclude that for Corri the act of blending would not fundamentally change the overall nature of the feigned voice itself, but that it retains its own character.

In the treatise *Musurgia Vocalis* (1836) by Corri's student Isaac Nathan, the feigned voice becomes a register in its own right, with distinctive qualities and functions. Nathan divides the falsetto register into subordinate registers, 'falsetto' and 'head', but also adds the 'feigned voice' as a fourth register in addition to the chest. The lowest register, or 'first register' is the chest voice, which he also calls the natural voice. The second register is the 'throat voice' named this way because Nathan describes it as being generated in the throat, though he subsequently calls it the falsetto.¹⁰⁰ The third register is called the head voice, but Nathan's falsetto seems to be more related to processes of the head, 'the process of breathing seems more than usually connected with the nostrils, and the sound is accordingly modulated by their influence.'¹⁰¹ This configuration was echoed in Garcia's later three-register theory, which is made up of chest, *falsetto* or medium voice, and head voice.¹⁰² Nathan, however, places a fourth register mechanism, the feigned voice, between chest and *falsetto*.

For Nathan, the feigned voice was a phenomenon separate from the *falsetto* with a character and function of its own.

There is a fourth kind of voice, which is but little appreciated, consequently rarely cultivated and since I cannot trace any sponsors, either among the Italian, or English, who have given a name to this peculiar style, I shall call it the feigned. I am aware that the falsetto is considered a feigned voice; and certainly that voice must be feigned which is produced by artificial constraint, and that does not consequently seem to come forth naturally from the chest; but the quality of the sound that I allude to is not that which is produced in the throat, and already distinguished under the name of falsetto; nor is it the

¹⁰⁰ Nathan, *Musurgia*, 1836, p. 117.

¹⁰¹ Ibid.

¹⁰² Garcia, *École*, 1847, p. 4 in 'Memoire' - However in his 1840–47 writings Garcia describes the falsetto-head as a single register where the head voice is actually an extension of the falsetto.

voce di testa. It is a species of ventriloquism, a soft and distant sound produced apparently in the chest, and chiefly in the back of the throat and head an inward and suppressed quality of tone, that conveys the illusion of being heard at a distance: It is as a sweet and soft melodious sound, wafted from afar, like unto the magic spell of an echo.¹⁰³

Nathan indicates that the feigned voice ‘does not consequently seem to come forth *naturally* from the chest’ but is a soft and distant ‘sound produced *apparently* in the chest, and chiefly in the back of the throat and head [emphasis added]’.¹⁰⁴ This is a complex and idiomatic way of describing a sound. It seems that Nathan is suggesting that the feigned voice is produced in the pharynx, or ‘back of the throat’ and the chest at the same time. He may be attempting to describe a type of ‘mixed voice’ which, like ‘pharyngeal voice’, seems to have chest voice qualities and therefore be produced ‘apparently’ by the chest voice. Seeing that the feigned voice is a subdivision of the falsetto, it is reasonable to imagine the feigned voice as being produced in the falsetto register but modified by the pharynx or ‘back of the throat’ in such a way as to have qualities of the chest register.¹⁰⁵

This definition of feigned voice as described by Nathan is the basis for my subsequent development of the idea of the ‘pharyngeal voice’ and its technical reconstruction. Nathan suggests a method for identifying the feigned voice which is wholly consistent with practical experiments in recovering the ‘pharyngeal voice’. He suggests that one can discover the feigned voice by exercising in falsetto register on the Italian [a] and by doing so, the student will find it ‘physically impossible to articulate’ in any way other than the feigned voice.¹⁰⁶ He then describes the perceived differences between the falsetto and the feigned voice:

[T]he falsetto is entirely governed by the contracted aperture of the mouth, the formation of which having no influence whatever in the production of the feigned voice: the intonation of the former is chiefly produced in the small cell or cavity above the arch of the mouth, called the internal nose; and the latter is formed at the back part of the head and throat, just above the glottis, where the uvula is situated [pharynx]. The veil of the palate becomes

¹⁰³ Nathan, *Musurgia*, 1836, p. 117.

¹⁰⁴ Ibid.

¹⁰⁵ This dissertation will assume the convention of describing the qualities of the chest register or chest voice as ‘modal’ rather than describing the qualities as chest-register-like.

¹⁰⁶ Ibid., 144–5.

elevated, which obstructs the sound from traversing the nasal passages, and is consequently compelled to pass direct and pure through the mouth.¹⁰⁷

The feigned voice, a sound that is produced predominantly in the head that is resonated in the pharynx which has strong chest voice components would indeed indicate a form of mixed voice and the location of the resonance described by Nathan is idiomatic for the ‘pharyngeal voice’.¹⁰⁸ His description of the feigned voice-falsetto relationship is also consistent with this research and describes a basic understanding of vocal acoustics as described in Section III.

Unlike Corri, who bridges the *falsetto* directly into the chest voice using the *messa di voce* technique that is in effect the same as the techniques described by Tosi, Mancini and other eighteenth-century pedagogues, Nathan uses the ‘feigned voice’ to create ‘a bridge’ between the two.¹⁰⁹ Nathan specifically indicates that the blending of the chest and falsetto registers ‘cannot be accomplished without the aid of the feigned voice, which may be justly considered the only medium or vehicle by which the *falsetto* can be carried into the *voce di petto* [chest voice].’¹¹⁰ Having the qualities of both registers allows the feigned voice to be used to blend the two registers and allow the singer to move between them without the characteristic ‘squeak’ that his teacher Corri disdains so much.¹¹¹ It would also imply that the quality of the chest voice should be carried up into the transition between registers, rather than bringing the head voice sound of the falsetto down to meet the chest register. This would have the effect of making the voice sound brighter and more ‘chesty’ at a somewhat higher pitch in the voice and would in no way contradict the idea of keeping the voice focused ‘high’. It would, however, have a pronounced effect on the interpretation of music.

¹⁰⁷ Ibid.; For more information on the behaviour of the soft palate during singing see Birch, P. et. al. ‘Velum Behavior in Professional Classic Operatic Singing, *Journal of Voice* 16(1) (2002): 61-71.

¹⁰⁸ Garcia (jnr.) and both father and son Lamperti considered the mixed voice to be central to the vocal technique and will be described later in the discussion of Garcia and the round timbre.

¹⁰⁹ The term used in this dissertation for the ‘bridge’ is the Italian term *passaggio*.

¹¹⁰ Ibid., 144.

¹¹¹ Corri, *Singers’ Preceptor*, 1810, p. 66.

Manuel Garcia: Falsetto-Head Register and Anterior Phonation

Manuel Garcia's (jnr.) register theory evolved over the course of subsequent versions of his work. In his early publications, like his predecessors, he considered the voice to be composed of two registers, the chest and the falsetto-head. However, after his use of the laryngoscope in 1854–55 he was able to observe the functioning of the larynx in operation and changed his analysis to a three-register theory, separating out a 'head' register from the *falsetto* register. Garcia is the first of the treatises writers to offer a physically based description of what a register is. He describes it as:

a series of consecutive and homogeneous sounds from low to high, produced by the development of the same mechanical principle, and whose nature differs essentially from another series of equally consecutive and homogeneous sounds, produced by another mechanical principle. All the sounds belonging to the same register are, consequently, of the same nature, whatever may be the modifications of timbre or force that they undergo to them.¹¹²

Register is thus considered to be a strictly mechanical phenomenon. Any acoustic changes that the sound may undergo through modification by the vocal tract will not affect the nature of the register, and consequently all sounds in the same register have the same 'quality and nature.'¹¹³ Judging by his definition of registers it is clear that he considered the head voice to be formed by a different 'mechanical means' to the *falsetto* register. Of central importance to the further understanding of the 'pharyngeal voice' according to Garcia's description of registers is that they are produced by a particular mechanism which is coordinated with the quality of the resulting sound.

Garcia gives a far more distinct description of registers and the ranges than earlier authors. He indicates that the limits of the registers do not vary by gender but are equal in male and female voices, and even more, that the changeover between registers occur in the same pitch area (on the same lines on the stave) in both sexes.¹¹⁴ For tenors chest voice is the lowest register and extends from the deepest notes that a voice can reach up to approximately f' natural (sometimes to a' natural), and the *falsetto*, which is the central

¹¹² Garcia, *École*, 1847, p. 6, 'Par le mot registre, nous entendons une série de sons consécutifs et homogènes de grave à l'aigu, produits par le développement du même principe mécanique, et dont la nature diffère essentiellement d'une autre série de sons également consécutifs et homogènes, produits par un autre principe mécanique. Tous les sons appartenant au même registre sont, par conséquent, de la même nature, quelles que soient d'ailleurs les modifications de timbre ou de force qu'on leur fasse subir.'

¹¹³ Ibid.

¹¹⁴ See also: Wistreich, 'Reconstructing', 2000, p.179.

register common to both men and women, overlaps the chest voice and extends upwards for about an octave and a half from g to about c'' sharp. Register extensions may vary in their extremities by gender, but Garcia says that the *falsetto* is central and equal in both.¹¹⁵ The *falsetto* is then connected 'end to end' with the head voice which extends upwards from c'' sharp / d'' flat, indicating that Garcia did not believe there to be any overlap between *falsetto* and head voice.¹¹⁶

Garcia is therefore the first published pedagogue to discuss the functions and qualities of the individual registers to a significant degree, and also how they interact. He describes the qualities of the chest voice as brighter or 'more brilliant' than the falsetto, requiring a 'more vigorous pinching of the glottis' which can be attained easily with the vowel [i].¹¹⁷ He says that the falsetto is the more 'veiled' of the two and permits a greater amount of air to pass through the vocal folds. Interestingly, Garcia also notes that when using the laryngoscope he observed that on low pitches the entire length of the vocal folds vibrate for both chest and falsetto registers.¹¹⁸ By defining the *falsetto* as being produced by the vocal tendons alone, Garcia is describing a *falsetto* function in the modern sense, and he is accurate in naming it such but he did not ascribe a vocal quality to it (see illustration 1

¹¹⁵ Garcia, *Complete*, 1984, pp. xlvi–vii.

¹¹⁶ Garcia, *New*, c. 1870, p. 6, If the locations of the registers do not vary by gender but rather occur on the same lines of the staff, and both genders experience the concept of *passaggio* in the relative locations between middle and upper registers, would it not be reasonable to deduce that there could be a secondary *passaggio* in the upper male voice there would allow the tenor to bridge from *falsetto* into *head voice*, parallel to what one would find in a female voice? This concept will be explored further in Chapter III and will attempt to demonstrate how by tuning resonances in the upper *falsetto*, and observing a secondary *passaggio*, the relative quality of the modal, or chest voice, that has been carried into the *falsetto* can be taken further into the head voice register.

¹¹⁷ Garcia, *Nouveau*, 1856, p. 6, 'La voix de poitrine, qui possède bien plus d'éclat que celle de fausset, exige aussi un *pincement* plus vigoureux de la glotte. Ce pincement, que l'on obtient facilement avec la voyelle *i*, est le procédé qu'il faut indiquer aux femmes pour leur faire trouver la voix de poitrine.' It is interesting that he asserts the [i] influences the functioning of the glottis. It is unclear whether this is actually a result of a muscular pinching, as he states, or the effect of inertance which increases adduction of the glottis and is the product of the acoustic setup of the vocal tract. It would not have been possible for him to observe the difference using the laryngoscope available to him. For information on inertive reactance (inertance) see: Titze, I. 'Nonlinear source-filter coupling in phonation: Theory', *The Journal of the Acoustical Society of America*, 123(5) (2008): 2733–49.

¹¹⁸ Garcia, *Complete*, 1984, p. 25, Donald V. Paschke, translator of this version, notes that this quote was not part of the original 1840–47 versions but was added after Garcia's investigations with the Laryngoscope in 1854 and 1855.

below).¹¹⁹ He does not say whether the larynx shifts in any way or if the glottis is shortened or lengthened, respective to each individual register.

According to Garcia, as the pitch ascends in both registers the arytenoid cartilages (identified by the dotted black arrows in illustration 1) become more tightly closed, and that when the cartilages are fully closed only the vocal tendons vibrate. He indicates that both the tenor mixed voice or half chest [*e'* natural to the *c''* natural] and the female upper head register an octave above are produced exclusively by vibration of the vocal tendons with the arytenoid cartilages tightly closed.¹²⁰ When Garcia explains the gradual closure of the arytenoid cartilages he is describing the transition from *abduction* to a state of *adduction* (demonstrated in illustration 1, below). In the illustration reproduced here, Herbst et. al. uses the terms falsetto register [left] and chest register [right] in a way consistent with Garcia.¹²¹ The glottis is shown in the abducted state on the top and adducted on the bottom. This becomes more important later when discussing how the 'pharyngeal voice' functions.

¹¹⁹ Ibid., 'The falsetto voice, ordinarily the more veiled of the two, also causes a larger expenditure of air. Both registers, for the low tones, place the entire length of the glottis into vibration; then, as we have just said, the gradual rise of the tones gives rise to a more and more extensive contact of the cartilages. When the contact is complete, only the tendons continue to vibrate, and then there appears, in tenors, a very distinctive range comprised between the *e'* and the *c''* called, by some musicians the mixed voice or half chest (mezzo petto) and, in women, the head register, which is placed an octave above. Both are produced exclusively by the vocal tendons.'

¹²⁰ Ibid.

¹²¹ Herbst, et. al. 'Membranous and Cartilaginous Adduction', *The Journal of the Acoustical Society of America*, 129(4) (2011): 2253–62.

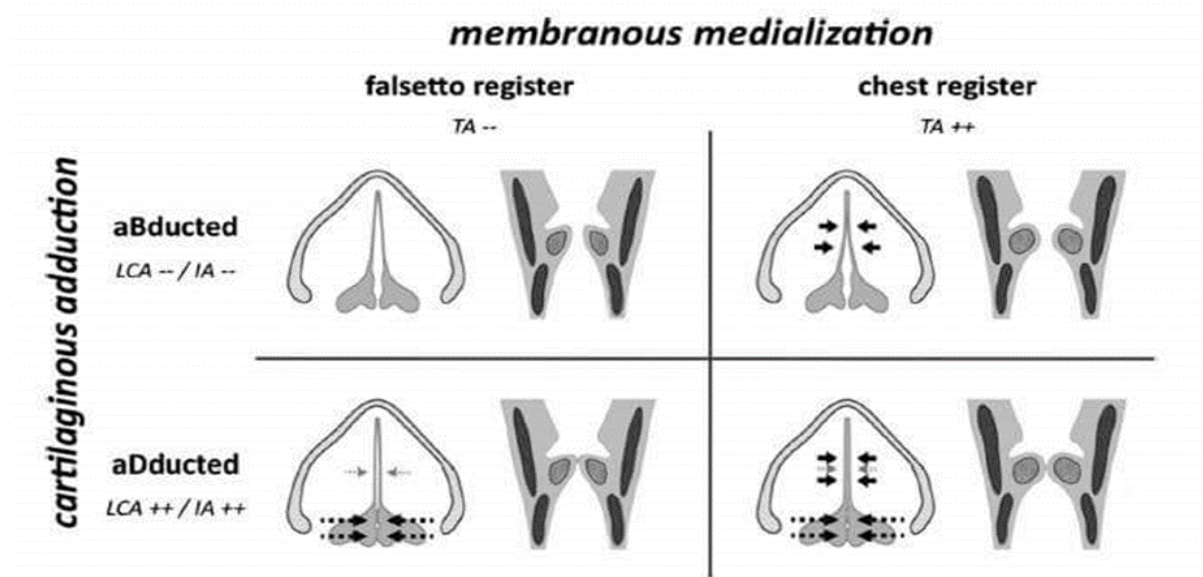


Illustration 1 – Herbst, 'Membranous', 2011, p. 2260

Garcia indicates that chest register ends around a' natural. By this he may be describing abducted chest [upper right] but not including adducted chest [lower right] in the range because he says that the 'half-chest', and female head voice, are produced by the tension in the tendons alone after the arytenoid cartilages are firmly closed by e' and e'' respectively. Therefore, he must be indicating that the male mixed voice is produced by the adducted chest [lower right] register.

Garcia presents a difficult concept, although, as he indicates that chest voice ends around a' or b' in most of the various graphs in his works, it is unclear whether he is referring to abducted or adducted chest voice.¹²² He seems to have believed that because of the high tessitura of music written for tenors in the early-to-mid nineteenth century they needed to be able to blend into falsetto register in order to perform it with success. This skill was determined by the ability of the individual singer to blend the qualities of the two registers so that the transition was imperceptible.¹²³ How this was accomplished is not

¹²² Garcia, M. *École de Garcia: traite complet de l'art du chant* (Paris: E. Troupenas et Cie: L'auteur, 1840) p. 5; See also the 'Table of Human Voices' p. 238.

¹²³ Garcia, *École*, 1840, p.6, 'Le fausset uni au registre de poitrine est, pour les ténors, plus que pour les barytons, une ressource heureuse et naturelle. Le diapason beaucoup trop élevé de la musique composée aujourd'hui pour les ténors ne leur permet pas de se passer du registre de fausset. Mais l'emploi de cette ressource doit pourtant être déterminé par l'aptitude de l'organe à fondre ensemble le métal des deux

described and seems to have been left to the singer (at least he gives no instructions in his curriculum). He also indicated that, unlike head and falsetto registers which meet end to end, falsetto overlapped the chest voice by about a fifth. This would place abducted falsetto [upper left] starting in the lower middle of the tenor range below middle c' natural.

It would appear, too, that Garcia is saying that the tenor mixed voice [roughly e' natural to c'' natural] is produced by the adducted action of the chest register, and the imperceptible transition to the falsetto register at some point via the adducting action of the falsetto register to c'' sharp, where the head voice begins in both sexes, and this is produced by fully adducted falsetto register. The nature of the falsetto register of the male head voice is less clear. It may be that he believed that tenors moved from abducted chest to adducted chest and then to abducted falsetto, but this is not directly stated. However, as was previously noted, he believed that only the vocal tendons vibrated in the upper tenor voice, so perhaps he was referring to adducted falsetto and not adducted chest. It would have been very difficult for him to verify which layer of the vocal folds were vibrating by sight using the limited capacity of the laryngoscope available to him. As will be discussed in Section III, the differences in timbre between these two register productions can be explained acoustically rather than mechanically. Either way it is difficult to ascertain from his writing what Garcia regarded as the relationship between male falsetto and male head voice. He did, however, warn that the head voice is quite different from the chest voice and that its use gives a terrible 'shock to the ear' and should be used infrequently and with great caution.¹²⁴ It is possible that the difference to which he is referring is the 'pure' alto-like sound that male voices can make when singing in falsetto, such as that used by modern 'English' countertenors.¹²⁵

The tight closure of the arytenoid cartilage as described by Garcia contributes to my explanation of the 'pharyngeal voice'. It is therefore important to recognize that even in early eighteenth century detailed concepts of registers and how the connection between them could be managed were in use by singers and teachers, even if the references to the

registres ; sinon, quelque bien dissimulée que soit la transition d'un registre à l'autre la disparité des sons choque l'oreille et anéantit l'unité d'effet; on croirait entendre deux individus différents chanter alternativement dans la même phrase.'

¹²⁴ Garcia, M. *École de Garcia: traité complet de l'art du chant par Manuel Garcia fils* (Mayence, Paris: Schott, (part 1: 1840, part 2: 1847), p.6, 'La voix de tête, offrant un contraste encore plus frappant avec la voix de poitrine, sera employée aussi avec plus de réserve.'

¹²⁵ This sound is described as 'whoop timbre' in Appendix 2: A Brief introduction to vocal acoustics, p. 351.

arytenoid cartilages had not been described in published treatises until Garcia had used the laryngoscope to confirm the mechanism in a scientific fashion in the mid-nineteenth century and incorporated them into a comprehensive singing method.¹²⁶ His observation must be regarded as confirmatory; it cannot be said to have created the techniques themselves, as is sometimes suggested.

Mezza Voce

The procedure advocated by Garcia to produce the so-called *mezza voce* [half voice] may be directly relevant to understanding how the *contraltino* and *tenore serio* can produce the extremely high notes of the head register in ‘pharyngeal voice’. The *Oxford Companion to Music* describes the *mezza voce* as ‘a direction to sing at half the vocal power’ indicating a half the normal fullness of sound, however from the context below by describing ‘the mechanism from which the tone results’ Garcia intends something more mechanical.¹²⁷ He indicates that there is a lightness but also a tautness in the vocal folds and that the air should be as light as possible. It is because of this description that I use the term *mezza voce* not only to indicate ‘half fullness of voice’ but also the specific mechanism by which it is achieved.

When sopranos want to emit the tones [b'' or c'''], it sometimes happens that the voice jumps by itself to the [d''' or e'''], and these high-pitched tones, supple [délie] and pure in character, cost them less effort than the lower tone which they were trying to reach. Here is the mechanism from which these tones result: The lips of the glottis are taut and accurately, but gently touching each other; the space between the superior vocal tendons is constricted [*resserré*]. In this position of the organs it sometimes requires only the least pressure of the air for it to pass through the glottis via an extremely tiny fissure, and that narrow opening produces very rapid vibrations with great facility. One imagines that the pressure of the air should be as light as possible if one wishes to keep the dimensions of the glottis small. The procedure which we have just described, used with success by certain female voices, can be used equally by certain male voices. It serves in that case to lighten relatively high tones of basses which are often too thick; it also offers tenors a means of increasing the range of the chest register and of singing its high notes in *mezza voce*.¹²⁸

¹²⁶ Garcia, *Complete*, 1984, p. 25.

¹²⁷ Latham, A. (ed.), *The Oxford Companion to Music* (Oxford University Press Online, 2011).

¹²⁸ Garcia, *Complete*, 1984, p. 26: Also, added after 1854–55. See FN above.

Garcia clearly indicates that some tenors can use the *mezza voce* to extend the range of the chest register and aid in the singing of high notes. It is very likely, although impossible to prove, that these high notes sung by tenors used ‘pharyngeal voice’ because the description is borne out in the practical experimentation that is described in this dissertation. It is the *mezza voce* [half voice] and the mixed voice as described above which become the vehicles by which the ‘pharyngeal voice’ can be established and blended into the head voice to produce high notes. The following describes how the mechanism functions to induce the *mezza voce*. As will be described further in Section III, often when singers in training attempt to sing a’ or b’ in the closed chest register, the voice ‘accidentally’ skips a third or fourth up. It was through this ‘accident’ of registration that the highest notes of the ‘pharyngeal voice’ are first achieved.

Coup de la glotte

It can be understood thus far that to Garcia, producing the *mezza voce* requires the use of the *falsestto* register and the *coup de la glotte*. The *coup de la glotte* is an action that occurs at vocal onset and is characterized as ‘the neat articulation of the glottis that gives a precise and clean start to a sound’.¹²⁹ At the moment of the *coup de la glotte* the vocal folds are firmly closed before singing and as the voice then moves toward the next tone the glottis ‘pinches’ tighter (adducts). This action creates a smaller opening and, as described above, causes the cartilages to close firmly and stop vibrating, leaving only the front (anterior) part of the vocal folds to vibrate.¹³⁰ Based on the descriptions above, it is reasonable to discuss the ‘pharyngeal voice’ as a modified version of the adducting action of the falsetto register. The advantage that the ‘pharyngeal voice’ has is that it transmutes the

¹²⁹ Garcia, *École* (part 1), 1840, p. 9–10; The *coup de glotte* can be understood by gently pronouncing the word ‘up.’ There are examples of the *coup de la glotte* in Section III in the exercises, but I have also made a recording to highlight the gentleness with which the sound is made. I refer to the ‘neat articulation of the glottis’ which are like gentle coughs. ‘The stroke of the glottis is somewhat similar to the cough, though differing essentially in that it needs only the delicate action of the lips and not the impulse of the air.’ Garcia, *Hints*, 1894, p. 13. for an audio demonstration: [Coup de la glotte Audio Demo](#). James Stark offers a substantial discussion of the *coup de la glotte*. Stark, *Bel Canto*, 2006, p. 14–32.

¹³⁰ John Catford described this type of phonation ‘anterior phonation.’, See FN 50. See also Stark, *Bel Canto*, 2006, p. 25.

false alto and head voice [adducted head register] by giving them both more chest voice qualities.¹³¹

As in Mancini's description, glottal pinching forms part of Garcia's method for blending registers. The pinching provides the basis for continued phonation through the mixed voice as mentioned above which provides access to the modified head register. Lamperti (jnr.) mentions Garcia's *coup de la glotte* several times as the stroke of the glottis. He advises that '[t]he injurious 'stroke of the glottis' should under no consideration be employed in tone-attack; it ruins the voice, and ought, in spite of the apparent certainty attained in tone-production, to be wholly eschewed.'¹³² He cautions against its use many times in his work but does not really offer a cogent example of a superior alternative.

Registration in Lamperti

Registration for Lamperti (snr.) is quite distinct from that of Garcia and is by necessity treated separately. As in Garcia's early treatises, Lamperti (snr.) describes the male voice as being divided into two registers: chest voice and *false alto*; he says that 'mixed voice' is merely the vulgar term for *false alto*.¹³³ Lamperti has a clear preference for the term *false alto* over mixed voice but confirms that the mixed voice is a production of the false alto register. His aversion to the term mixed voice may indicate that he does not believe that the *false alto* is a mix at all.¹³⁴

Illustration 2 depicts a division of registration similar to that of Garcia's from 1842 (Illustration 3 below 'Trattato') with the upper boundary of the chest register around *f'*, but it differs from Garcia in that Lamperti considers anything above *f'* to be in *false alto* or mixed voice. For Lamperti the mixed voice has a slightly lower limit than Garcia's limit of A natural. As can be compared with illustration 3 from Garcia's *Trattato (below)*, in general the register limitations in Garcia are much higher, but the upper limits of the *false alto* and mixed voice are relatively similar. Lamperti does not, however, bring into consideration notes above the tenor mixed voice, which Garcia considers to be head voice, nor does he attempt in any way to explain the highest register of the male voice. Rather Lamperti says that only the female

¹³¹ How this is achieved is discussed later in Section III.

¹³² Lamperti, G. *The Technics of Bel Canto* (New York: G. Schirmer, 1905) p. 10.

¹³³ Lamperti, F. *Guida teorico pratica elementaire per lo studio del canto* (Milano: G. Ricordi, 1864) p. 2.

¹³⁴ Interestingly the English version from 1890 translates the male high register as mixed voice.

voice possesses true head voice, which begins around c'' where the *falsetto* ends in both male and female voices.¹³⁵



Illustration 2 – Lamperti, F., Guida, 1864, p. 2

Comparing the Lamperti register graph to that of Garcia (illustration 3 below) shows a consistency in the *falsetto* range, but as shown in illustration 2, Lamperti does not discuss head voice as it relates to the male voice, in the way that Garcia does. Lamperti indicates that the chest voice ends much lower than for Garcia, and it would also seem that Garcia believes that the chest voice and the mixed voice (*falsetto*), while distinct, can inhabit the same range. Even though Lamperti does not mention a male head voice in his treatise, in his preface on the *Decadence of Singing*, Lamperti praised the great tenors who were capable of singing Rossini, especially Giovanni Battista Rubini (1794–1854), who for the purposes of this thesis is being considered as a *contraltino* tenor. It should also be noted that Garcia specifically indicates in Illustration 3 that the *Haute contre* (contraltino) chest voice can reach to c'' natural.¹³⁶

Registers and Resonance

Lamperti (snr.) gives little advice concerning the larynx and register, or pitch, or for that matter, timbre, which is discussed in below. He indicates only that the larynx should

¹³⁵ Ibid. p. 1

¹³⁶ It is worth noting that the singing teacher who preceded Garcia at the Paris conservatoire **Alexis de Garaudé** (1779 — 1852) also indicates that the *Haute contre* sings to c'' in chest voice. 'Le 1^{er} Ténor, qui est ce qu'on appelait jadis *Haute contre*, atteint quelquefois le *Si* et le *Do* de poitrine, sans compter quatre sons de tête, *Ré, Mi, Fa, Sol*. Le *Ré* et le *Mi* graves sont presque nuls dans cette voix.' 'The 1st Tenor, who is what was once called *Haute contre*, sometimes reaches the b' and the c'' in chest voice, not counting four sounds of head, d'' , e'' , f'' , g'' . The bass D and E are almost never in this voice.' Garaudé, A. *Méthode complète de chant, 2nd augmented and improved edition* (Paris: Chez l'auteur, 1841), p. 16.

remain 'perfectly natural and unconstrained.'¹³⁷ One might conjecture that as long as it is 'natural and unconstrained', Lamperti expected it to be free to behave 'normally'. It would be reasonable to conclude that because of his preference for the clear timbre and his insistence that the larynx should be 'unconstrained,' that specifically it should *not* be lowered and or 'held' artificially low in any way. Therefore, a further conclusion is that the larynx could be allowed to rise and fall in response to either pitch or timbre.



Illustration 3 – Garcia, *Trattato*, 1842, p. 11

G. B. Lamperti (jnr.) offers a much more detailed description than his father's on how he expects the larynx to behave. For him the larynx does not necessarily rise to produce a high pitch. It is a 'backward tilting' of the cricoid cartilage that is responsible for change in pitch and timbre.¹³⁸ He says:

[T]he backward tipping of the cricoid cartilage secures the upper tones of the voice. For low tones this ring-shaped cartilage tips forward to normal position, leaving the throat quiet, as in speaking. Though the larynx need not be held muscularly fixed in one position, for either upper or lower register, it should remain quiescent throughout a song. This repose is a sign of physiological action of the throat.¹³⁹

He goes on to say that the larynx should not 'rise unnaturally high while singing; otherwise the tone will sound 'throaty,' from the narrowing of the vocal tube.'¹⁴⁰ The larynx may be raised or lowered in order to modify the resonance of vowels, but not to attain pitch.¹⁴¹ This

¹³⁷ Lamperti, F. *Art*, 1890, p. 20.

¹³⁸ Lamperti, G. *Vocal*, 1931, p. 12.

¹³⁹ *Ibid.*

¹⁴⁰ Lamperti, G., *Technics*, 1905, p. 10.

¹⁴¹ Lamperti, G., *Vocal*, 1931, p. 97.

is in stark contrast to Corri and Nathan who both say that the larynx is distinctly seen rising; in Nathan's words: 'in the production of acute tones, and descending in low ones. For the purpose, therefore, of effecting the greatest possible elevation of this organ, we almost involuntarily throw back the head in great efforts of singing.'¹⁴²

For Lamperti (jnr.) there are three principal registers, not two as described by his father: chest, medium, and head, and these registers are defined by the location in the vocal tract where they appear to resonate, rather than a physiological difference in the larynx, as was described by Garcia.¹⁴³ Lamperti (jnr.) also describes a fourth register which pertains only to the male voice. 'Besides the registers already enumerated (chest, medium, and head), the male voice possesses a fourth, which renders it essentially different from the female voice, namely, the mixed voice'. He is in agreement with his father that it is wrongly called *false* *falsetto*.¹⁴⁴ This mixed voice seems to be similar to the *false* *falsetto* of his father, to the mixed voice [*false* *falsetto*] register of Garcia, and the feigned voice of Nathan.¹⁴⁵ Illustration 4 (below) describes the range and registers of the tenor voice of G. B. Lamperti (jnr.) and is broadly similar to that of his father (Illustration 2 - above), but limits the chest much lower and does not put an upper limit on the tenor voice, and calls the *false* *falsetto* 'middle register.'



Illustration 4 – Lamperti, G.B., *Bel Canto*, 1905, p. 25

For Lamperti (jnr.) concepts of registration are tied directly with where the voice is felt to resonate. He taught that 'the vocal registers are determined by the different points of resonance of the tones' and that the 'beauty and power of the tone depend ... on the

¹⁴² Nathan, *Musurgia*, 1836, p. 119.

¹⁴³ On three registers in Lamperti, G., *Vocal*, 1931, p. 10.

¹⁴⁴ Lamperti, G. *Technics*, 1905, p. 25.

¹⁴⁵ Because of the description of the feigned voice as being quiet and distant, as if heard from a far, it maintains the ventriloquist properties found in some of the literature regarding the 'pharyngeal voice'. While not definitive, my instinct says that the feigned voice of Nathan relates more to the *mezza voce* (mezzo petto) than to the mixed voice, which has the glottal pinch.

resonance of the voice in the chest and head.’¹⁴⁶ Similar to Mancini, Lamperti (jnr.) indicates that all voices should maintain a high focus regardless of voice type, quality or dynamic.¹⁴⁷ These high focused resonances form the basis for registration, but also for the ‘dark-light’ or *chiaroscuro* tone. The following description has strongly influenced the direction of my practical research on the ‘pharyngeal voice’.

The pitch (vibration) of your voice seems to emanate from the back of the mouth (pharynx) spontaneously. The resonance of your voice seems to originate in the front of your mouth (lips) voluntarily. These two together seem to make the ‘dark-light’ [chiaroscuro] tone. Though vibration alters its pitch it does not change its place (pharynx). Though resonance has many colours it does not jump from place to place [indiscriminately], but is modified by the movement of the lips in vowel formation.¹⁴⁸

The primary vibration of the pitch of the voice remains fixed in the pharynx and does not change its location based on vowel or pitch modifications. He says that ‘[r]esonance is always changing. Vibration never.’¹⁴⁹ He goes on to write, ‘[h]igh tones expand as to resonance, but do not spread as to vibration. Low tones narrow resonance and broaden vibration.’¹⁵⁰ It would seem that Lamperti is separating the sensations of vibration – the feeling of the sound waves emanating from the vocal folds hitting the interior surface of the vocal tract – from resonance, which can be assumed is the acoustic effect of standing waves and of interactions of the vocal formants with the harmonics produced by the voice, discussed later as natural resonances of the vocal tract, and felt in various locations. Furthermore, he would seem to support the idea that the vibration does not change location depending on the pitch, but rather can change generally in terms of its intensity, ‘narrow’ versus ‘broad’.

For Lamperti (jnr.) the ‘resonances’ of the vocal tract focus in different areas based on the shape of the vowel, the movement of the lips, and the pitch sung, but the primary sense of the voice is felt in the pharynx. The singer should therefore be aware of the location where each tone, vis-à-vis register, resonates in order to balance the voice. ‘The point of resonance for the medium voice is the hard palate; for the head-tones, the top of the head, in front. Should the latter vibrate in the forehead, the high tones will lack metallic

¹⁴⁶ Lamperti, G., *Technics*, 1905, p. 10.

¹⁴⁷ Lamperti, G., *Vocal*, 1931, p. 29.

¹⁴⁸ *Ibid.*, 38.

¹⁴⁹ *Ibid.*, 98.

¹⁵⁰ *Ibid.*, 99.

resonance.’¹⁵¹ (It should be noted that ‘metallic resonance’ is indicated by Lamperti (jnr.) as a positive vocal attribute.) In the middle (medium) register the pitches b natural, c’ natural, d’ natural, and d’ sharp (lower for light tenors), head resonance mixes with that of the chest voice, and ‘the singer sings with half the *chest voice*,’ or *mezzo petto*. ‘The main point is to blend the medium register with the so-called *voix mixte*; the chief object to keep in view being to acquire an even scale from the lowest tone to the highest’.¹⁵² It would seem that for Lamperti, a well-focused voice with a good balance of harmonics produces a voice that is consistently focused towards a high point in the pharynx and not downward into the chest. He also indicates that the pharynx should not be opened too wide as it causes that voice to sound ‘hollow’.¹⁵³ In the experiments in the teaching studio, finding the vibration in the pharynx became much easier once the idea of the widened pharynx was abandoned and this became a pivotal point in reconstructing the ‘pharyngeal voice’.¹⁵⁴

Lamperti indicates that the tenor should blend the ‘medium register’ with the *voix mixte*, a strong parallel with the concept of the feigned voice found in Nathan. Based on the descriptions of their locations, functions, and qualities, it seems reasonable to conclude that the *voix mixte* and the feigned voice are quite similar. For this reason, both have had influence on the practical research. The achievement of a high focused tone was important in the development of the reconstruction because it gave significant clarity and projection to the ‘pharyngeal voice’, as well as helping to blend registers.

The mixed voice of the light tenor is identified by the label *voix mixte* in illustration 4 (above); Lamperti (jnr.) laments the loss of this register, ‘And the very fact that the training of this register has been neglected may be the chief reason that we have so few eminent tenors, and that artists endowed with great vocal powers often mistake quantity of tone for quality.’¹⁵⁵ Because registers are defined by where they are perceived or felt to resonate, the concept of resonation is separated from that of primary vibration, which for Lamperti (jnr.) is associated with the direct sensation of the pitch and vibrating air column emitted

¹⁵¹ Lamperti, G., *Technics*, 1905, p. 26.

¹⁵² Ibid.

¹⁵³ Ibid.

¹⁵⁴ In all actuality, sensations of a widened pharynx are a false kinaesthesia.

¹⁵⁵ Ibid., 25. It seems that Lamperti is looking back to a time when such singers were to be heard, and indulging in a kind of ‘nostalgia for a lost golden age of bel canto’ that is a repeating trope in many singing treatises from the 18th century to the present day.

from the larynx that is focused exclusively in the pharynx.¹⁵⁶ Lamperti's preoccupation with the voice being focused in the pharynx became fundamental to the present research. Several exercises based on this idea and exploring how the vibrations can be felt and maintained were developed and are demonstrated in Section III.

Interestingly, Lamperti (jnr.) limits the top of the chest voice to f sharp, which is quite low compared to other writers, and nearly an octave lower than described by his father. He also shows no overlap with chest register and middle or mixed register. To Lamperti (jnr.) there must be a register-change event at that part of the voice which caused him to believe this. It was this graph that inspired my own investigation into 'shifting' occurring in that part of the voice. I considered the question 'what is the action that is causing the shift from chest into falsetto?' which leads to the development of a small intermediate shifting. This is discussed further in Section III as the First Registers Event (FRE). This small and almost imperceptible registration event opened the door to developing the 'pharyngeal voice'.

Lamperti has an interesting way of describing the tone quality of the tenor voice. He says that tenors should sound like the high tones of the violoncello which are '16-foot tones' and sound an octave lower. It was many years before this concept made any sense to me with respect to the 'pharyngeal voice', but eventually once the falsetto register was developed and the mixed voice became useful, the concept became essential to two of the exercises developed for the reconstruction.

It is a mystery as to why Lamperti included no discussion of the tenor head voice. Only generic terms are considered, so there is no definite way of discussing it with certainty at this point. Lamperti does, however, mention that 'On high [d'' flat] ... a change of register will usually occur. Here begins the head-voice, so called because the point of resonance is felt in the head. Sometimes not till [d'' natural or e'' flat], according to the individual character of the voice.'¹⁵⁷ This is not specific to the tenor voice, and head voice is not listed on the tenor voice chart, but it is directly relevant to how the upper notes of the 'pharyngeal voice' develop out of the mixed voice into the head voice at d'' flat.

In his book *A Vademecum* (1902), Salvatore Marchesi, who studied with Lamperti and Garcia, indicates that the tenor voice is made up of four registers *chest*, medium and

¹⁵⁶ Lamperti, G., *Vocal*, 1931, p. 98.

¹⁵⁷ *Ibid.* p. 13

head, the fourth being *falsetto* which is parallel to head register and 'replaces the head tones of the female voice'.¹⁵⁸ Here it is clear that the vocal quality of the male falsetto is not the same as the quality of the head voice. It can be deduced that the falsetto is more like chest or medium than head. He also clarifies that the chest voice and the falsetto should both be used and offer dynamic choices to the singer.

The tenor's falsetto is to be practised, developed, and used from [*f*' natural] up to the last medium tone. It may also be developed beyond this, if the special organic dispositions of the voice allow it. In every case it is indispensable that the medium and falsetto sounds alternate on the same scale, because a good singer must be able to execute the contrasts of piano and forte required by the different sentiments he has to express.¹⁵⁹

Here Marchesi confirms that the singer should not only develop the falsetto register but also the chest register. He indicates that they can each be used for different dynamics, falsetto for softer singing and medium for louder, and that the singer should be able to alternate depending on his musical interpretation. This facility could imply a relative similarity in vocal timbre between the two registers.

He goes on to say that the 'resonator of the falsetto in the male voice is the pharynx, formed of muscles and cartilages like the medium's resonator, against which the tone-waves strike; whilst the uvula, elevating and contracting itself, (rounding) closes the way to the cavities of the nose. Consequently, the sounds of the falsetto are as smooth and soft as those of the medium.'¹⁶⁰ Here Marchesi is discussing the movement of the uvula and the entry to the sinus cavities as a form of vocal tract configuration; he is however, to the best of my knowledge, not indicating that the uvula plays any role in sound generation. Like Garcia, for Marchesi it is the male head voice, not the falsetto, that is equivalent in quality to the female head voice. He specifies that men 'can produce the Head-tones exactly as a woman does,' that the head register is 'heterogeneous', or essentially different in quality to the medium register, and that that the *falsetto* is similar in quality to the medium register.¹⁶¹ Marchesi represents an interesting nexus between Lamperti and Garcia. He also provides some clarity regarding the basic quality of the 'pharyngeal voice' sound. It would

¹⁵⁸ Marchesi, S., *A Vademecum*, 1902, p. 28.

¹⁵⁹ *Ibid.*, 41.

¹⁶⁰ *Ibid.*, 29

¹⁶¹ *Ibid.*

seem that he confirms that the falsetto sound is similar in quality to the 'medium' register and therefore for chest voice, and that it does not sound like head voice.¹⁶²

Marchesi thus agrees with Garcia on the overall vocal qualities of the male voice; however, his explanations about what happens above the glottis tend to be similar to Lamperti: he follows the Lamperti technique concerning the backwards tilting of the cricoid cartilage for the medium and *falsetto* registers. His explanations of how the vocal tract is tuned to resonate the registers is written in a style inspired by Garcia's intensely physiological model, but clearly represent many of Lamperti's ideas. The resonating cavities above the glottis form an integral part of Marchesi's understanding of registers and timbres, because it is the focus within these chambers that indicate the register itself. Marchesi describes the vocal tract as the 'tuning fork' of voice production, saying that the resulting sound of the voice 'depends upon the shape of the resonator...which must be exactly tuned to the tone' produced by the glottis.¹⁶³ He seems to have a keen understanding of the fundamentals of what would become resonance tuning which played a striking part in the practical research.

Marchesi states that the resonance chamber for the chest voice is the hard palate, which is to say that when a man is singing in the chest register, the focus of the sound is felt in the roof of the mouth. That of the medium register is the soft palate and the 'resonance-chamber of the head-register is found, for both sexes, in the frontal sinus and the turbinated bones.'¹⁶⁴ Agreeing with Lamperti, Marchesi's belief that the 'resonator of the *falsetto* in the male voice is the pharynx' might indicate that the *falsetto* register of Marchesi is essentially similar to the *voix mixte* of Lamperti, and the feigned voice of Nathan.¹⁶⁵

¹⁶² In the lyric tenor, Marchesi indicates that the 'medium' register begins on *f'* sharp and can go as high as *c''* natural 'which in men the French call *voix-mixte*, the Italians *voce coperta*, the Germans *Gedecktes Register*, and the English *Covered register*'. He also indicates that in the *contraltino* tenor the medium register begins on his lowest note because he has no chest register. *Ibid.*, 41, 42–3.

¹⁶³ *Ibid.*, 30.

¹⁶⁴ *Ibid.*, 29.

¹⁶⁵ On the pharynx as resonator see *Ibid.*

Chiaroscuro: Pharyngeal Resonance

The concept of vibration in the pharynx for a *chiaroscuro* tone contrasts with that of the dark or covered tone.¹⁶⁶ The use of so-called ‘covered tone’ as a method of darkening the tone is a complex acoustic manoeuvre that Lamperti (jnr.) warns against; instead, he advocates an open timbre. As the student is developing breath control, they must learn to balance and focus the natural resonances of the voice and to distinguish those points of resonance from the other vibrations of the vocal tract.¹⁶⁷ For the development of the ‘pharyngeal voice’, *chiaroscuro* tone is necessary to building a reliable relationship between the chest, falsetto and head registers. However, through practical research, a heavily covered tone can be used temporarily to encourage the voice to release into the pharyngeal head voice while maintaining a clear vocal quality.

My practical research with singers in training shows that when the ‘pharyngeal voice’ is used with a ‘rounded timbre’ (discussed below) forming the mixed voice, which vibrates in

¹⁶⁶ *Chiaroscuro* is an amalgamation of the two Italian terms *chiaro* and *scuro*, which mean ‘light’ and ‘dark’ respectively. In the case of music, higher resonances are perceived as brighter and lower as darker, which would mean that the idea *chiaroscuro* tone would have sufficient high and low resonances. The exact proportion of these light and dark characteristics is not fixed and therefore the ‘ideal’ balance is up to personal and artistic taste. The ‘bright’ or light ‘element of the vocal tone is associate by firm glottal closure, which produces a tone that is rich in high-frequency components, that are then modified by the vocal tract to produce the darker components. Stark, *Bel Canto*, 2006, p. 34. Garcia indicates that the ideal, or ‘purest’, tones contain both *éclat* and *rondeur* (brightness and roundness), but as James Stark points out, Garcia did not use *chiaroscuro* to describe this tone quality but ‘his vocal ideal was nevertheless consistent with the definitions in the manuals by Mancini, G. B. Lamperti, and other advocates of the old Italian school of Singing.’ Stark, *Bel Canto*, 2006, p. 40. ‘Le son le plus pur s’obtient : 1° en aplatissant la langue dans toute la longueur, 2° en soulevant médiocrement le voile du palais, 3° en écartant les piliers par leur base. Alors l’orifice du larynx se découvre, et le pharynx réfléchit une première fois la colonne sonore de manière à l’acheminer vers la partie antérieure du palais. La voix étant de nouveau réfléchié par cette partie, qui est consistant et voisine de l’ouverture de la bouche, sort avec éclat et rondeur.’ Garcia, *Ecole*, 1840, p. 9; When describing the tenor voice in his 1842 Italian translation, Garcia did however use *chiaroscuro* for the French *timbrées*. He also uses *chiaro-scuri*, Italian equivalent to the French *clair-obscur*, to describe the artistic application of light and dark colours to the emotional interpretation of music. Garcia may be indicating that tenor voices have the capacity for more vocal colours, or their voices have both *éclat* and *rondeur*. It would seem that while his ‘purest tones’ seemed in line with the Italians on the overall ideal timbre of the voice being *chiaroscuro*, he reserves the use of the term for the artistic application of alternation between light and dark vocal colours in music. He may therefore imply that the *chiaroscuro* in the voice is the ability to perform colour variations. I use the term *chiaroscuro*, however in the same way Lamperti, quoted above, as the ideal tone that simultaneously has a balance of light and dark qualities, much as Garcia describes the ‘purest tones’. For ‘tenore voices’, see ‘Tenore. Queste voci, meno voluminose delle precedenti, han più rotondità, più chiaro-scuro, e son più facili negli acuti. Rare volle la loro estensione è di due ottave.’ Garcia, *Scuola*, 1842, p. 5, see also ‘Ténor. Ces voix, moins volumineuses que les précédentes, ont plus de rondeur, et sont plus timbrées, plus faciles dans la partie haute. Leur étendue est rarement de deux octaves.’ Garcia, *Ecole*, 1840, p. 6; For ‘*chiaro-scuri*’, Garcia, *Scuola*, 1842, pp. 33, 35.

¹⁶⁷ Lamperti, G., *Technics*, 1905, p. 9.

the pharynx, the modified head voice resonates precisely in the area of the frontal sinuses producing an ideal *chiaroscuro* quality. Like Nathan, Garcia and Lamperti (jnr.) locate the primary resonance of the voice in the region in the pharynx, the ‘back part of the head and throat, above the glottis, where the uvula is situated’.¹⁶⁸ In his *Vocal Wisdom*, G. B. Lamperti (jnr.) says, ‘The spot where tone seems to start, is the place where the vibration of ‘ng’ (as pronounced in the word ‘England’) is located.’¹⁶⁹

Your singing tone seems to start before you open your mouth and to remain after you close it, making a veritable ‘messa di voce.’ This hum-like vibration continues from word to word and pitch to pitch, even leaps over silences.¹⁷⁰

The location of the ‘ng’ is equivalent to Isaac Nathan’s description of the vibration of the feigned voice as located in the back of the throat, and forms the basis for all resonation for Lamperti as well.¹⁷¹ The vibration in the pharynx, the retention of the focus high in the head, and the concern with resonation in the ‘ng’ location are all ways of describing strategies for modifying, or tuning, of the natural resonances of the vocal tract.

Lamperti’s idea that the voice should retain the ‘hum-like sound and feeling’, whether or not the mouth is open or closed, as the primary vibration experienced in the pharynx, is closely associated with the *chiaroscuro*.¹⁷² It is the unifying principle that unites ‘the whole voice, equalizing all registers, head, medium and chest, eliminating attack and breaks.’¹⁷³ ‘It demands control of all muscles from top of head to middle of waist. Keeping such a tone focused in the head depends on the connected energies from waist to pelvis. The vocal bands then tune this *chiaroscuro* tone without push or pull.’¹⁷⁴ The *chiaroscuro* quality is ‘always present,’ and unites all registers.¹⁷⁵ Experience demonstrates that it is not advisable, or even possible, to force the voice into coordination, only to encourage the cooperation of the muscles of respiration and the laryngeal control of tone.

In modern terms, what Mancini, Nathan, Corri, Garcia, and both Lampertis and Marchesi are all suggesting is what I discuss as ‘resonance tuning’, discussed further in Section III. Briefly, resonance tuning’ is a way of adjusting the inner spaces of the vocal tract

¹⁶⁸ Nathan, *Musurgia*, 1836, p. 159.

¹⁶⁹ Lamperti, G., *Technics*, 1905, p. 56.

¹⁷⁰ *Ibid.*, 103.

¹⁷¹ On the feigned voice resonating in the back of the throat Nathan, *Musurgia*, 1836, p. 117.

¹⁷² On the ‘mouth open or closed’, Lamperti, G., *Vocal*, 1931, p. 72.

¹⁷³ *Ibid.*, 104.

¹⁷⁴ *Ibid.*, 61.

¹⁷⁵ *Ibid.*, 38–40.

(including laryngeal height, jaw and mouth opening, pharyngeal space and tongue position) to modify the natural resonances of the vocal tract.¹⁷⁶ While it may seem disingenuous to apply the concepts of modern vocal acoustics to an eighteenth- or nineteenth-century treatise, according to Kenneth Bozeman, author of *Practical Vocal Acoustics* (2013) ‘the terms head and chest arose out of real, shared physical vibratory sensations.’¹⁷⁷ That is to say that there are *real* physiological experiences shared among singers that led them to describe registers in this way. What has changed is our ability to describe the sounds scientifically, but not the acoustics.

The sensations themselves represent different aspects of the voice as it passes through the pharynx and mouth. While the singer or teacher may not be aware of the exact nature of the resonance relationships, the attuned musical ear naturally hears them and understands the implications for the voice. It should therefore be acceptable to believe that earlier writers were conscious not only of the beauty of the voice, but that they also had a tacit awareness of how the resonances interacted to produce the desired sounds, even though they lacked the specific scientific understanding or terminology.

Garcia was keenly aware of how the vocal tract modified the voice and tuned the harmonics, because as will be shown, this formed the basis of his understanding of timbres. He described the effect of the vocal tract on the voice by explaining how the length of the vocal tube and shape of the pharynx affect the sound emitted by the larynx:

The moment that a sound is emitted, it becomes subject to the influence of the vocal tube through which it passes; this tube, having the power of lengthening or shortening, contracting or expanding, and of changing its curvilinear form to that of a right angle, most perfectly fulfils the function of a reflector to the voice. Hence the varieties of timbre will correspond to the multitudinous mechanical changes of which the vocal tube is susceptible.¹⁷⁸

Learning to tune the natural resonances of the vocal tract is essential to developing the singing voice and no less so with the specific technique of ‘pharyngeal voice’. If the larynx is too low or too high, it will unbalance the relationship between the vowel and the pitch. This relationship determines the overall characteristics of the vocal quality and how the registers

¹⁷⁶ This concept was introduced by Hermann von Helmholtz and discussed throughout Helmholtz (von), H. *On the Sensations of Tone as a Physiological Basis for the Theory of Music* (London: Longmans, Green & Co. 1885); Herbert-Caesari E. *The science and sensations of vocal tone: a school of natural vocal mechanics* (London: Dent & Sons, 1936); Fillebrown T. *Resonance in Singing and Speaking* (Charleston, SC: BiblioBazaar, 2009).

¹⁷⁷ Bozeman, *Practical*, 2013, p. 77.

¹⁷⁸ Garcia, *New*, c. 1870, p. 7.

are realized. Developing an awareness of how the resonances should behave in the ‘pharyngeal voice’ was paramount, and without which any attempt at reconstruction would be fruitless. Vocal acoustics provides not only one way of describing a voice in objective terms, but it can be an extremely valuable tool in the training of singers.

The Pharyngeal ‘Register’: Mouth and Fauces (Pharynx)

Based on what has been presented so far, it should be possible to understand how each of the authors understood that the overall shape of the vocal tract is the singular factor most affecting the sound produced in the glottis. Garcia, Lamperti (jnr), and S. Marchesi each demonstrated a distinct concern for attention to the pharynx. Nathan indicated that the mouth controls the falsetto, and as has been seen, others showed equal concerns for the effect the shape of the mouth has on the voice. Corri also offered some basic advice on mouth shape that indicates resonance tuning, ‘[o]pen the Mouth in an oblong form, as smiling, so that the lower lip may not rise above the teeth, which otherwise will damp and weaken the tone of the voice.’¹⁷⁹ Using the mouth to shape resonance is echoed by many of the authors, including Mancini, who describes the ideal mouth position for singing. While he would not have been aware of the science involved with vocal acoustics and formant tuning, he would certainly have been aware of the effects of mouth position on the voice simply by listening. Certain elements, such as how the resonances behave when different parts of the vocal tract change shape, were significant enough to Mancini that he dedicated an entire chapter to the shape of the mouth:

Experience teaches that a mouth too widely open, or too closed, besides looking bad from the aesthetic point, renders the voice rough and unpleasant. I am of the opinion that to know well how to shape it, can reasonably be maintained as one of the essentials most important to a singer.¹⁸⁰

Mancini was certainly not intending to offer a substantial chapter on the nature of vocal acoustics and the benefits of the convergent voice filter as it could be understood, but there is every reason to believe that he understood how changing resonances affected the singing

¹⁷⁹ Corri, *Singers’ Preceptor*, 1810, p. 11.

¹⁸⁰ Mancini, *Practical*, 1776, p. 90.

voice.¹⁸¹ Keeping the mouth gently open and rounded with the resonances on the lips and teeth produces resonances that are favourable to the production of a *chiaroscuro* tone. If the mouth is opened too far the voice does not resonate properly, becoming ‘throaty’, with the *fauces* [the constricted aperture between the cavity of the mouth and the pharynx] ‘being under such strain, will in consequence, lose that flexibility which is so necessary to give the voice that clearness and facility in drawing it.’¹⁸² Uncorrected, the voice will lose the *chiaroscuro* and will have a ‘suffocated, crude and heavy quality.’¹⁸³ If the mouth is too closed it can produce a dead or nasal voice and the singer will have problems with diction.¹⁸⁴ He admonishes the student to get used to giving the chest register a ‘naturalness’ and to use the pharynx gently, that is not too widened and not too constricted. He goes on to say, that if the mouth and pharynx are perfectly tuned, the voice will be ‘clear and harmonious’.¹⁸⁵

Sorriso: The Smile

Nathan says that, ‘It is when the mouth is in a smiling form, that the sweetest tones are produced, and indeed, were it otherwise, it would be better to forego a little volubility, when we gain a pleasing exterior by the sacrifice.’¹⁸⁶ Garcia is in agreement with Nathan, and goes so far as to quote Tosi and Mancini: ‘Tosi¹⁸⁷ first, in 1723, and after him, Mancini,¹⁸⁸ tell us “that each singer should place his mouth as he habitually does it when he smiles naturally, that is to say, in such a manner that the upper teeth are separated

¹⁸¹ Bozeman, *Practical*, 2013, p. 104, A convergent voice filter is a resonator tract that is more open in the glottis and more closed toward the mouth like a reverse megaphone often associated with *voce chiusa* (closed voice), which is a way of describing the rounded or darkened timbre.

¹⁸² Mancini, *Practical*, 1776, p. 91; On the definitions of ‘fauces’ see Dorland’s Medical Dictionary for Health Consumers (2007), accessed 2 April 2014; see also Joiner, ‘Vocal Principles, 1979, pp. 5–6.

¹⁸³ Mancini, *Practical*, 1776, p. 91.

¹⁸⁴ *Ibid.*

¹⁸⁵ *Ibid.*, 96; Mancini, *Pensieri*, 1774, pp. 70–1, ‘Si dia dunque ogni scolare la fatica d’avvezzare il suo petto a dare con naturalezza la voce, e di servirsi semplicemente della leggerezza delle fauci. Se l’unione di queste due parti farà nel dovuto punto di perfezione, la voce non farà che chiara, e melodiosa; ma se queste stesse saranno disunite, e discordi, non può essere che ingrata, e difettosa, e conseguentemente guasto il canto.’

¹⁸⁶ Nathan, *Musurgia*, 1836, p. 161, It is my belief based on close readings of the texts, that the ‘smiling mouth’ discussed by Nathan, does not indicate that the corners of the mouth should be pulled back tightly in the shape of a broad smile, but should appear slightly opened with the teeth open no larger than the width of a finger, and that the zygomatic arches (cheek muscles) should be activated giving the appearance of a demi-smile.

¹⁸⁷ Opinioni dei cantori – Footnoted as in Garcia.

¹⁸⁸ Osservazione pratiche – Footnoted as in Garcia.

perpendicularly and moderately from the lower ones.”¹⁸⁹ Salvatore Marchesi, it might seem however, disagrees in principle with the smiling mouth shape that Nathan advocates.

For Marchesi, ‘The ‘smiling’ mouth in singing, approved by many teachers, is absolutely contrary to the laws of acoustics, and consequently hinders the production of aesthetic, rounded sounds, homogeneous in their succession.’¹⁹⁰ I suggest, based on experience, that Marchesi is not referring to the *sorriso* or demi-smile as in the descriptions by the other authors discussed, but rather to an exaggerated form whereby the corners of the mouth are drawn back to open the mouth quite wide. For the practical aspects of this research, Garcia’s version discussed above was employed because this allows for a more successful tuning of the *falsetto* register; however, maintaining the mouth shape throughout the phonation of a vowel as advocated by Nathan has clear acoustical benefits.

Garcia indicates how he believes production of purest tone is achieved:

1. flattening the tongue along its entire length
2. slightly raising the soft palate
3. separating the ‘pillars of the fauces’ at their base

This way, the larynx is given the space to allow the tone to be emitted freely and unrestricted, which allows the pharynx to ‘reflect the sound’ directed toward the hard palate. ‘The singer must then shape the instrument from the glottis to the lips by modifying the pharynx, the pillars, the palatal arch, the tongue, the separation of the Jaws and that of the lips in such a manner as to direct the sound rays against the osseous part of the palate and to reflect them in the direction of the centre [*axe*] of the mouth, which then amplifies the tone and is favourable to its emission’.¹⁹¹ By doing this, Garcia believes that voice will have ring [*éclat*] and roundness. From his description, it would appear that Garcia is discussing the emission of the middle voice. As shown previously, Lamperti (jnr.) also suggested that the middle notes are focused towards the hard palate in this way.

¹⁸⁹ Garcia, *Complete*, 1984, p. 41.

¹⁹⁰ Marchesi, S., *A Vademecum*, 1902, p. 15.

¹⁹¹ Garcia, *École*, 1847, p. 25, ‘Le son le plus pur s’obtient : 1st en aplatissant la langue dans toute la longueur, 2nd en soulevant médiocrement le voile du palais, 3rd en écartant les piliers par leur base. Alors l’orifice du larynx se découvre, et le pharynx réfléchit une première fois la colonne sonore de manière à l’acheminer vers la partie antérieure du palais. La voix étant de nouveau réfléchi par cette partie, qui est constatant et voisine de l’ouverture de la bouche, sort avec éclat et rondeur. Le chanteur doit conformer l’instrument, depuis la glotte jusqu’aux lèvres, en modifiant le pharynx, les piliers, la voute du palais, la langue, la séparation des mâchoires, celle des lèvres, de manière à diriger les rayons sonores contres la partie osseuse du palais et a les réfléchir dans la direction de l’axe de la bouche, ce qui accroit le son et en favorise l’émission.’

The concern for the use of the mouth, palate and the fauces in vocal-acoustic terms indicates that Mancini and Garcia are both advocating the use of the pharyngeal resonance of the vocal tract, and like Lamperti, they see it as a means of equalizing the voice across its full range.¹⁹²

Vowel Modification

Based on observations made during the experimental reconstruction, in general the mouth should not remain in a fixed shape throughout the entire vocal range, as this would lead to unfavourable tuning of the vocal tract and would most likely lead to awkward registration and significantly negatively impacted diction. Lamperti (jnr.) also indicated that as the voice enters into the head voice, the mouth shape will change and the jaw will open, and consequently the [a] vowel will require slightly rounded shading towards [ɔ].¹⁹³ The ‘vowel shading’ described in this dissertation as vowel modification, is one of the principal concerns in developing the voice: it is entirely defined by resonance tuning, and this is no less important with the ‘pharyngeal voice’.

When a singer moves through the registers, the resonances of the vocal tract make it necessary to modify the vowel in particular ways to accommodate the pitch. If the vowel is not modified correctly, it can become difficult to carry on through the registers without creating tension or unfocused tone. In principle, as the singer moves from the lowest register to the middle of the voice all vowels tend to close, or become rounded.¹⁹⁴ In part II of the *Traité Complet de l'Art du Chant* (1847) Garcia says specifically that the vowel must round moderately [*arrondir modérément*] and progressively into the higher tones.¹⁹⁵ Garcia clearly has similar ideas to Lamperti (jnr.) regarding the principles of vowel modifications and presents a chart is as follows:

- [a] approaches [ɔ]
- [ɛ] approaches [e], then [ʏ];
- [i] approaches [y] without the help of the lips;

¹⁹² Mancini, *Pensieri*, 1774, p. 165, ‘e così uguagliando la voce’. For more information on the behaviour of the soft palate during singing see Birch, P. et. Al. ‘Velum Behavior in Professional Classic Operatic Singing, *Journal of Voice* 16(1) (2002): 61-71.

¹⁹³ Lamperti, G., *Technics*, 1905, p. 13.

¹⁹⁴ Bozeman, *Practical*, 2013, pp. 37–48.

¹⁹⁵ Rounding refers to the round shape taken by the lips in the pronunciation of ‘rounded’ vowels.

- [o] approaches [u]¹⁹⁶

These vowel modifications pertain to each register in its entirety, and the student must allow the mouth to accommodate itself naturally to the vowel. This echoes Lamperti's avocation that the vowel 'ah' [a] should round to 'O' [ɔ] and the jaw must lower itself when entering the middle voice or head voice.

Allowing the vowel to accommodate the pitch had a distinct impact on the development of the 'pharyngeal voice'. The suggestions by more than one author to allow the [a] to move toward [ɔ] and subsequently to [u] inspired the development of the exercise discussed as 'Deep [u]' which allows for a release into the 'pharyngeal voice' and extreme high notes. Modifying all vowels towards the [u] in the upper register that solidifies the pathway into the 'pharyngeal voice'. It also creates a distinct timbral shift to a more closed tone, discussed below and in Section III.

¹⁹⁶ Garcia, *École* (Part II), 1847, p. 3.

Timbres

Vocal timbre is closely associated with vocal quality i.e. light, dark, open, closed, round et. al. but this dissertation discusses ‘vocal quality’ as any perceived characteristic of the voice, and only specific vocal qualities such as those described by Garcia and Lamperti when referring to timbre.¹⁹⁷ For example, ‘rough’ or ‘breathy’ could be considered vocal qualities not timbres. However when used specifically in the context of timbres ‘open’ and ‘closed’ would be. Garcia defines timbres as different ‘modes of vibration’ generated in the larynx and enhanced by the ‘reflecting power’ of the pharynx’.¹⁹⁸ It is in fact the pharynx, not the larynx, that ‘modifies the sound, and produces the various qualities of the voice’.¹⁹⁹ That is to say, the larynx produces a basic sound that is then changed by the pharynx to produce the complex qualities associated with the voice. The sound that emerges from the larynx alone as a result of vibration of the vocal folds would not be recognizable as the singing voice without having first been modified by everything that occurs above it. These modifications are closely associated with resonance tuning and form the basis of the singer’s ability to balance registration and create the *chiaroscuro* tone that is essential to the formation of any voice.²⁰⁰ A study of the different timbres is necessary, in order to be able to apply each one systematically and to decide how they affect the ‘pharyngeal voice’ throughout its reconstruction.

Garcia explains how movements of the larynx influence the shape of the pharynx and therefore the overall timbre of the voice. He says that the modifications are characterised by the height of the larynx, width of the pharynx, shape of the mouth and other physiological factors. Garcia clarifies that vocal timbre depends on the following three conditions:

1. Firstly: those of a fixed nature, by which each individual voice is characterized, as form, capacity, volume, firmness, and the healthy or unhealthy state of the vocal organ;
2. Secondly: its variable conditions, such as the directions which sounds take in the vocal tube during emission, whether through the nose or mouth, the shape and

¹⁹⁷ Stark, *Bel Canto*, 2006, p. 37; Hertegard S., Gauffin J., and Sundberg J., ‘Open and Covered Singing as Studied by Means of Fiberoptics, Inverse Filtering, and Spectral Analysis’, *Journal of Voice* 4(3) (1990): 220-230.

¹⁹⁸ Garcia, *New*, c. 1870, p. 6.

¹⁹⁹ Ibid.

²⁰⁰ For a discussion on the effect of timbre on voice classification see Cleveland, T. ‘Acoustic Properties of Voice Timbre Types and their Influence on Voice Classification’, *The Journal of the Acoustical Society of America* 61(6) (1977): 1622-9.

capacity of that tube, the tension of its sides, action of the soft palate, width between the upper and lower jaws, position of the lips, with the extent to which they can be opened;

3. Lastly: the elevation and depression of the tongue.²⁰¹

These three conditions allow for the disposition of all vocal qualities and timbres of the voice, but the writings of Garcia and Lamperti focus predominantly on the clear ‘open’ and the ‘*sombre*’ or darkened timbres. Within the discussion of timbres there is an inherent issue with laryngeal control. As is shown below, authors have differing positions regarding behaviour of the larynx in relation to timbres.

As previously discussed, Garcia says that the larynx moves up and down in response to pitch, especially in the open timbre, but for Lamperti (jnr.) laryngeal movement assists in modifying resonance of vowels, and not to aid pitch of tone. He says the larynx’s position is ‘governed by word and not by melody.’²⁰² He clearly indicates that the larynx must be allowed to rise and fall in response to the different timbres of the voice, not the attainment of the pitch. This is an important change in the understanding of why the larynx moves and demonstrates a shift away from earlier concepts of laryngeal movement which, as discussed, were tied to pitch and registration, towards one of voice quality and timbre.

Generally speaking the treatises considered have all described two primary timbres: open and closed for Lamperti (snr.), and the analogous clear and ‘*sombre*’ for Garcia, who also included a third timbre between the two which he identified as ‘rounded’.²⁰³ Garcia says that the most the obvious mechanism is demonstrated by the movement of the larynx. He says that the larynx rises with the clear timbre and lowers with the dark timbre.²⁰⁴ In clear timbre ‘the larynx rises toward the velum, and the velum lowers toward the larynx’ and in ‘*sombre*’ timbre the opposite occurs.²⁰⁵ He goes on to say that the ‘short and slightly

²⁰¹ Garcia, *École*, 1847, p. 8, ‘Deux sortes de conditions président a la formation du timbre: 1st les conditions fixes qui caractérisent chaque individu, telles que la forme, le volume, la consistance, l’état de santé ou de maladie de l’appareil vocal de chacun; 2nd les conditions mobile, telles que la direction que prend le son dans le tuyau vocal pendant émission, soit par le nez, soit par la bouche ; la conformation et le degré de capacité de ce même tuyau, le degré de tension de sas parois, l’action de constricteurs , celle du voile du palais, la séparation des mâchoires et des dents, la disposition des lèvres et les dimensions de l’ouverture qu’elles donnent à la bouche, enfin le gonflement ou la dépression de la langue, etc.’.

²⁰² Lamperti, G., *Vocal*, 1931, p. 97.

²⁰³ On clear and sombre timbres, Garcia, *Complete*, 1984, p. xli; On open and closed timbres, Lamperti, F., *Guida*, 1864, p. 4.

²⁰⁴ Garcia, *Complete*, 1984, p. 30.

²⁰⁵ *Ibid.*, 28–9.

curved' vocal tract produces clear timbre and the elongated more strongly curved form produces *sombre* timbre.²⁰⁶

Lamperti does not provide a description of how timbres are formed with the same precision of Garcia, but he does however agree with Garcia that the clear/open timbre is preferable to closed *sombre* timbre for the beginner. He advises young singers to use the open timbre over the closed timbre in training because defects in the voice can be more easily identified.²⁰⁷ He also states that the open timbre allows for easier high notes and does not 'fatigue the voice'. However, the singer should be careful not to 'confound this [open tone] with singing *bianco* [white] and *squajato* [*squaiato*];' in other words, 'white' and 'coarse, loud or obnoxious', which might be described as yelled or forced.²⁰⁸ It is difficult to reconcile exactly what Lamperti says but he may be indicating that the larynx should not be overly raised and the pharynx not constricted. It may also be connected with Garcia's description of the rounded timbre, discussed below.

Like Lamperti, Garcia also prefers the clear open timbre in the training of the voice. Speaking of the bridging from chest register into the falsetto, he indicates that the singer should prioritize the clear open timbre over the dark timbre otherwise the voice can be irreparably harmed:

One should not work the *sombre* timbre in these last tones until one has mastered them in the clear timbre, which is the most difficult to obtain in this part of the range, and the only one which gives clarity (ring) to the tones. If one neglects this recommendation, one would risk veiling or choking his voice.²⁰⁹

He does not believe that because the open timbre is easier the singer should show a preference for it, but precisely the opposite. He specifies that it is 'the most difficult to attain,' which would indicate that it is the darkened timbre that is easier to develop but

²⁰⁶ Ibid.

²⁰⁷ Lamperti, F., *Art*, 1890, p. 7; Lamperti, F., *Guida*, 1864, p. 4, 'Si adotta il timbro aperto perché con esso si correggono più facilmente i difetti della voce, si rende facile l'emissione dei suoni acuti, si fa sortire la voce più limpida e soprattutto non si stanca l'organo vocale.'

²⁰⁸ Lamperti, F., *Art*, 1890, p. 7; Lamperti, F., *Guida*, 1864, p. 4, 'Si disse più sopra che per lo studio fa duopo [sic] adottare il Timbro *aperto*, ma questo non va confuso col Timbro *bianco* e *squajato*.'

²⁰⁹ Garcia, *École*, 1847, pp. 27, 'On ne doit pas travailler le timbre sombre dans ces derniers sons tant que l'on ne s'est rendu maître du timbre clair, le plus difficile à obtenir dans cette partie de l'entendu, et le seul qui donne de l'éclat aux sons. Si l'on négligeait cette recommandation on s'exposerait à voiler et à étouffer sa voix.'

could lead to a dull voice if not balanced with the clear open timbre producing the ideal *chiaroscuro* tone.

It is important to clarify the difference between training the voice in clear open timbre and training it in chest voice or adding vocal weight. Timbres are qualities of all registers, and while the clear open timbre is most associated with chest voice, it would be erroneous to believe that Garcia or Lamperti are advocating covering the entire range in chest voice. Instead, it should be apparent that they both advocate training the chest, *falsetto* (mixed) and head voice registers with clear open timbre, and this should not be seen as advocating singing in chest voice as high as possible.

While maintaining a preference for the clear open timbre, Garcia has a bit more regard for the closed timbre than Lamperti. Both agree that the clear open timbre makes high notes easier and allows for suppleness and beauty, but for Garcia the darkened timbre has more value than for Lamperti, who wholly eschews it. For Garcia, the dark timbre adds richness and mitigates the shrill quality of the chest register and is the only means by which the 'rich quality of the voice is attained', however he does believe that either timbre can be taken too far.²¹⁰ He warns that when the darkened [*sombre*] timbre is exaggerated it 'muffles the sounds, and makes them dull and hoarse'.²¹¹ The exaggeration of either timbre is detrimental to the voice and should be avoided at all costs. Finding the appropriate balance between light and dark (*chiaroscuro*) is difficult and requires skill. Garcia would reject relying on either timbre exclusively for performance, but this is not the case for the training and development of the voice.

It could then reasonably be deduced that this preference for balancing the resonances towards the clear open timbre, combined with the knowledge that Garcia explicitly said that the larynx should be free to move up and down with the clear timbre, generally speaking indicates Garcia did not believe that larynx should be held consistently low during singing. The interview with Frederick Root from the 1 August 1894 in *The Musical Herald* makes it plain.

With regard to the position of the larynx higher or lower, or the more or less raising of the palate, he said that the singer need only follow natural

²¹⁰ Garcia, *New*, c. 1870, p. 6.

²¹¹ *Ibid.*

emotional effects, and larynx, palate, and the rest will take care of themselves.²¹²

The *Traité Complet de l'Art du Chant* from 1840 and this article appeared at opposite ends of his career, and indicate that regardless of what occurred in between, he returned to the idea that the larynx must be allowed to be natural and free. It can only be said that in the end Garcia returned to the training of his father, agreeing completely with Lamperti and most of the treatise writers addressed in this dissertation that the larynx should be 'perfectly natural and unconstrained.'²¹³

It is a reasonable assumption that in the 'pharyngeal voice' the larynx should be free to move unconstrained. Conversely, the larynx being held low could be one of the fundamental reasons the 'pharyngeal voice' lost its prominence. The reconstruction in Section III supports this assumption. Furthermore, in relation to timbres, the 'pharyngeal voice' should be able to exist in both open and closed timbres and considering that both Lamperti and Garcia advocate using the open timbre to train the voice perhaps that is best option. While some exercises were developed using exclusively the clear/open timbre, trial and error revealed that the timbre most suitable to bring out the 'pharyngeal voice' is described by the Garcia as a modification of the clear timbre called the 'rounded timbre'.²¹⁴

Rounded Timbre

Between the open and closed timbres exist the rounded timbre which is created by a larynx which is neither high nor fixed low. The rounded timbre is only slightly modified from the clear open timbre. I argue that this rounded timbre is essentially the quality of voice characterized by the 'pharyngeal voice' and is explored as the principal method vocal production. He describes it as follows:

When the larynx takes a position *a little lower than that for the clear timbre*, and the soft palate rises moderately, the 'sound column' [*colonne sonore*] straightens out a little and hits the middle of the palate. Then the voice is emitted brightly, but more *rounded* than in the clear timbre. The voice will lose some brightness but gain some roundness, if the soft palate is raised a

²¹² Root, F. 'Interview with Manuel Garcia (jnr.)', *The Musical Herald (London)* (1894): 227-230, p. 229.

²¹³ Lamperti, F., *Art*, 1890, p. 20.

²¹⁴ 'Arpeggio [ma]' exercise, see p. 310; See also Bunch, M. 'A Cephalometric Study of the Structures of the Head and Neck During Sustained Phonation of Covered and Open Qualities', *Folia Phoniatrica*, 28 (1976): 321-328.

little more, so as to leave only a *slight communication with the nasal cavities*. In this circumstance, the column of air, which is very slightly inclined, strikes in front of the palatal arch. [Emphasis added]²¹⁵

Garcia is explicit that in the rounded timbre the larynx position is only slightly lower than with the clear timbre and that the column of air, or resonance, strikes the front palate. There is a 'slight communication with the nasal fossae' which allows the voice to vibrate in the pharynx without becoming a nasal tone. This vocal timbre is bright but round, and aids in the production of the mixed voice and therefore 'pharyngeal voice'.

During my practical research, I noted that correct vocal timbre is essential to producing the 'pharyngeal voice' and in the development of head tones with a tenor vocal quality. Garcia says that these 'head tones, properly so called, can be used only in exceptional cases by some very high tenors'.²¹⁶ As was previously shown, Salvatore Marchesi also noted that some high tenors were capable of head register tones that were 'as keen and crystalline' in quality as their chest voice.²¹⁷ For some reason he did not associate this type of tenor with the contraltino, however he was aware that it was possible.²¹⁸

In the rounded timbre the larynx is not fixed low and remains flexible. This setting aided by a possible slight narrowing of the pharynx creates strong harmonics that reinforce the *falsetto* by allowing the singer to tune the resonances of the voice that bring the falsetto and head register in line acoustically with the chest voice. This configuration creates a form of mixed voice from the *mezza voce* previously discussed. Then when the co-ordinated registration of the rounded timbre *mezza voce* is carried into the head register the singer can preserve the resonance tuning essential to the tenor chest vocal quality. The procedure of coordinating the *falsetto* and chest resonances produces the tenor quality head register of the 'pharyngeal voice'. The flexible larynx, relaxed pharynx and slight communication to the nasal sinuses help to develop the pharyngeal upper register.

²¹⁵ Garcia, *École*, 1847, p. 16, 'Lorsque le larynx prend une position un peu plus basse que pour le timbre clair, et que le voile du palais se soulevé médiocrement, la colonne sonore se redresse un peu et va frapper contre le milieu du palais. Alors la vois sort éclatante, mais plus arrondie que dans le timbre clair. La voix perdra de l'éclat et gagnera de la rondeur, si la voile du palais de relevé davantage encore, de façon à ne laisser qu'une légère communication avec las fosses nasales. Dans cette circonstance, la colonne d'air, qui est à peine inclinée, va frapper au-devant de l'arcade palatine.'

²¹⁶ Garcia, *Complete*, 1984, p. 210, Variation found in the 1872 editions.

²¹⁷ Marchesi, S., *A Vademecum*, 1902, p. 28.

²¹⁸ *Ibid.*, 42–3.

Training Elements

Beyond registers and timbres, all of the treatises discuss several technical elements that are useful in the training of the voice. These elements include *messa di voce*, *portamento*, and breath management. While none is unique to the ‘pharyngeal voice’ their use and application have specific uses that aid its development. Through examination of the treatises, several exercises were developed, or traditional exercises modified, for use in training the ‘pharyngeal voice’ and are also direct products of the practical research.²¹⁹ The following discussions reveal the foundation of these elements in the treatises and how they relate to the ‘pharyngeal voice’.²²⁰

Messa di Voce

The *messa di voce* can be translated as ‘placing of the voice’ and as Corri describes, it is performed as a long slow crescendo on a single breath by beginning a *piano* (p) ‘with a delicate softness, increasing the tone to its loudest degree’ and then back to *piano* ‘diminishing it to the same point of softness with which you began’ ending with a *morendo*, or dying.²²¹ This should first be mastered on a single note then over a few notes and eventually over an entire phrase. According to Mancini, the *messa di voce* is executed slowly and at the onset ‘the mouth should be but slightly open, thus helping to draw the voice in its sweeter and softer quality’ the singer should then gradually ‘[reinforce] it proportionately to the greatest power to which it can be developed and then [take] it back with the same graduation that has been used in going from soft to loud.’²²² To Mancini the *messa di voce* should not be attempted before the student has learned all of the fundamental aspects of singing including the blending of registers and the *portamento*. The employment of the *messa di voce* as a technique provides a bridge between the concepts of resonance and breath management for the ‘pharyngeal voice’.

²¹⁹ Some of the exercises developed are similar to standard vocal exercises but the application and specific goals are different and have been developed specifically for the ‘pharyngeal voice’.

²²⁰ For a discussion of development and importance of the *messa di voce*, *portamento*, *Shake* and other treatise elements, see: Potter, ‘Vocal Performance’, 2012.

²²¹ Corri, *Singers’ Preceptor*, 1810, p. 14.

²²² On mouth opening see Mancini, *Practical*, 1776, pp. 117–8; On reinforcing and drawing back the voice Ibid., 120–1.

Corri however prioritizes *messa di voce* above all else in the development of the voice, ‘the swelling and dying of the voice; [the crescendo and diminuendo] without this important requisite no other can avail’ and makes it the focus of his first lesson.²²³ Corri instructs that ‘the intention of this exercise is to acquire the art of taking breath and *how to retain it*, by which is effected the swelling and dying of the Voice; the most important qualification in the vocal art.’ The performance of the *messa di voce* requires the singer, in Corri’s words, ‘to take as much breath as you can’ and to use it judiciously.²²⁴ Execution of the *messa di voce* is quite long and physically demanding, and Corri indicates that the beginning singer will be left panting and short of breath.²²⁵ This has also been observed often during the practical reconstruction exercises with students. Because of how demanding the exercise is, he advises that it should first be practiced for half an hour and then extended to three or four hours each day until it is acquired. After this period, it should not be abandoned but used to maintain and improve the instrument.²²⁶ As is referenced in illustration 5, Corri believed that the *messa di voce* was the ‘soul of music’ and represented therefore represented the highest form of artistic expression.

14

LESSON I.

p *cres* *f* *ff* *dim* *p* *mor.*

Begin with a delicate softness, increasing the tone to its loudest degree and diminishing it to the same point of softness with which you began.

ah

The swelling and dying of the Voice

Messa di Voce

The Soul of Music.

These accords are only intended to give the Notes their Harmonic parts, if Scholars find the Arpeggio difficult as noted, they may take only the Chord, which may be played with either hand.

as above

Voice

To enforce on the Ear the proper pitch of the Note first play this arpeggio several times over.

ah

Accompaniment

Piano Forte

Play this arpeggio as before.

ah

²²³ On *messa di voce* Corri, *Singers' Preceptor*, 1810, p. 1; The first lesson, *Ibid.*, 14.

²²⁴ *Ibid.*, 11.

²²⁵ *Ibid.*

²²⁶ *Ibid.*

Illustration 5 – Corri, *The Singer's Preceptor*, 1810, p. 14

It is difficult to understand precisely how to perform the *messa di voce* from Corri's descriptions, but it would be reasonable to understand that maintaining elastic control over the air in the lungs and using it with economy should be priorities for the singer. Perhaps the type of breathing implied by Corri is the method that Richard Miller attributes to Farinelli, who was a famous student of Porpora. In his book *The Structure of Singing*, Miller describes a breathing exercise in which the air is taken in slowly to a long count, retained or 'suspended', without being held, for the same count and the slowly released again to that count.²²⁷ This exercise is to be done entirely with low abdominal breathing and with the ribcage extended *laterally*. Unfortunately, Miller has no evidence for this as a historical technique and there is limited information to know if this is what was intended by Corri, or how he expected the *messa di voce* to be accomplished.

Nathan, like his teacher Corri, upholds the use of the *messa di voce* as the single most important tool that the singer has in the building and coordination of the vocal registers. 'This swelling and dying of the voice is the most important to practice, and one of the easiest requisites to acquire, if judiciously treated; on it depends the principal art of singing, for it sweetens, enriches, and gives that delicious roundness and fullness to the tone, so desirable for every branch of vocal science.'²²⁸ Through use of the *messa di voce* the feigned voice can first be unified with the *falsestto* and then with the *chest voice* using vowel modification. He advocates beginning on [e] or [u] in feigned voice and modifying the vowel to 'open' the sound to [a].²²⁹

When the singer after having cultivated the lower tones, (which form the basis and give the character to his voice) arrives at the break or meeting of the registers di petto and di testa, let him proceed in the feigned voice alone; let him increase its power by swelling, and let him gradually unite it with the chest voice rather by its own enlarged volume than by any exertion of the latter thus affected, the junction will be imperceptible, and once gained will never be lost. It is only by voices so formed, that the higher effects of the heart can be produced or that the qualities so often lauded be realized.²³⁰

²²⁷ Miller, R. *The Structure of Singing* (New York: Schirmer Books, 1986, pp. 29–33.

²²⁸ Nathan, *Musurgia*, 1836, p. 150.

²²⁹ *Ibid.*, 145.

²³⁰ *Ibid.*, 146.

By starting with the [u] or closed [e] the larynx is set to a feigned voice, or *false* register, and when the vowel is then opened to [a] the acoustics of the vowel may shift to include the brightness of the chest voice without engaging the full chest register.²³¹

Without further information it is again difficult to confirm to what extent the feigned voice connects with the actual chest register, but it is likely that the feigned voice is being changed acoustically to resemble the chest voice, which is to say adding characteristics of the chest voice into the feigned voice itself while remaining in the feigned voice register. This blending of qualities would essentially create a mixed voice register as discussed by Garcia and both Lampertis and is precisely the method by which the ‘pharyngeal voice’ is produced.

While the *messa di voce* is a pivotal tool in the unifying of the registers, it remains one of the single most important aspects of effective vocal performance practice. Domenico Corri, Ansani (the teacher of Garcia I), Isaac Nathan, and Manuel Garcia (snr.) each insisted that the *messa di voce* be used as a voice-building tool, among other things to bridge registers, from the beginning of training.²³² However, similarly to Mancini, Garcia (jnr.) believed that although the *messa di voce* was invaluable to the singer and their art, he thought that the *messa di voce* polished the voice rather than formed it. He also said that attempting the *messa di voce* too soon would tire the voice. It was his belief that the ‘ability to perform the *messa di voce* must be in some ways the result of all other studies; because to perform it well is to be a singer’.²³³ Garcia (jnr.) clearly believed that the *messa di voce* should be held off until the student was already in well-founded control of a stable voice, because the *messa di voce* was far too difficult for the beginner and could cause problems. Mancini and both Francesco and G .B. Lamperti agreed with Garcia that the *messa di voce* should be held off until the student is already advanced, and represents the ‘the last, the

²³¹ Based on the practical research it was found that in order to perform this exercise, it is required that the voice be in a closed supported falsetto (see: Herbst, ‘Membranous’, 2001) otherwise it the voice would lose integrity and the tone would have no focus or resonance. When performed with a closed falsetto a shift toward a more modal sound and engagement of the voice was experienced.

²³² On the *messa di voce* Corri, *Singers’ Preceptor*, 1810, p. 30 and Nathan, *Musurgia*, 1836, p. 145.

²³³ Garcia, *École*, 1847, p. 19, ‘Nous ne nous occuperons point d’abord des sons filés, dont nous croyons de devoir traiter que un des chapitres avancés de cette première partie. Filer les sons, c’est les polir, c’est leur donner le dernier vernis. Pour y réussir, il faut être du jeu des poumons, de l’action du larynx et de celle du pharynx. L’étude des sons filés, si on s’y livrait dans les commencements, n’aboutirait qu’à fatiguer l’élève sans l’instruire. La faculté de filer les sons doit être en quelque sorte le résultat de toutes les autres études; bien filer les sons, c’est être chanteur.’

most important, and most difficult method' that 'should only be practiced [sic] when the pupil is well advanced in vocalization.'²³⁴

In the training of the voice to execute the *messa di voce*, Lamperti indicates that where a singer would ordinarily develop the voice so that it resonates 'as far forward as possible,' it should instead be carried 'back towards the pharynx.'²³⁵ As has been shown, resonance in the pharynx is a universal concept for the 'pharyngeal voice', but in this instance allowing the voice itself to resonate as far back as possible would indicate that the typical vibration felt on the palate should not be sought. It is possible that the *messa di voce* is to be performed entirely in the pharynx, or that it is 'carried backwards' during its performance, but this is difficult to know. He does however indicate that it is produced 'solely by breath control,' and therefore perhaps the point of resonance does not move at all.²³⁶ I have included *messa di voce* as a training tool for the 'pharyngeal voice'. It is used to strengthen the feigned voice and to unite it to both the chest and head registers in order to develop the 'pharyngeal voice' in its entirety.

For Lamperti (snr.) the *messa di voce* helps the student to balance the voice, train the registers and sing expressively. The sentiment is echoed by his son while discussing the importance of training of the tenor *falseto*:

And the very fact that the training of this register [*mixed voice/falseto*] has been neglected, may be the chief reason that we have so few eminent tenors, and that artists endowed with great vocal powers often mistake quantity of tone for quality. How few singers there are who can sing with 'half-breath'; so few who know how to control or employ the *messa di voce* or an effective, buoyant *piano*! And may not this be attributed to faulty methods of breathing?²³⁷

For Lamperti (jnr.) the *messa di voce* (*filare la voce*) and the *portamento*— 'the gentle carrying-over ... of one tone to another [so that] the second tone is barely audibly anticipated at the end of the first' - represent the highest form of the vocal art, and each require the singer to have achieved an advanced level of vocal training.²³⁸

²³⁴ On holding off the *messa di voce* Mancini, *Practical*, 1776, p. 119–20; As Quoted in Lamperti, F., *Art*, 1890, p. 9.

²³⁵ Lamperti, G. *Technics*, 1905, pp. 20-1.

²³⁶ *Ibid.*, p. 21.

²³⁷ Lamperti, G., *Technics*, 1905, p. 25.

²³⁸ *Ibid.*, 21.

Portamento

The term *portamento della voce* means ‘carriage of the voice’ and defines an important vocal technique for *legato* singing already established at the beginning of the 17th century, albeit without a consistent terminology.²³⁹ Ellen Harris, in the *New Grove*, defines vocal *portamento* as ‘the connection of two notes by passing audibly through the intervening pitches.’²⁴⁰ Harris’s definition is distinctive and does represent the core principle of *portamento*. However it conjures images of a ‘dragged’ voice associated with heavy or careless singing, which has an impact on rhythm and cleanliness. That characterization could not be a less accurate image of the *portamento* discussed in this reconstruction.²⁴¹

Mancini, for example, says *portamento* ‘is one of the most important parts of the vocal art.’²⁴² Domenico Corri points to Farinelli as one of the preeminent singers of the day, and that it was not his ability to sing ornaments but rather that his merit, and that of others of ‘first eminence’, resided in their *portamento di voce*.²⁴³

Portamento di voce is the perfection of vocal music; it consists in the swell and dying of the voice, the sliding and blending one note into another with delicacy and expression—and expression comprehends every charm which music can produce; the *Portamento di voce* may justly be compared to the highest degree of refinement in elegant pronunciation in speaking.²⁴⁴

Corri would seem to feel that the *bel canto portamento* is the essence of beauty and *legato*. Mancini says that the voice must have ‘well-balanced control’ in ascending as well as descending passages. Using the *portamento*, he offers some important advice on how to blend registers when singing over large intervals.²⁴⁵ He describes *portamento* as the ‘passing and blending of the voice from one tone to another, with perfect proportion and union, in ascending as well as descending’; it should be produced without interruption and ‘must be a straight and limpid graduation that must pass, support and blend from one tone to the

²³⁹ Harris, E. T. ‘Portamento’, (Grove Music Online, 2001) accessed 14 Mar. 2014.

²⁴⁰ Harris, ‘Portamento’, 2001.

²⁴¹ The ‘Portamento exercise’ in Section III is one of the most universally important exercises which has resulted from this research and reflects the consistency and seriousness with which it is addressed in the treatises, see p. 333.

²⁴² Mancini, *Practical*, 1776, p. 108.

²⁴³ Corri, *Singers’ Preceptor*, 1810, p. 3.

²⁴⁴ *Ibid.*, 3–4.

²⁴⁵ These techniques represent a noteworthy skill that is required for any singer attempting *bel canto* repertoire, but especially those who sing the using the ‘pharyngeal voice’ including the *tenore serio* repertoire which requires large leaps, or *canto di sbalzo*.

other.’²⁴⁶ A particularly important element which is heavily relied upon in the reconstruction is Mancini’s advocacy that the ‘low tone must vibrate and be sustained with strength according to the requirements, and the high note attacked softly, keeping always a *corresponding proportion* between the tones’.²⁴⁷ He goes on to say that the blending of registers must always be with a ‘*portamento di voce*’.²⁴⁸ There can be no accidental breaking, skipping or shaking of the tones.

In the description of *portamento* below, Lamperti indicates an ‘anticipation with the vocal organ’ which echoes Mancini’s ‘corresponding proportion between the tones’ and suggests a tacit awareness of the physiological preparation of tone which incorporates the possible understanding of basic vocal acoustics.²⁴⁹

[Portamento] means passing from one note to the other by slurring the voice, but in such a manner that the *intervening notes are heard as little as possible*, this is done by leaving the first note before the end of its value, so as to anticipate with the vocal organ the other, to which the voice is to be carried. [Emphasis added]²⁵⁰

The preparation of the voice to anticipate the subsequent tone is a simple statement that conceals an extremely complex vocal technique. In brief it represents preparing the mechanism and acoustic tuning of the first note to incorporate, or prepare for, that of the second, and perfectly echoes Mancini’s ‘corresponding proportion’ between the notes. The procedure demonstrates a concept that is indispensable in the development of the ‘pharyngeal voice’ by aiding blending of chest and falsetto registers creating an acoustic and

²⁴⁶ Mancini, *Practical*, 1776, p. 111; Mancini, *Pensieri*, 1774, p. 91, ‘Per questo portamento non s’intende altro, che un passare, legando la voce, da una nota all’altra con perfetta proporzione, ed unione, tanto nel falire [sic], che nel discendere. Viepiù sarà bello, e perfezionato [sic], quanto meno farà interrotto dal figliar fiato, poiché dev’essere una giusta, e limpida graduazione, che lo deve reggere, e legare, nel passar che si fa da una nota all’altra.’

²⁴⁷ Mancini, *Practical*, 1776, p. 158; Mancini, *Pensieri*, 1774, p. 141, ‘Necessario anch’è, che l’esecuzione perfetta vada unita col portamento di voce, giacché se questo non lega la prima con la seconda nota, si sentirà quel distacco, che solamente conviene a chi canta il Baffo, oppure a quel Buffo, che coi suoi sbalzi, e caricature ottiene le risa, e Applauso;’

²⁴⁸ Ibid.

²⁴⁹ Mancini, *Practical*, 1776, p. 158; Mancini, *Pensieri*, 1774, p. 141, ‘Necessario anch’è, che l’esecuzione perfetta vada unita col portamento di voce, giacché se questo non lega la prima con la feconda nota, si sentirà quel distacco, che solamente conviene a chi canta il Baffo, oppure a quel Buffo, che coi suoi sbalzi, e caricature ottiene le risa, e Applauso;’

²⁵⁰ Lamperti, F., *Art*, 1890, p. 12; Lamperti, F., *Guida*, 1864, p. 9, ‘Intendesi [sic] passare da un suono all’altro trascinando la voce, ma in modo che si sentano il meno possibile i suoni intermedi, abbandonando il primo suono avanti il termine del suo valore per anticipare il secondo ove portasi la voce.’

mechanical bridge between the tones. Doing so helps to lend qualities of either register to the other. In my view, this is also parallel to Garcia's concept of the 'vocal pinch'.

The *portamento di voce* described by Garcia is consistent with the descriptions given by other writers considered in this section. He indicates that to 'carry the voice is to lead from one tone to another by passing through all of the possible intermediate tones.'²⁵¹ He goes on to say that 'The portamento will help to equalize the registers, the timbres, and the force of the voice'.²⁵² It requires the precise alignment of the mechanism so that in the moving from one pitch to another, regardless of the interval, the acoustics are balanced and there are no interruptions in the sound. John Potter points out that *portamento* 'would have been more controllable by singers who were well practiced in *messa di voce*, and the decline of this technique (especially in the twentieth century) may account for some of the complaints about the lack of skill and taste shown by those who overused their portamento'.²⁵³ In his 1847 treatise, Garcia (jnr.) provides a full page of exercises for the development of the *portamento*.²⁵⁴

The *portamento* is relevant to producing the 'pharyngeal voice', which is likewise an advanced singing technique that incorporates a blending of the vocal harmonics of each pitch and allows the voice to move cleanly from one tone to the other. Exercises have been developed in my practical research that are based on the preceding concepts, requiring the intermediary tones to be gently passed through without attacking any of the transient notes with a stroke of the glottis. The voice is required to slide from one pitch to another through all the intermediary tones, not just those within the tonality of the scale, while maintaining consistent intensity but without 'slurring'. If done correctly, the vibrato remains steady and free while not allowing any hint of 'straight tone' passing through or accentuating the intermediary pitches. These exercises allow a clean movement through the line while keeping in time and not creating a muddled texture or sliding of tones. As with most other voices, exact deployment of the portamento is one of the most effective ways of equalizing the registers in the 'pharyngeal voice', developing coordination between registers and the extremes required by the repertoire, which is investigated in Section II.

²⁵¹ Garcia, *Complete*, 1984, p. 55.

²⁵² *Ibid.*, 56.

²⁵³ Potter, *Beggar*, 2006, p. 535.

²⁵⁴ Garcia, *École*, 1847, p. 32.

Because the ‘pharyngeal voice’ relies on the falsetto register, there is a distinctive shift in the mechanism and the concept of ‘corresponding proportion’ is invaluable in the developing a muscular and acoustic ‘bridge’ between the registers. The *portamento* is applied to aid in ‘shifting gears’ analogous to the operation of a mechanical gear box; the priorities of the first tone succumb by proportion to the attributes of the second before establishing that tone. Like the *messa di voce*, the *portamento* is used to balance the resonances of the vocal tract, which in turn helps to maintain pharyngeal resonance of the ‘pharyngeal voice’ by coordinating breath support with laryngeal activity and resonance tuning. The *portamento* is difficult to learn and to teach, requiring concentration and patient study.

Breath Management

Management of breath pressure is of considerable concern for development of the ‘pharyngeal voice’ because of the very low breath pressure required for its proper functioning. Though this might be said for most vocal training, breath management requires a particularly cautious consideration and any misapplied effort can preclude its development. Generally speaking, the *falsetto* register, upon which the ‘pharyngeal voice’ is built, requires very little air pressure to bring the vocal folds into vibration.²⁵⁵ Excess breath pressure causes tension inside the larynx and is anathema to correct vocal production for any singer, but especially for the ‘pharyngeal voice’ singer.²⁵⁶

Mancini indicates that through skilled breath control, the singer ‘will be able to graduate and take back the breath, then find himself master in attacking a tone, letting go of it, to take it up again, and not to breathe because of the need to numb pain and

²⁵⁵ Sundberg, J. and Högset, C. ‘Voice source differences between falsetto and modal registers in counter tenors, tenors and baritones’, *Logopedics Phoniatrics Vocology*, 26(1) (2001): 26–36(11). See also: Titze, I., Sharyn M., and Story, B. ‘Acoustics of the Tenor High Voice’, *The Journal of the Acoustical Society of America*, 95(2) (1994): 1133–42; Titze, I. ‘The importance of vocal tract loading in maintaining vocal fold oscillation,’ *Proceedings of the Stockholm Music Acoustic Conference 1983*, 46(1) (1985): 61–72; Sundberg, J., Leanderson, R., and Euler, C. ‘Activity relationship between diaphragm and cricothyroid muscles’, *Journal of Voice*, 3(3) (1989): 225–32; Hulbert H. *Breathing for Voice Production* (London: Novello, c. 1903).

²⁵⁶ As a refinement to the concept of excess breath pressure, Ken Bozeman suggests that ‘it may be rather that it takes very little transglottal pressure difference—in other words, that pharyngeal voice, as with some other acoustic strategies, raises the supraglottic pressure to keep the transglottal pressure difference light. The felt effect is the same—no sense of pressure under the glottis, in other words, vocal ease.’ Bozeman, K. ‘Personal Interview’, 26 August 2020.

fatigue.²⁵⁷ Lamperti (snr.) echoes these sentiments on the first page of his work *Guida teorico*, concerning breath control of ‘the famous singer Pacchiarotti’ who wrote in his memoirs, ‘He who knows how to breathe and pronounce well, knows how to sing well.’²⁵⁸ He goes on by stressing that ‘this is one of the greatest truths which study and experience have ever suggested to the successful cultivators of the art of singing.’²⁵⁹ His conception of breath is fairly simple. He explains that there are three principal types of breath:

1. Abdominal / diaphragmatic: involves only with the lower body and *does not* include movement of the chest
2. Lateral: characterized by use of abdominal breathing *with the added outward movement of the rib cage*
3. Clavicular: which is a form of high breath that displaces the upper ribs, shoulders vertebrae, etc.²⁶⁰

According to Lamperti, breathing for singing is a ‘development of natural breathing’ but can only be acquired through months of ‘application and practice.’²⁶¹ The following quotation from the 1890 English edition of the *Art of Singing* offers an exercise in how to develop Lamperti’s preferred form of respiration, abdominal or diaphragmatic:

To obtain a respiration purely abdominal, let the reader, for the sake of experiment, seat himself on a chair, and cross his hands behind the back of it as high up as possible; then the shoulders and upper part of the chest being rendered immovable, a breath so taken cannot be other than abdominal.²⁶²

This very uncomfortable seated position prevents the singer from moving the upper torso, essentially forcing the body to draw breath exclusively from the abdomen with the diaphragm. For both Lampertis, the only mode of breathing that produced the appropriate support for artistic singing, and with the minimum of exertion, was diaphragmatic, and Giovanni Battista Lamperti (jnr.) clearly associated this type of breathing with the ‘old Italian Method’:²⁶³ ‘Singing voices were preserved much better and longer by the old Italian method, as taught by Rubini, Porpora, etc.’ and he disdained both clavicular and abdominal

²⁵⁷Mancini, *Pensieri*, 1774, p. 94, ‘che io progresso, accostumando così i mantici della voce a reggerla, graduarla, e ritirarla, egli si renderà padrone di pigliare, ripigliare, e lasciare la voce, non che di prendere fiato secondo il bisogno con insensibile pena, e fatica.’ See also Mancini, *Practical*, 1776, p. 113.

²⁵⁸ Lamperti, F., *Guida*, 1864; See also Lamperti, F., *Art*, 1890, p. 1.

²⁵⁹ Lamperti, F., *Guida*, 1864, p. 1.

²⁶⁰ Lamperti, F., *Art*, 1890, p. 20.

²⁶¹ *Ibid.*, 24.

²⁶² *Ibid.*, 20.

²⁶³ On diaphragmatic breathing see Lamperti, G., *Technics*, 1905, p. 5.

or diaphragmatic breathing.²⁶⁴ He explicitly follows his father's description of abdominal respiration.²⁶⁵

For Lamperti (jnr.) 'dynamic singing' is achieved wholly through the quantity of air pressed through the larynx, which means that the amount of breath must change in direct proportion to the volume i.e., more breath pressure for louder singing, and vice-versa. He indicates that in all singing, including soft singing, demands 'pelvic control of breath'.²⁶⁶ With abdominal breath support the pelvic floor is used to control the energy of the breath because the ribcage is not used to control the breath.²⁶⁷ He says that for singing *piano* the 'breath is held back' while the resonance is reduced and conversely for *forte* singing where the breath is 'released, without endangering the regularity of the vibration. It takes more muscle to hold the breath energy back with *piano* singing, than it does to let it go. Therefore, soft singing is more difficult than loud singing, and should be studied last.'²⁶⁸ The difficulty in holding back the breath to provide the low breath pressure required of *piano* singing requires the student have a core strength that can only come through development and coordination.

This type of respiration is a core singing concept, the rationale for which is to release the larynx while still providing the voice with the necessary amount of energy to produce a singing tone, while not conveying any tension into the vocal apparatus. This effectively separates the feeling of tension in the body from that of the larynx.²⁶⁹ In terms of developing the 'pharyngeal voice' through my own practical research, I have discovered that this type of breath support may be more beneficial when singing up into the modified head voice above c'' sharp. However the open rib cage employed by Garcia is useful for general vocal production and dynamic singing.

In order to overcome excess pressure, Lamperti (jnr.) suggests that 'in passing from low to high tones, the breath must take the opposite direction from the voice;' in short the higher the tones, the deeper the breathing.²⁷⁰ In other words, the feeling of support moves lower into the body creating a sense of 'inhaling the voice' and feeling of support does not

²⁶⁴ Ibid., 5

²⁶⁵ Lamperti F., *Art*, 1890, p. 20.

²⁶⁶ Ibid., 26.

²⁶⁷ Ibid.

²⁶⁸ Ibid., 50–1.

²⁶⁹ Lamperti, G., *Technics*, 1905, p. 5.

²⁷⁰ Lamperti, G., *Vocal*, 1931, p. 6.

rise with the pitch.²⁷¹ This technique is used for the ‘pharyngeal voice’ to reduce the pressure under the vocal folds. It has been suggested by Johan Sundberg, that the ‘inhaling of the voice’ may be related to the physiological principle called ‘tracheal pull,’ and is characterized by how the lowering of the diaphragm elongates the trachea and lowers the larynx without muscular intervention. When the diaphragm is activated, it creates a space below the thoracic cavity pulling air in, at the same time low upward breath pressure allows gravity to elongate the trachea.²⁷² Furthermore, using a coordination of the inhalation and exhalation muscular groups, referred to a ‘la lotta vocale’, ‘la lutte vocale’ [‘vocal struggle’], can give the singer the sense of inhaling while singing. Several standard exercises have been appropriated and modified to be used specifically with the ‘pharyngeal voice’, a few of which will be covered in Section III.

²⁷¹ Ibid., 136.

²⁷² Sundberg, ‘Activity relationship’, 1989, p. 83.

Conclusion

It is the assertion of this dissertation that the ‘pharyngeal voice’ can be developed by understanding and then applying principles of registers, timbres, and pedagogical techniques for controlling them, based on the methods described in the eighteenth- and nineteenth-century sources analysed in the foregoing Section. The ‘feigned voice’, first described in the work of Isaac Nathan, can be used not only as bridge between the chest and falsetto voice, but also be developed as a form of ‘mixed voice’ similar to that understood by Garcia as the *mezzo petto* [‘half’ chest]. Garcia believed that the registers should be joined using the timbres of the voice, that the closed or ‘*sombre*’ timbre was particularly suited to uniting the registers.²⁷³ I would add that the rounded timbre, focused in the pharynx, has the ability to help unify the registers in the ‘pharyngeal voice’. By observing this timbre and the relevant vowel modifications, the ‘pharyngeal voice’ can gain access to the *falsetto* register and then to the modified head voice, enabling the production of high notes with a chest voice quality. Along with rounding the tone, the use of the *coup de la glotte* and of anterior phonation, two of Garcia’s most controversial concepts, help to bring the blended registers into a unified quality.

When combined with Garcia’s ‘rounded timbre’ and the pharyngeal resonance tuning exemplified by Lamperti, the ‘feigned voice’ can be developed into the ‘pharyngeal voice’ which may be similar to that used by the high tenor voices in the repertoire of Section II. By maintaining the appropriate resonance tuning including the slightly narrowed pharynx the singer is able to produce the ‘pharyngeal voice’ throughout the vocal range without resorting to the sound of the modern countertenor or choral alto, described as ‘whoop’ timbre in Section III. But before moving to the description of the attempted reconstruction and its application in ‘modern’ singing, the next part of this dissertation continues with the historical investigation by considering the application of ‘high-tenor vocal techniques’ by the great singers of the age in which this kind of singing last flourished. Section II, then, is an investigation of how this special voice was employed by opera composers in the early nineteenth century and of the singers who were its greatest adepts. It uses case studies to try to ascertain what ‘pharyngeal’ voice’s particular qualities might have been.

²⁷³ Garcia, *École*, 1847, p. 28.

Section II – Singers and Repertoire

Introduction to the Literature

Section II is an investigation into the generation of virtuoso tenors who dominated the opera stage in the era of Rossini, Donizetti, Bellini and their contemporaries, and the repertoire composed for their voices. Literature about the singers and composers of this generation, ranging from as Stendhal's (Marie-Henri Beyle) *Vie de Rossini* (1824) to the 1908 biography of Manuel Garcia I (father) published by M. Sterling MacKinlay (1876—1952) provide sufficient detail to develop an overview of their repertoire and also some insights into how their vocal qualities were perceived by their listeners.²⁷⁴ Literature describing general qualities of voice and repertoire in this era is not lacking, and includes works by W. Ashbrook and Gualerzi on Donizetti, G. Appolonia and L. E. De Marco discussing Rossini voices, as well as J. Evans and R. Kosowski's work on the *leggiere* tenor, and others.²⁷⁵ Two of the most important tenors who frame the research are Guglielmo d'Ettore, the first *Mitridate, re di Ponto* (26 December 1770) who is the subject of a book by H. J. Wignall, and Manuel Garcia (father), subject of James Radomski's 2000 biography. Research on these tenors helps to provide considerable detail about their respective performance styles to

²⁷⁴ Stendhal (Beyle, M.) *Life of Rossini*, Coe, R. (trans.), (London: Calder & Boyars, 1970); Mackinlay, M. *Garcia the Centenarian and His Times* (New York: Da Capo Press, 1976).

²⁷⁵ Ashbrook, W. *Donizetti and His Operas* (Cambridge Univ. Press, 1982); 'The Evolution of the Donizettian Tenor—Persona' *The Opera Quarterly*, 14 (1998): 25–32; Gualerzi, G. 'Topologia del tenore serio donizettiano: Indagine nei teatri di Torino dell'Ottocento' Paper presented at the L'opera teatrale di Gaetano Donizetti: *Atti 110 del convegno internazionale di studio/Proceedings of the International Conference on the Operas of Gaetano Donizetti* (Bergamo, Italy, 1993); Appolonia, G. *Le Voci Di Rossini* (Turin: Eda, 1992); De Marco, L. 'Rossini and the Emergence of Dramatic Male Roles in Italian and French Opera' (Dissertation: Columbia Univ., 1998); Evans, J. *Characteristics of the Leggiere Tenor* (Dissertation: Univ. of Houston, 2008); Kosowski, R. *A survey of voice teachers' perceptions of and the characteristics used to identify the leggiere tenor voice* (Dissertation: Univ. of Houston, 2008); Boutet, E. *Une artiste d'autrefois: Adolphe Nourrit, sa vie et sa correspondance* (Paris: Plon-Nourrit et cie., 1903); Vest, J. *Adolphe Nourrit, Gilbert-Louis Duprez, and Transformations of Tenor Technique in the Early Nineteenth Century: Historical and Physiological Considerations* (Dissertation: Univ. of Kentucky, 2009); Walker, E. 'The Fable of Adolphe Nourrit', *Journal of Singing*, 64(4) (2008): 411-416; Walker, E. *Adolphe Nourrit (1802–1839): His Place in the History of the Operatic Tenor Voice* (Dissertation: Peabody Conservatory of Music, 1989); Pleasants, H. *The Great Tenor Tragedy: The Last Days of Adolphe Nourrit* (Portland: Amadeus Press, 1995); Austin, S. 'Like the Squawk of a Capon' - The Tenor 'do di petto', *Journal of Singing* 61(3) (2005): 309-313; Bloch, G. 'The Pathological Voice of Gilbert-Louis Duprez', *Cambridge Opera Journal*, 19 (2007): 11–31; Celletti, R. 'Arnold, ou l'invention de l'ut de poitrine', Moiroud, C. (trans.), *L'Avant-Scène Opéra*, 118 (1989): 106–7.

develop a relatively reliable picture of their vocal qualities and capacities as singers.²⁷⁶

Together with another giant of this era, Giovanni David, Giovanni Rubini is one of the most famous tenors of the nineteenth century, and the two characterize the technique of the *contraltino* 'pharyngeal voice'. Their respective performances in *Otello* (Rossini), *Bianca e Fernando* (Bellini), *La sonnambula* (Bellini) and *Anna Bolena* (Donizetti) represent some of the most extreme singing of the nineteenth century.²⁷⁷

Two other authors, Rodolfo Celletti and John Potter, both specifically historians of singing, have between them made significant contributions to the general history of the tenor voice, including extensive lists of singers, repertoire and reception.²⁷⁸ While neither of these two propose research relating to the 'pharyngeal voice' specifically, they offer a significant contribution to understanding how the tenor voice developed, the repertoire performed in the later *bel canto* period, and the relationships between singers and composers. Potter's work has been an important resource for my research.²⁷⁹ He has written an important history of the tenor voice, a chapter on the 'Reconstruction of Lost Voices', vocal style, and an important discussion of the development from the technique of the castrati.²⁸⁰ Nevertheless, his conclusions about high tenor singing do not align with mine in important ways. In his 2007 article 'The Tenor-Castrato Connection, 1760-1860' for *Early Music*, he suggested that the *contraltino* is essentially a form of countertenor with a strong chest voice.²⁸¹ Potter says that singers like Rubini would in fact have sung in pure *falsestto*,

²⁷⁶ Wignall, H. 'Mozart, Guglielmo D'Ettore and the Composition of Mitridate (K. 87/74a)' (Dissertation: Brandeis Univ., 1995); 'Guglielmo d'Ettore: Mozart's First Mitridate' *The Opera Quarterly*, 10 (1994), 93–112; 'The Genesis of Se Di Lauri: Mozart's Draft and Final Version of Guglielmo D'Ettore's Entrance Aria from Mitridate', *Mozart-Studien*, 5 (1995): 45–99; Radomski, 'García Manuel (del Pópulo Vicente Rodríguez)', in Sadie, S. (ed.), *The New Grove Dictionary of Opera*, Grove (New York: Oxford Univ. Press 1997) II: 345–7; Radomski J., *Manuel Garcia (1775–1832)*, 2000.

²⁷⁷ Marek, D. *Giovanni Battista Rubini and the Bel Canto Tenors: History and Technique* (Lanham: Scarecrow Press, 2013); *Singing: The First Art* (Boston: Scarecrow Press, 2007); Gara, E. 'Giovanni Battista Rubini nel centenario della morte' (Bergamo: Industrie grafiche Cattaneo, 1954).

²⁷⁸ Celletti, 'Arnold', 1989; *Storia Del Belcanto* (La Nuova Italia, 1986); *Voce*, 1989; Potter, *Tenor*, 2009; 'Tenor-castrato', 2007, pp. 97–110; Potter, 'Beggar', 2006, pp. 523–50; *Vocal Authority: Singing Style and Ideology* (Cambridge Univ. Press, 1998); *Companion to Singing*, 2000; 'Vocal performance', 2012; 'Reconstructing Lost Voices', in Knighton, T. & Fallows, D. (eds.), *Companion to Medieval & Renaissance Music* (London: Dent, 1992); *History of Singing*, 2012.

²⁷⁹ John Potter was the external examiner for my PhD transfer examination and offered important advice on the development of the thesis, including a specific recommendation not to follow up on the scientific questions regarding the research, but instead to rely on previous scientific investigations.

²⁸⁰ Potter, *Vocal Authority*, 1998; Potter, 'Beggar', 2006, pp. 523–50; Potter, 'tenor-castrato', 2007, pp. 97–110; Potter, *Tenor*, 2009; Potter, 'Vocal Performance', 2012.

²⁸¹ Potter, *Tenor-Castrato*, 2007, pp. 97 & 107.

with a vocal quality more akin to a modern countertenor than a high tenor.²⁸² Several other authors have discussed the relationship between the *countertenor* and the tenor voice in terms of vocal quality, history and (or) technique, including: Ian Howell-Smith, Robert Podesva, and Injoon Yang.²⁸³ These authors all help to define the characteristic vocal qualities and use of the *false* vocal production in repertoire.

Some authors other than Potter and Celletti who have speculated on the vocal quality of the tenors discussed here include Frances Killingley, who has written significant articles on the *haute-contre* and believes that the voices were more like altos than tenor.²⁸⁴ Neal Zaslaw argues convincingly that the *haute-contre* were indeed tenors, but the nature of the *haute-contre* is also discussed by Mary Cyr, S. Hill, and M. P. Regier.²⁸⁵ And although all of these various descriptions can help to define how the use of a *false* vocal quality by tenors is currently perceived, their conclusions are not the same as mine.

It is important to note that discussions of vocal quality, technique, artistry and other characteristics, regardless of how meticulously well-researched, are ultimately subjective. Sometimes even singers themselves do not have an adequate understanding of what they are doing, let alone a researcher looking through the lens of nearly two centuries, especially without the luxury of recordings. It is for this reason that many of the conclusions drawn by authors must be understood as conditional and often relate to their more or less informed opinions. Some authors (such as Celletti), provide extensive references to historical sources, but nevertheless present their personal theories as fact, or at least, often fail to substantiate

²⁸² Potter, Tenor, 2009, p. 20

²⁸³ Howell Smith, T. *The Use of a Functional, Supported Falsetto in Tenor Fächer* (Dissertation: Univ. of Houston, 2011); Podesva, R. 'Phonation type as a stylistic variable: The use of falsetto in constructing a persona', *Journal of Sociolinguistics*, 11(4) (2007): 478–504; Yang, I. 'The Castrati and the Aesthetics of Baroque Bel Canto Singing: Influences on the Romantic Tenor' (Dissertation: Temple Univ., 2008).

²⁸⁴ Killingley, F. 'Haute-Contre' - Alto or Tenor?' *Music & Letters*, 54(2) (1973): 256–7; 'The Haute-Contre' *The Musical Times*, 115(1573) (1974), p. 217; 'The Haute-Contre' *The Musical Times*, 118(1613) (1977), p. 561.

²⁸⁵ While the *haute-contre* is a French voice type and was not used in Italy, much more has been written about the *haute-contre* than the *contraltino*, and I believe that we can draw parallels between the voices for the purpose of understanding the demands of the repertoire and characteristics of the voices. Much of what is written about the *haute-contre* could be relevant to the *contraltino*. See: Zaslaw, N. 'The enigma of the Haute-Contre' *The Musical Times*, 115(1581) (1974): 939–41; 'End of an Era: During His Lifetime, Rossini Witnessed a Dramatic Change in the Art of Singing, as Virtuosity Fell into Decline', *Opera News*, 45 (1981); Cyr M. 'On Performing 18th-Century Haute-Contre Roles' *The Musical Times*, 118(1610) (1977): 291–5; 'The Haute-Contre' *The Musical Times*, 118(1616) (1977): 818–9; Hill, S. 'The Haute-Contre' *The Musical Times*, 115 (1974): 389–90; Regier, M. *The haute-contre voice: tessitura and timbre* (Dissertation: Univ. of Oregon, 1996), Ravens, S. *The Supernatural Voice: A History of High Male Singing* (Woodbridge: The Boydell Press, 2014) pp. 114–22.

their claims. For example, it would be difficult to confirm where a singer switched registers, whether or not they sang in chest voice or head voice on a particular note, or how loud their voice was in comparison to another. This can often be the case with historical authors as well. Contemporary witnesses naturally provide conflicting accounts of the same subject. Therefore, a certain amount of scepticism in reading either modern or historical authors is always prudent and has been taken into consideration when citing scholarship.

When it comes to the repertoire and practices of specific singers in this era, period-specific works on historical performance practice such as Clive Brown's *Classical and Romantic Performing Practice 1750–1900*, 'Vocal performance in the nineteenth century' and by Will Crutchfield help to frame the context on the reconstruction.²⁸⁶ In terms of individual composers, Phillip Gossett published extensively on subjects related to the *bel canto* era, including his book on *Anna Bolena*, several articles on Rossini, and many others.²⁸⁷ His critical editions of Rossini's operas have been crucial to parts of Part II of this section.²⁸⁸

²⁸⁶ Brown, *Performing practice 1750–1900*, 1999, particularly Chapter V 'Voices' in Part One: The Baroque Era by Ellen T. Harris, Chapter VI 'The Performer as Composer' in Part One: The Baroque Era, Chapter XV 'Voices' in Part Two: The Classical Era by Will Crutchfield, and Chapter XXI 'Voices' in Part Three: The 19th Century by Will Crutchfield; See also, Crutchfield, W. 'Vocal performance in the nineteenth century', in Lawson, C. and Stowell, R. (eds.), *The Cambridge History of Musical Performance* (Cambridge Univ. Press, 2012): 611-42; Crutchfield, W. 'The Bel Canto Connection', *Opera News*, 62(1) (1997): 30–5.

²⁸⁷ Gossett, P. and Rosen, C. (eds.) *Early romantic Opera: Bellini, Rossini, Meyerbeer, Donizetti, and Grand Opera in Paris* (New York: Garland, 1978); 'Gioachino Rossini', Gossett, P., et. al. (ed.) in *The New Grove Masters of Italian Opera: Rossini, Donizetti, Bellini, Verdi, Puccini* (New York: W. W. Norton, 1983); *Divas and Scholars: Performing Italian Opera* (Chicago: Univ. of Chicago Press, 2006); *Anna Bolena and the artistic maturity of Gaetano Donizetti* (Oxford: Clarendon Press, 1985).

²⁸⁸ Other authors who explore similar areas are Henry Pleasants and Charles Osborne who has published on *bel canto* performance history including his 1994 *Bel Canto Operas of Rossini, Bellini and Donizetti*, which provides the basis for the repertoire selection in Chapter II. John Rosselli produced an extensive look at *Singers of Italian Opera* (1994) and the same year Peter Giles published an extensive book on the history and technique of the countertenor which can help to form the framework for history and technique of the *bel canto* tenors found in Chapter III. Pleasants, *Nourrit*, 1995; *The Great Singers: From Jenny Lind to Callas and Pavarotti* (New York: Simon and Schuster, 1981); *The Great Singers: From the Dawn of Opera to Our Own Time* (New York: Simon and Schuster, 1966); Osborne, C. *The Bel Canto Operas of Rossini, Donizetti, and Bellini* (London: Methuen, 1994), Rosselli, *Singers*, 1995; Giles, P. *The History and Technique of the Counter-Tenor: a study of the male high voice family* (Aldershot: Scolar Press, 1994); and Mallinder, D. *The Counter Tenor* (London: Frederic Muller Ltd., 1982); *A Basic Countertenor Method for Teacher and student*, 2 ed. (London: Kahn & Averill, 2005).

Recovering Vocal Techniques from the Notation: A Methodology

Through close analysis of the chosen extracts, a distinct set of technical demands on the singer emerges. The type of demand, whether it be related to range, high-notes, tessitura, coloratura or other, can help to determine the particular qualities of the voice for whom the repertoire was written. When enough data is collated, it produces a sufficiently distinctive set of technical markers to allow the formation of a fairly accurate 'vocal portrait' of an individual singer. This information can also be used to compare how different composers wrote for the same singers, what similarities exist, and how those similarities form groups of skills exploited differently by composers. Subsequently, by examining repertoire that was shared between singers, the set of markers held in common can help to further refine the understanding of particular dissimilarities.

The set of case studies was decided on the basis of known repertoire created for each of the group of singers most closely identified with the different traditions discussed in Section I. Repertoire and composers were identified that would offer the most consistent subset from which to compare composers' approaches with the known attributes of different singers known to have shared those roles. Other examples have been chosen by identifying operas which employed more than one of the singers side-by-side in different roles, which offers the opportunity to analyse how one composer treated different singers within the context of the same work. Furthermore, duets between two tenors offer insights about how the composer viewed two 'similar' voices, not only in a duet, but also by eliminating variations in compositional style in different arias. Duets have proved to be valuable in demonstrating both consistencies and differences between voices which otherwise may not have been apparent.

The potential repertoire is large and my choices are naturally partly based on my familiarity with a considerable amount of this repertoire. Some bias towards certain works is therefore inevitable, but overall, examples have been chosen that have the potential to demonstrate the technical markers of the tenors under consideration. Unrelated pieces may have provided some clues as to a particular aspect of a voice but would be less easy to make comparison with because of the composition year, genre, composer, or other factor. After relevant repertoire had been chosen, a series of test-runs was made in order to establish

the categories and modes of analysis that could most effectively be applied uniformly to all the extracts and produce results both robust and useful.

Standard methods of pitch, harmonic and rhythmic analysis were rejected as not offering sufficiently detailed information about key integers such as tessitura, technical demands on the singer and other parameters of vocality. A preliminary description of surface features is made to identify particularly relevant features of the vocal line of the respective aria, such as wide intervals, florid passages, tempo, dynamics, and so on, but it soon became apparent that to establish objective data, a more precise statistical analysis was necessary, so that comparisons of such significant features as tessitura, florid or sustained singing could be made.

In order to provide more objective information upon which to build an understanding of each voice, two initial graphs were created for each extract by simply counting the occurrence of individual pitches and their durations (Graph 1 - below). The first graph records all sung pitches irrespective of duration. This provides an overall impression of the piece in terms of:

- Range
- Which notes are sung the most?
- Where is this voice apparently most 'comfortable'?
- What are the overall technical characteristics of the voice?

The second graph in each set plots notes which have durations of one crotchet or greater (making adjustments for meter or tempo,) and is a representation of each note duration measured in beats, not the number of occurrences of each pitch, as in the first graph. This produces specific data concerning the ability (or requirement) of the singer to sustain pitches in a given tessitura.

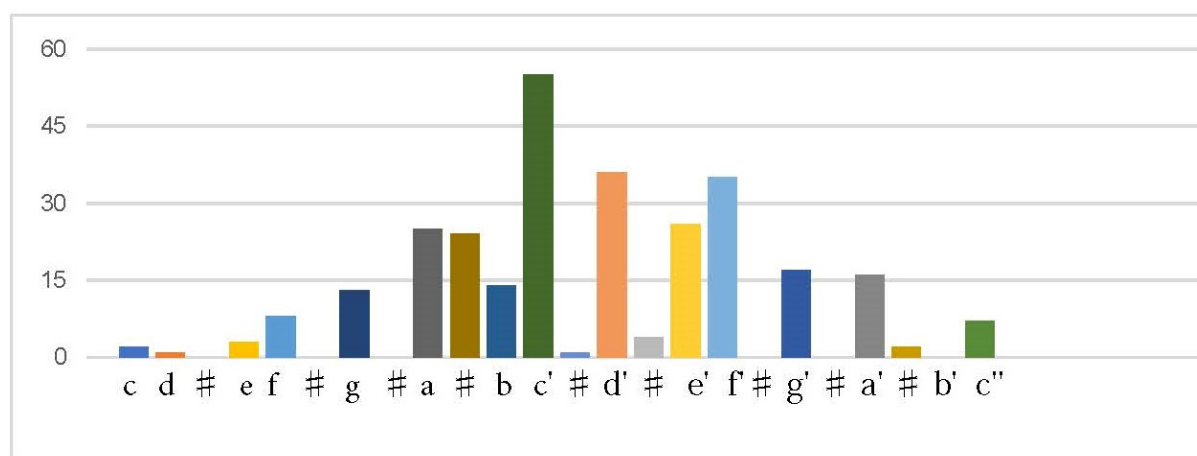
Comparison of the two sets of data produces a relatively complex picture of tessitura across the duration of an entire extract, which, as I have shown, is a critical consideration in classifying the vocal character of both music and singer. Although one might have expected the two graphs to show broadly similar pictures in this respect, in fact they are typically markedly different and show that while one voice may regularly be required to sing florid passages in one part of the voice it may apparently be more comfortable with sustained

pitches in another. To demonstrate how the methodology functions, the aria 'Vado incontro al fato estremo' from Mozart's *Mitridate, re di Ponto* (1770) was chosen. As with all following extracts, the aria information is presented in this manner, and Graphs 0.a, 0.b & 0.c which follow are the result of the analyses.

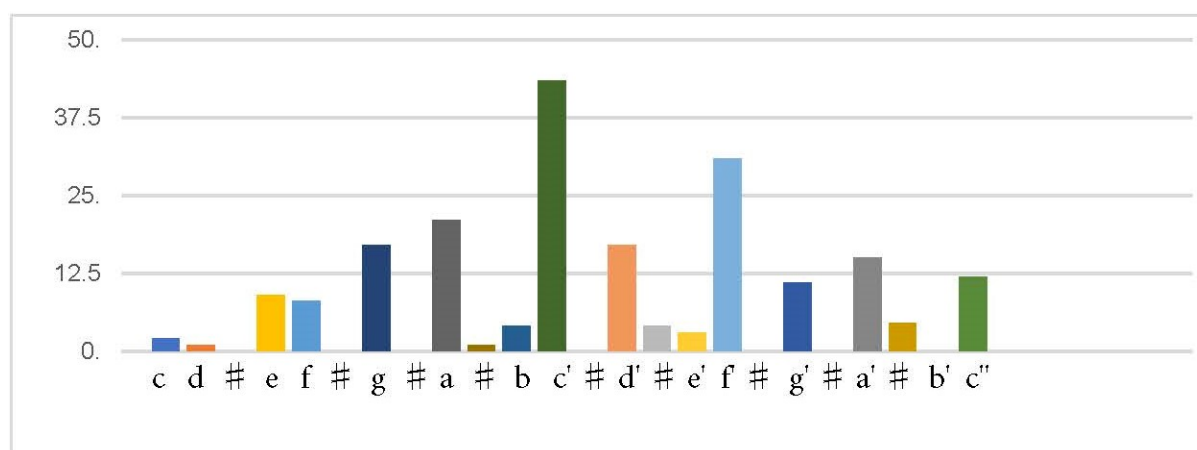
To create graphs that could be confidently compared, incidences of individual pitches and the relative durations of sustained pitches were chosen. Because of differences in key, tempo, meter and notation, minor adjustments were made to the precise method of recording the data for each extract. For example, in extracts with a very slow tempo, dotted quavers could be counted as three-quarters of a sustained beat, which would not have been counted at all in much a faster tempo. Highly syllabic singing on a single pitch was considered as 'sustained singing' whereas in more melismatic phrases a decision needed to be made as to whether syllabic singing represented statistically significant sustained singing. Also regarding syllabic singing, decisions were necessary to decide whether certain syllables represented a secondary attack on the same pitch, which would then increase the number of individual pitches, or whether the syllable constituted a continuation of the same pitch which could instead increase duration counts. These minor adjustments in data collection allow the diverse extracts to be reliably compared one to another with a reduced scope for error.

Throughout, the first graph represents the total number of notes plotted by individual pitches lowest to highest, and the second graph represents the durations of those pitches sustained for one crotchet or more. The graphs below from the Mozart aria, sung by Guglielmo d'Ettore, are very similar in distribution, but does this offer an accurate description of the voice? On its own, the data produced by these two procedures suggests that the voice is equally comfortable sustaining pitches and in singing quickly. However, there are other factors to be considered. One of those issues is the aggregation of data. Each of these figures demonstrates the raw numbers which shows very low counts between the higher-count columns. This is because within the given tonality there are always accidentals. The accidentals detract from the overall height of the nearest column and render that column a less accurate depiction of the vocal elements.

Aria	'Vado incontro al fato estremo', [Act III.iii, No. 20; 1–109] ²⁸⁹
Composer	W. A. Mozart
Opera / Character	<i>Mitridate, re di Ponto</i> , K. 87 (74a)
Premiere	26 December 1770 (Teatro Regio Ducale, Milan)
Tenor	Guglielmo d'Ettore (c.1740–1771/2) ²⁹⁰
Fach	Tenor (Contraltino)
Range / Tessitura	c natural to c'' natural (c'–f' centre) ²⁹¹ / a natural to a' natural



Graph 0 A – W.A. Mozart, 'Vado incontro al fato estremo', *Mitridate, re di Ponto*, Occurrences of Individual Pitches.



Graph 0 B – W. A. Mozart, 'Vado incontro al fato estremo', *Mitridate, re di Ponto*, Occurrence of Sustained Pitches.

²⁸⁹ NMA II/5/ 4: KV 87 / 20 (74a / 20) pp. 214–8.

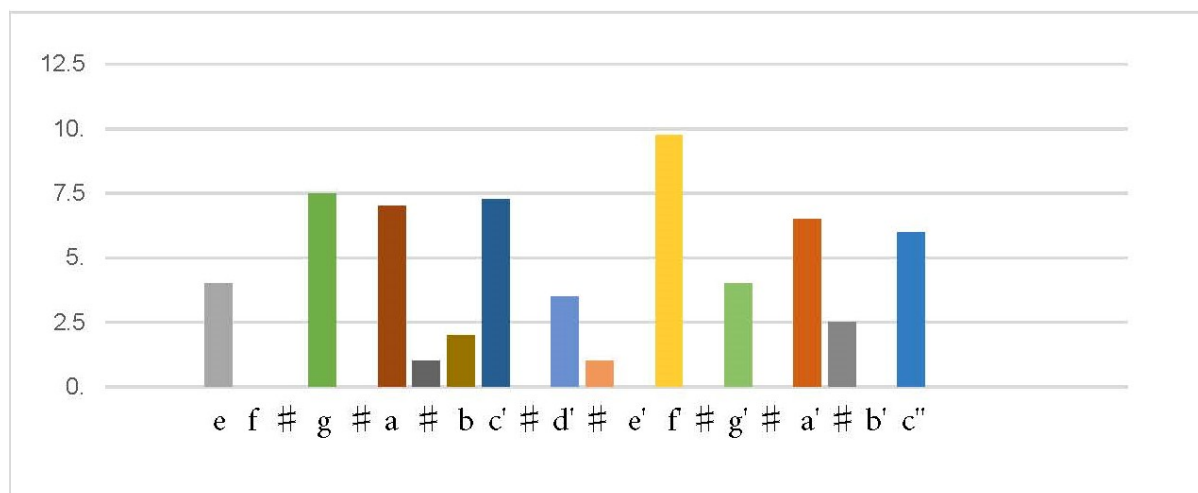
²⁹⁰ Wignall, H. 'Ettore, Guglielmo (born 1740), tenor' (Grove Music Online, 2001) accessed July 2015.

²⁹¹ 'weighted centre of the pitch range', see Below.

Refinements to method following initial test runs.

In order to produce a graph that offers the greatest amount of reliable information, it became clear that a measure more detailed than simple note duration had to be developed. In the end, the most natural method became apparent: music needs to be performed. By performing the music, even in a simple way, idiosyncrasies inform how the data can be collected to allow for a more reliable comparison. Based on how the voice responded to the meter, rhythm, melodic contour, etc. it became clearer how the extracts could be compared. Simple observation allowed for a better understanding of the rhythms' impact on pitch duration. In the end, I concluded that only counting note values of a minim or longer did not sufficiently account for the amount of 'sustained' singing required in the given piece. I therefore increased the parameter to count notes of a crotchet duration as well. Once the distinct duration was established, it was then applied equally across the entire aria, which produced a distinctly different graph.

In Graph 0.b (above) the new value of sustained notes is plotted based on the nature of sustained singing in the piece and it suggests that Ettore's voice was equally adept at both fioritura and sustained singing. That is, his ability to sing quickly or to sustain pitches decreases proportionally relative to the central pitch point of c' natural. However, when Graph 0.c is substituted for Graph 0.b a wholly different inference can be drawn. Graph 0.c shows a voice that has a much more even compass, capable of sustaining pitches throughout, albeit with an aberration at d' and e' natural. Graphs 0.b and 0.c show two very different sets of data and produce a significantly different image of the same voice and highlight how data choice can influence the outcome of a study such as this.



Graph 0 C – W. A. Mozart, 'Vado in contro al fato estremo', *Mitridate, re di ponto*, duration of individual pitches sustained for one minim or longer.

Graph 0.a demonstrates relative symmetry in the range with one octave above and below the centre point of c natural. However, with a much greater number of pitches above c' natural than below, the curve is heavily weighted to the right which indicates that notes above the centre point are far more likely to occur. This could indicate that the voice for which it was written, while having a lower centre, was actually more comfortable in the upper register. Graph 0.c, however, presents a very different vision of the voice; the sustained notes are almost equally distributed, not proportionally distributed against the number of notes sung, as seen in Graphs 0.a and 0.b.

These two types of graphs are intended to demonstrate significant characteristics of pitches, durations and tessitura of each extract in order to elucidate the distinctive nature of the music and subsequently of the demands made upon its singer. What they offer is a particularly efficient way of demonstrating the overall requirements of the piece, but to get the full picture, both graphs must be taken together. Tessitura is not as objective a musical feature as pitch or duration and is to a certain extent a matter of discussion. Any assessment of tessitura is in some degree arbitrary, and the use of any standardised device such as 'the borders of the upper and lower tessitura will be delineated by note values representing less than 30% or 50% of the highest note-value' would be equally as arbitrary

as just about any other. Therefore to determine the tessitura of any work, I have compared Graphs 0.a and 0.c using some reasonable assumptions both about pitch occurrences and sustained singing, including where the graphs seems to be weighted most, where there are significant changes on the graphs, or how the balance of one graph may affect the weighting of another. For example, Graph 0.a shows a distinctive spike at c' natural which is sung 55 times. This pitch is the highest point of the graph where the greatest number of pitches are sung. It is also equidistant from both ends of the range, and for the purpose of this study can be considered to be at the centre of the range. It just so happens that the centre of the range has the greatest number of pitches. Further inspection shows that the span from c' to f' natural occurs more often than the other pitches, which helps visual identification of a concentration in that part of the range. But in order to identify the relative tessitura of the extract, both graphs are necessary.

In the area of the voice below g natural there are far fewer notes, which seems to be another significant indicator of the tessitura of the aria. Also, there is a decline in individual pitches from a natural downwards, as demonstrated in Graph 0.a. So, comparing the two graphs, notes below a natural and g natural can be considered to be outside the limit of lower end of the tessitura. At the higher end of Graph 0.c, however, the notes tend to be sustained consistently until the top c'' natural, except for g' naturals and b' flats, which are sustained fewer times. The notes a' natural and c'' natural are sustained to a comparable extent but Graph 2 shows a much more regular decline in occurrences in this register rather than the nearly equal number of occurrences displayed in Graph 0.c. This would seem to indicate that a pitch is proportionally less likely to be sung, but more likely to be sustained, the higher the frequency. As instances of c'' natural are few, independent of how long it is sustained, it should not be considered to be within the general tessitura, but nevertheless influences the overall shape of the melodic structure. On both graphs, f' natural represents a very prominent pitch, pulling the weight of the tessitura upwards as well. It seems unreasonable to indicate f' natural as the top of the tessitura even though, as was noticed at the lower end of the tessitura, there is significant drop in pitch instances that occur above f' natural. A significant difference between the number of occurrences of g natural and a natural is observable; however, when compared to the graph in Graph 0.c, there is also a significant difference between sustained notes on the pitches f' natural and g' natural.

Considering that both g' natural and a' natural occur less to some extent in either graph, a tessitura spanning a natural to f' natural can be inferred from the data. This however does not take into account melodic contour, nor that there are several sustained high c'' naturals, which would pull the tessitura higher. Therefore, a reasonable assessment of the tessitura could also be made for the span from a natural to a' natural. This way one can reasonably use the most strongly weighted parts of the range to deduce the tessitura and identify the 'weighted centre of the pitch range', regardless of the number of occurrences of pitches above or below.

Deductions

Examination of the graphs indicates certain pitches or areas of the voice where the singer may have been more capable, or at ease, than in others. For example, there are comparatively few pitches to be sung or sustained between c' natural and f' natural. This could simply be an accident of the compositional style and tonality, or, as I hope to establish, it could indicate that the singer for whom the role was written was less comfortable in the upper *passaggio* region that the tessitura alone appears to indicate. A cursory look at a single aria may not necessarily reveal this clearly and might mean that objective information goes unnoticed. Comparing similar graphs of a range of extracts is the only way to substantiate whether this represents a 'problem' with the voice or is a deliberate compositional choice.

Without more information, only a subjective view of vocal ability – such as comfort within a given range, difficulty with particular pitches or transitions, whether a singer prefers sustained or florid singing in a particular range – can be produced. However, once the pitch and duration analyses have been presented in this manner, it should be possible to combine all the data into a single graph which will begin to reveal the unique contours, strengths, and weaknesses of an individual's voice. These images can be compared to those of other singers and used to show demonstrable differences in range and tessitura. When combined with more subjective information such as historical accounts of a singer's vocal qualities, his other vocal abilities such as registration events, his ability to perform particular feats such as leaping wide intervals, preference for *fioritura* over sustained singing, and

ideal vocal dynamics in a given range, an increasingly complex and precise picture of an individual singer's vocal range begins to emerge. All these elements together help in the exploration of the question of the use of the 'pharyngeal voice' and how each of the tenors who are investigated may have employed this technique and in what manner. Finally, in combining these individual vocal portraits with historical and technical discussion in Section I, my aim is to reach an understanding of how the 'pharyngeal voice' functions, how it could be reconstructed, and this how it might be taught to present-day singers.

Part I: The Tenors

In Part I of this section I analyse examples of the repertoire of several leading tenors for range, tessitura, vocal quality and any specific capacities. The tenors relevant to the research fall typically into the categories of *tenore serio* or *contraltino*, with the exception of Adolph Nourrit who began as a *contraltino*, or more likely an *haute-contre* as he was French, and then transitioned to *tenore serio*. Generally speaking, the *contraltino* tenors represent the lighter tenors and the *tenore serio* who performed the heavier roles. As is discussed in greater detail below, the heavier tenors like Manuel Garcia and Andrea Nozzari often sang baritone and even bass roles. While they were not baritones, strictly speaking, their voices had a 'baritonal' quality, that is to say a darker vocal colour and certain weight in the voice, which would have made them an interesting counterpart to the lighter-voiced *contraltino* tenors. Assumptions about vocal quality can be misleading and having a more well-informed idea of what they may have sounded like guides this reconstruction. The apparent vocal qualities become integral to the development of an understanding of the 'pharyngeal voice' because such qualities help to define how they may have sounded in relation to the repertoire. So when the reconstruction was attempted I had a better understanding of what the end goal was.

Manuel Garcia (senior)

Manuel del Populo Vicente Rodriguez Garcia was born in Seville on 21 January 1775. The biography of Garcia by Jose Joaquin Mora (1825) indicates that he received his musical

education from Antonio Ripa, *maestro de capilla* in the cathedral in Seville Spain.²⁹²

Radomski describes the instruction he received there in counterpoint, keyboard, and violin which provided him with the fundamental musicianship that would define his style and for which he would become known, including virtuosity, accuracy, and impeccable intonation.²⁹³ He did not, however, receive any formal operatic vocal training until 1811 when, at the age of 36 he began study with a famous tenor, Giovanni Ansani, in Naples, who in Radomski's words was a 'harsh disciplinarian whose dangerous presence the most famous castrati dreaded — he was precisely what Garcia needed.'²⁹⁴

His time in Italy provided him with the principles of the *bel canto* tradition and the refinement he needed to become a first-rate tenor. Ansani also laid the foundations for Garcia's entire vocal pedagogy, which through the published treatises by Garcia's son, is still being taught today as the essence of *bel canto*.

Vocal Quality

During his most successful period as a singer, Garcia's voice was said to be powerful and have a characteristic 'harshness', but according to Jean Baptiste Antoine Suard (1733–1817), a reviewer for *Gazette Nationale* who heard his Paris debut on 11 February 1808 in a performance of Paer's *Griselda*, Garcia's voice may have been considered small in his earlier years.²⁹⁵ Fétis gave an admiring account of Garcia's November 1807 debut in Paris in the baritone role of Count Almaviva in Mozart's *Le nozze di Figaro*, describing the him as having been a great success, adding that the fifty-two performances were 'scarcely enough to assuage the eagerness of the public.'²⁹⁶ He continued that Garcia was a 'vastly superior

²⁹² Mora (de), J. 'Manuel Garcia', *No me olvides* (London: Ackerman, 1825), p. 149–54.

²⁹³ Paulin, R. 'Notes biographiques sur Manuel Garcia', in Fétis, *Revue musicale*, 12 (1832), pp. 171–4.

²⁹⁴ Radomski, J., *Manuel Garcia (1775–1832)*, 2000, p. 104; John Potter says that Giovanni Ansani was a 'highly respected tenor and teacher' and that it was through him that Garcia had acquired the skills necessary to be able to handle Rossini's music. 'Ansani taught him how to project, and perhaps how to achieve the heavier sound that Mozart had recognized in all Italian singers as long ago as 1770, and presumably gave him the pedagogical rigour that would enable him to teach so authoritatively'. Potter, *Tenor*, 2009, p.45.

²⁹⁵ Suard, J. *Gazette Nationale* 13 Feb. 1808, p 178, '*M. Garcia* [sic] *est un peu de cette école* [the habit of over-embellishing attributed to Farinelli] : *la voix est peu forte , mais étendue et extraordinairement flexible : elle a de la justesse , et elle est agréable.*'; Radomski, J., *Manuel Garcia (1775–1832)*, 2000, pp. 93–4.

²⁹⁶ Fétis, F. *Revue musicale*, 6 (1830), p. 225, '*Figaro*, ouvrage alors inconnu du public parisien. Le rôle du Comte Almaviva a été écrit par Mozart pour un bariton mais au moyen de légers changemens [sic] et de

actor' only excepting to the fact that his over-ornamentation was unsuitable to Mozart's music.²⁹⁷ He noted that Garcia did not yet possess that self-confidences and calm 'domination of the scene' that comes with a solid technique, for which he would later be admired.²⁹⁸

Mozart's Almoviva would not be Garcia's only baritone role. His debut in the title role of *Don Giovanni* in Paris On 7 October 1820 was greeted with a boisterous reception, and it was a role which would become one of Garcia's most successful, and his final one, on 23 December 1829, also in Paris.²⁹⁹ In *L'Opéra-Italien de 1548 à 1856*, François-Henri-Joseph Blaze (1784–1857), a French musicologist, critic, composer, and music editor, known as Castil-Blaze, indicated that in Paris Garcia received more exuberant applause than

quelques transpositions, Garcia, qui possédait déjà quelques sons sa voix de ténore [sic], put jouer ce rôle, et lui donna une physionomie animée qu'aucun autre acteur italien de cette époque n'aurait pu lui prêter. Le succès fut immense, et tel qu'il n'y en avait point encore eu au théâtre Italien de Paris. Cinquante-deux représentations suffirent à peine à l'empressement du public qui ne fut plus borné, comme par le passé, à un certain nombre d'habitues, mais qui se composa de tout ce qui était sensible au charme de la musique. Garcia, déjà grand musicien à cette époque, ne possédait cependant pas encore cet aplomb cette Imperturbable domination de la scène, cette sûreté de méthode que l'on a admirés depuis en lui; mais il était déjà fort supérieur comme acteur à tout ce qui existait alors sur la scène italienne. Sa voix avait plus de fraîcheur, mais moins d'exercice: il était moins prodigue de *fioritures* mais le goût de ces ornemens [sic] n'avait pas pris alors le développement qu'il a acquis depuis l'apparition de la musique rossinienne. Ce qu'on remarquait déjà dans le talent de Garcia, c'était une tendance à donner à son chant une teinte dramatique, dont on ne sentait pas alors le mérite, mais dont les avantages ont été reconnus depuis lors.'; On 20 May 1802 he sang the Count in the Madrid premier of *Le nozze di Figaro* translated into Spanish. Potter, *Tenor*, 2009, p. 45.

²⁹⁷ Ibid., It is difficult to reconcile what critics, including Fétis, might have meant by 'over-ornamentation' in the 1820s and 1830s. Garcia may in fact have been ornamenting Mozart in a more 'historically accurate' way than current taste allowed. He may have been emulating Mozart singing style of an earlier eighteenth-century era, and based on his training with a teacher who was a near contemporary of Mozart in that he played the role of Count Almoviva in the Madrid premiere of Mozart's *Le nozze di Figaro*: perhaps he was, in fact, an important link back to the singing style of Mozart's own time, a style of ornamenting Mozart which had gone out of fashion. Even in his early years, Garcia's singing was already considered exemplary in the florid style, and according to Celletti, he was even capable of a full-voiced trill. Celletti, *History*, 1991, p. 175. Garcia's floridity did not, apparently, please English taste and he was often ridiculed for this 'garishness'. Radomski believes that his 'florid style was so contrary to the tastes of some English critics, that they could only imagine that he was trying to cover up defects.' Radomski, J., *Manuel García (1775–1832)*, 2000, p. 160. However, for the London premiere of *Il Barbiere di Siviglia* on 10 March 1818, *The Times* praised his singing as perfection of the florid style and 'having never been exceeded' but also that it was a 'mere exhibition of art' which could not produce any true satisfaction (*The London Times*, 11 March 1818). His floridity attracted both praise and rebuke in equal measure, but it never seemed to deter him.

²⁹⁸ Fétis, *Revue musicale*, 6 (1830), p. 225.

²⁹⁹ Radomski, J., *Manuel García (1775–1832)*, 2000, pp. 130, 255–9, A few alterations were made to the opera so that it was more suitable for the tenor's voice. The duet between Don Giovanni and Zerlina 'La ci darem la mano' was transposed a half-tone up to B flat and Don Giovanni's Champagne aria up a whole tone. Radomski suggests that this may have been due to a weakness in Garcia's lower register; Ibid., 142.

conventional baritones.³⁰⁰ He goes on to say that, like Nozzari, Garcia was able to emulate the bass voice, and that after having seen Garcia as Don Giovanni he could no longer entertain the idea of a bass in the role.³⁰¹

It seems that his study with Ansani had allowed him to develop the much more heroic sound which would so impress Fétis in later years. A review from 29 January 1817 in the *Allgemeine Musikalische Zeitung* described Garcia as having a 'somewhat harsh-sounding voice', and being rather coarse in the upper register.³⁰² And, in an article in from the *Quarterly Musical Magazine and Review* in 1823, while indicating that he possessed 'great volume', criticised Garcia for over-ornamenting. The article went as far as to accuse Garcia of using the excessive ornamentation as a cover for a failing voice.³⁰³ A review of his *Zelmira* (Rossini) performed at the King's Theatre in 1824 from the same publication offers a strong evaluation of his vocal prowess that echoes Fétis.

Signor Garcia's voice is a tenor of great volume and compass. It is so powerful indeed as to leave most others at a distance. It is formed according to the manner of the best schools, but perhaps is not so rich in quality nor so beautifully perfect as that of Crivelli, and it appears to lack the freshness of youth. It is however very brilliant and flexible, and so highly cultivated, that not only does no passage seem difficult to his facility, but he executes every conceivable combination of notes in a finished manner, tempering and preparing as it were his utmost vehemence according to the laws of science. He is an admirable musician, and his invention is more fertile than that of any other singer we ever heard.³⁰⁴

³⁰⁰ Castil-Blaze, *L'Opéra Italien de 1548 à 1856* (Paris: Castil-Blaze, 1856) p. 35, 'Quoique le rôle de Don Giovanni ait été disposé par Fauteur pour une voix de baryton, les ténors, tels que Tacchinardi, Garcia, qui l'ont adopté, se sont fait applaudir, à Paris, avec plus de vivacité que les barytons. Ces derniers se conformaient pourtant aux intentions de Mozart, tandis que les autres étaient obligés d'élever d'un ton «Fin ch' han dal vino», et de pointer une infinité de passages dans les ensembles.'

³⁰¹ Ibid., 362, 'Nozzari, Garcia, Lablache, dignes émules de Bassi, consultés par les musiciens illustres, leur ont donné plus d'une fois des conseils aussi précieux.'; p. 363 : 'Quelquefois, dans mes rêveries musicales, évoquant mes souvenirs, je me compose une réunion de virtuoses, et me fais exécuter Don Gioanni par Garcia, ténor prodige, type de Don Juan, pour moi qui n'ai pu voir Bassi dans ce rôle.'

³⁰² *Allgemeine Musikalische Zeitung* (29 Jan. 1817), pp. 83–4, 'Garcia hat eine etwas rohe, ja in der Höhe sogar etwas rauh tönende Stimme besitzt aber dabey [*sic*] eine ungemene, leider fast zu grosse Fertigkeit und Biagsamkeit der Kehle, die sehr oft in den leichten Verzierungen von grosser Annehmlichkeit ist, im Ganzen aber dennoch sich ohne alle Mässigung, ohne all Sparsamkeit zeigt, und nicht selten sogar zur Urkunde und Geschmacklosigkeit herabsinkt.'

³⁰³ *Quarterly Musical Magazine and Review*, 5 (1823), p. 262, 'Towards the latter end of May, Signor Garcia played Otello for Signor Curioni's benefit, and subsequently. His abilities as a singer are well known, but he appears to be fast approaching that period, when florid execution is found necessary to cover the havoc which time makes in the voice. He still however possesses great volume when he exerts himself, but that power over the entire conduct of the tone which proves its obedient ductility, the great test of fine singing, is fast departing.'

³⁰⁴ *Quarterly Musical Magazine and Review*, 6 (1824), pp. 58–9.

While saying that perhaps the voice was not as fresh and beautiful as some of his contemporaries, the reviewer praises Garcia's technique, flexibility, and musicianship. In addition to being characterised as having a loud voice that was sometimes harsh and with a wide range, Garcia would consistently be praised as a 'tenor of great power, taste, and an excellent musician'.³⁰⁵ The ability to sing baritone repertoire apparently did not impinge upon his ability to sing florid tenor roles with notable volume and floridity. His voice was not described as weak in the upper register, lacking power and projection, so it must be assumed that the 'pharyngeal voice', if this is what Garcia used, was potent as well as flexible. Any reconstruction would need to reflect this observation. It will also be important to try to discover whether the other tenors in this study had a similar capacity or whether Garcia's abilities were unique.

Andrea Nozzari

Andrea Nozzari was born on 27 February 1776 in Vertova in the valley of Seriana, Bergamo.³⁰⁶ He first studied with Luigi Petrobelli, *vice-maestro di cappella* in the cathedral there, and later with Giuseppe Aprile and the tenor Giacomo David, who was a student of Nicola Sala and father of the famous tenor Giovanni David.³⁰⁷ He made his debut in Lombardy in 1794 and sang at La Scala in Milan in the 1796 production of the comic opera *La capricciosa corretta* (1795) by Vicente Martín y Soler.³⁰⁸

Nozzari sang in Naples under Domenico Barbaja between 1815 and 1822, during which time he premiered ten roles composed specifically for him by Rossini: Leicester in *Elisabetta, Regina d'Inghilterra* (1815), Giove in the cantata *Le nozze di Teti e di Peleo* (1816), the title role of *Otello* (1816), Rinaldo in *Armida* (1817), Osiride in *Mosè in Egitto* (1818), Agorante in *Ricciardo e Zoraide* (1818), Pirro in *Ermione* (1819), Rodrigo in *La donna del lago* (1819),

³⁰⁵ Ebers, J. *Seven Years of the King's Theatre* (London: William Harrison Ainsworth, 1828), p. 191.

³⁰⁶ Saverio, L. 'Nozzari (Nosari), Andrea', *Dizionario Biografico degli Italiani*, 78 (2013), online accessed 19 Jan. 2014; Forbes, E. 'Nozzari, Andrea', in Sadie, S. (ed.), *The New Grove Dictionary of Opera* (Oxford Univ. Press, 1997); Lamacchia lists Nozzari's birth year as 1776, but Forbes lists it as 1775.

³⁰⁷ Saverio, 'Nozzari', 2013; Caprioli, L. 'Singing Rossini', in Senici, E. (ed.), *The Cambridge Companion to Rossini, Cambridge Companions to Music* (Cambridge Univ. Press, 2004).

³⁰⁸ Saverio, 'Nozzari', 2013.

Paolo Erisso in *Maometto II* (1820), and Antenore in *Zelmira* (1823).³⁰⁹ Donizetti also created the title role in *Alfredo il grande* for him for the 1823 season.³¹⁰

Vocal Quality

Like Garcia, Nozzari apparently had a baritonal voice, and indeed was able to sing baritone or bass roles, as well as tenor.³¹¹ A review from *Le Publiciste* says that his voice was more ‘serious’ than that of ordinary tenors, and as being what the Italians call ‘a baritone’.³¹² In fact, his contract with the theatre in Naples from 22 March 1818 indicates that Nozzari was obliged to sing bass roles as well as tenor roles, and these included the bass role of Fernando in Rossini’s *La Gazza ladra* in the summer of 1819.³¹³ He also sang the title role in Mozart’s *Don Giovanni* and Guglielmo in *Così fan tutte*.³¹⁴ Giuseppe Carpani, an Italian man of letters and music lover, wrote after having seen Nozzari in Rossini’s *Zelmira* that he was more of a baritone than a tenor, gifted with vocal strength uncommon among tenors, and that he had a great vocal range.³¹⁵ Stendhal believed that Nozzari was one of

³⁰⁹ Caprioli, ‘Singing Rossini’, 2004; Forbes, ‘Nozzari’, 1997.

³¹⁰ Caprioli, ‘Singing Rossini’, 2004.

³¹¹ Celletti, *Voce*, 1989, p. 90.

³¹² *Publiciste (Le)*, 16 May 1803, in Mongrédien, J. *Le Théâtre-Italien de Paris 1801–1831. Chronologie et documents*, II: (1801–1808) (repr. Lyon: Symétrie, 2008) p. 196, ‘Sa voix est un peu plus grave que ne l’est ordinairement celle des ténors; c’est ce que les Italiens appellent baritone’; Modern historical thinking is that ‘tenor’ before the late 18th century was the range now call ‘standard baritone chest voice’, see Wistreich, ‘Reconstructing’, 2000, esp. pp. 179–86). Perhaps the French critic was accustomed to the *haute-contre* voice type as a standard for tenor, which were similar to the Italian *contraltino*, and the fuller sound and lower extension of Nozzari’s voice reminded him more of the Italian baritone.

³¹³ Saverio, ‘Nozzari’, 2013, ‘Il contratto siglato con i regi teatri napoletani il 22 marzo 1818 informa che Nozzari era obbligato a cantare non solo da tenore, ma anche, seppur saltuariamente, da basso. In effetti cantò la parte del basso Fernando nella *Gazza ladra* di Rossini nell’estate del 1819 nel teatro del Fondo. Ancor prima, nell’autunno 1812, aveva tenuto il ruolo eponimo nel *Don Giovanni* di Mozart.’

³¹⁴ Celletti, *Voce*, 1989, p. 90.

³¹⁵ Carpani, G. *Le Rossiniane ossia Lettere musico-teatrali* (Padova: Tip. della Minerva, 1824) p. 159, ‘Nozzari è più baritono che tenore, ma dotato di forza non comune e di molta estensione di voce. La sonorità de’ suoi bassi va del pari con quella delle sue voci acute, nelle quali prende di salto il G e l’A. Egli possiede un bel metodo di canto, e, fra l’altre sue qualità, quella di staccare anche nei presti siffattamente un tuono dall’altro, che la sua voce sembra batter l’incudine, e numerare se ne possono i colpi ben intuonati e distinti. Questo artificio dà alla sua declamazione ne’ passi di sdegno concitato un’energia indicibile, e che lascia in forse l’uditore se questo virtuoso sia più come attore valente o come musico.’

the greatest singers in Europe.³¹⁶ Based on the similarities in the roles they sang, Nozzari and Garcia must have had similar ranges and also baritone qualities.

Celletti describes Nozzari as having had a notable power and a technique of the first order with a range in the Rossini repertoire from A natural to c'' natural in 'pharyngeal voice' (*falsettone*).³¹⁷ The repertoire shows that he was required to sing at least up to c' sharp in *Ermione* and d'' natural in *Otello*.³¹⁸ Neither notes are written to be sustained, even though there are opportunities to do so. Giuseppe Carpani (1752–1825), a librettist and musicologist, describes the quality of Nozzari's low register as being equal to that of his upper register and that he had a beautiful ['bel'] technique. He indicates that Nozzari often attacked his g' natural or a' natural by leap [*salto*].³¹⁹ A group of observers of one of his performances in 1803 indicated that his low and high voice were equally balanced and that he could skilfully pass from chest voice to head voice.³²⁰

Celletti appraises the *fioritura* written for Nozzari by Rossini as being quite difficult, but less virtuosic than those written for either Giovanni David or Manuel Garcia, and that Rossini tended to emphasise the breadth and nobility of Nozzari's singing.³²¹ In fact, in her article on Nozzari in the *New Grove Dictionary of Opera*, Elizabeth Forbes cites as evidence for this fact that the public were amazed at the force of his voice and the agility of his singing 'as well as the nobility of his bearing'.³²² According to *Le Courier des spectacles ou Journal des théâtres* of 15 May 1803, his voice was pure and flexible, and he sang with

³¹⁶ Stendhal (Beyle, M.), *Vie de Rossini*, (Paris: M. Lévy, 1854) p. 133, 'Les hommes pour lesquels il a écrit sont Garcia, Davide le fils et Nozzari, tous les trois ténors; Davide, le premier ténor existant, et qui met du génie dans son chant: il improvise sans cesse, et quelquefois se trompe; Garcia, remarquable par sa sûreté étonnante de sa voix; et enfin Nozzari, la moins belle voix des trois, et qui cependant a été un des meilleurs chanteurs de l'Europe.'

³¹⁷ Celletti, *Voce*, 1989, p. 90, 'una notevole potenza e una tecnica di primissimo ordine' and 'Nelle parti composte per lui da Rossini, l'estensione va dal la sotto il rigo al do acutissimo in falsettone...'

³¹⁸ Rossini, G. 'No. 6 Aria Pirro' *Ermione*, PV score based on the critical edition Brauner, P. (ed.) Gossett, P. (dir.), (Milan: BMG Ricordi, 2006) p. 132, bar 159; Rossini, G. 'No. 8 Terzetto' *Otello, ossia Il Moro di Venezia*, PV score based on the critical edition Collins, M. (ed.) Gossett, P. (dir.), (Milan: Ricordi, 2008) p. 253, bar 66.

³¹⁹ Carpani, *Rossiniane*, 1824, p. 159, 'La sonorità de' suoi bassi va del pari con quella delle sue voci acute, nelle quali prende di salto il G e l'A.'

³²⁰ Correspondence of amateur musicians written by the *Citizen Cockatrice*, 21 May 1803, cited in Mongrédien, *Théâtre-Italien*, 2008, p. 201, 'Nozzari a une voix superbe et étendue. Elle paraît également exercée dans les cordes graves comme dans les aiguës; il sait passer habilement de la voix de poitrine à la voix de tête.'

³²¹ Celletti, *Voce*, 1989, p. 90, '... la coloratura meno virtuosistica di quella riservata a Giovanni David o a Manoel Garda, ma pur sempre abbastanza ardua. Rossini tende soprattutto a far risaltare l'ampiezza e la nobiltà del canto di Nozzari.'

³²² Forbes, 'Nozzari', 1997.

‘superior talent’.³²³ According to Carpani, Nozzari’s *fioritura* consisted of ‘well-made strokes’ like that of hitting an anvil, with each stroke well-tuned and distinct.³²⁴

It would appear that while not possessing a voice as beautiful or agile as Garcia, Nozzari was a highly competent singer with a wide range and a powerful, yet flexible, voice. Unfortunately, he was not known for the strength of his acting: it is interesting to note that a critic in the *Journal de Paris* wrote, ‘What a pity that such a flexible and graceful voice should only be listened to with eyes closed!’³²⁵ Even worse, the *Gazette de France* from 29 July 1806 reported that ‘The most melodiously boring actor we’ve ever heard on any theatre’!³²⁶

In 1825, after retiring from the stage, Nozzari returned to Naples and devoted himself to teaching. Three of his students were among the most illustrious of their generation: Giovanni Basadonna, Nicola Ivanoff, and Giovanni Battista Rubini.³²⁷ Giovanni Pacini went so far as to call him the father of tenors [‘papà dei tenori’].³²⁸ Rubini had a remarkable career and would inspire both Bellini and Donizetti to create some of their finest works, three of which are the subject of case studies in this project: *Anna Bolena*, *La sonnambula*, and *Bianca e Fernando*.

Giovanni David

Giovanni David was born in Naples in 1790 and was probably one of the greatest *contraltino* tenors of the early nineteenth century. He studied with his father, Giacomo David, who had been a successful tenor himself. Giovanni made his début in Siena in 1808 in *l’Adelaide di Gueslino* by Simon Mayr, the teacher of Donizetti. In 1814 he made his début at La Scala in Milan in the world première of Rossini’s *Turco in Italia*, where he created the role

³²³ *Courrier (le) des spectacles ou Journal des théâtres*, 15 May 1803, p. 2, ‘Sa voix est pleine, pure et flexible. Son physique est des plus agréables. Il a chanté plusieurs airs avec un talent supérieur.’

³²⁴ Carpani, *Rossiniane*, 1824, p. 159, ‘... nei *presti* siffattamente un tuono dall’altro, che la sua voce sembra batter l’incudine, e numerare se ne possono i colpi ben intonati e distinti.’

³²⁵ *Journal de Paris*, 16 March 1805, in Mongrédien, *Théâtre-Italien*, 2008, p. 372, ‘quel dommage qu’une voix si flexible et si gracieuse ne doive être écoutée que les yeux fermés!’

³²⁶ *Gazette de France*, 29 July 1806, in Mongrédien, *Théâtre-Italien*, 2008, p. 501, ‘l’acteur le plus mélodieusement ennuyeux qu’on ait jamais entendu sur aucun théâtre.’

³²⁷ Caprioli, ‘Singing Rossini’, 2004; Saverio, ‘Nozzari’, 2013.

³²⁸ Pacini, G. *Le mie memorie artistiche* (Florence: G. G. Guidi, 1865) p. 41: ‘...Nozzari ch’era appellato il Papà dei tenori.’

of Narciso' he also played Don Ottavio in *Don Giovanni*.³²⁹ In Naples in 1816 he created the role of Roderigo in *Otello* together with Nozzari in the title role, and also sang in the premières several other works by Rossini including *Ricciardo e Zoraide*, *Ermione*, *La donna del lago* and *Zelmira*, also appearing in *Otello* (title role), *Tancredi*, *La gazza ladra*, *Matilde di Shabran*, *Bianca e Falliero*, *Mosè in Egitto*, and *Semiramide*.³³⁰ Between 1814 and 1822 Rossini wrote eight roles specifically for David including *Il turco in Italia* (Don Narciso), Peleo in the cantata *Le nozze di Teti e di Peleo*, *Otello* (Roderigo), Ricciardo e Zoraide (Ricciardo), *Ermione* (Oreste), Corifeo in the *Cantata da eseguirsi la sera del dì 9 maggio 1819*, *La donna del lago* (Giacomo V) and *Zelmira* (Ilo).³³¹

Vocal Quality

Celletti describes David as the 'prototype of the Rossini contraltino tenor' who had very high, bright, and virtuosic voices, but who also excelled at legato and the 'elegiac type of melody' such as those found in the *Otello* aria analysed below, 'Ah, perche mai non senti'.³³² Stefan Zucker says that David was able to sing three octaves in performance, but this must be based on performance accounts, because such a large range is not found in the notation of any of the considerable range of repertoire studied here.³³³ It could be, as Zucker continues, that David 'interpolated notes as high as – depending of your source – the A or B-flat.'³³⁴ The highest note written for him is the f'' in *Bianca e Fernando* by Bellini. Zucker goes on to say that more high c'' naturals and d'' naturals had been written for David than anyone else, but that he could also sing very low. Zucker indicates that Rossini took him to a low C in *La Donna del Lago*, and that Bellini wrote four low Cs and two low Bs for

³²⁹ Celletti, *Voce*, 1989, pp. 79–80.

³³⁰ Forbes, E. 'Davide [David], Giovanni', in Sadie, S. (ed.), *The New Grove Dictionary of Opera*, (New York: Oxford Univ. Press, 1997).

³³¹ Caprioli, 'Singing Rossini', 2004, p. 201.

³³² Celletti, *History*, 1991, pp. 165–6.

³³³ Zucker, S. 'Last of a Breed: Giovanni Battista Rubini Ruled as the Paragon of Virtuoso Tenors, King of the High F's', *Opera News*, February 13, 1982. Reprinted in Zucker, *The Origins of Modern Tenor Singing* p. 12.

³³⁴ Zucker, 'Last of a Breed', 1982.

him in *Bianca e Fernando*³³⁵ Castil-Blaze, indicates that David's upper extension reaches to high b'' flat.³³⁶

In a letter to Duke Salvatore Sforza-Cesarini (1798-1832), David's mistress soprano Teresa Adelaide Carpano, says that from about 1814 David had abandoned singing his high notes in his head voice.³³⁷ A report of David singing the high c'' natural in chest voice during a July 1822 performance of *Zelmira* in Vienna can be found in *L'Opéra Italien* by Castil-Blaze.³³⁸ This would mean that David was one of the first tenors to experiment with not using falsettone in this range, but this is unlikely and is also contradicted by John Rosselli in *Singers of Italian Opera*. He suggests that what was reported was 'full voice', which David used after recovering from smallpox. Rosselli suggests that few tenors of the eighteenth century were able to achieve 'full voice' above g', so it may have been perceived as chest voice. This sound, however, brought David more success, and as Rosselli posits, perhaps audiences were already 'hankering after that effect'.³³⁹

Celletti, however, paints quite a different picture of David. He says that David was 'moody, capricious and uninspired'. He claims David often sang in falsetto phrases which should have been executed in full voice, and that this overuse of falsetto was something which David had suffered from the beginning of his career and often drew whistles from the patrons at La Scala. He also says that it is difficult to ascertain up to which note that David actually sang in full voice. Perhaps this is because his voice was quite bright and he mixed his registers well. Celletti goes on to blame the use of excessive falsetto for the singer's vocal deterioration and that by 1829 David's voice was uneven and in decline.³⁴⁰ It is

³³⁵ Ibid., 12.

³³⁶ Castil-Blaze, *L'Opéra Italien*, 1856, p. 395, 'C'est un chanteur de la nouvelle école, plein de manière, d'affectation, de clinquant, abusant, comme Martin, d'un instrument superbe et d'une prodigieuse étendue (trois octaves comprises entre quatre si bémol).'

³³⁷ Adelaide Carpano to Duke Sforza-Cesarini, 28 May 1814, in Celani, E. 'Musica e musicisti in Roma 1750–1850', *Rivista Musicale Italiana*, 18 (1911): 1–63, pp. 28–9.

³³⁸ *Lettre sur la Zelmira de Rossini*, (Vienne, July 1822) reproduced in Castil-Blaze, *L'Opéra-Italien*, 1856, p. 433–4, 'L'ut aigu sort de sa poitrine avec un éclat victorieux.'

³³⁹ Rosselli, *Singers*, 1995, p. 177.

³⁴⁰ Celletti, *Voce*, 1989, p. 81, 'Va aggiunto che David era lunatico, capriccioso e svogliato. Spesso cantava in falsetto frasi che avrebbe dovuto eseguire a voce-piena. Questo gli fu rimproverato sin dall'inizio della carriera e lo rese invisibile ad alcuni pubblici. Soprattutto alla Scala fu abbastanza spesso fischiato. Narra Pacini (Le mie memorie artistiche, Firenze, 1865) che durante le prove degli Arabi nelle Gallie (1826) riuscì a convincere David ad abbandonare i falsetti e le eccessive fioriture, ciò che mutò l'atteggiamento del pubblico della Scala. Non si sa, comunque, fino a quale nota acuta David giungesse a voce piena. Di solito la nota più elevata dei tenori, a

difficult to reconcile these accounts, but it is interesting to note how different commentators can interpret the historical evidence about a voice so differently. Between 1835 and 1842, when David was in his mid-to-late-forties, his voice was clearly in decline and he only sang in small theatres.³⁴¹ He spent the last years of his career as director at Opera Italiana in St Petersburg, where he died in 1864.³⁴²

Beyond singing with a bright and full-voiced sounding high voice, David was apparently an elegant and stylish singer. Henry Chorley described his voice 'as a sort of Italian Garcia' and that he was endowed with a technique and natural spirit that 'were limitless in their effect — who could sometimes, shock, but oftener carry away, his audiences into transports.'³⁴³ Stendhal described his voice as 'elegant, pure, and full-toned voice' and was impressed by his seemingly unlimited ability to improvise.³⁴⁴

David's ability to sing with a vocal tone that resembled chest voice is a perfect example of what 'pharyngeal voice' can accomplish. While today it might be more recognizable as not being chest voice (modal voice), to an eighteenth-century ear used to a much more head-voiced or falsetto vocal production, the 'pharyngeal voice' probably sounded to many like a true chest voice. It would not be until Duprez sang the first recognizably 'chest voice' high c'' natural that the public would truly come to hear what it sounded like.³⁴⁵

voce piena, era a quel tempo il la 3. Va poi considerato che l'eccessivo uso del falsetto può influire negativamente sulla fonazione. Di qui i suoni ineguali e poco omogenei che furono a volte rimproverati a David, e che nel 1829 erano molto evidenti - lo si rilevò a Parigi - come il segno più palese d'un declino già iniziato. La discontinuità s'estendeva anche all'interprete, geniale a volte (la parola "genio" fu usata da Stendhal), animato, espressivo (Carpani), ma in molte occasioni negligente oppure lezioso.'

³⁴¹ Celletti, *Voce*, 1989, p. 79; Based on anecdotal evidence, this difficulty with the voice separating in the mid-forties is a common occurrence with head-voice dominant tenors.

³⁴² Celletti, *Voce*, 1989, p. 79.

³⁴³ Chorley, H. *Thirty Years' Musical Recollections*, 1 (London: Hurst and Blackett 1862), p. 26.

³⁴⁴ Stendhal, *Vie de Rossini*, 1823, pp. 91–2, 'Je n'oublierai jamais l'effet qu'y produisait Davide, le premier ou pour mieux dire le seul ténor qui existe aujourd'hui. C'était un des plus grands triomphes de la musique. Entraînés par les badinages de cette voix élégante, pure, sonore, les spectateurs oubliaient tout au monde. Le grand avantage de cette cavatine, c'est qu'il n'y a pas trop de passion.'; p. 168: 'Les couleurs qui chargent la palette de David sont les ornemens [sic] et les fioriture de tous les genres.'; p. 219: 'David, le premier ténor existant, et qui met du génie dans son chant : il improvise sans cesse, et quelquefois se trompe.'

³⁴⁵ It would be during an 1837 Paris performance of *Guillaume Tell* that Duprez would change operatic tenor history by singing the first purported chest-voice high c''. See also: Duprez, G. *Souvenirs d'un chanteur* (Paris: Lévy, 1880); Duprez, G. *L'art du chant* (Berlin: A.M. Schlesinger, 1845); Duprez, G. *L'art du chant* (Paris: Bureau Central de Musique, 1846); Elwart, A. *Duprez: sa vie artistique, avec une biographie authentique de son maître Alexandre Choron* (Paris: V. Magen, 1838); Escudier, M. *Etudes biographiques sur les chanteurs contemporains*

Giovanni Battista Rubini

[Rubini] ruled the stage by the mere art of singing more completely than anyone, woman or man, has been able to do in my time... He may be said to be the last of the remarkable company of Italian tenors for whom Signor Rossini wrote [...] The traditions of his method died with him.³⁴⁶

In his study of the ‘tenor-castrati’ tradition, John Potter says that Rubini was one of the most celebrated *tenore contraltini* and ‘the first real tenor superstar’.³⁴⁷ Born in Romano di Lombardia in the Province of Bergamo on 7 April 1794, Giovanni Battista Rubini was the son of a horn player and began his musical training, presumably with his father, at the age of eight.³⁴⁸ In 1815 he sang the role of Lindoro in *L’italiana in Algeri* (Rossini) at the Teatro San Moisè in Venice. It was here that he ‘came to the attention of Domenico Barbaia who offered him a long-term contract’ at the Teatro San Carlo in Naples.³⁴⁹ He made his Neapolitan premiere, again as Lindoro, at the Teatro dei Fiorentini in 1815. Julian Budden summarises Rubini’s ten-year career in Naples as ‘performing mostly at the smaller houses where comedy prevailed and benefiting from the tuition of Andrea Nozzari’.³⁵⁰

(Paris: J. Tessier, 1840); Devrient, E. *Galerie des artistes dramatiques de Paris* (Paris: Marchant, 1840–42); Berlioz, H. *Les soirées de l’orchestre* (Paris, 1852/R, 5/1895; Eng. trans., 1956/R, 2/1973); Scudo, P. *Critique et littérature musicales*, 2 (Paris: L. Hachette, 1859); Desarbres, N. *Deux siècles à l’Opéra* (Paris: E. Dentu, 1868); Jarro [Piccinni, G.]: *Memorie d’un impresario fiorentino* (Florence: Loescher e Seeber, 1892); Morini, U. *La Reale Accademia degli immobili ed il suo teatro ‘La Pergola’ (1649–1926)* (Pisa: Simoncini, 1926); Monaldi, G. *Cantanti celebri* (Rome: Ed. Tiber, 1929); Landini, G. ‘Gilbert-Louis Duprez ovvero l’importanza di cantar Rossini’, in *Bollettino del Centro rossiniano di studi*, 1-3 (1982): 29–54; Rosselli, J. *The Opera Industry in Italy from Cimarosa to Verdi* (Cambridge UNiv. Press, 1984); Celletti, *Voce*, 1989; Corti, S. *Edizione critica delle lettere del tenore G.L. Duprez nell’archivio dell’impresario teatrale Alessandro Lanari presso la Biblioteca nazionale di Firenze* (Dissertation, Univ. of Pisa, 1991); Beghelli, M. ‘Il “Do di petto”: dissacrazione di un mito’, *Il jaggatore musicale*, 3(1) (1996): 105–49; Rosselli, *Singers*, 1992, pp. 158, 171, 177, 254; Smith, M. ‘Adolphe Nourrit, Gilbert Duprez, and the high C: The influences of operatic plots, culture, language, theater design, and growth of orchestral forces on the development of the operatic tenor vocal production’ (Dissertation: Univ. of Nevada, Las Vegas, 2011).

³⁴⁶ Chorley, *Thirty Years*, 1862, p. 33.

³⁴⁷ Potter, ‘Tenor-castrato’, 2007, pp. 97–8. Further reading on Rubini: Brewer, B. ‘Rubini, the King of Tenors’, *Opera*, 30 (1979): 326–9; Chorley, *Thirty Years*, 1862, pp. 1, 29; Donati-Petteni, G. *L’arte della musica in Bergamo* (Bergamo: Istituto Italiano d’Arti Grafiche di Bergamo, 1930); Gara, E. *Giovanni Battista Rubini nel centenario della morte* (Bergamo: Industrie Grafiche Cattaneo, 1954); Huber, K. *Giovanni Battista Rubini: ein italienischer Opersänger in Wien* (Dissertation: Univ. of Vienna, 1991); Locatelli, A. *Cenni biografici sulla straordinaria carriera teatrale percorsa da Giovanni Battista Rubini* (Milan: F. Colombo, 1844); Marek, *Rubini*, 2013; Pleasants, H. ‘Giovanni Battista Rubini (1794–1854)’, *Opera Quarterly*, 10(2) (1993): 101–4; Traini, C. *Il cigno di Romano: Giovanni Battista Rubini* (Bergamo, 1954).

³⁴⁸ Pleasants, ‘Rubini’, pp. 101–3.

³⁴⁹ *Ibid.*

³⁵⁰ *Ibid.*

In his early years he sang the most difficult repertoire of Rossini, by whom he was 'extremely well thought of.'³⁵¹ In those great Rossini roles, Rubini was considered the natural heir of Giovanni David.³⁵² In addition to the operas already mentioned, Rubini sang *La Cenerentola*, *Otello*, *Il Barbiere di Siviglia*, and *Mosè in Egitto*. He was particularly proficient at 'every species of ornament and *fioritura* [which was] given with a perfection [as to be] the despair of other singers.'³⁵³ But it was in the more Romantic style of Bellini and Donizetti that he truly excelled. The exceedingly long lines and faultless legato required in their operas allowed Rubini to demonstrate his particular vocal mastery. He created the tenor leads for Bellini in *Bianca e Gertrude* (1826), *La sonnambula* (1831) and *I puritani* (1835) as well as the fiercely difficult role of Percy in Donizetti's *Anna Bolena* (1830) which, according to William Ashbrook, 'demands powers of execution that few tenors today can claim.'³⁵⁴

Vocal Quality

Rubini's vocal range is purported to have extended from e natural to b' natural in chest voice, with a *falsetto* reaching to f'' natural,³⁵⁵ although in each of his treatises Garcia (junior) puts Rubini's top note in chest voice at c'', not accounting for tuning.³⁵⁶ And Carozzi notes that his voice 'reached almost an octave above his second G [i.e., top g''] without this prodigious extension occasioning any disadvantage to the smoothness and homogeneousness of his voice.'³⁵⁷ In an anonymous article in *The Musical World* in 1839, Rubini's voice is described as being faultlessly 'intonated [sic] with perfect truth and evenness. The scale which was mentioned is one of two octaves and a note, but this is but his ordinary compass; for we heard him, last year, in *Roberto Devereux*, ascend to the

³⁵¹ Caprioli, 'Singing Rossini', p. 203.

³⁵² Celletti, *Voce*, 1989, p. 103.

³⁵³ Anon. 'Characteristics of Rubini's Singing,' *The Musical World*, 190 (1839), p. 431.

³⁵⁴ Ashbrook, W. 'Anna Bolena,' *The Musical Times*, 106(1468), (1965), p. 435.

³⁵⁵ *The Musical World*, p. 431; Celletti, *Voce*, 1989, p. 103.

³⁵⁶ Garcia, *École*, 1847, p. 22, although there may be some room for a discussion of relative tuning.

³⁵⁷ Carozzi, G. 'Practical Suggestions on Vocal Culture', *Proceedings of the Musical Association*, 9(1) (1882): 17-38, p. 20.

[g'']'.³⁵⁸ However, sometimes he was said to sing in 'falsetto what should come from the chest.'³⁵⁹

One of his most impressive qualities was the unification of falsetto and head registers.³⁶⁰ *The Musical World* article suggests that as 'he reaches the limit of his chest register, he passes the bridge so marvelously, as to defy the most accurate ear to seize the exact moment of change.'³⁶¹ The author continues by indicating that the power of Rubini's voice met even the most dramatic demands of the music but never 'shocked the ear' by being too rough or forceful.³⁶² The author described his voice as if it were 'clothed in a light gauze' that did not impede the voice in any way.³⁶³

Frédéric Chopin found Rubini to have an 'incomparable *mezza voce*' and according to Celletti, he always sang in full-voice, never in head.³⁶⁴ Chorley however said that Rubini had difficulty with *mezzo forte* and *piano*, inevitably singing everything either *forte* or *pianissimo*.³⁶⁵ Celletti suggests that perhaps Rubini imitated Giovanni David's vocal affectation of quickly switching dynamics. It can be difficult to reconcile these differing accounts. However, there may not be a correlation between *mezza voce* and *mezzo forte* and perhaps Rubini sang in mixed voice in *mezzo forte* passages, which is entirely possible. Likewise it is also possible that his head voice register sounded like chest voice.³⁶⁶ Taste plays a major role in the perceptions of different listeners, as do the variations of performance that a singer may go through over the course of his career.

Rubini is also said to have been blessed with a superior lung capacity, and the ability to mete out his breath with evenness, using only 'that quantity of breath necessary to produce the length of note required. His method of *inspiring* is also one of his secrets, and difficult to describe. He dissembles it so adroitly, that we cannot catch the moment of

³⁵⁸ *The Musical World*, p. 431.

³⁵⁹ *Ibid.*, 432.

³⁶⁰ Bonaventura, A. 'Rubini, Giovanni Battista', *Enciclopedia Italiana*, (1936).

³⁶¹ *The Musical World*, p. 431.

³⁶² *Ibid.*

³⁶³ *Ibid.*

³⁶⁴ Chopin, F. *Narodowy Instytut Fryderyka Chopina*, Online (date 21 November 1831) accessed 20 May 2019; Celletti, *Voce*, 1989, p. 105.

³⁶⁵ Chorley, *Thirty Years*, 1862, p. 30.

The Musical World, p. 431.

³⁶⁶ Celletti, *Voce*, 1989, p. 105.

repletion'.³⁶⁷ This seems to suggest that Rubini's breathing would have been silent and not overtly evident.

Adolphe Nourrit

Adolphe Nourrit (1802–1839) was the son of the French tenor, Louis Nourrit (1780–1831) and in 1824, the same year he married Adèle Veillard DuVerger, succeeded as principal tenor at the Paris Opéra.³⁶⁸ Nourrit's father did not want him to take to the stage as he had, but the young Adolphe finally convinced his father to allow him to have music lessons consisting of solfège and harmony. His practice caught the ear of the great tenor Manuel Garcia (snr.) who had overheard him singing something from *Armide* by Gluck. It was Garcia who eventually persuaded Louis that Adolphe should in fact study singing, and with Garcia, of course.³⁶⁹ Celletti says that Adolphe had the great foresight not to study with his father, who was apparently in the 'Gluck School' of 'the scream' [*urlo*].³⁷⁰ Garcia gave him exercises that were single lines, so that Nourrit could carry them around with him and practice wherever he may have been. After about eighteen months of arduous study Adolphe, requested that he be permitted to begin an aria.³⁷¹

On 2 October 1826, Adolphe shared the stage with his father in the premiere of Rossini's *Le Siège de Corinthe*, where Nourrit (snr.) created the role of Cléomène and his son the role of Néoclès. Adolphe went on to create many major roles including Aménophis (*Moïse*, Rossini 1827), Masaniello (*La muette de Portici*, Auber 1828), Count Ory (*Le Comte Ory*, Rossini 1828) Arnold (*Guillaume Tell*, Rossini 1829), Robert (*Robert le diable*, Meyerbeer 1831), Gustave (*Gustave III*, Auber 1833), Éléazar (*La Juive*, Halévy 1835), and Raoul (*Les Huguenots*, Meyerbeer 1836). After his victorious performances of *Les*

³⁶⁷ *The Musical World*, p. 431.

³⁶⁸ Lopez, E. 'Adolphe Nourrit, la destinée romantique d'un ténor montpelliérain', *Académie des Sciences et Lettres de Montpellier*, 13 October 2014, pp. 273–4; See also Quicherat L. *Adolphe Nourrit: Sa vie, son talent, son caractère, sa correspondance* (Paris: L. Hachette and Co, 1867) ; Zucker, S. 'The Origins of Modern Tenor Singing' (NY: Bel Canto Society, Inc., 1981-86); 'End of an Era: During His Lifetime, Rossini Witnessed a Dramatic Change in the Art of Singing, as Virtuosity Fell into Decline', *Opera News*, 45 (1981).

³⁶⁹ Potter, *Tenor*, 2009, p. 46–7.

³⁷⁰ Celletti, *Voce*, 1989, pp. 106–7, 'Adolphe ebbe l'accortezza di non studiare con il padre, esponente della scuola gluckiana dell'urlo, ma, segretamente, con Manoel Garcia.'

³⁷¹ Potter, *Tenor*, 2009, p. 47.

Huguenots, Nourrit retired from the Paris opera rather than share leading roles with Gilbert Duprez.³⁷²

Vocal Quality

Nourrit started his career as a typical *haute-contre*, the French equivalent to the Italian *contraltino*.³⁷³ His voice was apparently clear with a wide range. His upper register was easy, though less impressive than Giovanni David, so he was comfortable with very high tessitura singing. Celletti says that Nourrit sang full voice up to g' after which he would use *falsettone*.³⁷⁴ Celletti describes Nourrit's voice as being very bright but having a certain guttural quality and not very beautiful. He says that it had a certain hardness and dryness when he sang and that Nourrit dragged and forced the voice.

According to Celletti, Nourrit was not a *tenore serio* [*tenore di forza*] like Garcia but rather was much more of a *contraltino* [*tenore di grazia*] who was able to confront very high notes in a well-developed 'pharyngeal voice' [*falsettone*]. He also had a particular strength in the elegance of his phrasing and the richness of his vocal nuance. Unlike Nozzari, Nourrit was also a great actor.³⁷⁵ Celletti also indicates that Rossini reduced the intricacies of the *fioritura* and virtuosity of the roles written for Nourrit based on the practices of the French *haute-contre*.³⁷⁶

When Duprez returned to Paris in 1837 after a triumphant 1836–1837 season in Italy where he sang Edgardo in Donizetti's *Lucia di Lammermoor* at the *Regio di Parma*, it signaled the rapid decline of the great Nourrit. It would be in the 1837 Paris Opéra revival of *Guillaume Tell*, which had been premiered by Nourrit in 1829, that Duprez would seal Nourrit's fate by singing the now notorious chest voice high c''.³⁷⁷ Michael Lee Smith Jr.

³⁷² Pleasants, *Nourrit*, 1995, pp. vii–viii.

³⁷³ For more on the *haute-contre* see FN 277 & 278.

³⁷⁴ Celletti, *History*, 1991, p. 167.

³⁷⁵ Celletti, *Voce*, 1989, p. 107–8, 'Il cui timbro non era affascinante. Oltre ad avere una certa gutturalità, presentava qualche durezza e secchezza quando il cantante, trascinato dalla foga, forzava il suono. D'altra parte, sebbene la voce mancasse di sonorità, Nourrit non era un tenore di forza, ma un tenore di grazia che affrontava tessiture molto acute grazie al falsettone. Il suo fascino, a parte l'azione scenica, era nell'accentazione, nell'eleganza del fraseggio, nella ricchezza delle sfumature.'

³⁷⁶ Celletti, *History*, 1991, p. 167.

³⁷⁷ Typically, high notes including the top c'' natural today are sung in what is called 'chest voice' rather than in the less full-voiced 'pharyngeal voice'.

posits that it was not, however, the first time he would have used his chest voice for a high c''. He indicates that Duprez sang the role of Arnold in Luca in 1831 and performed the role with its two c'' sharps, twenty-eight high c'' naturals as well as the b' and b' flats in the full-voiced manner.³⁷⁸ Celletti also says that when Duprez sang the chest-voice high c'' natural in Italy there was not much fanfare. It was not until he used it in Paris that there was an uproar and he became associated with the 'invention' of the chest-voice high c''. In fact, as Celletti points out, the chest-voice high c'' was sung by Manuel Garcia (snr.) and the French tenor Jacques Lavigne, but it was Duprez who has been presented as the innovator. It was the fanfare over Duprez' high c'' natural in Paris that effectively created the rivalry between Duprez and Nourrit.³⁷⁹

Because of his jealousy, Nourrit refused to share roles with Duprez and decided to leave the Paris Opéra in the spring of 1838 and to go to Naples. Here he would study singing with Gaetano Donizetti and learn the 'Italian' method.³⁸⁰ While in Naples, they worked together for several hours every day and Nourrit 'became obsessed with all things Italian' and according to John Potter he wanted to make his voice 'indistinguishable from the native product.' He goes on to suggest that Nourrit had become convinced that he needed to eliminate his French nasality completely and also 'his lifelong dedication to clarity of diction and the primacy of the text in favour of consistent tone production'.³⁸¹

One can see in this characterisation the differences between French and Italian singing styles, but also how much the development of singing had changed even in Italy over those years since Garcia and David had been singing in Naples. Nourrit had studied with Garcia who himself had studied in Naples with Ansani only twenty years earlier. It would seem that nuance and flexibility were giving way to the consistent tone production, which is

³⁷⁸ Smith, M. 'Adolphe Nourrit', 2011, p. 8.

³⁷⁹ Celletti, *Voce*, 1989, p. 109, 'In Italia quel do di petto sfoggiato nel Guglielmo Teli non aveva suscitato troppo clamore. Duprez s'era fatto strada per il complesso delle sue doti e aveva raggiunto l'apice nella Lucia, opera nella quale, a parte la suggestione della musica e dell'argomento, s'era mostrato capace di cantare con dolcezza e con foga. In Francia, invece, la sua fama di "inventore del do di petto" fece scalpore, anche perché sostenuta da una clamorosa pubblicità ... Il do di petto era già stato sfoggiato in qualche occasione da Manoel Garcia e da un altro tenore francese, Jacques Lavigne, che aveva cantato all'Opéra dal 1809 al 1825 (cfr. il Dizionario universale dei musicisti di Carlo Schmidt), ma l'ut de poitrine di Duprez fu presentato come una novità assoluta, e in un clima che mise in apprensione. Nourrit e creò subito una rivalità.'

³⁸⁰ Pleasants, *Nourrit*, 1995, pp. vii–viii; Celletti, *Voce*, 1989, p. 110.

³⁸¹ Potter, *Tenor*, 2009, p. 49; Nourrit's statement illustrates the difference between the French and Italian national styles as well as supporting the Italian 'bel canto' concept of prioritising beauty and ease of vocal production over diction which is sometimes referred to as 'voice first' by practitioners.

the hallmark of what I and most other pedagogues would describe as ideal Italian sound today.

Unfortunately, his work with Donizetti in Naples did not work out for Nourrit, and his wife, Adèle Veillard DuVerger (daughter of the director of the *Opéra-Comique* in Paris), was not supportive of the new sound. She wrote in a letter to her brother on 6 February 1839 that 'his head voice is gone, and his *mezza voce* is gone He is darkening it as Donizetti required ... it is nothing new that the development of the chest voice extinguishes the head voice and the half-voice. Rubini almost never uses the chest voice.' She also wrote that after having heard how loud and 'devoid of nuance his voice had become' that she had to shut the door during his practice.³⁸²

Eventually, Nourrit accepted that his voice was failing, and he tried to recuperate some of his innate French qualities by modifying what Donizetti had been asking of him, but it was too late. He was unable to rectify his vocal damage. Subsequently, he became convinced the Neapolitan public would not accept his voice in that condition and on 8 March 1839, just five days after his thirty-seventh birthday, in a mental crisis brought on by disillusionment, paranoia, and alcoholism he committed suicide.³⁸³ According to John Potter, he climbed the stairs of Villa Barbaia in Naples and threw himself from a window.³⁸⁴

³⁸² Potter, *Tenor*, 2009, p. 49; Pleasants, *Nourrit*, 1995, p. 105.

³⁸³ Lopez, *Adolphe Nourrit*, 2014, pp. 281–3.

³⁸⁴ Vocal damage, see Potter, *Tenor*, 2009, pp. 49, 4.

Part II: The Repertoire

Introduction

Having ascertained the characteristics of the individual voices and the vocal qualities of a group of exceptional singers in the early nineteenth century according to the evidence of contemporary commentators and the opinions of modern scholars, it is now important to evaluate what their capabilities might have been on the basis of what they sang. A key way to do this is to see how they were perceived by the composers who wrote specifically for them. By analysing examples of the repertoire, a set of technical markers can be developed that may help to identify the specific characteristics of individual tenors. When writing for a particular singer, did the composer choose certain features which help to triangulate a particular voice, or is the writing effectively generic? Does tessitura reveal anything specific about a singer or voice type? Can these technical markers aid in the modern reconstruction of the 'pharyngeal voice'?

The premise of the following Section is that, notwithstanding the fact that there are of course no surviving recordings of early nineteenth-century operatic tenors, the surviving notated arias that were written for them can, if analysed in terms of what is known about the 'theory' of singing at the time, yield up sufficient information about how the music might once have been executed and even how it may have sounded. Through close analysis of the notation of chosen extracts from works known to have been written for specific singers who were masters of the 'pharyngeal voice' technique, a distinct set of technical demands that were made on the singer emerges. The type of demand, whether it be related to range, high-notes, tessitura, coloratura or other, can then help to determine the particular qualities of the voice for which the repertoire was written. When enough data is collated, it produces a sufficiently distinctive set of technical markers to allow the formation of a fairly accurate 'vocal portrait' of an individual singer. This information can also be used to compare how different composers wrote for the same singers, what similarities exist, and how those similarities form groups of skills exploited differently by composers. Subsequently, by examining repertoire that was shared between singers the set of markers held in common can help to further refine the understanding of particular dissimilarities.

Rossini: *Il barbiere di Siviglia* (1816)

Il Barbiere di Siviglia was premièred on 20 February 1816 at the *Teatro Argentina* in Rome with Manuel Garcia (snr.) in the lead tenor role of Count Almaviva.³⁸⁵ Garcia would go on to sing Almaviva in the premières of *Il Barbiere* in London (1818), Paris (1819), and New York (1825).³⁸⁶ The opera is set in Garcia's own home town of Seville.³⁸⁷ The role of Count Almaviva, a character which he had previously portrayed in the Madrid première of Mozart's *Le Nozze di Figaro*, is this time a much younger figure than in Lorenzo da Ponte's version of Beaumarchais' play.³⁸⁸

Just before the brief finale dedicated to love, 'Amor e fede eterna, si vegga in noi regnar!', Almaviva sings his most virtuosic and difficult recitative and aria, 'Cessa di più resistere', in which he finally declares that he is in fact the Count and not Lindoro. This aria is often cut in modern performances and is not even included in many publications of the score partly because, as Charles Osborne explains, the aria is 'beyond the vocal grasp of most Almavivas'.³⁸⁹

Case Study 1: Act II.x aria (No. 19) 'Cessa di più resistere' – Manuel Garcia

Aria	'Cessa di più resistere' [Act II; Sc. xi. No. 19; 1–177]
Composer	Gioachino Rossini
Opera / Character	<i>Il barbiere di Siviglia, ossia L'inutile precauzione</i> / Almaviva

³⁸⁵ Osborne, *Bel Canto Operas*, 1994, p. 52.

³⁸⁶ Rutherford-Johnson, T., et. al. (eds.) 'Garcia, Manuel del Populo Vicente', in *Oxford Dictionary of Music Online* (2013) accessed 18 March 2018; Radomski, J., *Manuel García (1775–1832)*, 2000, p. 128, London 1818; p. 136: Paris 26 October 1819; p. 196: New York 29 November 1825.

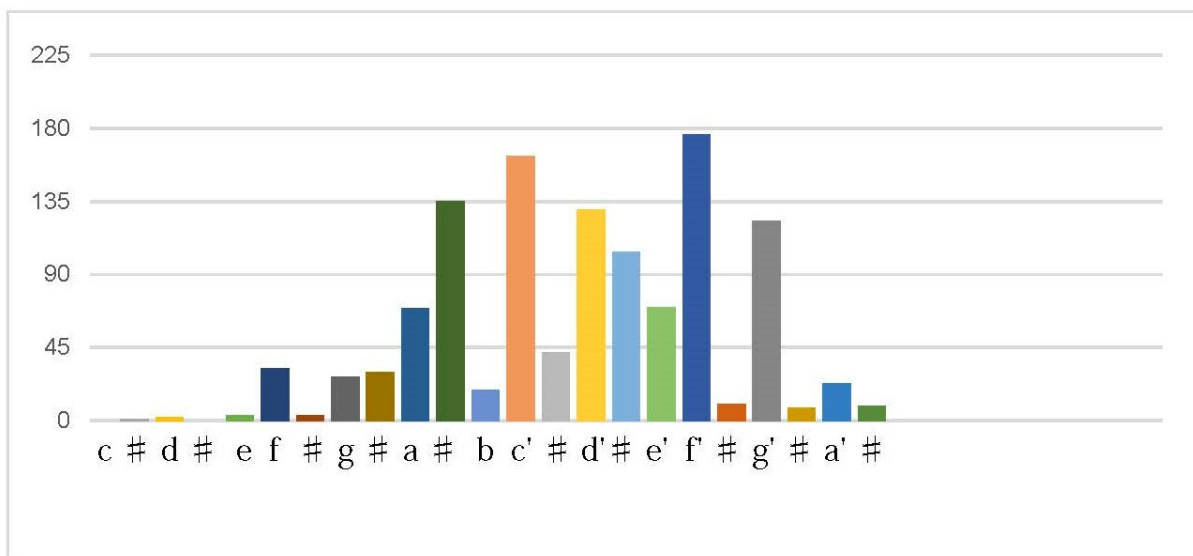
³⁸⁷ Osborne, *Bel Canto Operas*, 1994, pp. 52–9.

³⁸⁸ Rossini's opera centres around the courtship and subsequent engagement of Almaviva to the young Rosina, the ward of Don Bartolo, an older and less than desirable bachelor of questionable ethics who wishes to marry Rosina himself. In the comedy, Almaviva disguises himself as several different individuals including Lindoro, a priest, and in the guise of a soldier attempts to win the attention of Rosina with the help of the town factotum, Figaro. Eventually, disguised as Lindoro, Almaviva convinces Rosina of his love for her. But Bartolo persuades Rosina that Lindoro is in fact in love with another, so she reluctantly agrees to marry him. Lindoro once again convinces Rosina of the truth of his affections and reveals his true identity as Count Almaviva. Bartolo tries to have Lindoro arrested but upon finding that Rosina and Lindoro have already married and that Lindoro is in fact the Count he reluctantly concedes. Bartolo's disdain is assuaged when he is permitted to keep Rosina's dowry. Osborne, *Bel Canto Operas*, 1994, p. 59.

³⁸⁹ Osborne, *Bel Canto Operas*, 1994, p. 60.

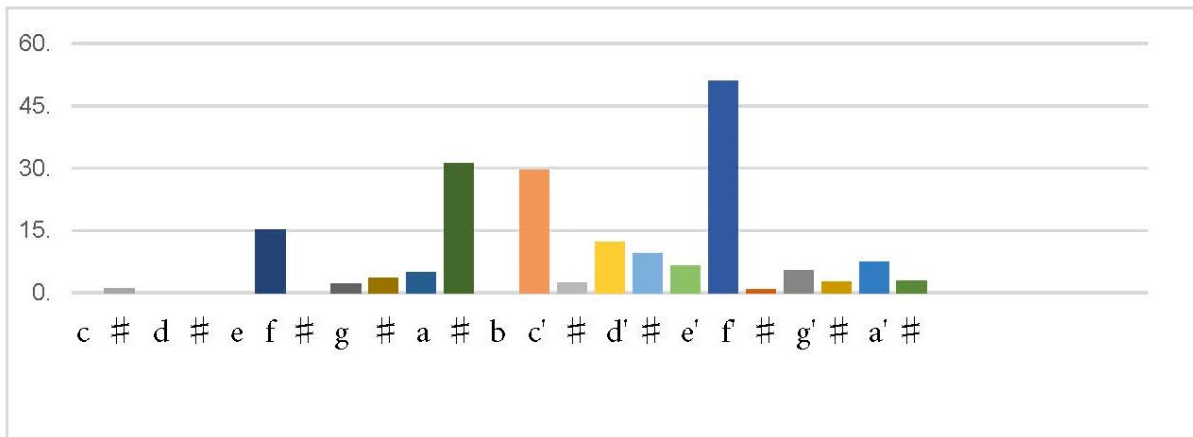
Premiere	20 February 1816 (Teatro Argentina, Rome)
London Premiere	10 March 1818 (King's Theatre)
Tenor	Manuel Garcia (snr.) (21 January 1775 – 10 June 1832)
Fach	Tenore serio
Range / Tessitura	d flat to b' flat / a natural to g' natural

The act II aria 'Cessa di più resistere' is known as one of the most difficult arias in the tenor repertoire.³⁹⁰ The aria is composed of three sections and is extremely florid, requiring rapid singing across the entire two octave range. Rossini borrowed the melodic structure of the *moderato* 'Ah il più lieto' for the mezzo soprano aria 'Non più mesta' in his 1817 opera *La Cenerentola*. Interestingly Rossini transposes the aria up only a fourth for the mezzo, which demonstrates an interesting relationship between the way Rossini conceived of *tenore serio* and mezzo soprano voices.



Graph 1 A – Gioachino Rossini, 'Cessa di più resistere' (Almaviva), *Il barbiere di Siviglia*, ossia *L'inutile precauzione*. Occurrences of individual pitches.

³⁹⁰ Osborne, *Bel Canto Operas*, 1994, p. 60; The aria is not present in several scores including: Rossini, G. *Il Barbiere di Siviglia* (Milan: F. Lucca, n.d. before 1891); Rossini, G. *Le Barbier de Séville* (Paris: Choudens, 1897) even though the title page indicates that it conforms to the manuscript of Rossini (*Edition Conforme au Manuscrit de Rossini*); Rossini, G. *Le Barbier de Séville* (Paris: J. Tallandier, n.d. ca. 1900).



Graph 1 B – Gioachino Rossini, 'Cessa di più resistere' (Almaviva), *Il barbiere di Siviglia, ossia L'inutile precauzione*. Duration of individual pitches sustained for one minim or longer.

One of the prominent features of the aria demonstrated in Graph 1.a is the distribution of notes producing something of a bell curve with pitches in the middle far more prevalent than outer-lying pitches. There is a distinct reduction in the use of d' natural, e' flat and e' natural, which is precisely mirrored in Graph 1.b. While there are similarities in the most used pitches the distribution of sustained pitches differs significantly. Graph 1.b shows that only four pitches are sustained to any significant degree: f natural, b flat, c' and f' natural. No pitch in the upper register is sustained for more than eight beats in total; furthermore f' natural is sustained nearly to the exclusion of all other pitches. To a much lesser degree, b flat and c' natural are held but represent pitches in the lower middle voice. A large portion of the aria is composed of thirty-second notes and often demands the singing of sixty-fourth notes. *Gruppetti* and *melismi* are used as both ascending and descending melodic elements, with only a slight preference for descending shaped *gruppetti*.

There seems to be no real preference for entering the upper register, because many of the phrases ascend chromatically and descend by ornamented melody (or arpeggio and interval) and vice-versa. Wide interval leaps are prevalent throughout and represent a significant character of the aria, but they do not seem to be limited by range or interval. There are no written pitches above b' flat, but it may well have been expected that Garcia,

who as discussed was known for significantly ornamenting his arias, added ornamentation that took the voice above the written pitches. It is significant to note that few pitches above *f'* are sustained to any significant degree. It may be that because this aria occurs near the very end of the opera the singer may have been expected to be tiring, or it may be that Garcia was not as comfortable with sustained high singing as he was with florid singing.³⁹¹ The highest sustained pitch is *a'* natural which is held for a dotted quarter-note in a quick tempo. It is also worth noting that his first act aria, 'Ecco ridente', does not include any sustained pitches above *g'* natural and of which there are only 14 beats total.

The analysis reveals an aria that is not particularly high and despite a few *b'* flats in fioritura contains no obligatory sustained high notes above *a'* natural.³⁹² It is however an aria that requires the tenor to be exceptionally agile. The aria never gives the tenor a moment to really sustain any pitch or to find a place to relax into the voice. The aria shows that Garcia was clearly particularly comfortable with sustaining *f'* natural and had an extraordinary facility for intricately florid singing. This is borne out by reviews of his performances cited above.

While many notes in the upper register are approached by scale, none of the sustained pitches are approached that way. All the sustained pitches in the upper register are approached by intervallic leap, occasionally as wide as an octave.³⁹³ But no sustained *a'* naturals are approached any way other than by interval. One peculiarity of the aria is a dip in the length of individual pitches and sustained notes durations between *d'* natural and *e'* natural. This could indicate a peculiarity of the composition style, or as these pitches fall in the tenor *primo passaggio* it could mean that Garcia had some difficulty moving into *passaggio*.

³⁹¹ Celletti, History, 1991, p. 165, 'Garcia had *L'italiana in Algeri* in his repertoire but faced with the extremely high tessitura and the mainly syllabic writing of '*Languir per una bella*', he transposed the aria down a minor third, perforating it in c major instead of e flat.'

³⁹² 'High notes' is a relative term, but in the context of the repertoire addressed in this dissertation high notes defined as any note above the second *passaggio* of the leggiero tenor which is approximately *g'* sharp. See: Miller, R. *Training Tenor Voices* (New York: Schirmer Books, 1993, pp. 1–14. Therefore, high notes are defined as being *a'* natural and higher with *sovracuti* being *b'* flat and above.

³⁹³ This holds true for his Act I.i (No. 1) aria 'Ecco ridente', except where attacked after a rest or where the language allows for a break as at the words '*e puoi dormir cosi*' where *g'* natural is approached by a chromatic *f'* sharp and the plosive '*p*' allows for a disconnection. There are also no sustained notes above *g'* natural in the Act I.iii (No. 3) *romanza* 'Se il mio nome' but there are two briefly sustained *g'* naturals which are approached by scale.

Il Barbiere was the second collaboration between Garcia and Rossini. The previous year Garcia had premiered the role of Norfolk in Rossini's *Elisabetta, Regina d'Inghilterra*. Garcia sang side by side with the great Italian *tenore serio* Andrea Nozzari, who performed the role of Leicester. In *Elisabetta*, the Act II arias 'Deh! Troncate' (no. 9) and 'Sposa amata' (no. 10) were written for Garcia and Nozzari respectively. The Act. II duet, written for both tenors, 'Deh, scusa i trasporti' (no. 13), is also analysed to help to build a fuller picture of the *tenore serio* voice.

Rossini: *Elisabetta, regina d'Inghilterra* (1815)

Elisabetta, regina d'Inghilterra is in two acts and based on the libretto by Giovanni Federico Schmidt. This was Rossini's first opera for Domenico Barbaja (1777-1841) the impresario at Teatro San Carlo in Naples where it was premiered on 4 October 1815.³⁹⁴ The opera was an unmitigated success and according to Phillip Gossett it 'undoubtedly did much to open the gates of the city to this young composer from Pesaro.'³⁹⁵ The opera focuses on the relationship between Queen Elizabeth I and Leicester with whom she is in love. Elizabeth learns from the Duke of Norfolk that Leicester is secretly married to Matilda (not to Amy Robsart, as in real life) and has Leicester imprisoned; but when she finds out about Norfolk's plots against Leicester, she pardons him.³⁹⁶

Elisabetta demonstrates Rossini's role as a reformer of *bel canto* operatic style. Firstly, this opera contains no roles for lower male voices, which leaves the three male roles to be filled by tenors: Nozzari, Garcia, and Gaetano Chizzola.³⁹⁷ Rossini went on to write *Otello* in 1816 and *Armida* in 1817, both requiring no less than six tenors each. Another notable difference in *Elisabetta* from Rossini's previous works is his use of accompanied *recitativo*, which Phillip Gossett describes as reflecting 'the standard practice for the Teatro

³⁹⁴ Eisenbeiss, P. *Bel Canto Bully, The Life and Times of the Legendary Opera Impresario Domenico Barbaja*, (London: Haus Publishing Ltd., 2013) pp. 8, 221 & 242.

³⁹⁵ Rossini, *Otello*, 2008, p. XLIV.

³⁹⁶ Osborne, *Bel Canto Operas*, 1994, p. 47.

³⁹⁷ *Ibid.*, 48; Chizzola was a tenor whom Rossini frequently employed as second tenor, but for whom he never wrote a leading role.

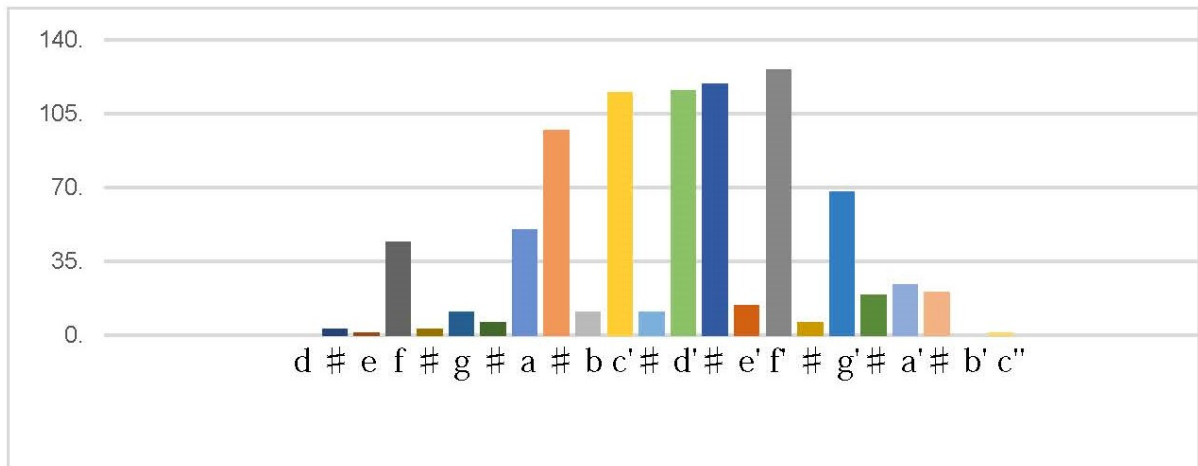
San Carlo' at the time; rather than allowing the voice to convey the dramatic movement alone, string accompaniment of a few chords is used to reinforce the basso continuo.³⁹⁸

Case Study 2: Act. II.x & xi (no. 9) aria 'Deh! Troncate i ceppi suoi' - Manuel Garcia

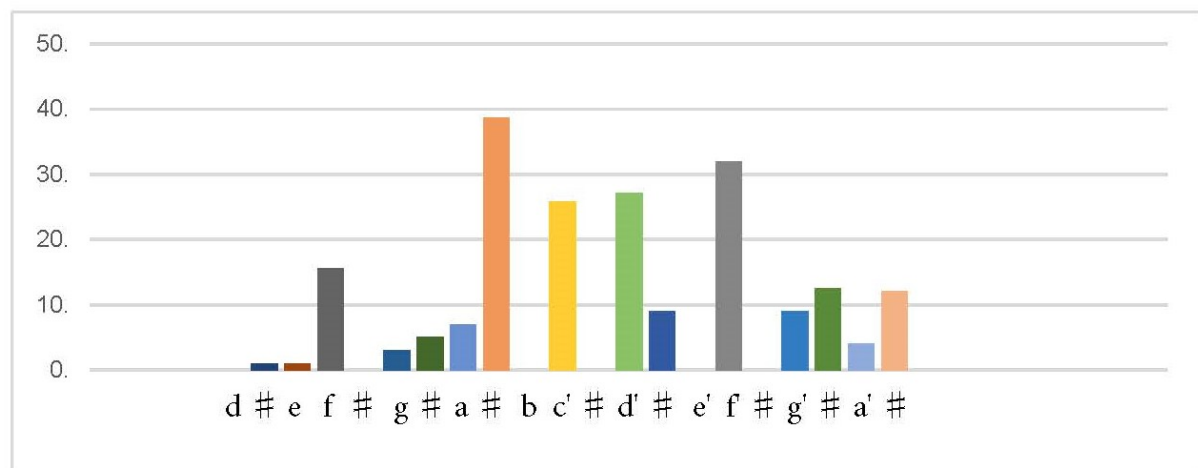
Aria	'Deh! troncate i ceppi suoi' [Act II.x; No. 9; 235–398]
Composer	Gioachino Rossini
Opera / Character	<i>Elisabetta, regina d'Inghilterra</i> / Norfolk
Premiere	4 October 1815 (Teatro San Carlo, Naples)
London Premiere	30 April 1818 (King's Theatre)
Tenor	Manuel Garcia, Sr.
Fach	Tenore Serio
Range / Tessitura	e flat to b' flat / b flat to g' natural

The aria 'Deh! troncate i ceppi suoi' has a comparatively similar shape to the Almaviva aria composed for Garcia previously analysed, with a build up towards f' natural and a steep fall-off at g' natural. This aria, written the year before the composition of *Il Barbiere* does not have the same characteristic dip in note values around d' and e' natural. Instead the pitches c' natural through e' natural are equally utilised therefore maintain a rate consistent with the curve. It could mean that Rossini, for whatever reason, was unhappy with Garcia's *primo passaggio* and decided to avoid its exposure in *Il Barbiere* the following year, or it could again be simply a function of the compositional style. Notes just above *primo passaggio* (i.e., f' natural and g' natural) occur almost twice as frequently in the *Barbiere*. Another significant difference is that 'Deh! Troncate' requires the tenor to sustain notes in the upper register twice the duration of those in *Il Barbiere*. Perhaps Rossini preferred Garcia's f' natural and g' natural to the notes above and below, or maybe they were Garcia's best notes.

³⁹⁸ Rossini, *Otello*, 2008, p. XLVI.



Graph 2 A – Gioachino Rossini, 'Deh! troncate i ceppi suoi', (Norfolk) Elisabetta, regina d'Inghilterra, Occurrence of individual pitches.



Graph 2 B – Gioachino Rossini, 'Deh! troncate i ceppi suoi', (Norfolk) Elisabetta, regina d'Inghilterra, Duration of individual pitches sustained for one minim or longer.

I examine 'Deh! Troncate' to see if it is composed for Garcia in the same manner as 'Cessa di più resistere'. Similarly, with the *Il Barbiere*, nearly all sustained notes in the upper register are approached by a leap of up to an octave, with one glaring exception (Graph 2.a, below). This phrase, which is repeated twice at the end of the aria, begins at measure 368 and takes the tenor from f natural to b' flat, but with no notes shorter than a quarter note, and once reaching the f' natural octave at measure 371, the note values double to half-

notes. This makes it appear to slowly progress into the upper register; however, the switching of registers during the movement into the upper register may be accomplished by a linguistic device.³⁹⁹ A punctuation device, two commas, is used to break the line, one after the word *punirà* and another after *sì*, which allow the singer to switch without observing the phrase marking, but also the plosive [p] in *punirà* and sibilant [s] in *sì* offer opportunities to shift registers with a legato line implied but essentially being unvoiced. While being a technical feat in itself, having the singer break the line with an interjection of *sì* permits him to make the transition without needing to transition in a legato fashion, essentially offering him a place to re-attack the note and even breathe, which would sound as if the note had been approached by interval. It also offers the singer a theatrical way to avoid singing legato while maintaining intention and direction in the line.

368
Norfolc
8
Que - st'al - ma quel - l'in - gra - ta pu - ni - rà, sì,

372
Nor.
8
pu - ni - rà l'in - gra - ta pu - ni - rà.

Example 1 – Gioachino Rossini, 'Deh! troncate i ceppi suoi', (Norfolc) Elisabetta, regina d'Inghilterra, measures 368-74

eh! troncate i ceppi suoi', (Norfolc) Elisabetta, regina d'Inghilterra, measures 368-74

Something of a pattern begins to emerge in the shapes of the graphs for Garcia and a possible preference for entering the upper register by leap, though with one notable exception. Relatively speaking there are very few sustained a' naturals and the highest sustained pitches are b' flats, with only the briefest of top c'' naturals. Analysing arias

³⁹⁹ I use the term 'linguistic device' to mean any element in language that allows for the adjustment of the vocal mechanism in the disguise of a vocal tract adjustment such as voiceless consonants like sibilants [s], fricatives [f], plosives [p] and punctuation etc. which interrupt vocal cord vibration or sonorants like nasals [m] or [n] and approximants [l] which will bring voice are used to accomplish the same task.

written for other tenors of similar voice type, such as Rossini's role of Leicester for Andrea Nozzari, helps to shape an understanding of how these voices may have been structured, and offers clues as to what compositional elements may have been idiomatic to individual singers. It also helps to outline similarities and differences in overall graph shape and consistencies in tessitura or composition style.

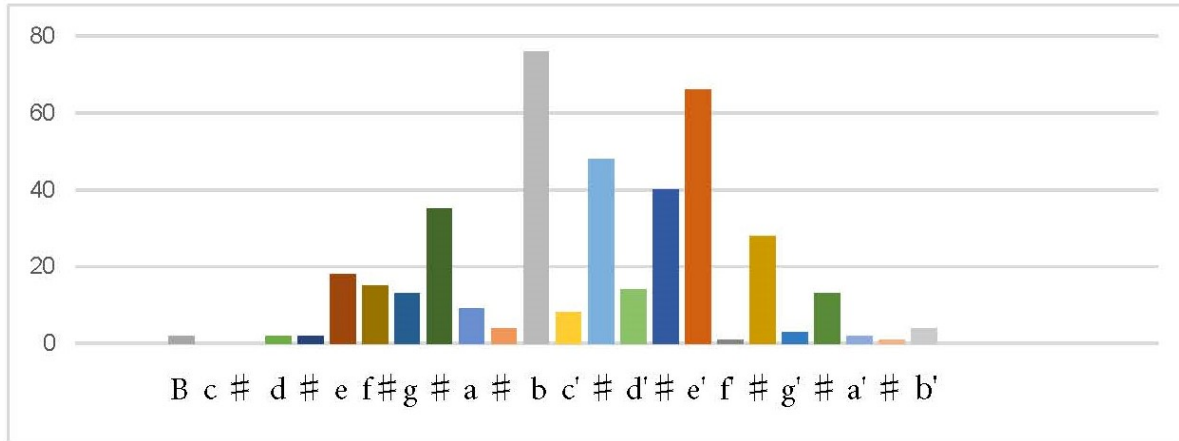
Case Study 3: Act. II.xii (no. 10) aria 'Sposa amata' – Andrea Nozzari

Aria	'Sposa amata' [Act II.xii; No. 10; measures 48–197]
Composer	Gioachino Rossini
Opera / Character	<i>Elisabetta, regina d'Inghilterra</i> / Leicester
Premiere	4 October 1815 (Teatro San Carlo, Naples)
London Premiere	30 April 1818 (King's Theatre)
Tenor	Andrea Nozzari (Vertova 27 Feb 1776 – Napoli 12 Dec 1832)
Fach	Tenore Serio
Range / Tessitura	e natural to a' natural (c'/d' centre) / g sharp to e' natural

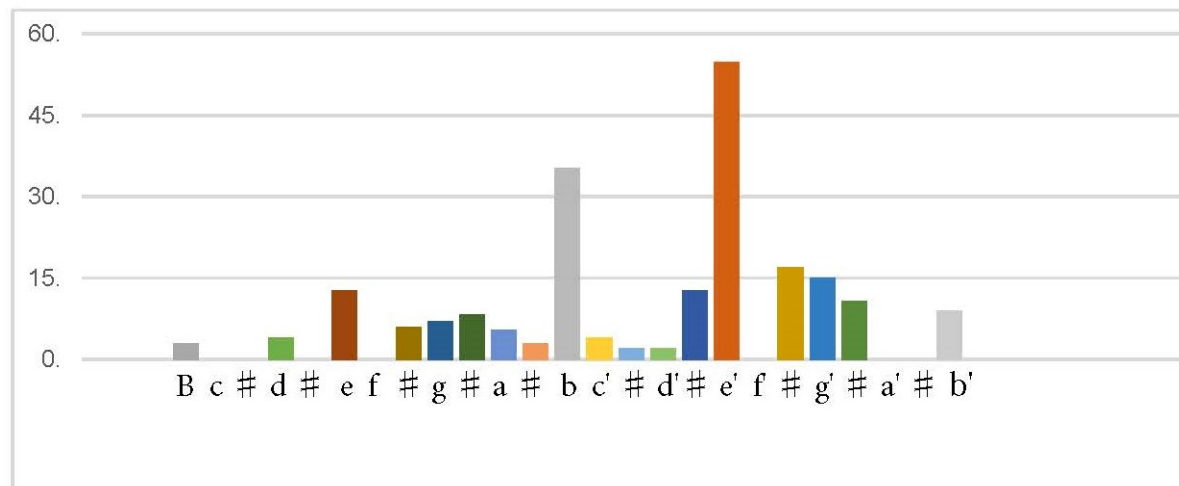
In the second act recitative and aria 'Sposa amata' from *Elisabetta* written for Nozzari, Leicester laments how his life has been upturned by cruel fate. Speaking in his sleep, he thinks of his wife Mathilde reawakening to the stark reality that they are all imprisoned and that he is about to be put to death.⁴⁰⁰ The aria begins with an andantino section which maintains a relatively low tessitura but requires a two-octave range B to b' natural and a one octave upward leap to b' natural. The allegro section has a significantly higher tessitura with significant fioritura, wide upward leaps of over an octave and one two-octave leap down from top b' natural to low B natural (measure 133). One of the main features of the aria is the use of wide intervals throughout. Aside from some of the more *sostenuto* phrases, nearly every line has a wider interval leap of a fifth or more until the final section when the lines become more evenly distributed both rhythmically and melodically. Towards the end of the aria (measures 142–89), the leaps make a reappearance

⁴⁰⁰ Rossini Opera Festival Website: <http://www.rossinioperafestival.it/?lang=eng&IDC=243> accessed 9 May 2018.

interspersed with smoother, more even elements creating an exciting juxtaposition to the typically Rossinian resolution of the aria.

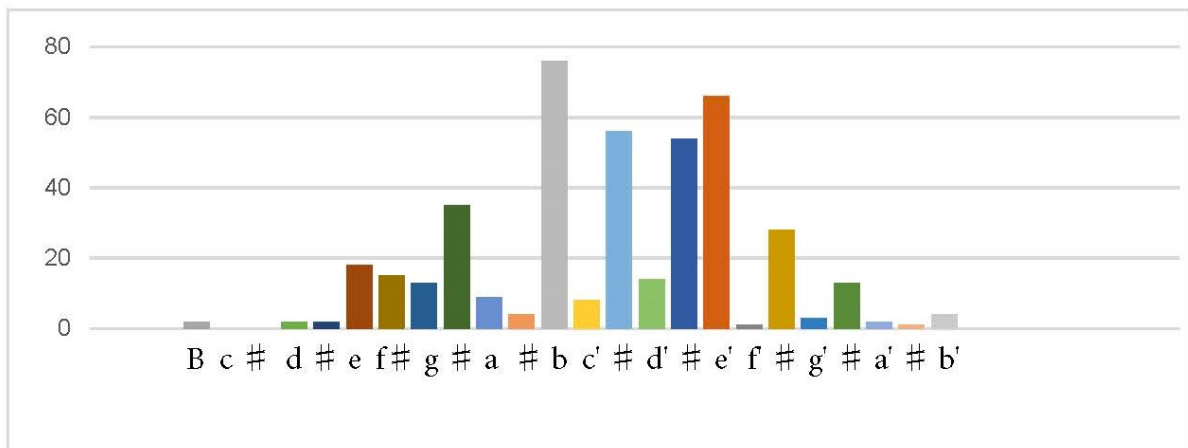


Graph 3 A – Gioachino Rossini, 'Sposa amata', (Leicester) Elisabetta, regina d'Inghilterra, Occurrence of individual pitches.



Graph 3 B – Gioachino Rossini, 'Sposa amata', (Leicester) Elisabetta, regina d'Inghilterra, Duration of individual pitches sustained for one minim or longer.

The shape of the graphs in this aria are distinctly different to those of Garcia in the same opera which showed a fairly even distribution of notes up to f' natural in both individual and sustained pitches. With Nozzari there is a somewhat jagged distribution more similar to how Rossini wrote 'Cessa di più resistere' from *Il barbiere* for Garcia. One reason for this could be the key change from G major to E major at measure 90, but this accounts for only 18 measures of actual note values, and probably contributes only marginally to the distortion shown in the graph adjusted for the key change in Graph 3.c below. The pitches which draw the most attention in Nozzari's graphs are b natural and e' natural, whereas in the Garcia graph f' natural is clearly the dominant tone in the graphs from both arias. Garcia, however, also had many more g' naturals, with 123 in the arias from *Elisabetta* and 68 instances in *Il barbiere*, to Nozzari's 45 total instances of f' sharp, g' natural, and g' sharp.



Graph 3 C – Gioachino Rossini, 'Sposa amata', (*Leicester*) *Elisabetta, regina d'Inghilterra*, Occurrence of individual pitches (slightly adjusted for key change).

Garcia sustained f' natural nearly to the exclusion of other notes in that part of the voice, and Nozzari shows a comparable inclination by sustaining e' natural to a similar proportion. The overall spread of sustained pitches is very low. Generally speaking, at this point it might seem that Nozzari does far less sustained singing than Garcia. The differences in the voices could be a function of the relative tonalities, E major to B flat major (both

Elisabetta and Il Barbiere), or just as likely the key choices are a reflection of a difference in the technical strengths of their respective voices. A semitone difference in tessitura should not put them into different voice categories. It may only suggest that perhaps Garcia has a slightly higher tessitura than Nozzari.

As with the aria from this opera written for Garcia, there are virtually no notes sustained in the upper register that are not approached by an interval leap, typically a fifth or larger, with one major exception. At measures 141–42 Rossini has Nozzari move through the scale to from *c'* sharp to a sustained *f'* sharp then up to a briefly sustained *g'* sharp and back down. This would be a difficult feat for nearly any tenor and is essentially the only time Rossini requires such a phrase in either of these arias, with the noted exception. There is the possibility however of employing a linguistic device as mentioned before.

138
Leicester

Im - mers - so, oh dio! mi - sen -

142
Leic.

-to nel - pri - mo af - fan - no, af - fan - no il cor.

Example 6 – Rossini, ‘Sposa amata’ (Leicester), measures 138–46

If the singer utilises the sibilant [s] on ‘sento’ it will necessitate the cessation of phonation, otherwise it would be a voiced [z], essentially breaking of the line, but not necessarily the legato. He can then quickly place the *f'* sharp into the upper register, relating it to the *g'* sharp rather than ‘pulling up the weight’ of the voice to the *g'* sharp. Considering that the line begins *piano* and that Rossini writes a decrescendo up to the *g'* sharp, it is likely that he was indicating that this should indeed be sung with a more head voice based tone anyway which might encourage an easier shift to the *g'* natural. So, while it may seem that this phrase may not adhere to the current speculation about intervals being used to progress into the upper register, it may in fact be the exception that proves the rule.

As already mentioned, both Garcia and Nozzari were considered baritonal types of tenors with extensions in the ‘pharyngeal voice’ up to d’’ natural; the roles which both tenors sang in *Otello* have a d’’ natural. The individual arias have suggested some differences between the voices, but further analysis is needed to establish how the *tenore serio* is differentiated from the *contraltino*. To further clarify the character of these two voices, investigating how Rossini handled writing for them at the same time is useful. After Leicester’s (Nozzari) second act aria, Norfolk (Garcia) enters and the two sing a duet. This duet has been chosen because it demonstrates differences in the way that music was composed for two ‘equal’ tenors.⁴⁰¹

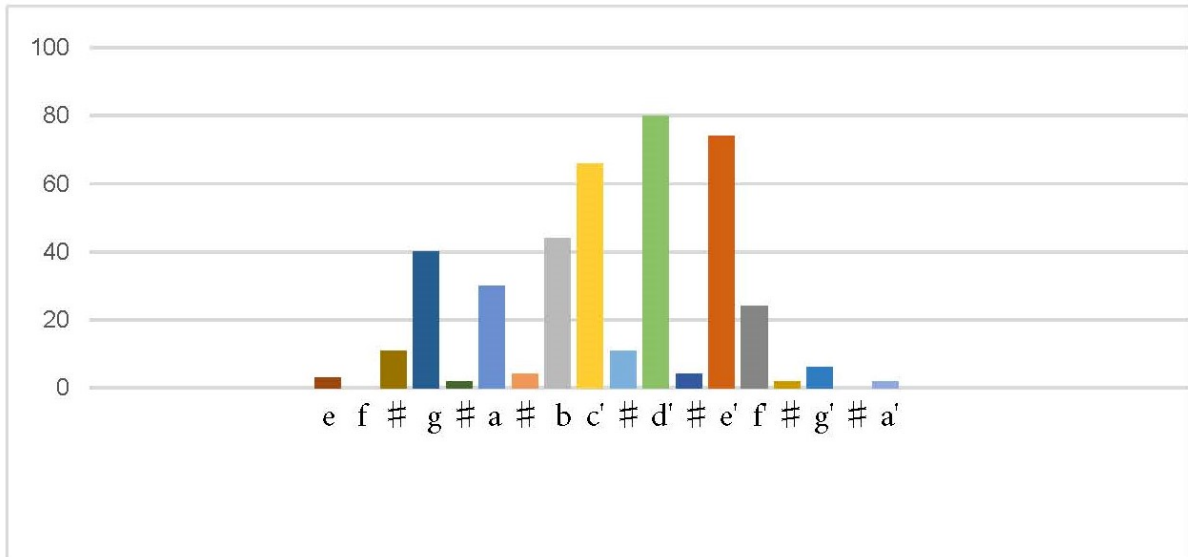
Case Study 4: Act. II.xii (no. 11) duet ‘Deh, scusa i trasporti’ – Garcia & Nozzari

Duet	‘Deh, scusa i trasporti’ [Act II.xiii; No. 11; measures 1—136]
Composer	Gioachino Rossini
Opera / Character	<i>Elisabetta, regina d’Inghilterra</i> / Leicester (1) & Norfolk (2)
Premiere	4 October 1815 (Teatro San Carlo, Naples)
London Premiere	30 April 1818 (King’s Theatre)
Tenor	(1) Nozzari, Andrea (2) Garcia (snr.), Manuel
Fach	Tenore Serio
Range / Tessitura	(1) e natural to a’ natural (c’/d’ centre) / g natural to e’ natural (2) B natural to b’ flat (f’ sharp centre) / g natural to g’ natural

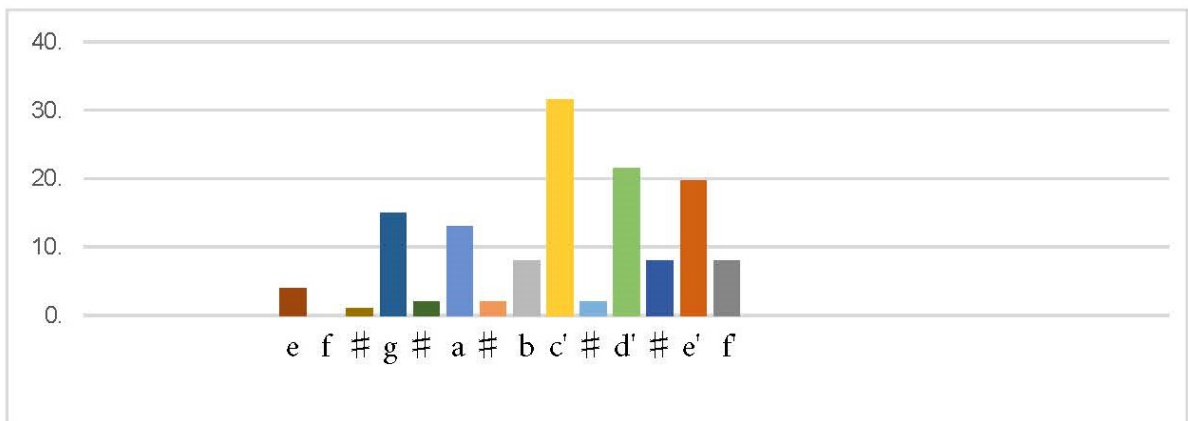
By analysing how Rossini treated the two singers when they sang in tandem, perhaps an understanding can be built of not only their differences but suggest what are some further similarities. For example, are they written for equally or are there significant differences? Do the tenors share the same range and tessitura? Does one tenor sing

⁴⁰¹ Through the course of this recitative and duet Norfolk convinces Leicester that instead of having betrayed him to Elizabeth, he has begged her to pardon him. Leicester and Norfolk sing of fraternity and friendship. Rossini Opera Festival Website: <https://www.rossinioperafestival.it/en/stories/elisabetta-regina-dinghilterra/>, accessed 9 May 2018.

consistently above the other, or do they alternate the higher tessitura lines? What does this indicate about the voices?



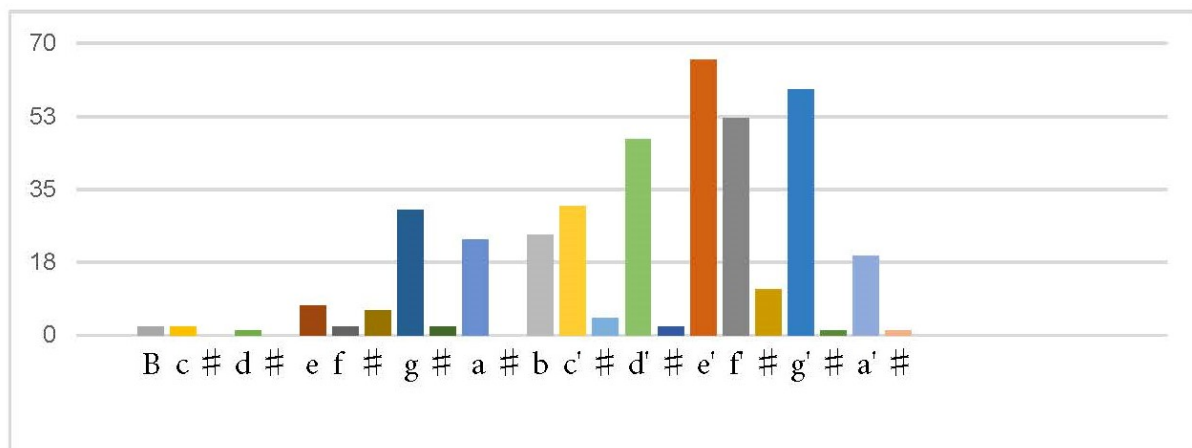
Graph 4 A – Gioachino Rossini, 'Deh, scusa i trasporti', (Norfolc) Elisabetta, regina d'Inghilterra, Occurrence of individual pitches.



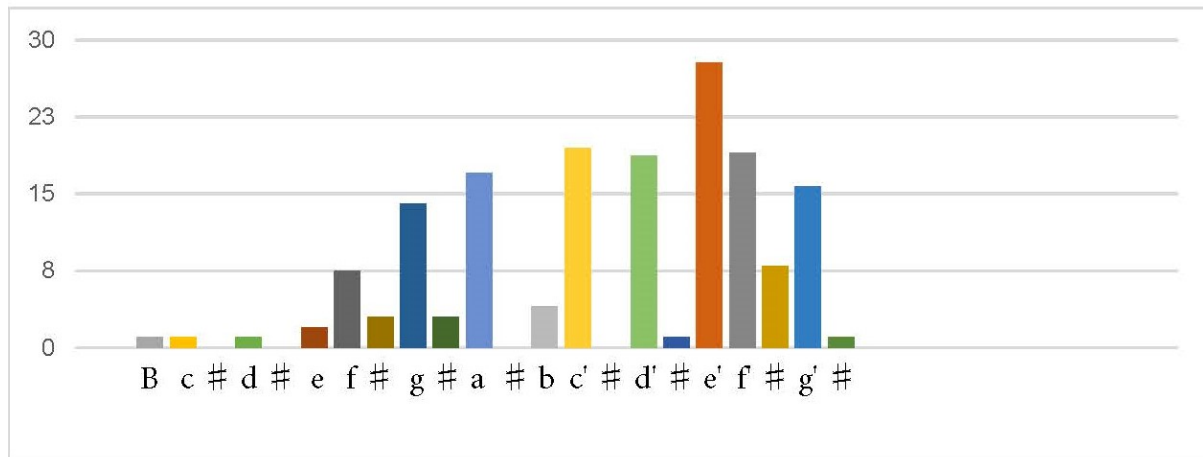
Graph 4 B – Gioachino Rossini, 'Deh, scusa i trasporti', (Norfolc) Elisabetta, regina d'Inghilterra, Duration of individual pitches sustained for one minim or longer.

The first tenor line analysed is that of Leicester (Nozzari). The range of this duet is from e natural, which does not stretch very far into Nozzari's lower register, to a' natural. Rossini had written down to low A natural for Nozzari in *Otello*, for example. The highest note, a' natural is only briefly touched twice not sustained. The tessitura of g natural to e' natural is relatively low among the repertoire studied here and the highest sustained pitch is f' natural, which is only sustained a total of eight beats. The centre of the tessitura is c'/d' and the further from this point the less likely the pitch will be either hit or sustained, but the curve for the sustained pitches drops off much faster than that of the individual pitches. This means that higher pitches are more like to be hit momentarily than sustained.

The second tenor role of Norfolk is the higher of the two. While not considered the lead tenor role, it is quite difficult and still a very large role in the opera. The range for Garcia in the duet is greater at both ends than that written for Nozzari and extends nearly two octaves from B natural to b' flat, with a centre roughly three semitones higher at f' sharp. The tessitura of g natural to g' natural has the same lower extension as Nozzari's but is also three semitones higher at the upper end.



Graph 4 C – Gioachino Rossini, *'Deh, scusa i trasporti'*, (Leicester) Elisabetta, regina d'Inghilterra, Occurrence of individual pitches.



Graph 4 D – Gioachino Rossini, ‘Deh, scusa i trasporti’, (Leicester) Elisabetta, regina d’Inghilterra, Duration of individual pitches sustained for one minim or longer.

When comparing the overall shape of the graphs, what stands out most strongly is that the pitches fall off quite sharply from d’ natural and e’ natural for the role of Leicester, indicating that the notes above d’ natural are significantly less likely to be sustained, whereas for Norfolk e’ natural is the strongest pitch and the fall off occurs after g’ natural. In Nozzari’s solo aria, however, e’ natural was also highly utilised. The graphs of individual pitches for both tenors have a similar curve, but Garcia’s shows an increased strength in the distribution of the upper register at g’ natural and a’ natural, something not seen in Nozzari’s graph. The graphs of the sustained pitches are quite different. Norfolk (Garcia) has a fairly regular curve with a slight spike at e’ natural while Leicester has an irregular distribution and spike in sustained pitches much lower, at c’ natural. This distribution may not be surprising considering that they are singing a third apart much of the time in the key of C major.

Another significant difference is the behaviour of the singers above f’ natural. Leicester (Nozzari) is required to sing g’ natural only six times in total, but Norfolk (Garcia) sings it nearly sixty times and sustains it for almost sixteen beats, while Leicester is not required to sustain it at all. The tenors do sing two identical vocal lines which are not particularly high. But when they sing together the top line is reserved exclusively for Garcia.

It is clear from Leicester's second act aria 'Sposa amata' that Rossini expected Nozzari to sing b' natural consistently and strongly, but it would seem that his upper register was possibly neither as consistent nor possibly as easy as that of Garcia. Could this mean that Nozzari had a heavier voice than Garcia, or possibly that Garcia could more successfully, or consistently, use the 'pharyngeal voice'? As previously discussed, both were baritonal voices and very loud but Nozzari was described as more a baritone than a tenor by Giuseppe Carpani.⁴⁰²

Typically, Norfolk sings in parallel thirds above Leicester, which places Norfolk's tessitura that much higher than Nozzari. Given the character of the duet, if Rossini had seen Nozzari and Garcia as equal voices, he could have easily had the voices alternate who was singing the top line, without compromising the integrity of the duet, but he did not. As is consistent with the previous analyses, there are no notes sustained in the upper register that are approached legato. This could be merely a compositional stylistic choice, or a peculiarity of the *tenor serio* voice. Analysing other composers and the *contraltino* voice will throw more light onto this question, but as it stands it could be Rossini's own decision and not dictated by the particular characters of the voices of each tenor.

The 'equal voices' in this duet would have been well matched in agility and probably also in potency. As the tenors echo one another and sing florid passages in parallel thirds, both are ostensibly equally capable in terms of agility, though Nozzari may not have been as agile in the upper register as Garcia. Considering that both tenors sang the title role in *Don Giovanni*, it is interesting to consider that Garcia was apparently a higher, more agile tenor.⁴⁰³

These pieces alone are not sufficient to provide a definitive judgement concerning the overall vocal abilities of these singers, but they do seem to be representative comparative examples of their voices based on a statistical analysis of frequency of pitch occurrence, tessitura, modes of approach to and away from high notes, sustained and florid singing. However, a dimension such as the vocal acoustic differences – that is to say vocal

⁴⁰² Carpani, *Rossiniane*, 1824, p. 159.

⁴⁰³ Radomski, J., *Manuel García (1775–1832)*, 2000, p. 130, 255–9, A few alterations were made to the opera so that it was more suitable for the tenor's voice. The duet between Don Giovanni and Zerlina 'La ci darem la mano' was transposed a half-tone up to B flat and Don Giovanni's Champagne aria up a whole tone. Radomski (p. 142) indicates that this may have been due to a weakness in Garcia's lower register.

timbre or colouration – between the two tenors cannot be determined through such an analysis. Generally speaking, the two singers seem to have been described in similar terms, but perhaps Garcia's voice was more 'metallic' in tone than Nozzari's and, if Celletti is to be believed, more 'beautiful'.⁴⁰⁴ It is clear however that Garcia's voice was at least equal if not superior in range and agility and had a somewhat higher tessitura. Also, Garcia had a facility in the upper register not equally evident with Nozzari. These factors would uphold the idea that Nozzari was the heavier of the two singers, or that Garcia was indeed more skilled at the use of the 'pharyngeal voice'.

This analysis also seems to suggest that Rossini considered the two voices to be very similar, and Stendhal indicated that while Nozzari had premiered the role of Otello, Rossini had in fact written it for Garcia.⁴⁰⁵ Otello did become one of Garcia's greatest roles and his performances of the role were seen as 'absolute perfection' in Paris.⁴⁰⁶ I have therefore chosen to address the role of Otello for what it might tell about both Nozzari and Garcia. There is nothing in the Ricordi Critical Edition to indicate that any changes were made to accommodate one voice over the other.⁴⁰⁷ An analysis of the tessitura and any individual characteristics in the aria can be compared with what is now known about their voices and compare this to the first *contraltino* under investigation in this dissertation.

Rossini: *Otello* (1816)

The immense success of *Elisabetta, regina d'Inghilterra* impressed Neapolitan audiences and laid the foundations for a positive reception of *Otello*.⁴⁰⁸ Rossini's *Otello* is a setting of a libretto by Francesco Maria Berio di Salsa which is loosely based on Shakespeare's play, but contains several 'absolutely ludicrous' theatrical adaptations.⁴⁰⁹ *Otello* was a huge success and went on to be staged throughout Europe and America for the

⁴⁰⁴ Celletti, *Voce*, 1989, p. 88; Potter, *Tenor*, 2009, p.45.

⁴⁰⁵ Stendhal, *Vie de Rossini*, 1824, p. 282, 'Nozzari, qui chanta le rôle d'Othello que Rossini avait écrit pour Garcia ...'.

⁴⁰⁶ Radomski, J., *Manuel García (1775–1832)*, 2000, pp. 149–51, 154, 158–64, 173.

⁴⁰⁷ Rossini, *Otello*, 2008, p. XLIV.

⁴⁰⁸ Ibid.

⁴⁰⁹ Marchese di Salsa o Salza (Naples 1765 - Naples 1820); 'absolutely ludicrous', Osborne, *Bel Canto Operas*, 1994, p. 65.

next fifty years. There were 291 productions of Rossini's *Otello* between 1816 and 1890 in 87 cities, 26 countries, and 8 languages.⁴¹⁰

As in the case of *Elisabetta*, Rossini made the move to the Neapolitan convention of accompanied recitatives. In this his second opera for Naples, he transforms his recitatives from simple string accompaniment with a few chords, to a full 'musical discourse more flowing, above all in terms of the rapport between the voices and the orchestra.'⁴¹¹ Otello, Iago, Rodrigo, Lucio and even the Doge of Venice are all tenors; and just for good measure even the Gondolier is a tenor.

Case Study 5: Act I.i (No. 2) cavatina di Otello – Andrea Nozzari

Aria	'Ah sì, per voi già sento' [Act I.i; No. 2; 1–172] ⁴¹²
Composer	Gioachino Rossini
Opera / Character	<i>Otello, ossia Il Moro di Venezia</i> / Otello
Premiere	4 December 1816 (Teatro del Fondo, Naples)
London Premiere	16 May 1822 (King's Theatre)
Tenor	Andrea Nozzari
Fach	Tenore Serio
Range / Tessitura	A natural to a' natural (d' natural centre) / a natural to f' sharp w/ a natural to d' natural focus

The first aria of the opera and Otello's only solo piece of music in the entire work is the Act I. cavatina 'Ah sì, per voi già sento'. It is a three-part aria with a vigorous full-bodied

⁴¹⁰ Rossini, *Otello*, 2008, p XLV, as found in Montemorra Marvia, R. 'Il libretto di Berio per l'*Otello* di Rossini', *Bollettino del centro rossiniano di studi*, 31(1991), p.55; The entirety of the action of Rossini's *Otello* is set in Venice. The primary theatrical agent in Shakespeare's *Othello*, the strawberry handkerchief, is replaced by a love letter from Desdemona to Iago. The letter contains a lock of her hair which had been intended for Otello, but it is intercepted by Elmiro, Desdemona's father, who reads the letter and assumes that it was intended for Rodrigo. Roderigo conspires with Elmiro against Otello to win Desdemona for himself. Otello is convinced by Iago that a letter written for Otello was in fact intended for Roderigo. Desdemona is to marry Rodrigo (a combination of Roderigo and Cassio in Shakespeare's *Othello*) but Otello interrupts the wedding and challenges him to a duel. Otello is exiled but secrets back to Venice and where, in a fit of jealous rage, he murders Desdemona. Iago, convinced Otello of Desdemona's infidelity regrets his actions and commits suicide. Osborne, *Bel Canto Operas*, 1994, p. 64.

⁴¹¹ Rossini, *Otello*, 2008, p. XLVI.

⁴¹² *Ibid.*, 37–55.

opening cavatina, an andantino where Otello thinks about Desdemona that is slower and more heartfelt, closing with a cabaletta that demonstrates coloratura and flexibility.⁴¹³

The cavatina begins with a strong martial feeling with minimal ornamentation and is equally balanced between ascending and descending legato lines. It contains only two eighth-note a' naturals, neither of which are particularly important but serve as melodic emphasis without adding undue technical difficulty. The following andantino section is sung legato and covers a full two-octave range of A natural to a' natural both of which pitches are sustained. Throughout the aria, however, the low A natural is more likely to be sustained than the high a' natural, which is rarely sustained for more than one beat. In fact, throughout the aria, a' natural is sustained only for more than one beat on two occasions and is only ever approached by interval or attacked directly. One of those instances requires a *messa di voce* of six beats *a piacere* and is found in the final *tempo primo* section (measure 91–2). It is likely that Nozzari would have used the 'pharyngeal voice' to accomplish this *messa di voce* because it would have provided the control and gentle sound needed. It cannot be determined if this was accomplished entirely with the 'pharyngeal voice' or if Nozzari transitioned registers in the middle of the *messa di voce* into full voice.

Most of the dynamic markings for the aria are marked *piano* (*p*) and *pianissimo* (*pp*) including most of the a' naturals, which are sung either *piano* or *sottovoce*. Each of the g' naturals are however to be sung *forte* (*f*) and any of the a' naturals that are not sung *sottovoce* or *piano* are also sung *forte*; finally, only one of those *forte* a' naturals is sustained at all. These limited dynamics might indicate that Nozzari was not particularly skilled at registering between the 'pharyngeal voice' and full voice especially in the upper register, assuming that the a' naturals were sung by him in full-voice at all. Celletti describes the limit of his chest voice as a' so it is still possible that Nozzari sang these notes in full chest voice.⁴¹⁴ This could also indicate that Nozzari had limited or no *voix mixte*, or mixed head voice, which would have allowed him to achieve dynamics between *forte* and *mezzo piano*. It would appear however that Nozzari was particularly adept at both legato and fioritura

⁴¹³ Osborne, *Bel Canto Operas*, 1994, p. 66.

⁴¹⁴ Celletti, *Voce*, 1989, p. 76–7, 'Il tenore baritonale tende al canto largo ed epicheggiante, con un'estensione che a volte va dal la sotto il rigo (la 1) al do acutissimo (do 4), ma con acuti emessi a piena voce soltanto fino al sol 3 e forse, in qualche caso, al la 3. Più in alto interveniva il falsettone. Anche per il tenore acuto la nota più elevata a voce piena era generalmente il la 3. In falsettone s'arrivava eccezionalmente al re 4, ma è noto che nelle improvvisazioni alcuni tenori rossiniani acuti raggiungevano il mi 4 o il fa 4.'

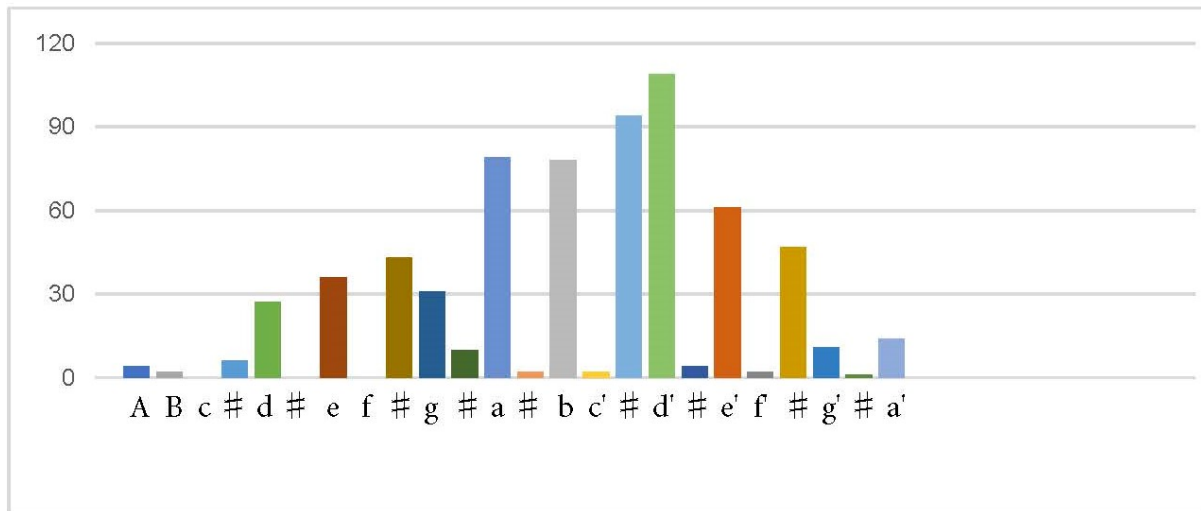
from A natural to f' natural, which is no small feat, especially if he could not control his vocal dynamic between soft or loud.

The final section of the aria requires the most coloratura. This consists mainly of double-dotted rhythms, octave arpeggios, repeated *gruppetti*, and a couple simple scales, but does not demand particularly intricate coloratura. Compared to the other repertoire addressed in this dissertation this aria is quite low. Most of the individual pitches are in the middle and low registers, and the voice only goes into the upper register for emphasis. In fact, this aria has one of the lowest tessituras in this thesis.⁴¹⁵

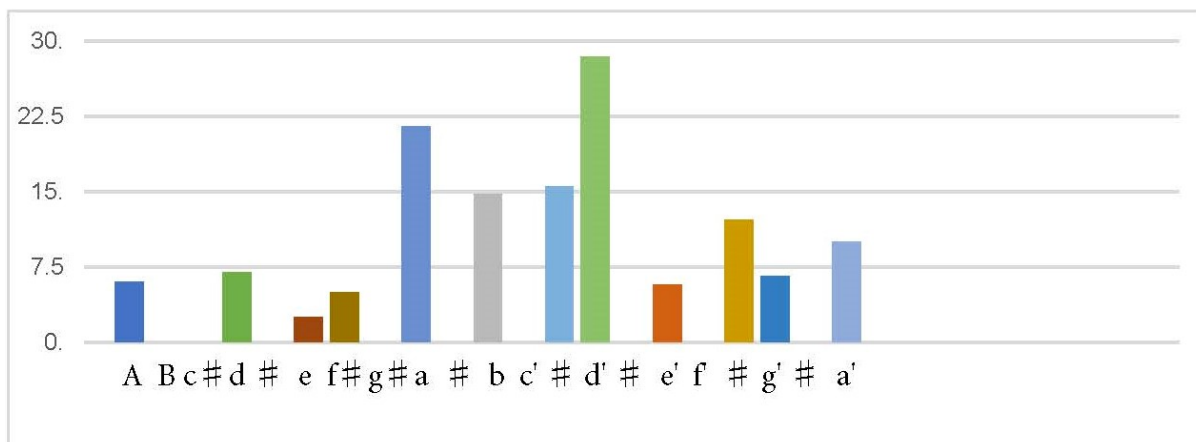
One notable feature is that as the pitch rises from d' natural, the less likely it is to be sung. However once in the upper register notes are more likely to be sustained than sung quickly, which may indicate once again that Nozzari was not as particularly proficient at high fioritura as Garcia. But if this were indeed written for Garcia, the case becomes a bit confused. But if one compares Graph 5.a and 5.b of Otello's cavatina, they do resemble the shape of the graphs for Nozzari's aria in *Elisabetta* more than Garcia's. Rossini places Garcia's voice centre clearly around f' natural and this has a much lower tessitura and range.

The highest pitch written for the tenor in this piece is only a' natural and is needed very few times, and the clear majority of the fioritura is below f' natural while for Garcia his fioritura tended to be much higher. The agility sections while low and not particularly varied, are quite rapid and intricate. This relatively low tessitura and lack of varied or high fioritura may substantiate the previous statement concerning Nozzari's abilities.

⁴¹⁵ As was previously shown, the aria by Rossini for Nozzari in *Elisabetta* has a centre of c'–d'.



Graph 5 A – Gioachino Rossini, 'Ah sì, per voi già sento' (Otello), Otello, ossia Il Moro di Venezia, Occurrence of individual pitches.



Graph 5 B – Gioachino Rossini, 'Ah sì, per voi già sento' (Otello), Otello, ossia Il Moro di Venezia, Duration of individual pitches sustained for one minim or longer.

This aria contains no scales into the upper register and is approached only by arpeggio or wide-interval leap. Once the tenor is in the upper register the descent back into the middle voice is accomplished in varied modes including scales and *gruppetti*. This may indicate that it was more difficult for the tenor to enter the upper register smoothly than to

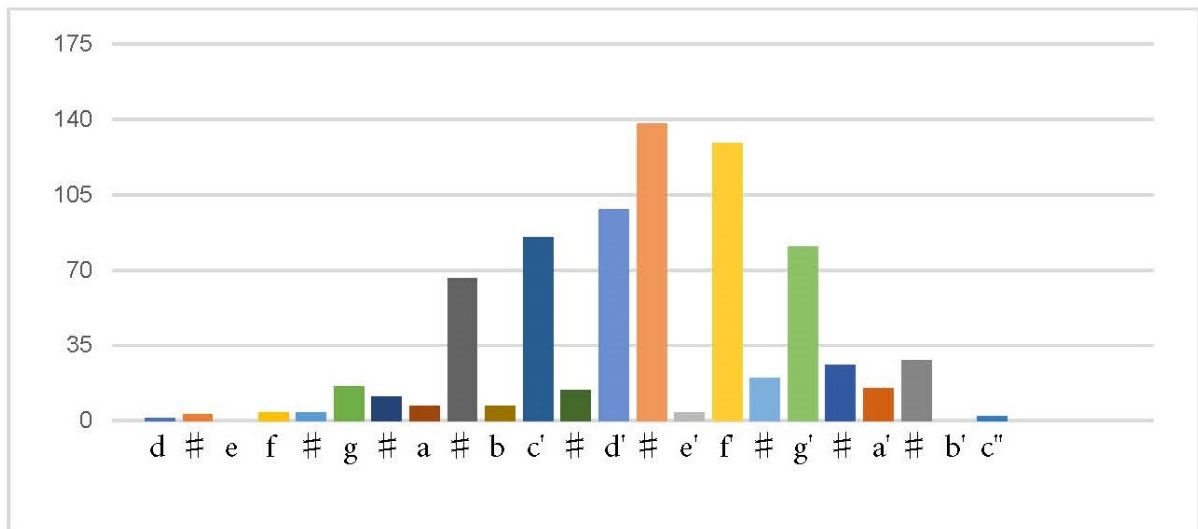
get back down, which seems to be a similarity between the *tenore serio* voices. This aria is in stark contrast to the aria written for Roderigo, sung by the contraltino tenor Giovanni David. Since the second act duet requires the tenor to sing to d'' natural and has significant fioritura, a formal analysis of that may provide more information about this type of voice, and a comparison to other arias written for the baritonal type of tenor will also some give insight.

Case Study 6: Act II.i (No. 6) aria 'Che ascolto!' – Giovanni David

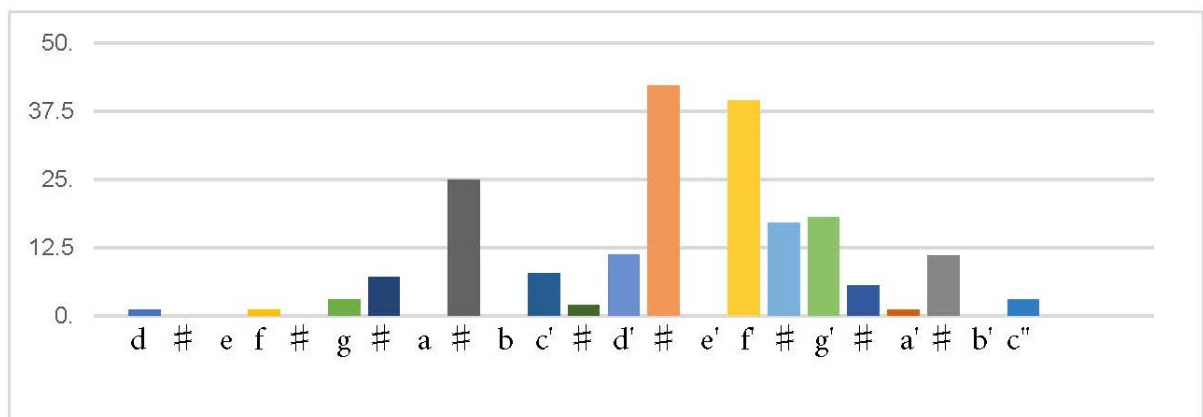
Aria	'Che ascolto!' [Act. II.i; No. 6; 1–136]
Composer	Gioachino Rossini
Opera / Role	<i>Otello, ossia Il Moro di Venezia</i> / Roderigo
Premiere	4 December 1816 (Teatro del Fondo, Naples)
London Premiere	16 May 1822 (King's Theatre)
Tenor	Giovanni David
Fach	Contraltino
Range / Tessitura	d natural to c'' natural / b flat to g' natural (e' flat / f' natural centre)

Roderigo's *recitative* and aria with *cabaletta* 'Che ascolto! ... Ah! come mai non senti pietà' occurs in the second act.⁴¹⁶ The aria comprises three sections: the first is *maestoso*, followed by two *allegro* sections; it does not have a *da capo*. The aria begins with seven measures in recitative style followed by a cadenza which introduces the second section characterised by a high tessitura (e' natural to g' natural) and melody that is sparsely ornamented with a few grace notes and minimal sixteenth notes. It concludes with a cadenza that is a far greater in range and chromaticism across three measures.

⁴¹⁶ Desdemona tells Roderigo that she is already married to Otello. Rodrigo admonishes Desdemona for rejecting him, then exits swearing to punish Otello, denouncing him as 'the traitor'. Osborne, *Bel Canto Opera*, 1994, p. 66.



Graph 6 A – Gioachino Rossini, 'Che ascolto!' (Roderigo), *Otello, ossia Il Moro di Venezia*, Occurrence of individual pitches.



Graph 6 B – Gioachino Rossini, 'Che ascolto!' (Roderigo), *Otello, ossia Il Moro di Venezia*, Duration of individual pitches sustained for one minim or longer.

The following two *allegro* sections maintain the high tessitura and become progressively more ornamented. Consistent with the previous sections, the *allegro* sections exploit wide upward leaps, the largest being a 12th (f natural to c'' natural) followed by downward melodic lines. Upward moving melodies are pervasive but limited to a sixth in compass except for a single melisma (g natural through b' flat) that utilises wider-interval

arpeggiation to cross registers. This melisma is concluded with the aforementioned upward 12th (Example 3 below) which includes a sixteenth-note rest between the f' natural and the c'' natural to allow for a quick registration shift.⁴¹⁷

Above g' natural, there are no melodic elements approached *legato* without the use of a wider interval or ornamentation. In fact, a' flat despite being the dominant of the tonality is the least utilised pitch in the upper register.⁴¹⁸ This underuse of a' flat represents a distortion in what would otherwise a somewhat regular note distribution. As demonstrated with the other tenors, pitches are only sustained in the upper register when either approached by interval or a linguistic or rhythmic device. If, however, David's middle register persisted to g' flat instead of f' natural, which will continue to be investigated, there are none at all. It is equally likely that David switched very low bringing his head voice down quite far.

There is a distinct underuse of sustained pitches c' natural through d' natural. This may be a simple by-product of the composition's key with Rossini not wanting to sustain the sub-dominant, sixth and seventh of the key. However, an equally valid possibility is that the key of E flat major was chosen to avoid sustaining pitches in the difficult registration breaks in David's voice. As was previously mentioned in Section I, there may be an important registration occurring around a' flat / a' natural (possibly as high as b' natural in some voices). If there is a problem with this first registration event a loss of focus can occur around c' natural and d' natural, or above, depending on the location of the FRE.⁴¹⁹ This is very similar to what was seen in *Il Barbiere* with Garcia and the very low instances of d' natural. This could be a coincidence or could indicate that Garcia and David, apart from being differing voice types, subscribed to a similar technique. Nozzari studied with David's father, but would have had a very different voice. Further inquiry will be needed to demonstrate consistency.

⁴¹⁷ The melisma occurs at measure 73 to 76 and is repeated at 106 to 109.

⁴¹⁸ I include a' natural in the calculations even though the aria is in E flat major.

⁴¹⁹ The 'First Registration Event' (FRE) which is discussed further in Section III, see p. 297.

Rodrigo
miei tor-men - - ti, del mio tra - di - to a -

Rod. *rallentando* *(a piacere) (a tempo)*
mor del mio tra - di - to del mio tra - di - to a -

Example 7 – Gioachino Rossini, 'Che ascolto!' (Roderigo), *Otello*, 2008, p. 209

This aria represents a voice of wide compass that is comfortable sustaining a high tessitura with a good upper register. It may also indicate that the singer is less than comfortable bridging from the middle voice into the upper register smoothly and may be more comfortable singing a wider interval or ornament allowing for register transitions. This is further supported by the fact that most of the highest pitches, including the highest (c'' natural) is preceded by a rest.

In this role, Rossini did not challenge the extensive range of David as Bellini would do in his *Bianca e Fernando* (1828). The role of Fernando written for David twelve years later, would require him to sing f'' natural more than twice, while Roderigo is 'limited' to d'' natural. David, who was 26 when the role of Roderigo was written for him, was just entering his prime, so it might be safe to assume him capable of such feats. Perhaps it is just that Rossini never wrote much above d'' natural for any tenor and disdained the highest notes of the 'pharyngeal voice'.

Case Study 7: Act II.vii (No. 8) Trio Otello, Roderigo & Desdemona – Nozzari & David

Duet/Trio	'Ah vieni, nel tuo sangue' [Trio: Act II.vii; No. 8; measures 1–129]
Composer	Gioachino Rossini
Opera / Character	<i>Otello, ossia Il Moro di Venezia</i>
Premiere	4 December 1816 (Teatro del Fondo, Naples)

London Premiere	16 May 1822 (King's Theatre)
Tenor	(1) Nozzari, Andrea (2) Giovanni David
Fach	(1) Tenore Serio (2) Contraltino
Range / Tessitura	(1) c natural to d'' natural (c' centre) / g natural to g' natural (2) e natural to d'' natural (e–f' centre) / c natural to g' natural

The final piece discussed in *Otello* is the Act II.vii (no. 8) tenor duet portion of the fiercely difficult trio between Otello and Roderigo before the entrance of Desdemona which begins the trio. The duet requires both tenors to sing to d'' natural which, according to Celletti, was accomplished with 'pharyngeal voice' [*falsettone*].⁴²⁰ Performance tradition has altered the performance of the duet portion to include several high c'' naturals which are interpolated into the performance though not written in the score. A search of media reveals a performance quite different from the score (see footnote for an example).⁴²¹

For both singers the vocal lines have similar characteristics. Octave leaps often to g' figure prominently followed by swift melismatic passages. One phrase requires both tenors to sing ascending intervals to a sustained c'' natural followed immediately by a melisma with a written to d'' natural, first Roderigo then Otello (measures 29–35 and 63–9). Another notable feature is the use of *acciaccatura* which dominate throughout the first section. In the second section in which the tenors sing in thirds, Rossini uses multiple forms of emphasis: *slancio*, *marcato*, and *staccato*. He also uses rhythmic devices to increase the musical and dramatic tensions with entire phrases predominated by double-dotted eight

⁴²⁰ Celletti, *Voce*, 1989, pp. 88–90; In the previous scene, Otello having been convinced of Desdemona's infidelity by Iago, swears to kill her and then himself. In the trio, after Iago's departure, Roderigo enters and the duo sing of revenge in what is described by Charles Osborne as 'a battle of the high Cs.' Osborne, *Bel Canto Operas*, 1994, p. 67.

⁴²¹ https://www.youtube.com/watch?v=QeH_Nu6J0yU

notes. In the score, Roderigo (David) is required to sing sixteenth note high c'' naturals, but in performance practice both tenors sustain several c'' naturals indefinitely.

Rodrigo

29

8

sì, sì, di strug - ger - lo sa - prò, sì, sì, _____

Rod.

32

8

di strug - ger - lo sa - prò

Example 8 – Gioachino Rossini, 'Ah vieni, nel tuo sangue' (Roderigo), *Otello*, measures 29–35

Otello

63

8

sì, ven - di - car - mial fin do - vrò, di lei, _____

Ot.

66

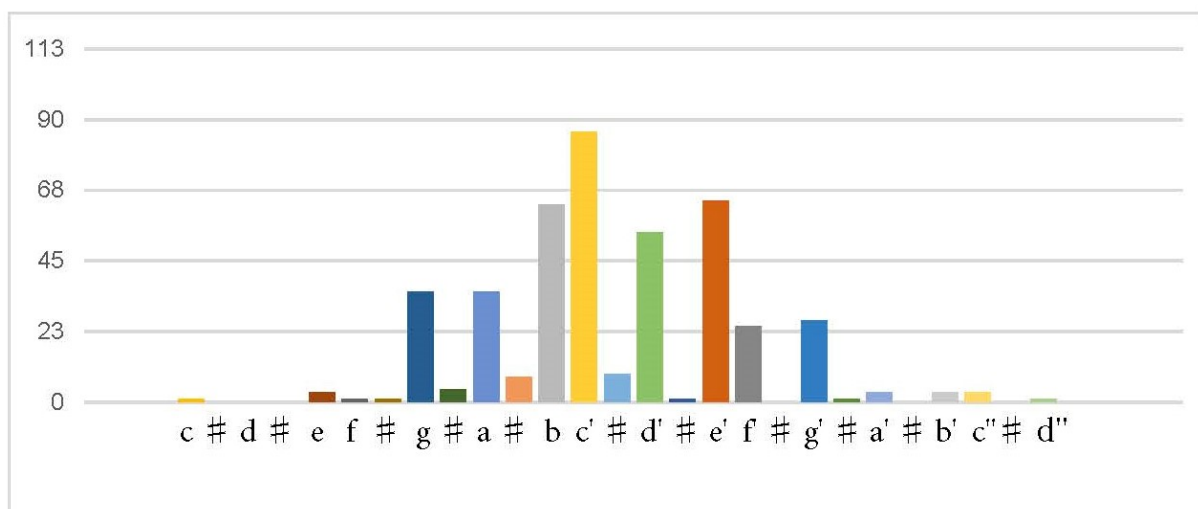
8

di te sa - prò sa - prò

Example 9 – Gioachino Rossini, 'Ah vieni, nel tuo sangue' (Otello), *Otello*, measures 63–69

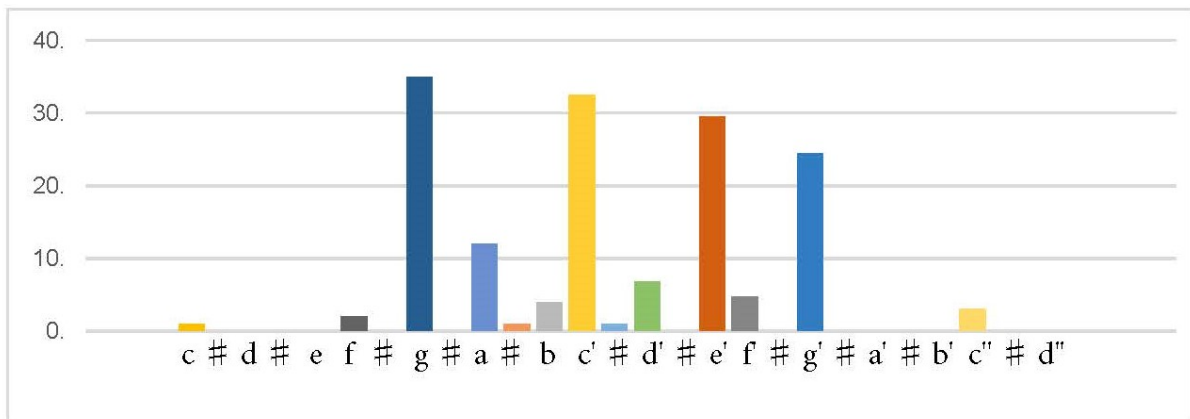
In this duet, the role of Otello has over a full two-octave range from low c natural to high d'' . The tessitura lies roughly b natural to e' natural with being centre around c' natural. Though not as pronounced, once again a predominance of c' natural and e' natural is shown in Nozzari's graphs. In terms of individual pitches, there is an even distribution in pitches with only a light deviation to the lower side of the curve. When compared to the previously discussed role of Leicester from Nozzari by Rossini, the duet shows a very similar tessitura and centre. The fact that Otello sustains more g' than Leicester accounts for the variation, but the curve is similar. However, compared to the cavatina written for Otello, there is a slightly higher tessitura for the duet of a whole tone. I believe this can be accounted for by

the fact that the David does not simply sing a third above Nozzari the entire time. Instead by shifting the lower tenor down a whole tone the tessitura of the higher tenor can remain natural to their voices. Might this indicate that the natural tessitura difference between the *tenore serio* and the *contraltino* is a whole tone or greater?⁴²²



Graph 7 A – Gioachino Rossini, 'Ah vieni, nel tuo sangue' (*Otello*), *Otello, ossia Il Moro di Venezia*, Occurrence of individual pitches.

⁴²² For *tenore serio* see Gualerzi, G. 'Tipologia del tenore serio Donizettiano', *International Conference on the Operas of Gaetano Donizetti* (Bergamo: 1992): 353–8.



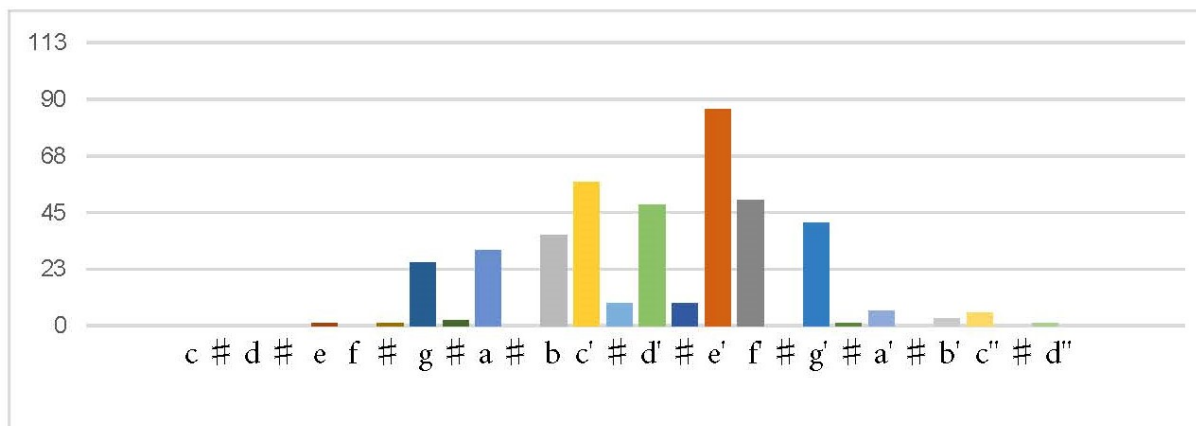
Graph 7 B – Gioachino Rossini, 'Ah vieni, nel tuo sangue' (*Otello*), *Otello*, ossia *Il Moro di Venezia*, Duration of individual pitches sustained for one minim or longer.

Again, Rossini is writing for two tenors who are essentially singing the same lines in sequence followed by a section singing in thirds. While through much of the piece the tenors sing ostensibly identical lines which would lead one to consider the tenors equal, this ensemble section sees David singing consistently above Nozzari, as had Garcia. Based on the tenors' exactly repeated phrases, one might conclude that Rossini considered them equally matched. I however would suggest that this is a theatrical device showing that the characters of Otello and Roderigo share a state of mind, and that their lust for retribution was equally misguided. While singing parallel to Otello, Roderigo sings consistently above Otello indicating that he is in all likelihood the higher, probably lighter, tenor, which has been shown to be the case. In fact any time that the two tenors sing together in the opera, when they are not singing the same line, Roderigo (David) sings the higher tenor line. One could not extend the aforementioned theatricality to favour Roderigo as singing 'on the higher ground' because while he himself does not kill Desdemona, he is not a redeemable figure as he is equal in desiring revenge.

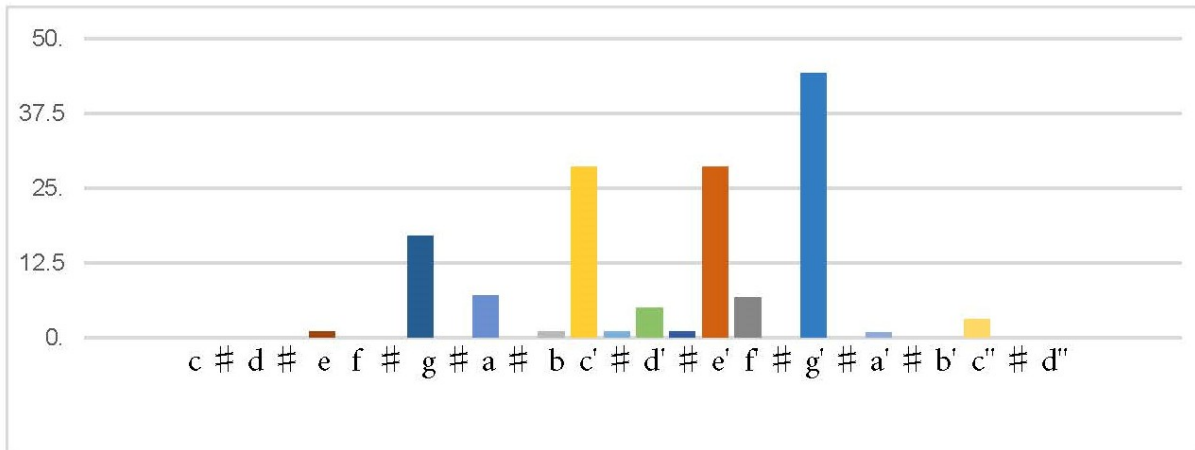
For Nozzari, the graph of sustained pitches has a very interesting element. As the pitches rise from g natural to g' natural they are progressively less likely to be sustained. Low g natural is sustained ten beats, nearly 30%, longer than high g' natural. He sustains c' natural around 33 beats in this duet and 31 in the duet from *Elisabetta* and 28 beats in the

Otello cavatina. In the *Otello* trio he sustains 28 beats from g' and over and a total of 29 in the *Elisabetta*. These numbers seem to have an internal consistency that is difficult to deny. That is not necessarily to suggest that Rossini specifically counted the notes as I have but he may have been working under a particular assumption about Nozzari's voice. The graphs do however depict a significantly different image of David's voice.

Aside from where the tenors sing in thirds, the vocal lines are seemingly the same, however this is not really the case. Comparing David's graphs to Nozzari's shows voices which are treated in nearly an opposite manner, even symmetrically, rather than simply a third higher as it seems. Not only does Rossini write more than 60 additional notes above d' for David than for Nozzari, which could be accounted for by the higher lines, David is more likely to sustain notes the higher they are approaching g' natural. This is the opposite of what previously occurred with Nozzari, and can be easily identified in the graphs.



Graph 7 C – Gioachino Rossini, 'Ah vieni, nel tuo sangue' (Roderigo), *Otello*, ossia *Il Moro di Venezia*, Occurrence of individual pitches.



Graph 7 D – Gioachino Rossini, 'Ah vieni, nel tuo sangue' (Roderigo), *Otello, ossia Il Moro di Venezia*, Duration of individual pitches sustained for one minim or longer.

This in-depth look at *Otello* offers the chance to see how Rossini thought about the *tenore serio* and the *contraltino*. It also gives the opportunity to ask if it was really written for Garcia or Nozzari. While Garcia would go on to be an internationally renowned *Otello*, the small sample of work suggests that Rossini did not have Garcia's voice in mind when writing the role. The overall structure and shape of the writing neither resembles what Rossini did for Garcia in *Il Barbiere* nor *Elisabetta*.

Otello and *Il Barbiere* both from 1816 and *Elisabetta* from 1815 indicate that Rossini may have had a particular idea of what Garcia's voice was like in this period. As for David, this is the first look at his voice and what is seen is a voice with a high tessitura and easy coloratura capable of easily navigating to c'' natural and d'' natural. Rossini did not push the young tenor's capabilities as Bellini would in *Bianca e Fernando*. To help confirm the ideas about their relative voices, the opera *Ermione* written by Rossini for Nozzari and David is discussed; there is however no duet between the relevant tenor characters.

Rossini: *Ermione* (1819)

The opera *Ermione* premiered on 27 March 1819 at Teatro San Carlo of Naples.⁴²³ Andrea Nozzari performed the role of Pirro (Pyrrhus), son of Achilles and King of Epirus, and Giovanni David as Oreste (Orestes), messenger of the Kings of Greece and son of Clytemnestra and Agamemnon. Ermione persuade Orestes to murder Pirro the lover by whom she was rejected. Following the murder, she condemns Orestes for his actions and kills herself on Pirro's funeral pyre.⁴²⁴

Case Study 8: Act I.iv (No. 6) aria 'Balena in man del figlio' – Andrea Nozzari

Aria	'Balena in man del figlio' [Act I.iv; No. 6; 1–269]
Composer	Gioachino Rossini
Opera / Character	<i>Ermione</i> / Pirro
Premiere	27 March 1819 (Teatro di San Carlo, Naples)
Tenor	Nozzari, Andrea
Fach	Tenore Serio
Range / Tessitura	A natural to c'' sharp (d' natural centre) / a natural to f' natural

Andrea Nozzari's Act. I aria 'Balena in man del figlio' is a long three-part aria that includes interjections from Ermione, Andromaca, Oreste and evolves into a septet with chorus more than once.⁴²⁵ One of the most dominant features of this aria is the range which is from low A to high c'' sharp. Neither note at the extremes is required by Rossini to be sustained but the range itself is noteworthy. Within only four measures 155–159 (Example 6) Nozzari is required to sing the entire expanse of the range as fioritura.

⁴²³ Rossini, *Ermione*, 2006.

⁴²⁴ Osborne, *Bel Canto Operas*, 1994, p. 90.

⁴²⁵ Pirro, captor of Andromaca, enters with his entourage and has her sit with the nobles which enrages Ermione. Oreste, son of Hector, tells Pirro that the Kings of Greece want to stop the re-emergence of Troy as a power by killing Astianatte, son of Andromaca, and so that he may avenge the death of his father. Pirro refuses saying that Astianatte may even share his throne, and publicly announces his intention to marry Andromaca, shocking Andromaca and infuriating Ermione. Rossini Opera Festival Website: <http://www.rossinioperafestival.it/?lang=eng&IDC=244>; Osborne, *Bel Canto Operas*, 1994, pp. 89–92.

155
Pirro
te l'a - man - te il
Ermione
i-te, o fu - rie, a la - ce - rar

157
Pir.
Re, of - fre a
Erm.
i - te, o fu - rie, a la - ce - rar

159
Pir.
te l'a - - - - - man - te, il
Erm.
si a la - ce -

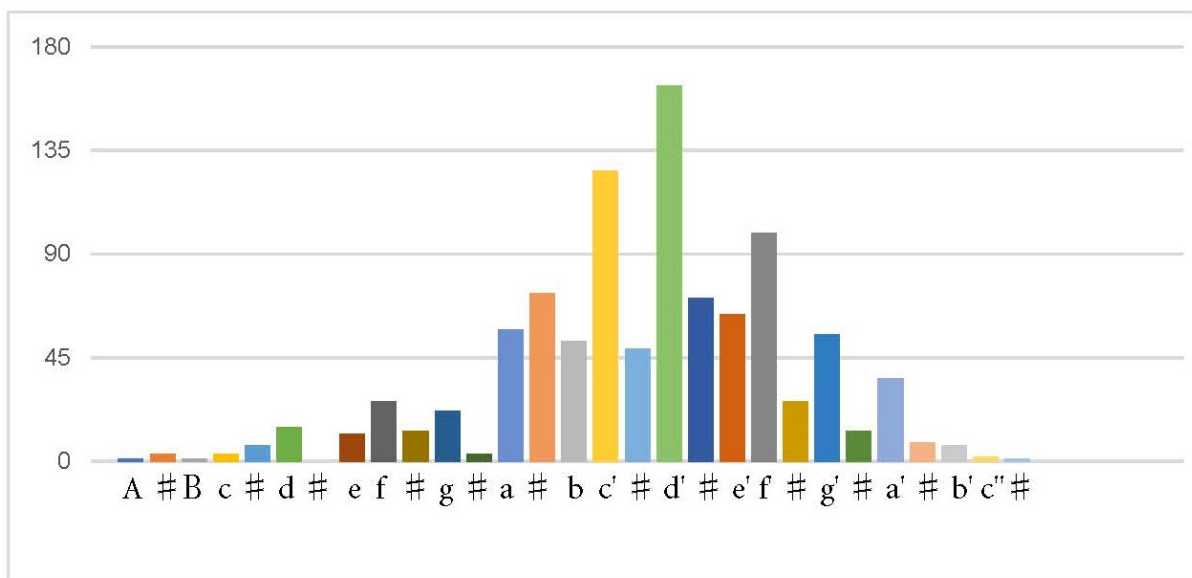
161
Pir.
Re l'a - man - te, il Re.
Erm.
rar a la - ce - rar a l'a - ce - rar!

Example 10 – Gioachino Rossini, 'Balena in man del figlio' (Pirro), Ermione, measures 155–63

Based on the graphs, the tessitura is centred around d' natural with over 160 notes sustained a total of nearly 100 beats, but the graphs are reasonable bell curves. Interestingly, c' natural is sung over 125 times but is sustained a disproportionately low amount, while the notes either side maintain proportionality between graphs. It is difficult to say if this is a result of the tonality and key changes, or if there was something about c'

natural that, while being sung often, did not sound quite right in Nozzari's voice at this time. There does not seem to be corroborating information in the other arias, but it is worth noting.

Other than the c' natural, the graphs maintain an apparent cohesiveness in the distribution. The further from the centre of the tessitura, the less likely a pitch is to be sung or sustained. As with his previous aria, as notes approach g' natural the less likely they are to be sustained. There is a slight increase at b' flat but that is most likely a response to the tonality being B flat major for the first and third parts of the aria, but it may well have been a very good note in his voice. The graphs confirm a wide range, a strong middle voice with a fairly low centre which is comfortable with the greatest amount of sustained singing up to about f' natural. At which point, the comfort with sustained pitches drops off rapidly unlike Giovanni David, or Adolphe Nourrit discussed later, whose capacity for sustained singing is quite strong in the upper register.



Graph 8 A – Gioachino Rossini, 'Balena in man del figlio' (Pirro), Ermione, Occurrence of individual pitches.

Phrases often combine both *legato* and *fioritura* singing with the fast sections following sustained notes. There are very few examples of *fioritura* passages followed immediately by sustained pitches. Upward moving *fioritura* tends to be arpeggiated with scales descending from higher pitches. Consistent with other arias, higher pitches above *passaggio* are often leaped to by wider intervals and there are intervals of up to two octaves (measure 159 – see Example 6 above).

Nozzari's voice was clearly formidable in scope and facility. A cursory look at the aria would show that he had a tremendous ability for both sustained and melismatic singing. The *allegro* section contains several phrases of difficult syllabic singing which add a great deal of character to the aria. The aria is generally robust singing and could be characterised as having phrases with upward leaps and dotted rhythms. It requires the tenor to be able to sing to c'' sharp in *fioritura* which as discussed would have been in 'pharyngeal voice'.⁴²⁶ Even though Nozzari was described above as having an even voice with tone of equal power in the low and high ranges, the phrasing of the *fioritura* as described as well as the breaks and wide leaps would allow an easier transition into 'pharyngeal voice'.

In measure 159 (above) where the tenor is required to sing the c' sharp, the phrase is attacked by the aforementioned two-octave leap to b' natural. This allows the entire upper part of the phrase to be sung in 'pharyngeal voice' and then, in the descending melisma, bridged back into the full voice. In fact, all sustained pitches a' natural and above are attacked by wide interval allow for an easier transition to 'pharyngeal voice'. The pitch held the longest is b' natural at seven beats is approached by an octave leap but is followed directly by descending fifth (measure 242–4 & 250–2).

Nozzari was clearly skillful not only in his management of the 'pharyngeal voice' but also general technique. His baritonal voice quality coupled with the powerful and clear high notes must have been stunning to experience. The arias analysed indicate his extensive range. He was also able to sing *fioritura* across its entirety. His *tenore serio* vocal quality would be complemented by the lighter *contraltino* quality of Giovanni David who sang the role of Oreste. Though Pirro and Oreste do not have a duet, Oreste takes part in the septet within Pirro's aria sometimes doubling his melodic line. Rossini maintains the

⁴²⁶ Celletti, *Voce*, 1989, pp. 75–6, 93, According to Celletti, Nozzari sang in full voice up to g' and sometimes a' natural after which he used 'pharyngeal voice' (falsettone) up to d'' natural.

integrity of Nozzari as the dominant tenor voice throughout and at no time does the lighter tenor sing above him.

Case Study 9: Act I.iii (No. 4) aria 'Reggia aborrita!' – Giovanni David

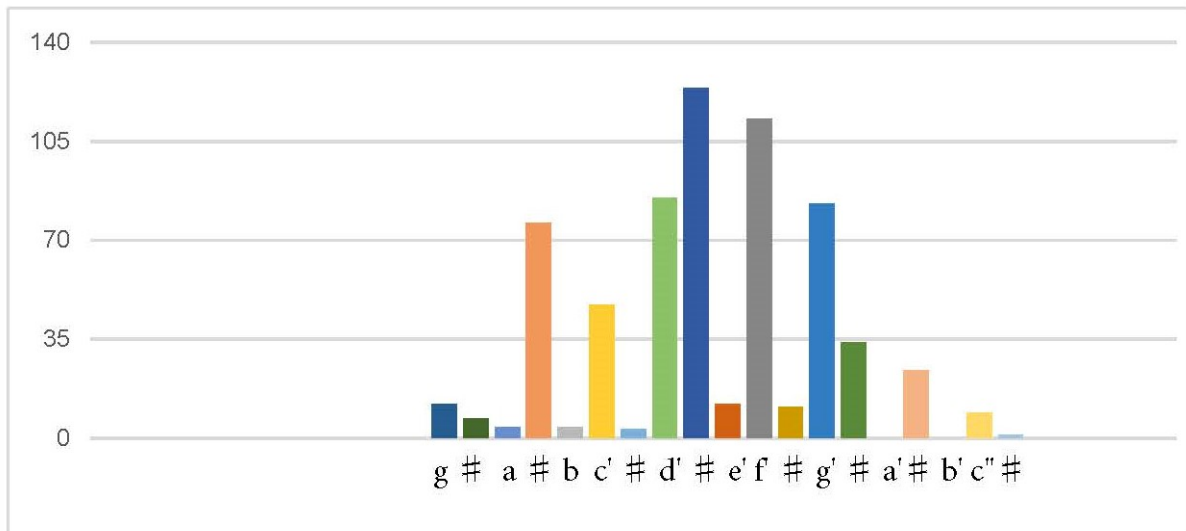
Aria	'Reggia aborrita!' [Act I.iii; No. 4; 1–176]
Composer	Gioachino Rossini
Opera / Character	<i>Ermione</i> / Oreste
Premiere	27 March 1819 (Teatro di San Carlo, Naples)
Tenor	Giovanni David (Naples 15 Sept 1790– Saint Petersburg 1864)
Fach	Tenore Contraltino
Range / Tessitura	g natural to c'' sharp (d' sharp centre) / a sharp to g' natural

The Act I.iii aria 'Reggia aborrita! Ah! Come nascondere la fiamma vorace' was written for Giovanni David.⁴²⁷ The e flat major aria is in cavatina-cabaletta form; Pilade's interjections during the cavatina develop it into a duet of sorts during the cabaletta. Orestes continues his repeated melody and maintains a very high tessitura with spectacular high notes. The aria does not have as wide a range as that of Nozzari but maintains a high tessitura throughout. The aria also differs in respect to fioritura. Where Nozzari had a significant amount of fioritura throughout his range, for David this role limits the rapid singing to the middle and upper range. It is clear from the graphs below that while the aria goes as low as g', which is not particularly low at all, most of the singing is done above b' flat. The higher the notes are the less likely they are to be sung, especially above g' natural. This is consistent with the other arias analysed that had been written for David by Rossini.

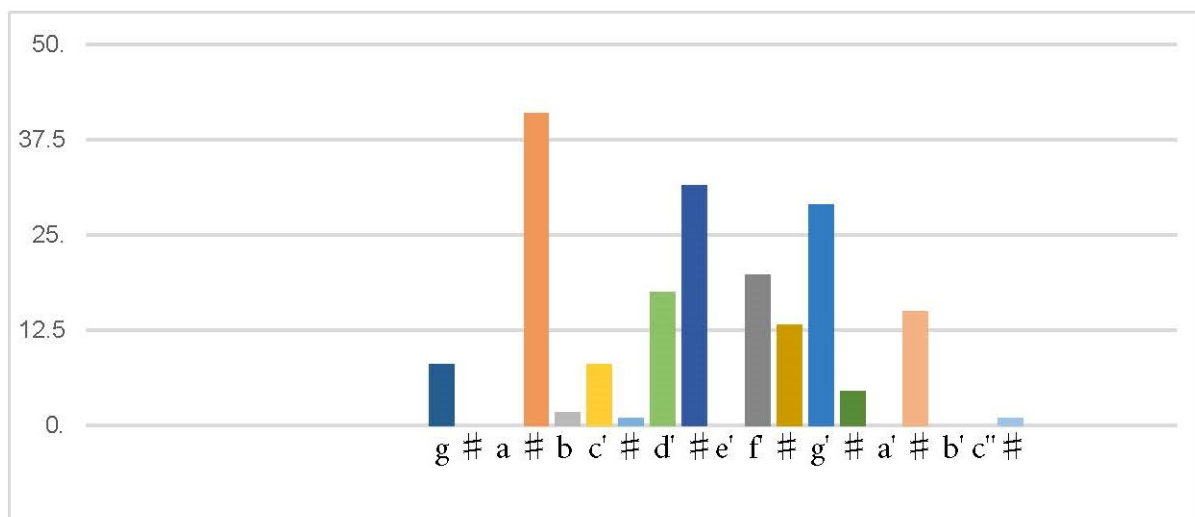
These graphs show a voice that is comfortable in the middle with a high tessitura who is also very capable with fioritura. There is however very little sustained singing in the upper register. David's voice was typically contraltino in that the centre of his voice was quite high and capable of sustaining g' or a' flat with little difficulty. There are sustained high-notes a'

⁴²⁷ According to the sequence in the opera this aria occurs just before that of Pirro sung by Nozzari, but it is treated here out of order for narrative continuity. Rossini, *Ermione*, 2006, pp. 93–105; Oreste professes his love for Ermione, but Pilade insists that he should do his duty to Greece.

natural to d'' flat, but overall these notes are not connected to the middle voice. The cabaletta contains nine high c'' natural but none are sustained. I believe has more to do with composition style than capability, but the sustained singing in the upper register is nearly all attacked by large interval or a rest.



Graph 9 A – Gioachino Rossini, 'Reggia aborrita!' (Oreste), Ermione, Occurrence of individual pitches.



Graph 9 B – Gioachino Rossini, 'Reggia aborrita!' (Oreste), Ermione, Duration of individual pitches sustained for one minim or longer.

While there are phrases that have quick moving upward scales to high notes, unlike in Nozzari's aria, mainly notes from a' natural and above are attacked by interval. There are several staccato high c'' naturals and b' flats sustained in isolation. The sustained d'' flat is also approached by an interval of nearly an octave. These characteristics are ideal for a tenor making copious use of the 'pharyngeal voice'. In fact, the aria is optimal for a tenor using the 'pharyngeal voice' because it requires very little mixing of registers and the high notes are attacked and sustained lightly connection to heavier notes in the voice. David would be able to move in and out of the 'pharyngeal voice' with ease. The light and agile singing in the upper register that is not encumbered by the need to skilfully mix registers, for which David would come to be so renowned.

While this aria would require a great amount of skill, it would be Nozzari's aria that was far more challenging. Comparatively while not as high, Nozzari would spend more time in his upper register, and be required to more skilfully blend his registers to create the evenness for which he was known. Again, the underuse of notes around c' is seen as with both Nozzari and with David in the *Otello* aria (which is also in the key of E flat major). This could be a peculiarity of David's voice, the tonality, or possibly something to do with the tenors who sing with the 'pharyngeal voice'.

Bellini: *Bianca e Fernando* (1828)

Bianca e Fernando is melodrama in two acts by Vincenzo Bellini to a libretto by Felice Romani which premièred at Teatro Carlo Felice in Genoa on 7 April 1828.⁴²⁸ The opera was a revision of his earlier work, first performed as *Bianca e Gernando*, with libretto by Domenico Gilardoni, premièred at the Teatro San Carlo in Naples on 30 May 1826.⁴²⁹ *Bianca e Gernando* had been announced for 12 January 1826, with three of the finest singers of the day Adelaide Tosi as Bianca, Giovanni David as Fernando and Luigi Lablache as Filippo, but

⁴²⁸ The opera is based on the play *Bianca e Fernando alla tomba di Carlo IV duca di Agrigento* by Carlo Roti's. Maguire, 'Bianca e Fernando', 2002.

⁴²⁹ The censor changed 'Fernando' to 'Gernando' to avoid any parallel with the heir to the throne Ferdinand II of the Two Sicilies (1810–1859). Osborne, *Bel Canto Operas*, 1994, p. 312; Willier, S. *Vincenzo Bellini: A Guide to Research* (New York: Routledge, 2009) p. 2.

the death of King Ferdinand I of the Two Sicilies (Ferdinand IV of Naples) (1751–1825), King Francis I of the Two Sicilies (1777–1830) forced a five-month delay to the production, which meant that the Tosi and David could not perform as they were under contract elsewhere and could not remain in Naples, so were replaced for the première by Henriette Méric-Lalande and Giovanni Battista Rubini.⁴³⁰ *Bianca e Gernando* was an immediate success, and the impresario Barbaja offered Bellini a new contract for an opera for the next season at La Scala, which was *Il Pirata* and premièred 27 October 1827.⁴³¹

After the success of *Il Pirata*, impresario Bartolomeo Merelli (1794–1879) invited Bellini to provide an opera for the opening of a new Teatro Carlo Felice in Genoa. Bellini proposed a revision of *Bianca e Gernando*, and with the help of librettist Felice Romani, he offered *Bianca e Fernando*.⁴³² This time he would get Tosi and David but with Tamburini substituting for Leblanche as Filippo. The revisions to *Fernando* were extensive.⁴³³ In a letter to Dottore Francesco Florimo at the Real Collegio di Musica in Naples, dated 27 February 1828, Bellini indicates that the opera is virtually new, and goes ‘far beyond the simple adaptation of the music’ which he had done to suit Rubini and Méric-Lalande.⁴³⁴ ‘You can tell Cottrau of the whole Bianca that only the following pieces remain intact: the major duet and the Romanza; everything else is retouched, and almost half is new.’⁴³⁵

⁴³⁰ Osborne, *Bel Canto Operas*, 1994, p. 312–3; Orrey, L. *Bellini* (London: J. N. Dent & Sons Ltd., 1973) pp. 18–9, 23; Willier, *Vincenzo Bellini*, 2009, p. 2; Maguire, ‘Bianca e Fernando’, 2002.

⁴³¹ Osborne, *Bel Canto Operas*, 1994, p. 313–6; Orrey says that it was after the success of *Bianca e Fernando* in Genoa that Barbaja offered Bellini the contact for *La Scala*. ‘After the success of *Bianca e Fernando* in Genoa the operatic world was at his feet, and Barbaja lost no time in offering him a new contract for an opera for the next carnival season at La Scala. This was *La Straniera*, produced on 14th February 1829’. He also says that it was *La Straniera*, but the opera subsequent to *Bianca e Gernando* was *Il Pirata* performed 27 October 1827 at the Teatro alla Scala in Milan. Osborne says: ‘The success of *Bianca e Gernando* at the Teatro San Carlo in Naples attracted the attention of Domenico Barbaja, the impresario whose interests extended to Milan and Vienna. Barbaja invited Bellini to compose an opera for La Scala, Milan, and on 5 April 1827 the young composer left Naples to travel to Milan.’ Orrey, *Bellini*, 1973, p. 31; Osborne, *Bel Canto Operas*, 1994, p. 316.

⁴³² Osborne, *Bel Canto Operas*, 1994, p. 313.

⁴³³ Orrey, *Bellini*, 1973, p. 23.

⁴³⁴ *Ibid.*

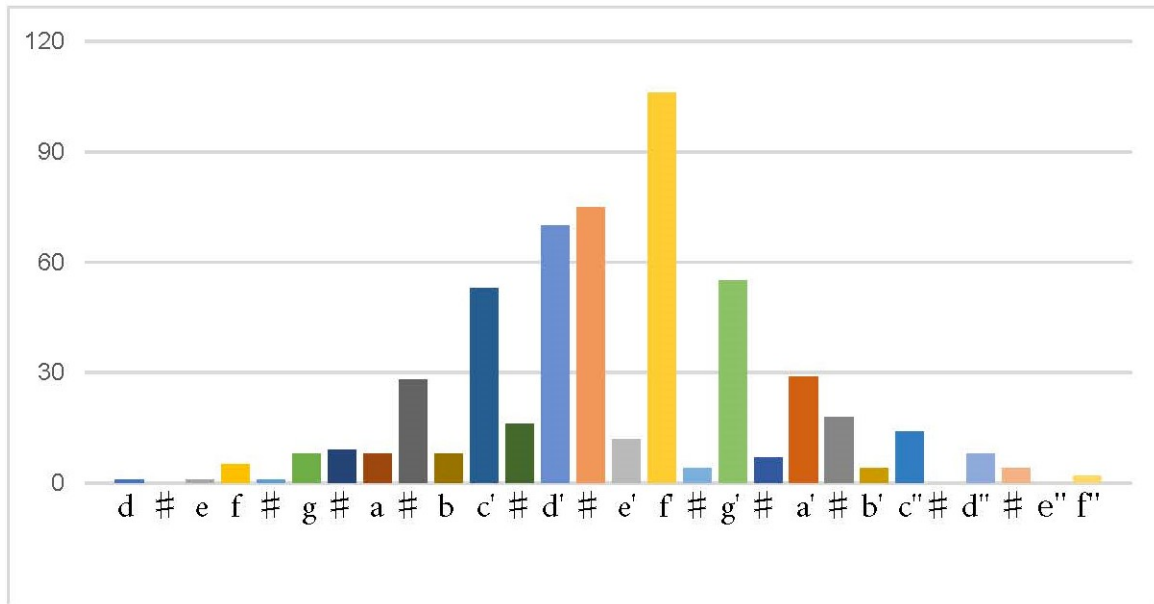
⁴³⁵ Guillaume-Louis Cottrau (1797–1847) was a French composer and music publisher; Bellini, V. *Epistolario*, Cambi, L. (ed.), (Verona: Monadori, 1943) p. 58, Letter dated 27 February 1828 to Dottore Francesco Florimo at the Real Collegio di Musica in Naples, Italy: ‘Puoi dire a Cottrau di tutta la Bianca che restano solamente intatti i soli pezzi seguenti: il gran duetto e la Romanza; tutto il resto viene ritoccato, e di nuovo quasi la mettà [sic], e perciò i pezzi soli che potrà mandare in Genova sono i sudetti: ai capito? A David cambio la cabaletta alla cavatina, l'istesso a Tamburrini, e così nel terzetto, e forse anche alla cavatina della Tosi: E cambiata la stretta del Finale, ed una nuova sinfonia, servendo di largo l'introduzione.’

Case Study 10: Act I. 'A tanto duol' – Giovanni David

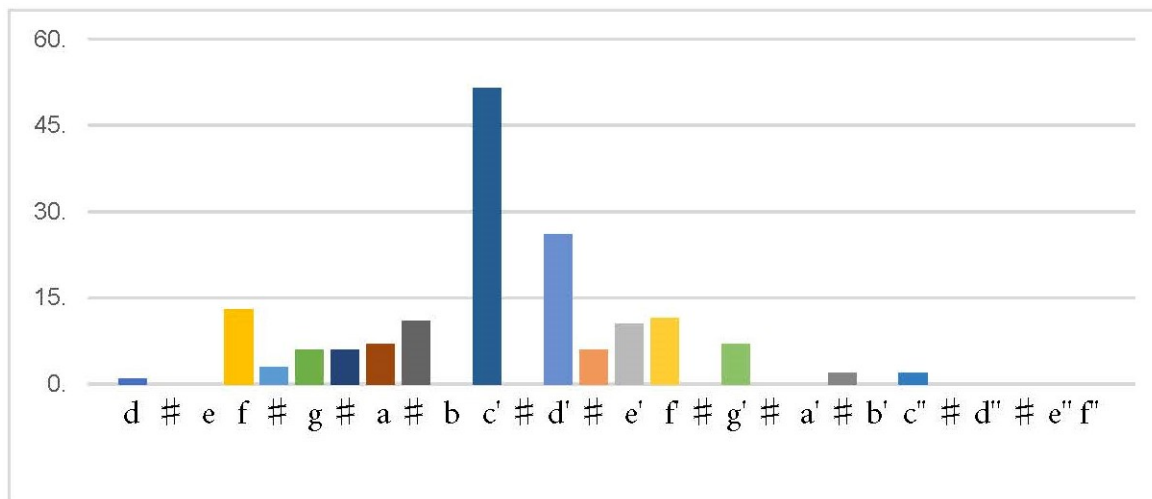
Aria (Cavatina)	'A tanto duol' [Act. I]
Composer	Vincenzo Bellini
Opera / Role	<i>Bianca e Fernando</i> / Fernando (2nd Version, Orig. Bianca e Gernando 30 May 1826)
Premiere	7 April 1828 (Teatro Carlo Felice, Genoa)
London	15 March 1981 (Queen Elizabeth Hall)
Tenor	Giovanni David
Fach	Contraltino
Range / Tessitura	d to f'' / b flat to a' (f' / g' focus)

The cavatina 'A tanto duol' is a virtuosic aria written for Giovanni David that begins larghetto and finishes with an allegro moderato cabaletta. It has a fairly extensive range from d to f'' natural. It demands that the tenor to sing f'' natural twice, four e'' flats, eight high d'' naturals and no less than fourteen high c'' naturals.⁴³⁶ The cavatina is also characterised by significant use of fioritura as compared to sustained singing. The graphs clearly demonstrate that most of the aria comprises faster singing and that very few notes are sustained. A quick glance at the charts reveals that the aria is centred around f' and that while the tenor is required to sing over 100 of them, the sustained value for that pitch is only just over 50 beats in total. The second most sustained pitch is g' natural representing only half the value of f' natural. Outside of these two pitches, the cavatina has an even distribution of most other notes of six to twelve beats. This would indicate clearly that the cavatina requires secure agility and quite a wide range.

⁴³⁶ He is also required to sing further f'' natural in other parts of this opera.



Graph 10 A – Vincenzo Bellini, 'A tanto duol' (Fernando), Bianca e Fernando, Duration of individual pitches sustained for one minim or longer.



Graph 10 B – Vincenzo Bellini, 'A tanto duol' (Fernando), Bianca e Fernando, Duration of individual pitches sustained for one minim or longer.

As has been shown with all previous arias, this one is also characterised by wide leaps, a sustained high tessitura with florid passages throughout, and the ability to sing well

into the head voice up to f'' natural (possibly higher with ornamentation). One thing that stands out from the beginning of the cavatina is the need for the singer to be comfortable with wide leaps, or *canto di sbalzo*, of up to an octave. The first line begins with an upward leap of a 6th, then a brief florid passage followed by another upward leap of a major 7th to high a' natural. This tendency to sing wide intervals, both ascending and descending, is persistent throughout the piece, including octave leaps upward to c'' natural and downward to d natural. This requires the tenor to be able to balance the extremities of his registers without the benefit of intermediary tones to act as a passage between the relative ranges.

Another aspect of the aria that becomes clearer through analysis of the graph is that the tenor is more likely to sustain tones in the second *passaggio* and upper register than in the first *passaggio* or the lower register. The pitches b' flat through e' flat are far less likely to be sustained than f' natural or g' natural, yet actually contain the highest proportion of the pitches sung.⁴³⁷ The total value of the pitches of only f' natural and g' natural represent more than 75 beats (out of 150+ notes) while the b' flat to e' flat represent only 46 beats worth of music out of 250 notes. Proportionally the tenor is required to sing a nearly equal the number of notes e' natural and above as below. This may indicate that the tenor is less comfortable with sustaining tones in the lower tessitura or that the voice is perhaps more beautiful above second *passaggio* and the composer wanted to exploit that region of the voice.

The extreme coloratura of this piece takes the voice to the highest pitches of the tenor voice. The notes above b' flat can be considered *sovracuti* notes, or 'above the high'. It is in this part of the voice that the 'pharyngeal voice' demonstrates the integration of the normally alto sound of the head voice with the tenor timbre of the mixed voice.

Fernando

a tan - to duol, que - st'a - ni - ma

Example 8 – Vincenzo Bellini, 'A tanto duol' (Fernando), Bianca e Fernando, measures 4–6

⁴³⁷ The pitch e' flat considered within the region of the lower *passaggio*.



Example 9 – Vincenzo Bellini, 'A tanto duol' (Fernando), *Bianca e Fernando*, pp. 41 & 42

This cavatina requires flexibility throughout. Similarly, the piece offers challenges of octave leaps throughout the entire voice followed by many downward melismatic passages. The wider the interval and the more disparate the register, i.e. chest voice to head voice, the more difficult the balance. Most of the *sovracuti* are sung by wide leaps, and only one is reached by upward cadenza. Highest pitches aside, there is a consistency between the elements of this aria and the general requirements of that written for him by Rossini. Bellini had originally written the first version this opera as *Bianca e Gernando* (1826) for Giovanni Battista Rubini, but this aria was not included. It is important to compare Rubini and David to clarify how the *contraltino* voice differs from the *tenore serio* of Garcia and Nozzari. The first role which will be used to investigate Rubini's voice is Lord Riccardo Percy from Donizetti's *Anna Bolena*.

Donizetti: *Anna Bolena* (1830)

Anna Bolena is an *opera seria* in two acts by Gaetano Donizetti to a libretto by Felice Romani, and premiered in Milan at the Teatro Carcano, 26 December 1830.⁴³⁸ Its premiere was an unambiguous triumph and *Anna Bolena* became Donizetti's first truly international success with its first foreign performance at His Majesty's Theatre in the Haymarket London, on 8 July 1831.⁴³⁹ *Anna Bolena* would become Donizetti's first opera to be heard in Paris in September of the same year, and between 1831 and 1850 there were productions in least twenty-five European cities in Europe, including St. Petersburg.⁴⁴⁰ According to William

⁴³⁸ After Ippolito Pindemonte's *Enrico VIII* ossia *Anna Bolena* and Alessandro Pepoli's *Anna Bolena*. Ashbrook, 'Anna Bolena', 1992.

⁴³⁹ Osborne, *Bel Canto Operas*, 1994, p. 194–5; *Anna Bolena* was the first of his operas to be performed in London on 8 July 1831 and Paris on 1 September 1831. See also: Ashbrook, *Donizetti*, 1982, p. 66.

⁴⁴⁰ Osborne, *Bel Canto Operas*, 1994, p. 195.

Ashbrook, the première cast with Pasta and Rubini then followed by their replacements, Giulia Grisi and Mario, firmly placed *Anna Bolena* 'in the repertory in London and Paris for more than a quarter of a century'.⁴⁴¹ Phillip Gossett says that his opera 'emerges as a work in which the composer's mature style is first clearly manifest' and solidified his place as one of the great three leading Italian composers alongside Rossini and Bellini.⁴⁴²

Case Study 11: Act. I.xi (No. 3) aria 'Da quel di' ... 'Ah! Così nei ridenti' – Giovanni Battista Rubini

Aria	'Da quel di' ... 'Ah! Così nei ridenti' [Act I Sc. xi; no. 3]
Composer	Gaetano Donizetti
Opera / Character	<i>Anna Bolena</i> / Lord Riccardo Percy
Premiere	26 December 1830 (Teatro Carcano, Milan)
London Premiere	8 July 1831 (King's Theatre)
Tenor	Giovanni Battista Rubini
Fach	Contraltino
Range / Tessitura	f to e'' flat / b flat to b' flat

Donizetti wrote one of his most difficult roles, Lord Riccardo Percy, for Rubini. The role exemplifies Rubini's extraordinary vocal capabilities. The aria 'Da quel di' ... 'Ah! così ridenti' in Act I represents perhaps some of the most difficult singing ever composed for any tenor. The role is so difficult in terms of tessitura and range that neither the first nor the second Act arias were ever published in the original Rubini keys. From the time Rubini originally sang the role the first act aria was transposed down a minor third and the second act aria down a whole tone in all publications.⁴⁴³ In many contemporary productions the arias are heavily cut or omitted entirely, particularly the second act aria.⁴⁴⁴ Since there are no published scores in the original key, for the purposes of this research I have transposed

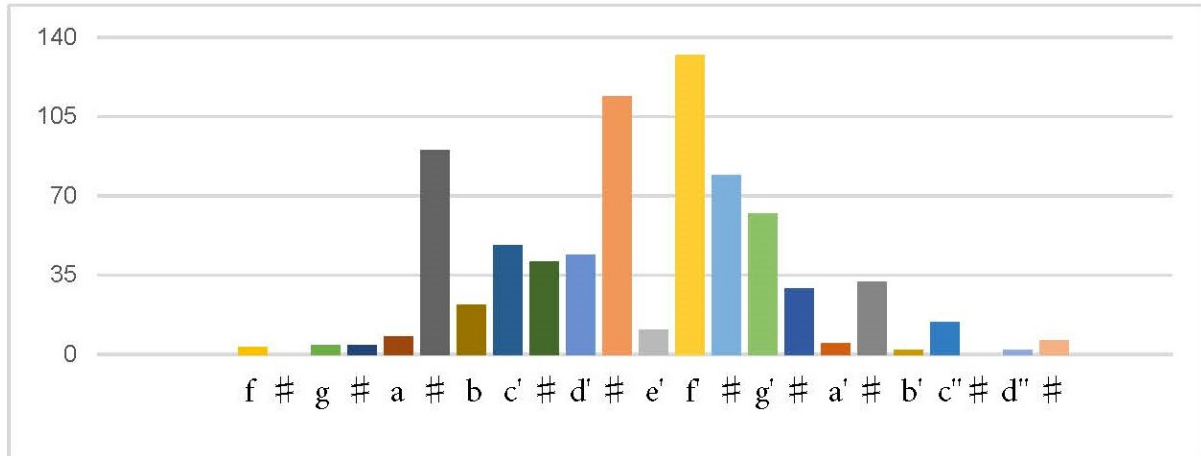
⁴⁴¹ Ashbrook, *Donizetti*, 1982, p. 66.

⁴⁴² Gossett, P. *Anna Bolena and the artistic maturity of Gaetano Donizetti* (Oxford: Clarendon Press, 1985) p. 11; Guillaume Tell, Rossini's final opera, had been staged the previous year.

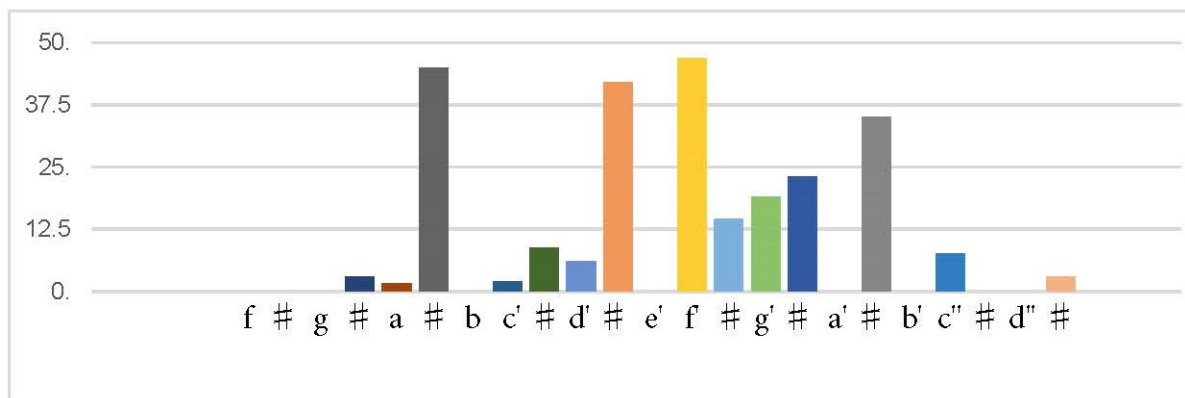
⁴⁴³ Gossett, *Anna Bolena*, 1985, p. 22.

⁴⁴⁴ Ashbrook, 'Anna Bolena', 1965, p. 435.

both arias to the original 1831 keys as sung by Rubini and those are the versions discussed here (Vol. 2: Repertoire).



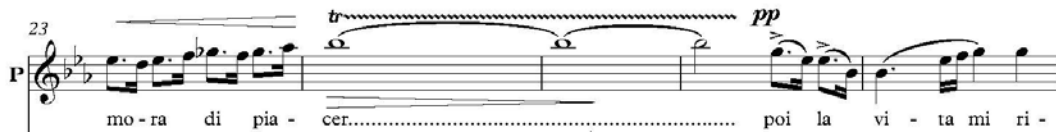
Graph 11 A – Gaetano Donizetti, 'Da quel di' ... 'Ah! Così nei ridenti' (Precy), Anna Bolena, Occurrence of individual pitches.



Graph 11 B – Gaetano Donizetti, 'Da quel di' ... 'Ah! Così nei ridenti' (Precy), Anna Bolena, Duration of individual pitches sustained for one minim or longer.

The Act I aria is divided into two sections, an *allegro giusto* in the key of B flat minor, and a *moderato* in E flat major. Both range and tessitura are high. The vocal range for this aria is nearly two octaves with a regular distribution of individual pitches throughout the tessitura. There is a high correlation between florid and sustained singing in the middle voice, but a comparison of Graph 11.a and 11.b demonstrates that the more the aria rises in

pitch from f' natural upward to b' flat, the more likely the pitch is to be sustained. In Graph 11.b, the higher pitches are more likely to be sustained than the lower. For example, g' flat is sung roughly 80 times, of which only 15 beats are fully sustained; however, b' flat is attacked little more than 30 times and sustained for a total of 35 beats. This does not imply that each b' flat was sustained in fact, quite the contrary. The b' flat is most often sung in coloratura, but when it is sustained, the pitch is held for up to ten beats. Twice it is trilled with c'' natural for ten beats, with a *decrescendo* to *pp* (measures 24–6 and 68–70).



Example 12 – Gaetano Donizetti, ‘Ah! Così nei ridenti’ (Precy), *Anna Bolena*, measures 23–7

The aria requires the tenor to sing six e'' flats, three of which are sustained for one beat each. It is anticipated that the tenor could embellish to f'' natural or higher in ornamentation.⁴⁴⁵ Each of the e'' flats are approached by an octave leaps followed by either a scale or arpeggio downwards. There are also fourteen high c'' naturals that are approached in several ways including intervals of a fourth, fifth, a scale or arpeggio. There is something of a preference for descending from the c'' natural by downward scale, including two chromatic scales.

Case Study 12: Act II.iii (No. 10) aria ‘Vivi tu, te ne scongiuro’ ... ‘Nel veder la tua costanza’ – Giovanni Battista Rubini

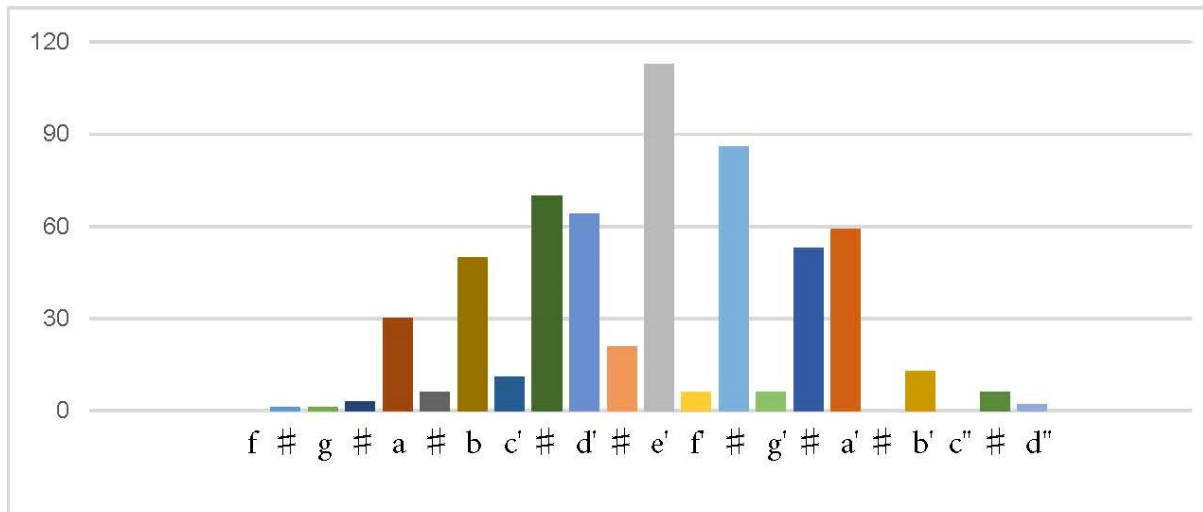
Aria	‘Vivi tu, te ne scongiuro’ ... ‘Nel veder la tua costanza’ [Act II Sc. iii; no. 10]
Composer	Gaetano Donizetti
Opera / Character	<i>Anna Bolena</i> / Lord Riccardo Percy

⁴⁴⁵ Brewer, B. ‘Rubini’s Repertory’, *The Donizetti Society Journal*, 4 (1980): 161–3, Rubini is reported to have sung to g'' in Donizetti’s *Roberto Devereux*.

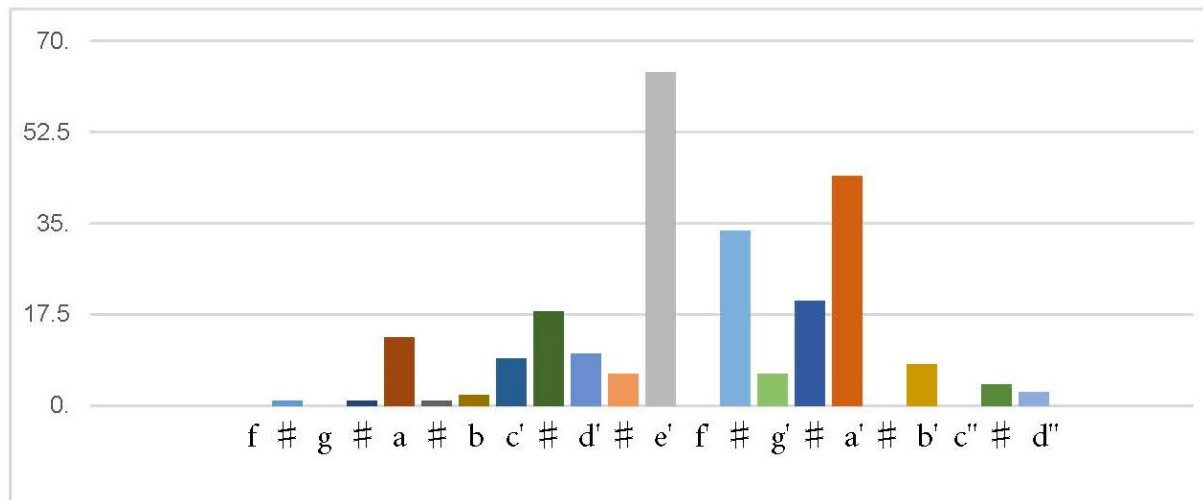
Premiere	26 December 1830 (Teatro Carcano, Milan)
London Premiere	8 July 1831 (King's Theatre)
Tenor	Giovanni Battista Rubini (7 April 1794 – 3 March 1854)
Fach	Contraltino
Range / Tessitura	F sharp to d'' natural / a natural to a' natural

The second act recitative and aria from *Anna Bolena* begins in the Tower of London where Percy and Rochefort have both been condemned to death.⁴⁴⁶ Both the *cantabile* and the *cabaletta* were originally composed in the key of A major but subsequently transposed down a whole tone in all publications. The aria is characterised by very high sustained lines (e natural to a' natural) requiring both syllabic and *spianato* (*legato*) singing. The section begins with slow downward legato musical lines indicating the comforting yet mournful characteristic of the text and continues into a more complex undulating melodic line all the while maintaining the overall downward movement. Donizetti uses wide upward intervals to bring the vocal line higher to reinforce the downward movement at the same time to bring the voice to the high-lying lines of the second part of the *cantabile* at measure 20.

⁴⁴⁶ Hervey enters to tell them that they have been pardoned by the King. Percy, however, refuses the pardon because Anna is still to be executed. In the *cantabile* 'Vivi tu, te ne scongiuro,' Percy pleads with Rochefort to accept the King's pardon but Rochefort refuses, and instead accepts his death as has Percy. Percy is trying to convince Rochefort that he should live and find a life of safety in a less sad land, but to stay alive so that someone might remain alive and lament the deaths of Anna and himself. They are to be taken to separate cells so must make their final farewells. In the *cabaletta* 'Nel veder la tua costanza' Percy says that they will meet again in death and that there will be no one left for them on earth. Gossett, *Anna Bolena*, 1985, pp. 30–1



Graph 12 A – Gaetano Donizetti, 'Vivi tu, te ne scongiuro' ... 'Nel veder la tua costanza' (Precy), Anna Bolena, Occurrence of individual pitches.



Graph 12 B – Gaetano Donizetti, 'Vivi tu, te ne scongiuro' ... 'Nel veder la tua costanza' (Precy), Anna Bolena, Duration of individual pitches sustained for one minim or longer.

In this *leggiere* section the voice sits very high sustaining legato a' and essentially remaining in the upper register for nearly 20 measures until the end of the *cantabile* section. In stark contrast to the *cantabile*, the most significant characteristics of the

cabaletta, from a vocal standpoint, are the slow ascending legato lines to *forte* d'' natural followed immediately by *piano* c'' naturals and the downward *melismi* that they precede. There are however no florid or rapidly ascending lines. It is the slow upward movement of the melodic lines in the *cabaletta* that give way to downward melisma.⁴⁴⁷

Example 11 – Gaetano Donizetti, ‘Nel veder la tua costanza’ (Percy), *Anna Bolena*, measures 128–35

The range of the aria is well distributed from F sharp to d'' natural with a midpoint at e' natural and a centralised tessitura of one octave: a natural to a' natural. The focus of the sustained singing is however in a distinct range (e' natural to a' natural) with e' natural being the pitch sustained the greatest number of beats, followed by a' natural which is sung nearly 2/3 as often. Pitches below e are much less likely to be sustained and the total number of sustained beats below e natural is fewer than number of e naturals alone. Not accounting for *rallentandi* or *fermate*, the tenor must sustain nearly fifteen beats above a' natural including six c'' sharps and two d'' naturals, each typically sustained for an entire beat or more.

The *cantabile* begins *piano* with very little dynamic change through the entire section until Rochefort and Hervey interject, which moves quickly to *forte* and back then to *piano*. Percy interjects *fortissimo* (ff) on a' natural (measure 53) but the orchestration moves quickly back to piano but increases once again to *fortissimo* through to the *moderato* at measure 68 which, as with the other sections, begins *piano*. The *moderato* ‘Nel veder la tua costanza’ demonstrates rapid changes in dynamic often alternating between *piano* and *forte*

⁴⁴⁷ This could indicate Percy's acceptance of his death and that it is in his ascent into heaven where he can once again be with his friend Rochefort and his beloved Anna, and the melismatic joy to be found together in heaven where they will meet in death.

sequentially on ascending melodies. For example, at 116 the melody begins *forte* ascending to a' natural, followed immediately by a *piano* a' natural at measure 121. The line crescendos to *forte* (*f*) on b' natural (126) followed immediately by a' natural *piano* at 128. The dynamics continue to alternate quickly to a' natural and are then followed by a rapid crescendo from measure 131 to 132 on an upward moving line to a *forte* (*f*) d'' natural then to be followed immediately by a *piano* c'' sharp. Each of the high-notes d'' natural, c'' sharp and a' natural are followed quickly by descending *melismi* and an upward octave leap to the next high-note. The entire figure of measures 128–132 are repeated exactly, then the aria finishes *fortissimo* (*ff*) with an a' natural to a natural phrase.

Examination of this aria reveals a voice that is extremely high, with what appears to be stratospheric legato singing requiring both *piano* and *forte* singing well into the upper register. The analysis upholds this general view but demonstrates that comparative pitch has virtually no relevance to dynamic or legato singing, at least in the upper register. In fact, there is very little *forte* singing below c' sharp. This constrained dynamic and the limited quantity of sustained singing in the lower half of the voice, coupled with the dynamically expressive upper register, would seem to indicate a voice that is more comfortable in that range, and less comfortable in the lower. With both *forte* and *piano* on all pitches from f' sharp to c'' sharp, there is virtually no limit placed on the dynamic or pitch duration in the upper register. The tenor needs to be able to climb slowly to *forte* d'' naturals as well as leap to *piano* c'' sharps. In fact, this aria is decidedly characterised by upward leaping, and downward *legato* singing though it does markedly require a couple of upward legato phrases. This is somewhat in contrast to Nozzari's voice which shows he sang either loud or soft but not much else.

With the majority of upward moving phrases being either wide leaps with occasional legato climbing, the aria lacks any quick moving upward phrases. There are many downward passages with rapid sixteenth notes, but there are no upward phrases with more than two upward-moving sixteenth notes in a row. Whereas in the downward phrases, there are entire sets of downward *melismi* with tripleted sixteenth notes, in fact all rhythms faster than a sixteenth are only found in a downward movement. This makes one question the ability of Rubini to sing quick upward lines. It requires further comparison with other music written for Rubini around this period of his life. There are also very few descending leaps

while there are many upward leaps of an octave or more for Percy, and Rochefort sings descending fifths during this aria. In fact, aside from one staccato seventh and one octave (each repeated), there are no downward intervals greater than a fourth. Compared to the vast number of upward intervals this is a striking disparity.

The *Anna Bolena* arias reveals a voice that is extremely controlled and expressive in the upper register, but certainly not one with a vast range. The expressiveness may be limited to the upper half of the voice, and the phrasing seems to uphold the nature of the technique being 'top down.' It is only through comparison with other repertoire by other composers that a fuller picture of the context can be made. Another role from the same year as Donizetti's *Anna Bolena* is the title role of *La sonnambula* by Bellini.

Bellini: *La sonnambula* (1831)

La sonnambula is a melodrama in two acts based on the libretto of Felice Romani, and premièred in Milan at the Teatro Carcano on 6 March 1831, in the same season as Donizetti's *Anna Bolena* with the same principles Giuditta Pasta as Amina and Giovanni Battista Rubini as Elvino.⁴⁴⁸ It received its London première in Italian only a few months later on 28 July 1831 at the King's Theatre with Pasta and Rubini.⁴⁴⁹ Maria Malibran performed the role of Amina first in an English adaptation by Henry Bishop.⁴⁵⁰ Julian Budden et. al. indicate that *La sonnambula* demonstrates Bellini's mature style and is a 'synthesis of heartfelt melody, expressive declamation and coloratura from which all Rossinian hedonism has been banished'.⁴⁵¹

⁴⁴⁸ Budden, J., et. al. 'Sonnambula, La ('The Sleepwalker')', (Grove Music Online, 2002), accessed 28 Sept. 2019. The plot of the libretto was taken from the ballet-pantomime, *La Sonnambule, ou l'Arrivée d'un Nouveau Seigneur* by Eugene Scribe and J.P. Aumer. Osborne, *Bel Canto Operas*, 1994, p. 333–4, 'Romani had wanted to make Amina the Count's long-lost daughter, born out of wedlock, but Bellini vetoed the idea. A trace of Romani's suggestion, however, remains in the words of Count Rodolfo's elegant cabaletta, "Tu non sai", in which he is moved by Amina's beauty to exclaim that she strongly resembles a young woman he loved long ago.' (p. 335).

⁴⁴⁹ Osborne, *Bel Canto Operas*, 1994, p. 333.

⁴⁵⁰ Budden, 'Sonnambula', 2002. Bellini, V. *La sonnambula*, vocal score Bishop, H. (ed.), (London, 1833).

⁴⁵¹ Ibid.

Case Study 13: Act I.v (No. 3) aria 'Prendi: l'anel ti dono' – Giovanni Battista Rubini

Cavatina	'Prendi: l'anel ti dono' [Act. I; No. 3; 73–273]
Composer	Vincenzo Bellini
Opera / Character	<i>La sonnambula</i> / Elvino
Premiere	6 March 1831 (Teatro Carcano, Milan)
London Premiere	28 July 1831 (King's Theatre)
Tenor	Giovanni Battista Rubini
Fach	Contraltino
Range / Tessitura	F natural to d'' natural / d natural to a' natural

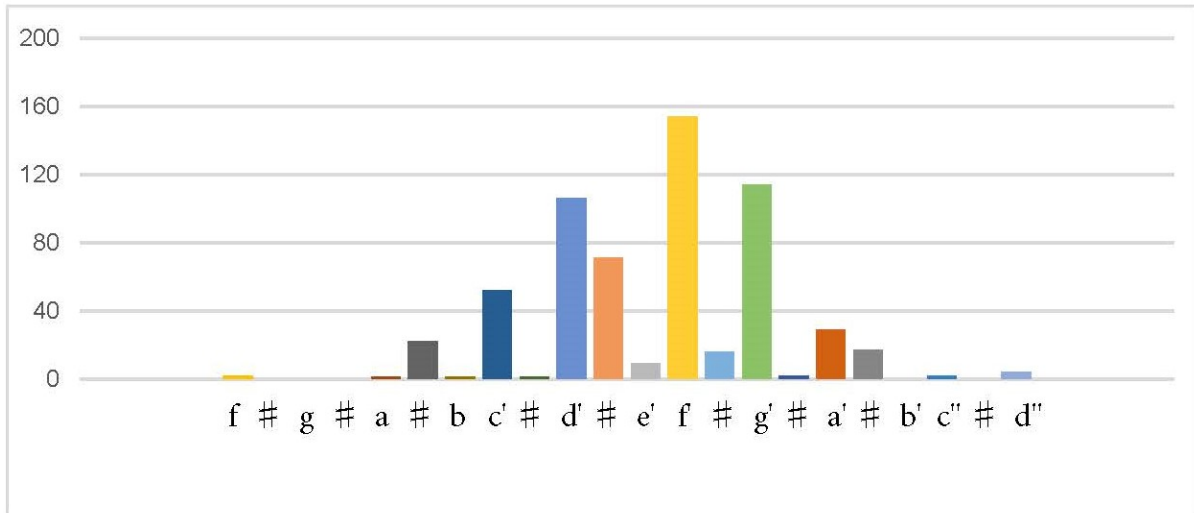
The role of Elvino from the opera *La sonnambula*, also from 1831, was written for Rubini, then 37 years old. While not featuring the extremities of Percy or Gernando, it requires a form of Bellinian *canto spianato* unlike anything in the repertoire presented in this dissertation.⁴⁵² The cavatina, 'Prendi: l'anel ti dono' ... 'tutto, ah!', was originally composed in the key of B \flat major but, as with arias from *Anna Bolena*, was subsequently transposed down for later tenors. The Ricordi critical edition provides the restored key as well as two additional keys of A \flat major and G major, the former being the most commonly published key. In addition to the cavatina, the duet with Amina 'Son geloso' was also transposed down a whole tone in subsequent publications.

The structure of this cavatina includes several atypical elements such as sections of a duet with Amina, a duet between Teresa and Alessio, and ends with a quartet between Elvino and the three other voices with chorus in five parts. Elvino remains vocally prominent by maintaining the top melody throughout. The cavatina begins *ppp* and retains a very low dynamic for much of the work with some exceptions, but generally builds in the end ensemble to a *fff* dynamic finale.

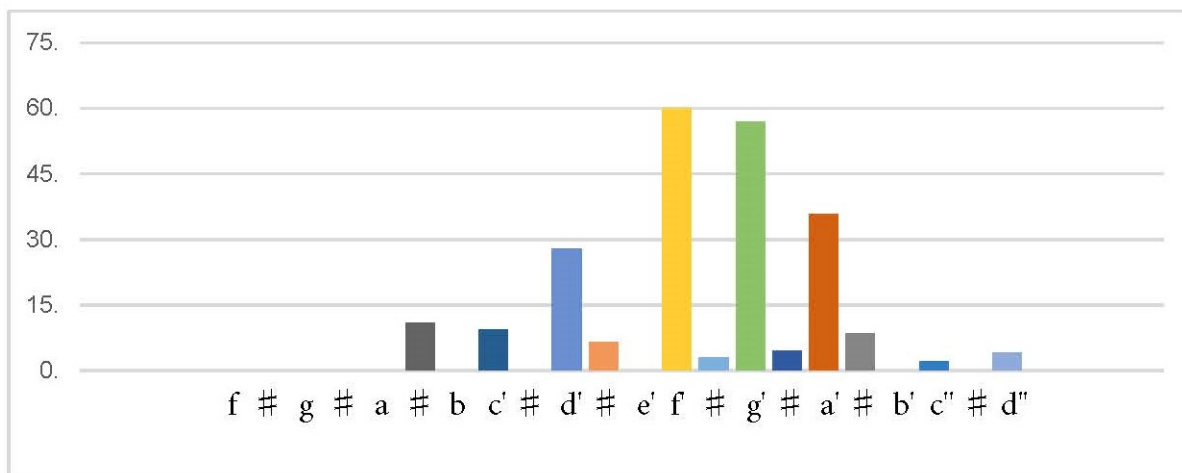
One of the most striking features of the cavatina is not simply the high tessitura, but the prevalence of high sustained singing. Consistent with what is demonstrated in Graph 11.b from *Anna Bolena*, Graph 13.b below shows that Rubini is more likely to sing legato in

⁴⁵² Bellini, V. *La sonnambula*, vocal score based on the critical edition, (Milano: Casa Ricordi, 2010), pp. 50–73.

the upper register than in the middle or lower. Comparing the pitch a' natural on both graphs, it is apparent that Rubini is far more likely to sustain a' natural than to sing quickly and is exactly converse to the tones below f' natural.



Graph 13 A – Vincenzo Bellini, 'Prendi: l'anel ti dono' (Elvino), *La sonnambula*, Occurrence of individual pitches.



Graph 13 B – Vincenzo Bellini, 'Prendi: l'anel ti dono' (Elvino), *La sonnambula*, Duration of individual pitches sustained for one minim or longer.

Up to the pitch of high b' flat Rubini is more likely to sing a slow *legato*, however pitches above that are all approached with the aid of a wide interval. Consistent with how Donizetti wrote the role of Percy for Rubini, intervals of a fourth are common but anything wider within the central tessitura are rare; there are only a few intervals of an octave and those are consistently into the upper register. Furthermore, the highest pitch of d'' natural is approached exclusively by wide-interval leap (Example 13).⁴⁵³ While Elvino's cavatina contains rapid syllabic singing, it does not however require a vast amount of coloratura, contains very few *a piacere* sections and only one true *cadenza*.

171

Elvino

con abbandono

stentato in tempo

d'ar - di: io lo leg go ne' tuoi sguar-di nel tuo vez - zo lu - sin ghier

Example 12 – Vincenzo Bellini, 'Prendi: l'anel ti dono' (Elvino), *La sonnambula*, measures 171–5

This narrow range of only an octave and a sixth reveals a voice that is more likely to sing sustained in the upper register than in the lower has a wide dynamic range. Based on the dynamic markings and tessitura, the voice may have lacked projection in the middle, and the *ff*–*fff* markings are exclusively in the upper register. This would indicate that Rubini was able to sing from *pianissimo* to *fortissimo* predominantly in the upper register but may have not had the ability to sing *fff* in the middle or lower voice substantiating the comment earlier. Having a mastery of the *mezza voce* would be evident from the use of dynamics and would also contradict the notion that the voices of this period were soft or did not project in the upper register. Considering that the aria is consistently *legato* from f' through b' flat and that wide intervals are only used to or above that pitch, it would be reasonable to conclude the voice had an even quality to at least b' flat, and furthermore that the very high notes

⁴⁵³ With the one notable exception from the second act aria of Anna Bolena already discussed, the wide interval leaps into the upper register are de rigueur.

may have been produced using a different mechanical function that was more easily accessed by wide interval.

It would be simple to dismiss differences in repertoire by saying that composers wrote for the voices as they saw fit, and it was the style of the day which dictated the vocal lines more so than the abilities of the individual singers. Knowing however that the composers wrote specifically for these individual tenors does substantiate the conclusion that roles maintain peculiarities of the singers. But another way to check is to compare these elements to repertoire written by the singers themselves. This way a fuller picture may develop of the expectations that they had for their own voices.

Rubini was not a prolific composer like Garcia (snr.) who wrote his own operas, and neither did he write a major treatise like Garcia (jnr.). He did however put together lessons for singers much in the way Mathilde Marchesi, student of Garcia (jnr.), would do. *Twelve Lessons for Modern Singing* by Rubini is the first of his two publications. It is difficult to date but was published before 1840.⁴⁵⁴ The lessons become progressively more difficult and include vocalisations as well as songs. Studies on *triplets*, *appoggiatura*, *gruppetti*, trills, *cadenzas*, expressive and animated singing. The 'Twelfth Lesson' entitled 'Animated Singing' is to be sung 'with the full voice' and is set to poetry.

Giovanni Battista Rubini: Twelve Lessons in Modern Singing

This series of twelve lessons are represent as accompanied songs each designed to present aspects of singing pedagogy: legato, portamento, trill, appoggiatura and acciaccatura, syncopation, subdivisions, *gruppetti* and mordent, roulade, cadenza, *mezza voce* and recitative. This edition cannot be for beginner singers as a wide range and a great deal of technical skill is required from every lesson. The 'Seventh Lesson' which focuses on the trill at one point requires the singer to execute the trill exercise on b' flat to a' flat.

⁴⁵⁴ This work is not treated in section I of the dissertation because, though similar in scope to Garcia (snr.), it is not a treatise in the same way as the others. Marek, *Rubini*, 2013, Appendix I, p. 416.



Example 13 – Giovanni Battista Rubini, 'Seventh Lesson', *Twelve Lessons*, p. 40

As the last and possibly the most difficult lesson, it incorporates the techniques from the first eleven lessons. Musically it is not terribly inventive, but this analysis concerns more what it says about the expectation of the tenor voice, not its musical value or ingenuity. Not unlike Garcia (snr.) and Mathilde Marchesi, the lessons do not concern themselves with exactly how the voice should be produced. There are scarce explanations and very little practical information on precisely how to accomplish the singing.⁴⁵⁵

Case Study 14: 'Twelfth Lesson'

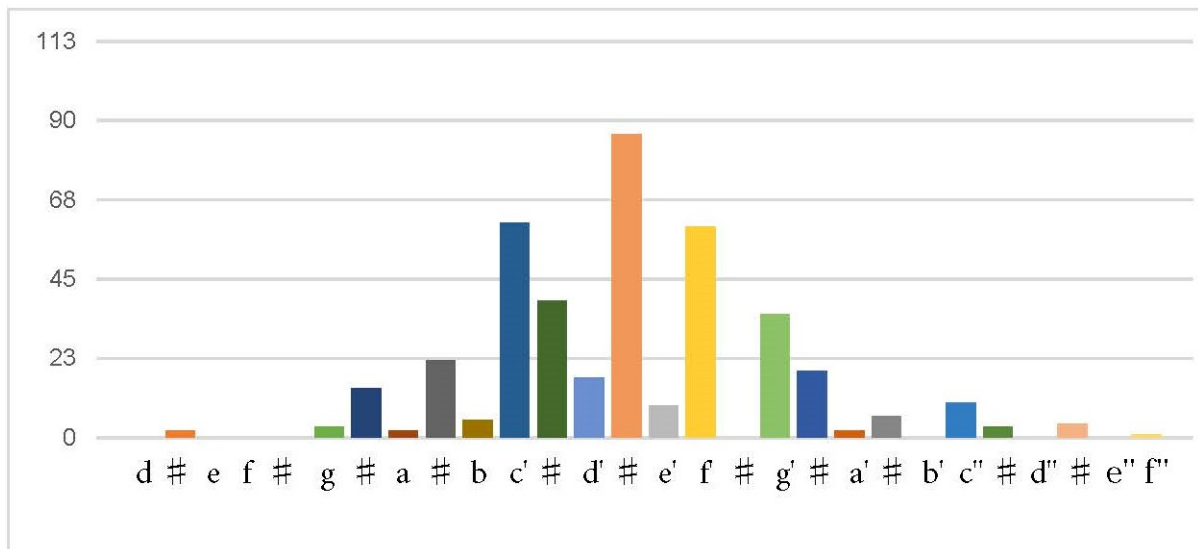
Aria	'Twelfth Lesson' <i>Twelve Lessons in Modern Singing for Tenor or Soprano</i>
Composer	Giovanni Battista Rubini
Opera / Character	N/A (High Voice)
Premiere	New York: G. Schirmer, 1906 (reprint)
Fach	Tenor or Soprano
Range / Tessitura	e flat to f'' natural / c' natural to a' flat

The range of the 'Twelfth Lesson' covers over two full octaves from e flat to f'' natural and has an even bell curve with e' flat at the top of the curve and all other notes

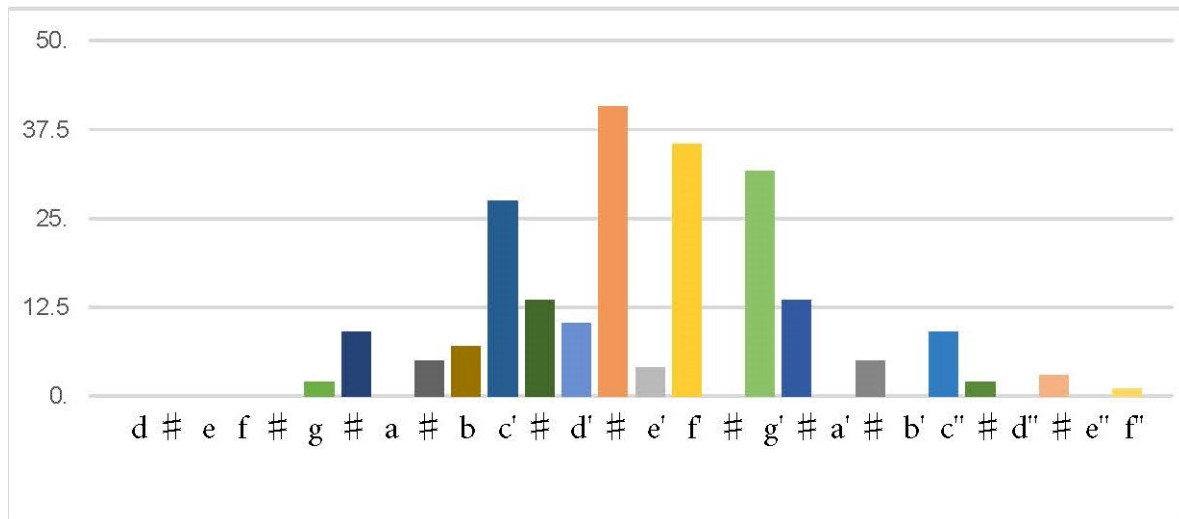
⁴⁵⁵ Marek, *Rubini*, 2013, Appendix I, pp. 416–49. In his book on Rubini, Dan Marek interprets these lessons by including the vowel modifications that one should use to accomplish the proper registration of the lessons.

evenly distributed to either side with a slight deviation to the right. The tessitura is also central from c' natural to a' flat. The distribution of sustained notes mirrors that of the number of individual pitches, meaning that any given note is as equally likely to be sustained as it is to be sung quickly. By comparing Graphs 14.a and 14.b below, it is easy to see the direct correlation that exists practically through the range of the lesson.

There is however a higher likelihood that notes above f' natural will be sustained than those below. There is almost a 1:1 correlation between the number of times a note is sung and its duration.



Graph 14 A – Giovanni Battista Rubini, 'Twelfth Lesson', *Twelve Lessons in Modern Singing for Tenor or Soprano*, Occurrence of individual pitches.



Graph 14 B – Giovanni Battista Rubini, 'Twelfth Lesson', *Twelve Lessons in Modern Singing for Tenor or Soprano*, Duration of individual pitches sustained for one minim or longer.

The Twelfth Lesson begins *piano* (*p*) but by measure 11 the dynamic crescendos quickly to *forte* (*f*). Most of the song is sung *forte* (*f*) and *fortissimo* (*ff*) with only a few phrases to be sung *piano* (*p*) and *pianissimo* (*pp*) including high *c''* natural sung both *ff* and *pp*. Most phrases crescendo with the rise in pitch including those to *d''* flat, *e''* flat and *f''* natural, with many notes above staff indicated as *marcati* and include a *rallentando*. Based on the dynamics it can be gleaned that the singer must have complete control over the dynamics of the voice in all registers, and it cannot be supported that the upper register would have been weak or sung principally softly.

One of the principal features of the song is the high tessitura legato singing with wide upward legato intervals to high *c''* natural consistent with each of the pieces analysed here. The highest ranges of the voice (*e''* flat and *f''* natural) are reached by leap and via cadenza, but not by sustained singing. In the cadenzas the song does not indicate reaching *e''* natural and *f''* natural in any particular fashion so it could easily be assumed that they are at the discretion of the singer. Considering these approaches to the upper register, it could be deduced that the singer is expected to be able to sing full-voiced legato to *c''* natural but would then switch into modified 'pharyngeal voice' for above that. There are two instances

where the singer is expected to sustain e'' flat: they are approached by a leap of an octave and a minor third (c' natural to e'' flat) on the word *si* and is preceded by a breath.

As head voice is typically somewhat less connected to the full voice, and the [i] vowel is highly conducive to producing the appropriate tenor sound in that register, this example would help to confirm that 'pharyngeal voice' is used to sing these pitches. However, the f'' natural is reached in cadenza on [a] and one might assume that the vowel is modified to accommodate the ascending pitch. It would suggest though that vowel independence, although limited, is still expected into the highest registers and that evenness to the top of the voice was also a prerequisite. It may furthermore suggest that while jumping to the upper register is frequent, doing so to a completely different vocal character may not have been accepted. The high tessitura of the piece may have helped to maintain the connection to the upper half of the voice by limiting the time spent in the full chest voice thereby reducing the comparison in timbre and lessening the tendency to over-engage the lower part of the voice.

Another distinctive feather of the song is the prevalence of trills. The tenor is expected to trill multiple times on every note from c' natural to g' natural within a legato phrase (trilled *portamento*) with no consideration to which vowel is being sung or whether the phrase is ascending or descending.⁴⁵⁶ They are sung at all dynamics, during *crescendos*, *stringendos*, and before small interval leaps. The only singing that does not require trills is where there are *decrescendos* and extreme high notes. Examples of this can be found in the first act *cabaletta* from *Anna Bolena*, 'Ah! Così nei dí ridenti', which as requires a *decrescendo* b' flat c'' natural trill to *pp* (Graph 14.b); and while a trill is not indicated in the Bellini aria, it is required several times in the duet with the soprano on f' natural, g' natural, a' natural and b' natural (measures 89–90).

Donizetti, Bellini, and Rubini himself upheld a consistency in composing for the voice throughout the repertoire. While my examples are taken principally from the repertoire

⁴⁵⁶ Garcia, *École*, 1840, p. 56, 'Ce trille peut être appliqué au port de voix, soit en montant, soit en descendant. Tosi, qui le premier, à ma connaissance, a parlé de cette espèce de trille, dit qu'on l'obtient en faisant monter ou descendre imperceptiblement la voix d'un comma à l'autre par un trille continu, de manière à ce que l'auditeur ne puisse analyser l'élévation ni l'abaissement du son.' Tosi, *Opinioni*, 1723, pp. 26–7, 'Il quinto e il Trillo calato, che confitte nel far discendere ineffabilmente la voce non si distingua il declino a Coma per Coma col Trillo in forma che non si distingua il declino.'

written for Rubini in 1831, they do represent the peak period of his career and vocal prowess. In fact, by 1835 Bellini, who was to die in September of that year, had written the role of Arturo in *I puritani* for the great tenor, who was 40 years old at the time, with very little *fioritura* and only a few high notes. This opera is often mentioned for containing the most famous top f'' natural in opera, but it is not representative of the same type of singing.

In the final assessment, this repertoire indicates a voice that is most comfortable in the upper register, where it is able to demonstrate the greatest range of dynamics, *fioritura* and legato singing. Rubini was clearly comfortable singing legato, typically up to about b' flat, but on occasion to c'' natural. Most notes above that are approached by a leap, or at least preceded by a breath, allowing the singer to change registers. His mastery of the *mezza voce* can be substantiated by the marking of *ppp* singing in the upper register, but also that he was capable of *fff* there as well. It is also fairly clear that he was not as comfortable singing at great volume in the lower half of his voice, from about e' flat and below.

It might therefore appear that Rubini had difficulty producing a proper mixed register *in passaggio*, accounting for his noted lack of full-voiced *piano* and *mezzo forte*. He may have attempted to sing his *mezzo forte* in mixed voice causing it to lack resonance, and the description of his voice as being covered in a light gauze. As was pointed out, David apparently had similar tendencies. This could perhaps indicate that the two contraltino singers both had difficulty producing a resonant *mezzo forte*, because they lacked some chest connection in the middle voice. But by not over-weighting the voice and darkening through *passaggio*, this may have enabled them to reach up to the extreme high range; it would also account for the exemplary *mezza voce* for which they were both so noted.

Rossini: *Le siège de Corinthe* (1826)

When *Le siège de Corinthe* (*The Siege of Corinth*) premiered in 1826 much of the music had already been heard though nearly every number had been revised to some extent.⁴⁵⁷ *Le siège* was the second iteration of the plot and much of the music which Rossini premiered in Naples under the guise of *Maometto II* (1820). Rossini's 1820 opera for Naples concerns 'the

⁴⁵⁷ Osborne, *Bel Canto Operas*, 1994, p. 124.

war between the Venetians and the Turks which culminated in a Turkish victory at Negroponte in 1470', whereas the action of the Siege of Corinth was adjusted back to 1459 when Corinth was under siege by Mohammed's forces in 1459.⁴⁵⁸ The war for Greek independence was in the Parisian newspapers daily, and Rossini changed the plot in hopes to exploit the anti-Turk pro-Greek sentiment in Paris at the time.⁴⁵⁹

Case Study 15: Act III (Nos. 10 & 11) aria 'Qu'entends-je? Pamira!' ... 'Grand Dieu faut-il qu'un peuple qui t'adore' – Adolphe Nourrit

Aria	'Qu'entends-je? Pamira!' ... 'Grand Dieu faut-il qu'un peuple qui t'adore', [Act III; No. 10 - choir & No. 11 - aria]
Composer	Gioachino Rossini
Opera / Character	<i>Le siège de Corinthe</i> / Néoclès
Premiere	8 October 1826 (Salle Le Peletier of the Paris Opéra, Paris)
London Premiere	as <i>Le siege</i> Chelsea Opera 1992 (Queen Elizabeth Hall) as <i>Maometto II</i> Garsington Opera 1993 (UK Premiere)
Tenor	Adolphe Nourrit
Fach	Tenore Serio
Range / Tessitura	e flat to c'' natural (e' flat centre) / g natural to g' natural

The aria 'Qu'entends-je? Pamira!' ... 'Grand Dieu faut-il qu'un peuple qui t'adore' occurs near the beginning of Act III and is set in the tombs of Corinth.⁴⁶⁰ It has an interesting

⁴⁵⁸ Ibid., 102, (*Maometto II*) and Ibid., 123 (*Le siège*).

⁴⁵⁹ Ibid., 123. The daughter of the Governor of Corinth, Pamira, has fallen in love with the enemy Mahomet who was under a pseudonym. Her father, Cléomène, wants her to marry Néocles a young Greek officer. When she realises that her lover is in reality Mahomet, she stabs herself rather than become the wife of the man who has besieged her country. In *Maometto II*, the role of Calbo was the character of Néoclès and written for contralto but was changed to a tenor for *Le siège de Corinthe* because the Parisians had a distaste for trouser rolls. Osborne, R. 'Le siège de Corinthe', in Sadie, S. (ed.), *The New Grove Dictionary of Opera*, (4) (London: Macmillan Publishers, Inc., 1998), pp. 364–5.

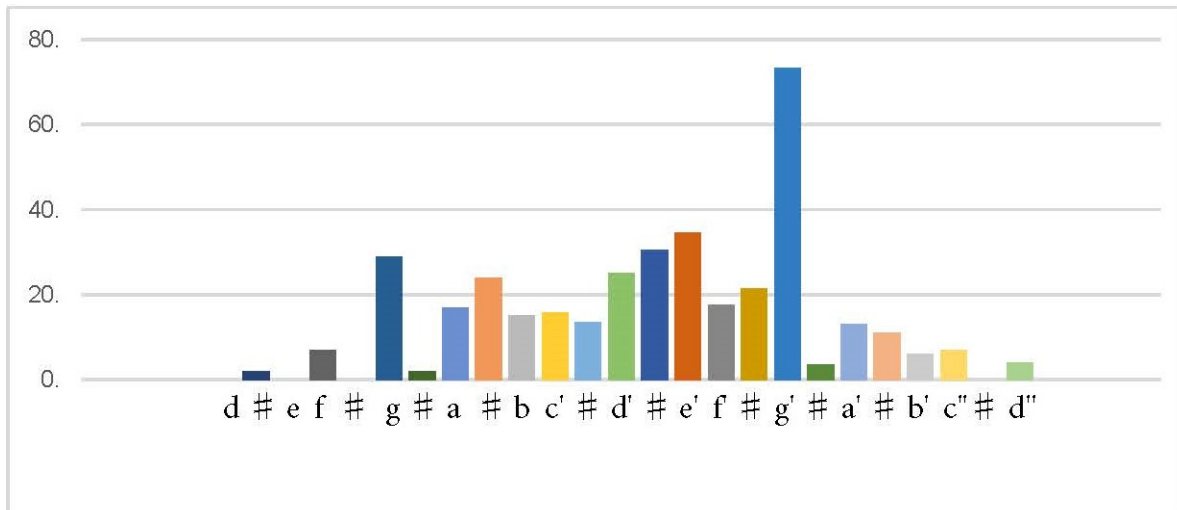
⁴⁶⁰ Néoclès who is prepared to fight the Turks with the Greeks, is informed by Adrastus that the battle is already lost, but that the Greeks will fall back to the catacombs to make a last stand against the Turks. A chorus of women led by Pamira call for revenge against the Turks, and upon hearing their voices Néoclès sings 'Qu'entends-je? Pamira!' ... *Grand Dieu faut-il qu'un peuple qui t'adore*'. Rossini, G. '*Le siège de Corinthe*' Recording: Teatre Carlo Felice, Genoa – July 1992, Jacket notes p. 19: Néoclès is distraught that the Greeks are going to be wiped out in Corinth and that Pamira will die by her own hand, but he is hopeful that the Greeks will prosper once again. Rossini, G. *Le Siège de Corinthe*, jacket notes to CD, Müller, R. (ed.) Stevens, D. (trans), (Rossini in Wildbad Festival, 2010) p. 4.

graph though something which has been seen before with some of Rossini's works for Garcia. Rather than the bell curve seen in many of the graphs, here the closer the tenor sings to g' the more likely the note is to be hit: it shows a smooth increase to g' and a fairly sharp fall off. There are over 100 g' naturals in this aria alone with nearly 75 sustained beats. This could indicate that Nourrit's voice was much more comfortable in the higher tessitura singing and that g' natural was one of his best notes.

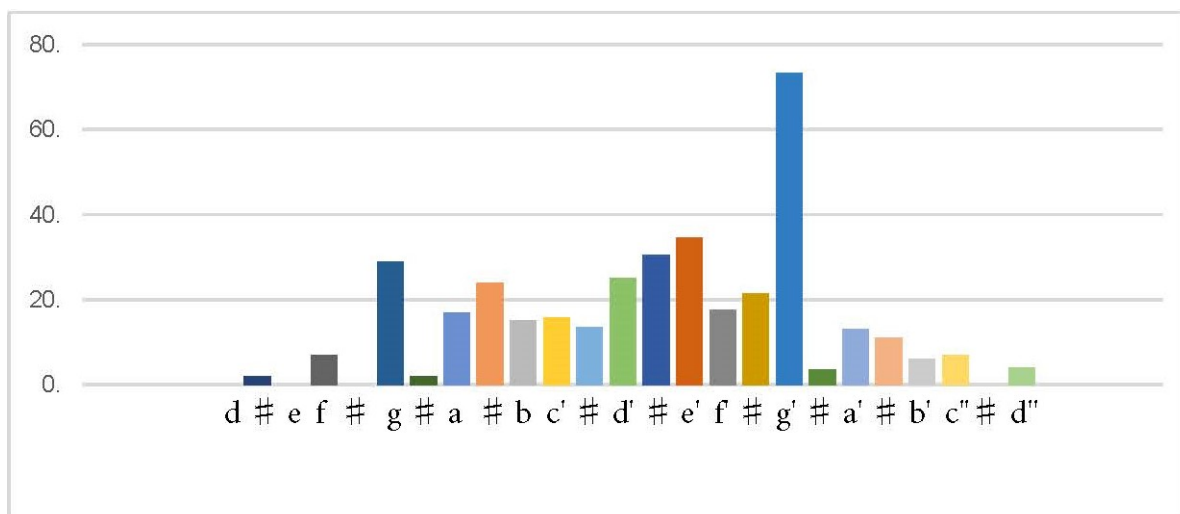
The note sustained by far the most is g' natural at nearly twice the second most sustained note of e' natural. Above g' natural the number of incidences of a pitch is roughly equal to the likelihood of it being sustained. For example, there are 14 a' naturals which are sustained a total of 13 beats. This does not indicate that each note is sustained a beat, but rather that notes in the upper register are as likely to be sustained as they are to be sung which indicates that Nourrit's ability to sing fioritura was roughly equal to his ability to sustain pitches in the upper register. While the number of pitches in the upper register are significantly less, it would not seem that Nourrit could be described as having a particular difficulty.⁴⁶¹

The graph of individual pitches is linear, but there is some variation in the graph of sustained pitches below g' natural. There does not seem to be a pattern than can be extrapolated from the data. This could be a result of the three different keys: from D minor when Néoclès' is singing over the choir of women, to G minor in the cavatina, and then to D major for the cabaletta. This does not however seem to have had any significant effect on the graph of individual pitches. Because of this not much can be garnered from that graph comparison, but looking ahead to *Guillaume Tell* will offer some clarity.

⁴⁶¹ A comparison with the aria from *Guillaume Tell* demonstrates consistency in these elements.



Graph 15 A – Gioachino Rossini, 'Qu'entends-je? Pamira!' ... 'Grand Dieu faut-il qu'un peuple qui t'adore' (Néoclès), *Le siège de Corinthe*, Occurrence of individual pitches.



Graph 15 B – Gioachino Rossini, 'Qu'entends-je? Pamira!' ... 'Grand Dieu faut-il qu'un peuple qui t'adore' (Néoclès), *Le siège de Corinthe*, Duration of individual pitches sustained for one minim or longer.

The characteristics of this aria paint a portrait of a voice with exemplary capabilities. Other than range, e flat to c'' natural which is not particularly wide for the works assessed in

this research, the tessitura is quite high. The aria also contains some of the most difficult of features discussed in all the other arias. At some point in the aria nearly every note to c'' natural is sustained at least two beats or more, sometimes in slow-moving upward phrases culminating in sustained high c'' natural followed immediately by faster downward passages. There are many fast downward fioritura passages but there are none that are phrased upward. The upward passages tend to be arpeggiated or scales. To give the impression of upward moving fioritura passages Rossini has written either scales in dotted rhythms or arpeggios alternating with quick turns.

Sau- vant_ le vic-ti - me tu dai - gnes com- bler_ mes_

voeux Sau- vant_ le vic-ti - me Tu dai - gnes com bler com-bler_ mes_ voeux.

Example 1414 – Gioachino Rossini, 'Grand Dieu faut-il qu'un peuple qui t'adore' (Néoclès), *Le siège de Corinthe*, p. 292

Consistent with other arias there are wide intervals into the upper register. But unlike much of the other repertoire, Nourrit sings seemingly legato lines up to sustained a' natural and even c'' natural. Top c'' natural is approached by scale and arpeggio. It would seem that Nourrit was an extremely competent singer and had little preference for approaching the high notes. There does seem to be a preference for legato singing in the upper register. Rossini wrote what might seem an inordinate number of g' naturals, with a significant proportion of sustained singing, for Nourrit to sing.

Unlike other tenors' arias analysed, this aria demonstrates that Nourrit was probably more comfortable moving legato from g' natural up to c'' natural, rather than singing legato up to g' natural and then switching or using an interval to reach higher notes. While other tenors sang legato in the upper register, none have done so to this extent. There is also a different characteristic to the legato lines in this aria. Several times a single pitch will be sustained, either held or in syllabic singing, and will subsequently move higher. Of course,

there are also quick notes which suddenly jump higher, but this quality of sustained singing especially from g' natural occurs disproportionately often.

The sheer number of occurrences of g' natural could lead one to consider that pitch to be quite significant in Nourrit's voice as either his centre or possibly the first note in the upper register. It is arguable that Nourrit switched into 'pharyngeal voice' for g' natural which would give him more control over the g' natural and above. Phrases like the one below (Example 16) show Nourrit leaping an octave to the g' natural and singing upward in a scale. While he could technically switch g' sharp to a' natural using the 'm' [*mes*] it would disrupt the line and undermine the integrity of the phrase. It is also possible to do the same using the 'v' in *vœux* on the b' natural.

There is realistically nowhere for him to switch after the g' natural without making it too apparent. Therefore, it is most likely that Nourrit is using the g' natural as his basis for the 'pharyngeal voice' at least in this line. And if Example 16 above is considered once again, this might show that Nourrit could either breathe before the g' natural, which is reasonable considering the rest of the phrase needs be sung in one breath, or he is both capable of switching very subtly and has great breath control.

Switching to the g' natural early would also give him a smoother transition into the upper register and with would make the voice much more even. Subsequently however it could remove some of the weight from g' natural and make it a bit sweeter rather than a powerful tone. It is however possible to sing the pitch as both a full-voiced note and a transition note depending on how he would like to phrase the line.

Sau-vant la vic-ti-me Tu dai-gne com-ble-mes-
vœux tu dai-gnes com-ble-com-ble-mes-vœux

Example 15 – Gioachino Rossini, 'Grand Dieu faut-il qu'un peuple qui t'adore' (Néoclès), *Le siège de Corinthe*, p. 295

There are multiple incidences of *f* or *ff* for *g'* natural and above, which would indicate that even his upper register, while not being as powerful as Nozzari, was still capable of a powerful tone. It's possible that Nourrit relied on resonance and projection rather than in sheer heft. In fact, Nourrit is called on to sing *mezzo forte* or *forte* for most of the phrases in the upper register. There is very little call for piano singing in the higher line. Analysis of another aria would be required to determine Nourrit's piano singing capabilities in the upper register. That being said, if Nourrit is entering the 'pharyngeal voice' at a lower point, it would be reasonable to believe that he had a great capacity for *mezza voce* and piano singing.

This aria shows that Nourrit was truly a remarkable tenor capable of the greatest of singing. It's no wonder that he was so highly acclaimed during his reign in Paris, which makes his downfall even more sad. He was clearly capable of tremendous vocalism and deserved his place in history as one of the greatest tenors. His skilful singing demonstrates an evenness of tone that would be the zenith of 'pharyngeal voice' singing. Training with Garcia (snr.) as a young singer in Paris would have given him a fine 'pharyngeal voice' technique.

Rossini: Guillaume Tell (1829)

Guillaume Tell premiered in Paris on 3 August 1829 in which the tenor Adolphe Nourrit, arguably one of the most famous French tenors of the mid-19th century, debuted in the role of Arnold.⁴⁶² It would be Rossini's last opera, and perhaps his greatest work for the stage.⁴⁶³ It is possible to hear the prefiguration of both Verdi and Puccini at times throughout this aria section 'Amis, amis, secondez ma vengeance'. Rossini's ability to hear the future of the art form would lead him to reject the nascent aesthetic and to stop writing opera altogether.

Case Study 16: Act IV.i & ii, aria 'Asile héréditaire' ... 'Amis, amis, secondez ma vengeance'—Adolphe Nourrit

⁴⁶² Osborne, *Bel Canto Operas*, 1994, p. 132.

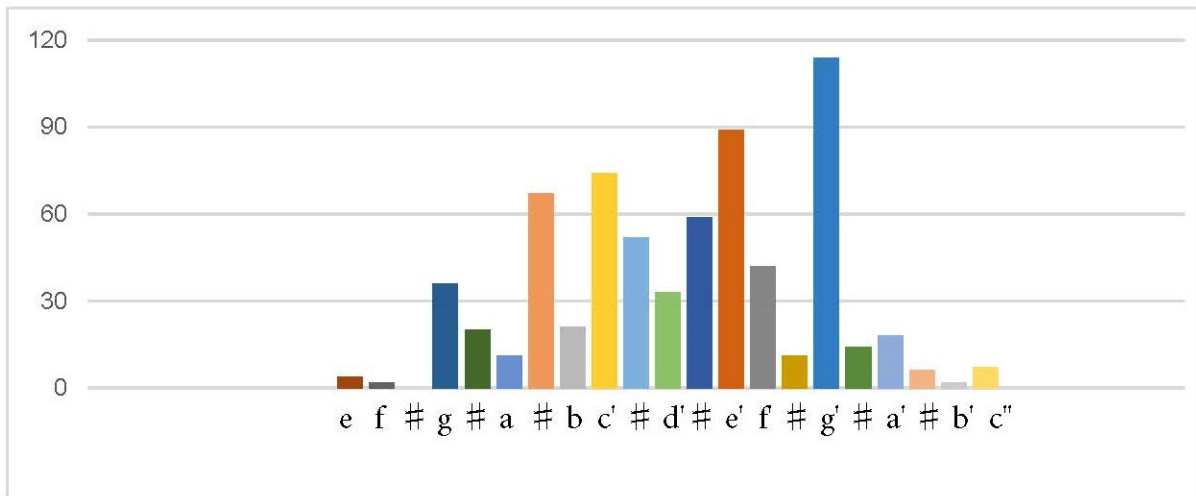
⁴⁶³ *Ibid.*, 135.

Aria	'Asile héréditaire' ... 'Amis, amis, secondez ma vengeance' [Act IV.i & ii]
Composer	Gioachino Rossini
Opera / Character	<i>Guillaume Tell</i> / Arnold
Premiere	3 August 1829 (Salle Le Peletier of the Paris Opéra, Paris)
Tenor	Adolphe Nourrit
Fach	Tenore Serio (previously contraltino)
Range / Tessitura	e natural to c'' natural / b flat to g' natural

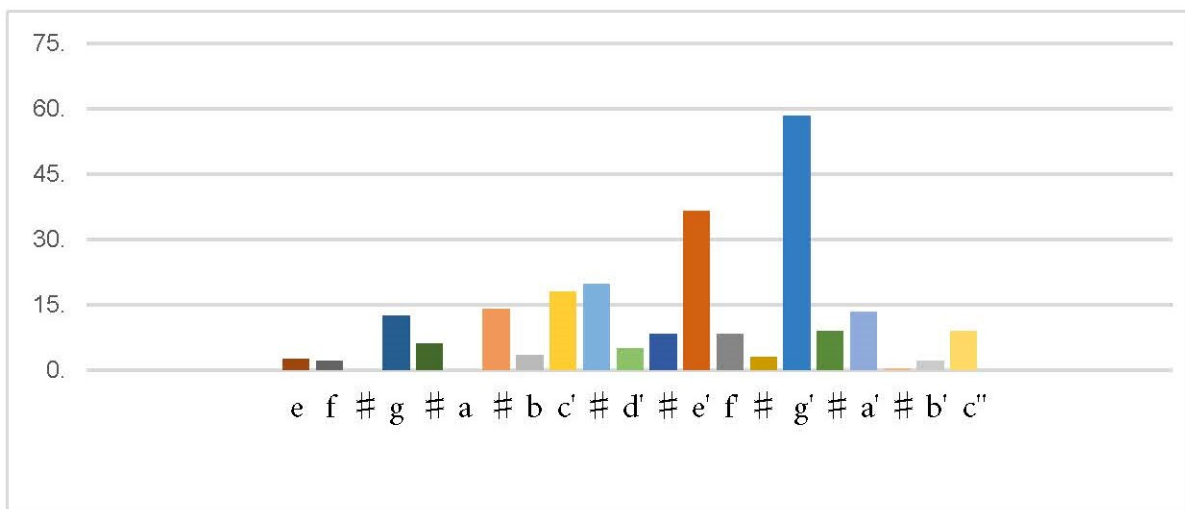
The aria 'Asile héréditaire' would set off a chain of events that saw Nourrit supplanted as *primo tenor* in Paris by Gilbert Duprez and would eventually lead to his apparent suicide in Naples 10 years later. It was Duprez who altered the course of musical history with the 'chest voice' high c'' natural that changed not only the life of one tenor, but also influenced all tenors succeeding him. This is not a discussion of Duprez and the ensuing palaver, but instead focuses on the aria itself and what Nourrit would have done when in 1829 the fashion for the 'pharyngeal voice' was already fading.⁴⁶⁴ Arnold is a stunningly difficult role which few tenors take up. It has '456 [g' naturals], 93 [a'] flats, 54 [b'] flats, 15 [b' naturals], 19 [c'' naturals] and 2 [c''] sharps'. Even Luciano Pavarotti 'refused to make his debut at La Scala as Arnold, claiming that the role would have ruined his voice'.⁴⁶⁵ Arnold's principal aria alone has over one hundred g' naturals.

⁴⁶⁴ The literature review contains an overview of the works dedicated to Duprez, the chest voice high c'' and the changing attitudes toward the tenor voice.

⁴⁶⁵ Osborne, *Bel Canto Operas*, 1994, p. 132.



Graph 16 A – Gioachino Rossini, 'Asile héréditaire' ... 'Amis, amis, secondez ma vengeance' (Arnold), Guillaume Tell, Occurrence of individual pitches.



Graph 16 B – Gioachino Rossini, 'Asile héréditaire' ... 'Amis, amis, secondez ma vengeance' (Arnold), Guillaume Tell, Duration of individual pitches sustained for one minim or longer.

The aria is set up in a *cavatina cabaletta* style in which the main melodies are repeated twice in each section.⁴⁶⁶ The *cavatina* section 'Asile héréditaire' is marked *piano* except where the melody rises above staff typically to a' flat or b' flat when Rossini creates crescendos to *forte*. The *cavatina* alternates between long unbroken legato lines of four measures with short two or three beat phrases punctuated by eighth or sixteenth-note rests. The lines require both slow ascents sometimes with entire measures on one pitch, and wide interval leaps of up to an octave into the upper register. The *cavatina* never requires a note below g but does contain an *a piacere* high c'' natural.

As with most of the other repertoire discussed, most of the notes of the upper register are reached by interval. While there are many high c'' naturals in the aria they are approached using either an interval with a linguistic break such as the glottal 'G' in Guillaume, several even have staccato markings deliberately breaking the line. There are however two distinct exceptions. One phrase which is repeated begins on g' natural and ascends the scale to c'' natural slowing from quarter-notes to half-notes once it reaches the upper register at g' natural and finally resting on a sustained top c'' natural for six beats, in a very similar fashion to 'Grand Dieu faut-il qu'un peuple qui' from *Le siège de Corinthe*.

The image shows two staves of musical notation. The top staff is labeled 'Arnold' and the bottom staff is labeled 'A.'. Both staves are in 4/4 time and G major. The Arnold staff begins with a treble clef and a common time signature (C), then changes to 4/4. The melody starts on G4, moves to A4, B4, C5, and then has a wide interval leap to G5. The lyrics 'per noi Gu - gliel - mo non mor - rà' are written below the staff. The A. staff begins with a treble clef and a common time signature (C), then changes to 4/4. The melody starts on G4, moves to A4, B4, C5, and then has a wide interval leap to G5. The lyrics 'no, Gu- gliel - mo non mor - rà' are written below the staff.

Example 16 – Gioachino Rossini, 'Amis, amis, secondez ma vengeance' (Arnold), *Guillaume Tell*, pp. 502 & 504;

(The text in the critical edition is Italian and not the original French.)

⁴⁶⁶ In the main tenor aria Arnold is contemplating the dilapidated and abandoned house of his childhood in Altdorf Switzerland. He thinks of his father who was killed by the Austrians. He hears his confederates approach lamenting that William Tell is being held prisoner at fort Küssnacht, and in his cabaletta 'Amis, amis, secondez ma vengeance' Arnold rouses them to follow him to save Tell. Rossini, G. *Guglielmo Tell*, PV score Parenti, M. (ed.), (Milan: Ricordi, 1961), pp. 486–505; Osborne, *Bel Canto Operas*, 1994, pp. 134–5.

The line does not finish after the top c'' natural as it is tied with a bar to the subsequent measure for a minimum of another five beats. The tempo is *allegro*, but the line is still very difficult and leaves a question as to how it was achieved. So far, the analyses have shown a preference to jump into the upper register by interval rather than a legato line and for the most part this is the case with this aria, however this line would require not only extraordinary breath control but the ability to sing a legato line an octave and a fifth into the highest register of the voice.

To decide whether this violates what has been thus far discussed, a brief comparison of the Italian version and some contemporary performance practice can be helpful. The Italian text is very different from the French in that the French is syllabic on all melodic notes up to the c'' natural while the Italian text stops at the g' natural with the word '*morra'*' allowing the singer to continue on the vowel [a], but many tenors will instead take this opportunity to breath and say '*no, non morra'*' continuing the syllabic nature of the line as in the French phrasing.⁴⁶⁷ But if the French has a line that is ostensibly legato to the top, would that mean there is no register switching involved? I would suggest that Nourrit would have switched around a' natural where his normal vocal register change occurred but using the language to help just as modern tenors do.⁴⁶⁸ Nourrit would have been able to avoid the awkward shifting by breathing before the word '*arrachons*' allowing him to switch registers more simply and to have enough breath to carry the line through. Some tenors even ignore the phrasing markings and breathe after the c'' natural regardless. So, it would seem that generally speaking a tenor could still have a register shift into the 'pharyngeal voice' while maintaining the integrity of the full voice in the lower part of the line. Rossini would not typically ask this of the tenor very often in the works discussed.

While this aria does not have a particularly wide range, e natural to c'' natural, the tessitura could be considered quite high. There are no fewer than 114 g' naturals and the value of the sustained notes is nearly 60 beats. That is almost twice the second most frequent pitch of e'. Entire sections of the aria sit predominantly above the staff, dipping down only for one or two beats at an instance. Both graphs of sustained and individual

⁴⁶⁷ Rossini, *Guglielmo Tell*, 1961, pp. 502 & 504; Luciano Pavarotti singing the Italian version '*O muto asil del pianto*' is a typical example of the phrasing at 8'23'', <https://www.youtube.com/watch?v=VXIhrkvqDck>

⁴⁶⁸ Bryan Hymel singing '*Asile héréditaire*' with typical phrasing at 8'19'' <https://www.youtube.com/watch?v=mnhHz6qtIM>

itches have the same shape. The higher the pitch up to g' natural the more like it is to be either sung or sustained. From that point there is a significant drop off.

Because of the even slope of the graphs, the tessitura for this is more difficult to discuss. Looking at the graphs one would assume that the top note of the tessitura was clearly g' natural and the lower end might be as low as g natural, but that does not really give an adequate representation of the tessitura. Because the graph is so skewed toward the g' natural it would be more helpful to artificially skew the tessitura by almost a whole tone to compensate for the disparity, which would make it quite clear how very high this aria is.

It would be easy to think of this type of high singing to be the domain of the *contraltino* or of the modern *leggiere* tenor but that would not necessarily be the case.⁴⁶⁹ Nourrit was a heavier tenor: some have gone as far as to call him the first dramatic tenor.⁴⁷⁰ As a *tenore serio*, like his teacher Manuel Garcia (snr.), he would have had a baritonal voice quality and fuller sound. His upper register was strong and piercing, but the upper reaches were still in 'pharyngeal voice' not full voice. It was this sound that would distinguish him from Duprez. This is one Rossini role that has held the character of the *tenore serio*. As previously discussed, Almaviva in *Il Barbiere* is now mostly sung by *leggiere* tenors rather than the fuller sound of the *tenore serio*. It would seem though that for many modern tenors who do not have access to the 'pharyngeal voice', the heavier *bel canto* repertoire is out of reach.

⁴⁶⁹ Kosowski, R. *A survey of voice teachers' perceptions of and the characteristics used to identify the leggiere tenor voice* (Dissertation: Univ. of Houston, 2008).

⁴⁷⁰ Pleasants, *Nourrit*, 1995, p. 3.

Towards a Conclusion on the Vocal Quality of the ‘Pharyngeal Voice’

One of the main objectives of this section has been to discover what the greatest of this generation of tenors may have sounded like and to identify some of their particular vocal qualities that might inform a subsequent reconstruction of the extraordinary vocal technique and style that they pioneered and mastered. It must be said that when evaluating or comparing singers, no two voices will be identical, but if there is to be a reconstruction there must be a basis of generic characteristics upon which to build. The following section relies on the reported vocal qualities of the five tenors investigated. While complete synthesis is not sought, a direction toward a particular precept or model is: reconstructing a ‘lost’ vocal quality which has some uniquely identifiable patterns is possible.

Discussion of the *Contraltino* in Garcia’s Works

The Contraltino Voice (*Counter-Tenor*) [*sic*]: This, the highest male voice, possesses a clear, light quality, and has almost the same compass as the female contralto, extending from [d, e, f to b’ flat, b’ or c’]. In this voice, the chest register is most easily allied with that of the *falsetto*, although it is thinner and more effeminate than any of the other male voices; *it differs essentially from the head register, which must be exclusively reserved for the female voice.* [Emphasis added]⁴⁷¹

In the English edition of Garcia’s *Traité complet de l’art de chant, the New Treatise on the Art of Singing*, published in 1857, Garcia describes the *contraltino* voice as ‘the highest male voice, [which] possesses a clear, light quality, and has almost the same compass as the female contralto.’⁴⁷² The voice type is further defined as having a chest voice that is more easily blended into the *falsetto*, or mixed voice, than the lyric tenor. Additionally, the *falsetto* and the head voice ranges of the *contraltino* are virtually identical to that of the lyric tenor. It is only noted that in the *contraltino* sings slightly higher in chest voice.⁴⁷³

In this English version of the *Traité*, however, the terms *haute-contre* and *contraltino* are translated into English as ‘countertenor’. The following discussion shows how this

⁴⁷¹ Garcia, *New*, c. 1870, p. 9.

⁴⁷² Garcia, *New*, 1870, p. 9.

⁴⁷³ *Ibid.*

translation conveys a fundamentally different understanding of the voice type than the other language treatises. While ‘countertenor’ may have been an accurate translation linguistically, it does not adequately convey the likely vocal quality of *contraltino*.⁴⁷⁴ Simply put, while possibly having technical similarities, this dissertation argues that neither the *contraltino* nor the *haute-contre* voice types resemble the modern countertenor in vocal quality. This historical shift in meaning has led to a consistent misunderstanding of ‘high tenor’ singing.

Because the Italian and French languages are more closely allied, the translation into 1842 Italian is much more consistent with the French and communicates the essence of vocal quality more faithfully. The unfortunate English translations, however, may have influenced a historical misunderstanding of these voice types. As difficult as the English translations are (below), they do lead one to assume that the *contraltino* is a sound *akin* to the pure falsetto sound, and therefore, potentially, an undesirable way for a tenor to sing.

If the English, French, Italian, and German translations are compared, the assumption that the *contraltino* is a countertenor is shown to be less than reasonable. The French text reads:

Haute-contre (Contraltino) : Dans ces voix, le registre de poitrine se marie fort bien avec la voix de fausset; mais, quoique plus mince et plus efféminé que toutes les autres voix masculines, il forme une disparate avec le registre de la voix de tête exclusivement réservé à la femme.⁴⁷⁵

The translation of the first sentence is not particularly in question, and adequately represents the voice types. However, the final dependent clause of the second sentence is where problem lies: ‘*il forme une disparate avec*’ translates literally as: ‘it [the head register] forms a disparate with [to/from].’ It is possible to translate ‘disparate’ directly into English as a noun meaning ‘things so unlike that there is no basis for comparison,’ however it is not normally used this way in modern English.⁴⁷⁶

⁴⁷⁴ It must be acknowledged here that, as John Potter points out, Manuel Garcia (jnr.) ‘approved his English students using the translation of his treatise (even if he did not himself translate it) means that our understanding today need not be filtered through possible misunderstandings of the original French.’ However, the crux of the discussion here, is more of a misunderstanding than a mistranslation. Furthermore, it can hardly be said that a single dependent clause concerning a predominantly extinct voice type would undermine the authority of the translations as a whole. Potter, ‘Beggar’, 2006, p. 529.

⁴⁷⁵ Garcia, *École*, 1847, p. 22.

⁴⁷⁶ Oxford Dictionary Website: www.oxforddictionaries.com/definition/english/disparate accessed 8 March 2014.

The question then becomes: to what is the *contraltino* head voice so unlike? Is it the natural tenor voice, or something else? The subordinate clause of the sentence is simply '*le registre de la voix de tête exclusivement réservé à la femme*' ['the head voice exclusively reserved for women.']. It is important to note that in the French there is no comma separating the clauses as there are in both English translations. This indicates that the phrase concerning head voice being reserved for women is directly related to the first part of the sentence and not a secondary thought. Therefore, a better translation might be: 'In these voices the chest register pairs well with falsetto; but, although thinner and more effeminate than any other male voices, the head voice is completely different ['forme une disparate'] from that which is exclusively reserved for women.'⁴⁷⁷

A comparison with the Italian version substantiates this translation; published in 1842, gives the sentence as follows:

Contraltino (Haute-Contre): In queste voci, congiungersi a perfezione il registro di petto con quello di falsetto; ma a benché più sottile e più femminino che in tutte le altre voci d'uomo, quest'ultimo ha una diversità di carattere col registro di testa, il quale è riserbato esclusivamente alla donna.⁴⁷⁸

The first sentence is nearly identical to the French, but the second is even clearer in translation: 'quest'ultimo ha una diversità di carattere col registro di testa' - '[the former] has a diversity of character to the head register' 'il quale [from that which] 'è riserbato esclusivamente alla donna' [is reserved exclusively for women]. While this translation includes the comma as in the English, *il quale* [which] clarifies the relationship. Therefore, the following translation is more reasonable: 'In these voices the chest register joins the falsetto to perfection; but, although thinner and more feminine than in all the other male voices, this latter has a different character to the head voice which is reserved exclusively for women.'⁴⁷⁹

In the 1870 English translation above, Garcia indicates that the *contraltino* is the same as an [English] countertenor. This fundamental assertion could lead one to the conclusion that the upper register of the singer has the vocal quality of a contralto. The

⁴⁷⁷ Translated from French by the author.

⁴⁷⁸ Garcia, M. *Scuola di Garcia: Trattato completo dell'arte del canto pt. 1*, Mazzucato, A. (trans.), (Milano: Ricordi, 1842), p. 6.

⁴⁷⁹ Translated from Italian by the author.

second sentence would then qualify that statement by insisting that the vocal quality is effeminate and that the head register is somehow different, or changes from the head register, which correspondingly must be ‘exclusively reserved for the female voice’.⁴⁸⁰ These three elements could naturally lead one to conclude that the vocal quality of the ‘pharyngeal voice’ was one aligned to the alto sound. It would not be reasonable to infer from this description that the *contraltino* sounded like a high tenor. Rather, it would be perfectly reasonable to understand the *contraltino* as the same as what might be today called a countertenor.

A more recent English translation from 1984 by Donald V. Paschke also affirms the *contraltino* as a countertenor.

Counter-Tenor Voice.

The highest voice of the man. This clear and nimble voice, whose range is the same as that of the contralto voice, and is composed of the same cords, extends from In this voice, the chest register blends very well with the falsetto register, but,



Illustration 6 – Garcia, *Vocal Range, Complete*, 1984, p. 21

although more thin and more effeminate than all the other masculine voices, it blends poorly [*forme une disparate*] with the head register, which is exclusively reserved for the woman.⁴⁸¹

In this version, the first sentence has its own difficulties, but sheds no light on the question of vocal quality. By ‘composed of the same cords’ it may be argued that Paschke was assigning a similar vocal production to both the contralto and the *contraltino*: but there is no context to assess that statement. The second sentence, however, is more relevant. The linguistically difficult translation ‘it blends poorly [*forme une disparate*] with the head register, which is exclusively reserved for the woman’ does not offer clarity. One cannot be clear as to what ‘it blends poorly with the head register’ means and is perhaps another symptom of the general misunderstanding of the *contraltino* voice.

⁴⁸⁰ At this point it is important to understand that the *head register* is the highest register in both the male and female voices which typically resembles the *falsetto* vocal quality in men. A fuller description follows in the section on registers found later in this chapter.

⁴⁸¹ Garcia, *Complete*, 1984, p. 21.

What is clear is that Paschke reaffirms that the head register is ‘exclusively reserved for the women.’ The reasonable assumption is that the timbre is not suitable for a male singer, perhaps because it implies a ‘male alto’ sound which, aside from the modern countertenor, is not, nor was, used in opera. The difficulty in reconciling the subject and predicate of this sentence offers insight into reevaluating the vocal quality of the ‘pharyngeal voice’. However, Garcia only discusses the *contraltino* in his section on voice types so there is no other way to contextualize the translation within his other works.

There exists also a French and German parallel translation from 1841 which makes mention of the haute-contre voice. The discussion is set up similarly to the other versions, with a brief description of the vocal qualities and a comparison between the falsetto and chest voice. There is virtually no variation from the previous translations in the first half, but the German version is very clear concerning the quality of the head voice: ‘so findet doch zwischen ihm, und der den Weibern ausschliesslich vorbehaltenen Kopfstimme, ein grosser Unterschied Stall [there is a great difference between it and the head voice that is reserved exclusively for women.].’⁴⁸² There is very little doubt in the German translation as to whether the *contraltino* head voice sounds like the female head voice. Only the English versions imply that the ‘pharyngeal voice’ head register quality may be similar to that of a female alto. There is strong linguistic evidence that the vocal quality of the ‘pharyngeal voice’ is indeed more similar to that of a high tenor than a countertenor (i.e., a male falsettist).

Garcia clearly confirms both that the *contraltino* uses *head voice* as the highest register and has a vocal quality significantly different from the head voice used by women. Furthermore, he implies that if a lyric tenor were to sing in his head voice, the resulting vocal quality would be essentially different from that of the *contraltino*, a vocal quality described later in Section III as ‘whoop timbre’. Unlike the *contraltino*, when a lyric tenor enters his head voice, the vocal quality would be similar to that of a contralto. Therefore the quality of the *contraltino* ‘pharyngeal voice’, while being generally more effeminate in character overall, retains the vocal quality of a natural tenor to the highest pitches of head

⁴⁸² Garcia, M. *Garcias Schule oder Die Kunst des Gesanges* (Mainz: B. Schotts Söhne, 1841) p. 11. ‘Diese Stimmen sind klar dünne durchdringend. Ihr Umfang ist derselbe wie jener der Altstimmen, und geht Bei diesen Stimmen eint sich sehr gut Brustregister mit Falsett; und obgleich dünner, weibischer als alle anderen Männerstimmen, so findet doch zwischen ihm, und der den Weibern ausschliesslich vorbehaltenen Kopfstimme, ein grosser Unterschied Stall.’

register. By translating the term as *countertenor*, subsequent translations have become distorted and do not represent either the quality of the voices or the intentions of Garcia, leading to current misunderstandings.

Garcia makes a clear distinction between voice quality and voice register. This is because a register may produce a wide variety of sounds that can be similar in quality to one register, but formed in another. Similarly, Garcia was aware that with the *contraltino* voice, the head register of which is normally reserved for the female singer, produces a sound that is *not* consistent with female sound, but instead produces one that is entirely different [*disparate*].⁴⁸³ The concept of a physiological difference between registers, and an understanding that the mechanism responsible for that register may be altered to produce a sound wholly different from the tones native to that register, will form the basis for an investigation into how the modern chest / falsetto register (*head* register in Garcia) can produce a sound that is tenor-like, and not contralto-like in quality.

As previously shown, the discussion of the *contraltino* (*haute-contre*) was included in the various versions of Garcia's treatises until 1870; however, this is not the case in the subsequent works. The last vestiges of the *contraltino* voice found in Garcia after the 1870 English treatise discussed above are vaguely alluded to in illustration 6.

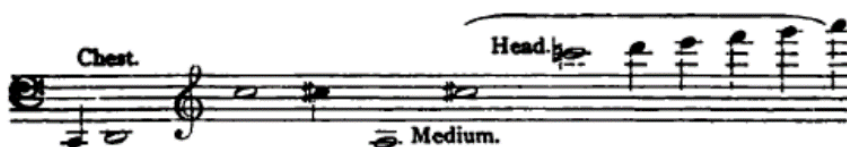


Illustration 17 – Garcia, 'Table of Human Voices', *Hints on Singing*, 1894, p. 11

Caption reads: "This 5th is very rare, and when not spontaneous must never be attempted."

This illustrates the range of the tenor and is indicated as head (register). The caption for illustration 6 in the treatise cautions that the top fifth of the voice is very rare and when the *head voice* is not spontaneous it should not be attempted.⁴⁸⁴ This suggests that by 1870 the *contraltino* voice had virtually disappeared as a vocal category and was so remote from

⁴⁸³ Garcia, *École*, 1847, p. 22.

⁴⁸⁴ Garcia, M. *Hints on Singing*, Garcia, B. (trans.), (London: Ascherberg, Hopwood and Crew, Ltd., 1894), p. 11. By *spontaneous*, Garcia means that unless the tenor can access the *head register* naturally without any problems, he should not attempt to sing in that register. This would also indicate that the ability to teach (or learn) this form of singing was either lost, impractical or impossible.

contemporary music or vocal pedagogy as to not merit detailed discussion. It would also suggest that it was believed to be unteachable, and therefore an effort to produce a systematic pedagogy would not have been anticipated.

Salvatore Marchesi does not discuss specifically how the ‘pharyngeal voice’ is produced, but he does offer a brief description of the *contraltino* voice:

The Contraltino, or Haute-contre, has no chest-register. His Medium begins with his deepest tone, and goes up to [g or a] in consequence of the smooth quality of his voice, the contraltino can very easily sing falsetto through the medium range, and go very far beyond its limits. Such voices are particularly abundant in England, where they are employed in the choruses of Handel's oratorios, as already mentioned.⁴⁸⁵

His description varies decidedly from that of Garcia, who described their *chest voice* as being relatively coeval to that of a lyric tenor. Garcia considered the major difference between the tenor and the *contraltino* not to be in overall range, but rather in that the *contraltino* voice has a head voice that was developed to match their central register.⁴⁸⁶ It would seem that Marchesi is under the impression that the *contraltino* was purely a form of *countertenor*.⁴⁸⁷

⁴⁸⁵ Marchesi, S., *A Vademecum*, 1902, pp. 42–3.

⁴⁸⁶ Garcia, *Complete*, 1984, p. 21, Note that this is based on a translation of the French by the author of this review.

⁴⁸⁷ The word ‘countertenor’ as it is used today is a relatively recent development that does not go back much before Michael Tippett used it to describe Alfred Deller’s voice in the 1950s. Alfred Deller was a male choral alto at Canterbury Cathedral. He and Tippett met in 1943 when Deller was already 39 years old. Tippett felt that in ‘Deller’s voice he had at last found the true Purcellian counter-tenor’ (cited in Ravens, *Supernatural*, 2014, p. 2. Countertenors are regularly referred to in nineteenth-century English sources, as in the Garcia when discussing English vocal music such as Handel or Purcell. Speaking of the English musical tradition, A. K. Holland says that ‘the male alto (or counter-tenor) is a real voice and a traditionally English one [...] [and] was a very popular solo voice in Purcell’s day.’ Holland, A. *Henry Purcell: The English Musical Tradition* (London: G. Bell and Sons, 1932), pp. 124–5. However, the idea that the singers of the high tenor parts in Purcell were countertenors (falsettists) has been conclusively refuted by, among others, Andrew Parrott; see Parrott, ‘Falsetto Beliefs: The ‘Countertenor’ Cross-Examined’, *Early Music*, 43 (2015): 79–110. Simon Ravens draws on the *falsettist* traditions to help frame and understanding of the countertenor voice, but in the end posits that ‘any attempt to define the ‘true’ counter-tenor as a single historical entity is always likely to be futile.’ (pp. 4–5). For more on Alfred Deller see: Beghelli, M. *Ermafrodite armoniche : il contralto nell'Ottocento* (Varese: Zecchini, 2011); Clapton, N. ‘The singularity of Alfred Deller (1912–1979)’, *Early Music*, 40(2) (2012): 291–6; Ravens, *Supernatural*, 2014, esp. Chapter 1 and Extempore 6; Michael and Hardwick, M. *Alfred Deller: A Singularity of Voice* (London: Proteus, 1980). There is greater scope for studying how the nineteenth-century counter tenor may have differed from the modern countertenor. Perhaps during Garcia’s time, the countertenor was a ‘pharyngeal voice’ tenor and therefore truly the equivalent of the contraltino. However, it is precisely this comparison that causes confusion. If it is the sound of the modern English countertenor voice, which evolved from the English choral tradition, that changed and is in fact not related to the countertenor of Handel or Purcell, then the comparison may be valid.

Neither the *contraltino* nor the *haute-contre* as they will be shown to have been throughout this work could be said to have been common in England at the turn of the twentieth century as suggested by Marchesi, and would certainly not have been appropriate for Handel oratorios, as the modern English countertenor [falsettist] would have.⁴⁸⁸ It would seem that by the early twentieth century the *contraltino* voice was so remote and the misunderstandings about the voice had taken such firm root that this vocal type is essentially lost to history.

Had the *contraltino* sounded like a countertenor or choral alto and not a tenor, perhaps Garcia would have included them in with a different voice type. Having included them with tenor voices should give added weight to the nature and quality of their voices as being homogenous with that of the tenor, rather than that of the countertenor.

The Resonator of the Falsetto in the male voice is the Pharynx, formed of muscles and cartilages like the Medium's Resonator, against which the tone-waves strike ; whilst the Uvula, elevating and contracting itself, closes the way to the cavities of the nose. Consequently, the sounds of the Falsetto are as smooth and soft as those of the medium. A man, by the same procedure, can produce the Head-tones exactly as a woman does; but their timbre is too sharp, as already stated, and consequently heterogeneous to the color of the Medium, while the Falsetto is more homogeneous to it.⁴⁸⁹

Marchesi indicates that the timbre of the *falsetto* is homogenous with the medium voice. This is one of the clearest descriptions found in the treatise of the vocal quality of the historical *falsetto* register and offers a unique and clear understanding of the timbre of the *falsetto* voice. By indicating that the *falsetto* has the same (homogenous) vocal quality as the chest voice, this demonstrates for the first time that it is not in fact the same as the modern understanding of *falsetto*.

The confirmation that the falsetto is more alike in timbre to the medium and therefore the chest voice, adds credence to the translation issue described earlier when discussing vocal quality. It has become much clearer that the sound of Garcia's falsetto has chest voice, or modal, qualities; and it is reasonable to assess the vocal quality of *contraltino* and *tenore serio* singers as sounding like tenors, rather than 'modern' countertenors.

Marchesi also suggests that some tenors have the ability to alternate between medium and falsetto in the same region, and that when they sing b' natural or c'' natural

⁴⁸⁸ Marchesi, S., *A Vademecum*, 1902, p. 30.

⁴⁸⁹ *Ibid.*, 29–30.

they can produce their head register tones ‘as keen and crystalline as that of the chest-tones, in accordance with the similar physical texture of the bony (cartilaginous) resonance-walls.’⁴⁹⁰ Here he appears to support the idea that there are indeed tenors who can sing in head register with chest register qualities. He however does not necessarily associate those tenors with the *contraltino*. This may be because he associates them with countertenors and the English tenor instead. Perhaps, because his work was published in 1902, he was so far removed historically from the true sound of the ‘pharyngeal voice’ that he was unable to recognise it. Garcia would have been in a much better position to understand the ‘pharyngeal voice’, because his father had been a major practitioner.

Vocal Quality: A Proposal

Overall it would appear that many of the operatic tenors of the period under consideration, predominantly *tenore serio*, were described as having ‘bright’ or ‘brilliant’, ‘powerful’, and sometimes even ‘harsh’ voices.⁴⁹¹ The three *tenore serio*, Garcia, Nozzari and Nourrit, were each individually described as having a harsh or forceful quality to their voices.⁴⁹² David was described as having a brilliant voice.⁴⁹³ It was only Rubini’s voice that was described as being somewhat veiled in quality, but still vibrant and warm.⁴⁹⁴ Aside, from this veiled quality of Rubini’s voice, which could be explained by resonance tuning, it would seem that the ‘pharyngeal voice’ has a characteristically bright sound, or ‘vibrant’ as in Rubini’s case. The two *contraltino* tenors seem to have been less ‘harsh’ or forced, and perhaps this is a difference in the balance of chest and falsetto registers, with the *tenore serio* utilising more chest register and the *contraltino* using more falsetto register in the ‘pharyngeal voice’ mix. This is ultimately unknowable but can influence choices made in the reconstruction depending on the voice of the individual singer.

One element that seems to be common to all is evenness of registration. Their ability to move easily between chest and falsetto registers is an important feature to consider in

⁴⁹⁰ Ibid., 28.

⁴⁹¹ Garcia see Radomski, J. *Manuel García (1775–1832)*, 2000, p. 136, *Allgemeine Musikalische Zeitung* (29 Jan. 1817), pp. 83–4, 87; Nozzari see Forbes, ‘Nozzari’, 1997; Nourrit see Celletti, *History*, 1991, p. 167; David see Celletti, *Voce*, 1989, p. 104.

⁴⁹² Garcia see *Allgemeine Musikalische Zeitung* (29 Jan. 1817), pp. 83–4, 87; Nozzari see Forbes, ‘Nozzari’, 1997; Nourrit see Celletti, *History*, 1991, p. 167.

⁴⁹³ Celletti, *Voce*, 1989, p. 81

⁴⁹⁴ *The Musical World*, p. 431; Celletti, *Voce*, 1989, p. 104.

reconstruction. This ability would imply that the vocal qualities of chest and falsetto must have been similar enough, or mixed well enough, to avoid detection, but it also leads to a question about how much chest register was used and how high up singers took it. With Garcia, David and Rubini, it is difficult to know up to which note they tended to sing in chest voice, but it is asserted by Celletti that the *tenore serio* voices, like Nozzari and Nourrit, could take the chest to g' or possibly a little higher before switching to falsetto.⁴⁹⁵

Garcia, David, and Rubini are all described as having sung to high c'' natural in chest register.⁴⁹⁶ It is unlikely that they actually sang c'' natural in full, unmodulated chest register – something effectively physically impossible – but it is interesting to note that they may have sung in something akin to a chest voice quality, and this would support the idea that in certain circumstances, the falsetto register can have similar qualities to the chest register.⁴⁹⁷ One must assume though that their high c'' natural was sufficiently bright and similar in timbre to the other singers, but lacked the vigour and power of what was perceived in the other voices as chest. Or, it is possible that the other tenors sufficiently modified the mix of registers to allow for their high c'' natural to have more of a chest quality. Garcia and Nozzari were both notable for their power so there may have been something distinctive about Garcia voice or his technique which allowed him to perform the high c'' natural in chest voice and not Nozzari.⁴⁹⁸

As is seen in the previous section, the high c'' natural is not nearly the highest note sung by any of these tenors. Each one can be shown to have been required to sing to at least d'' natural and both David and Rubini are reported to have sung much higher: David is said to have sung to a'' natural or b'' flat.⁴⁹⁹ It was also recorded in *The Musical World* that in the opera *Roberto Devereux*, Rubini climbed to g'' natural.⁵⁰⁰ Carozzi says of Rubini that he was able to integrate these extraordinary notes 'without this prodigious extension occasioning any disadvantage to the smoothness and homogeneousness of his voice'.⁵⁰¹ It

⁴⁹⁵ Celletti, *History*, 1991, p. 167; Celletti, *Voce*, 1989, p. 107; Celletti provides no supporting evidence for this assertion.

⁴⁹⁶ Celletti, *Voce*, 1989, p. 109; Zucker, 'Last of a Breed', 1982, p. 12; Garcia, *École*, 1847, p. 22.

⁴⁹⁷ Celletti, *Voce*, p. 90.

⁴⁹⁸ Ebers, *Seven Years*, 1828, p. 191; Celletti, *Voce*, 1989, p. 90, 'una notevole potenza'; Carpani, *Rossiniane*, 1824, p. 159.

⁴⁹⁹ Castil-Blaze, *L'Opéra Italien*, 1856, p. 395, 'C'est un chanteur de la nouvelle école, plein de manière, d'affectation, de clinquant, abusant, comme Martin, d'un instrument superbe et d'une prodigieuse étendue (trois octaves comprises entre quatre si bémol).'

⁵⁰⁰ *The Musical World*, p. 431.

⁵⁰¹ Zucker, 'Last of a Breed', 1982, p. 12.

would seem that these tenors had exceptional ranges from as low as G natural up to high g'' natural in some cases. While this may seem unbelievable to a modern singer or pedagogue, I have in fact been able to reproduce this range in experiments at reconstruction.

Along with a wide range, these tenors were noted for their agility, some more so than others, but each to a very high degree of accomplishment. The repertoire requires agility from both the lighter and the heavier voices, and each tenor was notable in their execution of both rapid *fioritura*, as well as legato singing. The *contraltino* tenors tended to have the capacity for sustained agility slightly higher in the range than the *tenore serio* tenors; however, singers like Garcia and Nourrit seemed to be able to sustain a high tessitura in agility, but less so with syllabic singing.

Based on what is found in the notation alone, it would seem that there was very little not required of singers of this repertoire. Prominent features, however, are the prevalence of wide-interval leaps sometimes over an octave, all tenors needing to be able to sing to at least d'' natural and sometimes beyond, an even transition into the upper register and head voice, and a head voice that resembles the chest voice in some way as to not be confused with pure falsetto sound.

The repertoire suggests that the *contraltino* voices perhaps shifted into their upper registers two to four semitones higher than the *tenore serio*. This is likely a function of the heavier darker 'baritonal' qualities of the *tenore serio* voices, which may well have limited them to a shorter upper extension in head voice, as neither *tenore serio* were noted as having sung to the stratospheric high head voice tones of David or Rubini. Both voice types were, however, able, as has been shown, to sing legato up to high c'' natural, especially when having started in the upper register. It is however also the case that the *contraltino* tenors were able to sing legato in the upper register with more ease. Both types of tenors consistently used the downward cadenza and preferred upward leaps to the head voice but rarely used upward *fioritura* to sustained high notes, with the exception of *mezza voce*.

While the singers featured in this study were all at the highest levels of technical skill, the evidence suggests that there must also have been enough tenors capable of at least a reasonable standard in order to supply the numerous provincial opera houses in Italy and beyond in this extremely popular repertoire. There would have been a significant need for tenors throughout Europe capable, to a greater or lesser degree, of recreating the roles that had been created by the great singers examined above. What each of them must have

sounded like in practice is unknowable, but this exercise in reconstruction seeks to create a reasonable approximation of the technique that allowed them to flourish. To that end it is essential that a reliable working goal, a basis upon which to build the vocal quality, is decided upon.

Conclusion on the Nature of the 'Pharyngeal Voice'

In summary, for the most part it would seem that the voices were bright, although sometimes hard, possibly with the exception of Rubini. The *tenore serio* voices were both able to sing very loud and capable of singing baritone and even bass repertoire. All these singers had high ranges, with the *contraltino* tenors capable of singing beyond the written range in ornamentation that may have taken them as high as g'' natural or a'' natural, or possibly even b'' flat.

I have been persuaded by studying the admittedly scant evidence already cited that in some way for these singers there was a unanimity of sound between their falsetto and chest registers and that somehow they modified their falsetto to match the vocal characteristics of each register. However, the quality of the most extreme high notes of the historical tenors is not as clear.

As was just mentioned, Rubini was apparently able to create evenness in his highest notes without affecting the 'homogeneity' of his voice.⁵⁰² This would imply that while he was the tenor with perhaps the most 'veiled' quality of voice, which I would qualify as a voice with softer texture or a less-penetrating quality, it is probable that his upper extension also sounded similar to his chest voice. Garcia reports that Rubini sang to high c'' in 'chest' voice, and it would seem that he was able to maintain a homogenous sound into this extension, however it was actually produced.⁵⁰³ This is at odds with how many would assess the upper extension of the tenor voice, including John Potter, who describes it as 'pure falsetto', comparing the sound directly to that of the modern countertenor.⁵⁰⁴ For this reason, I think it is important briefly to consider what the sound may have been like and why there may be confusion concerning the differences between *contraltino* and the

⁵⁰² Zucker, 'Last of a Breed', p. 12.

⁵⁰³ Garcia, *École*, 1847, p. 22.

⁵⁰⁴ Potter, 'Tenor-Castrato', 2007, pp. 107–9.

modern countertenor.⁵⁰⁵ While it will always remain difficult to imagine what those extreme notes may have sounded like, several tenors who have taken part in the reconstruction in Section III are able to demonstrate exercises and repertoire that takes them to f'' natural, and three demonstrate to a'' flat in vocalise and repertoire.

Based on the historical evidence, I conclude that the 'pharyngeal voice' is not a single uniquely identifiable vocal quality, in the same way as a colour, register or timbre, but is rather a set of vocal characteristics that are produced as part of an integrated technique which encompasses and unifies different registers and timbres. Therefore, it results in a sound with an observable 'pharyngeal' quality rather than a separate register or timbre. When listening to a tenor using the 'pharyngeal voice', it is usually possible to identify whether the singer is combining it with chest voice, falsetto or head voice to achieve their vocal goals. Authors such as Celletti have used the term *falsettone* to describe the extraordinary high notes sung by the tenors who performed this repertoire. I have proposed that *falsettone* is in some ways equivalent to, or more precisely a function of, the 'pharyngeal voice'. In other words, the 'pharyngeal voice' is more than just the extreme vocal extension: *falsettone* is likely a product of the 'pharyngeal voice'.

⁵⁰⁵ For more on the countertenor see FN 479.

Section III – Historical Reconstruction

Introduction

Given that there are no recordings from the nineteenth century of practitioners of ‘pharyngeal voice’, much of the preceding part of the dissertation has been devoted to laying out the historical evidence for it. The remaining part of the dissertation and its accompanying examples constitute a consideration of whether, and how, this evidence can be used in the reconstruction of the technique by modern singers. The pedagogical materials might serve as a reference point for the future training of tenors in the use of ‘pharyngeal voice’.

The building blocks for this reconstruction are the concepts from the first section, which were clarified through the repertoire study in the second section, and these have then been applied to the training of individual tenor voices as part of my pedagogical practice. During the research process, several student tenors have undertaken training with greater or lesser degrees of success. Some were able to integrate the techniques in the development of a ‘pharyngeal voice’ production, while others were not able to do so. Examples of both successful and unsuccessful attempts are shown.

Because this research has been focused solely on the development of the ‘pharyngeal voice’, ‘mainstream’ modern vocal pedagogy (which is normally fundamental to any singer’s training) does not form a significant portion of the argument but does serve as a common framework for the relevant discussion.⁵⁰⁶ No digressions into contemporary vocal pedagogy are made to substantiate the techniques used in the reconstruction, in order to convince, as they need to stand on their own in their effectiveness. As might be expected, many of the techniques and resulting sounds diverge significantly from ‘normal’ contemporary standards, while others would be comfortable alongside most vocal training, in which case the difference in application is discussed. During the research I have identified several techniques that encourage the development of the ‘pharyngeal voice’ and I have

⁵⁰⁶ For the basics of vocal pedagogy see Ware, C. *Basics of vocal pedagogy: the foundations and process of singing* (New York: McGraw-Hill, 1997).

categorized them into four basic concepts, which I also apply more generally to vocal training: Respiration, Registration, Resonation, and Articulation. Each of these concepts group together separate elements of technique to help instruction and assimilation.

Each student is briefly introduced, to provide the reader with some context about their voice and their training, although no information that could be used to identify them individually is included. Information includes such things as age and some basic biographical information, including how training was carried out (live or via Skype, etc.); descriptions of their previous training and musical attainment; what their musical goals have been; and how the 'pharyngeal voice' has figured in their training.

A general discussion of the basic elements of techniques used in the research introduces the section about basic exercises, which provides background and general understanding of the principles and context used for the development of the 'pharyngeal voice'. Audio and video recordings demonstrate how the techniques are applied and to what extent they are effective for a variety of different tenors. Recordings demonstrate different stages in the students' development, in some cases over a period of years. Others demonstrate how these techniques might be applied to operatic repertoire or repertoire relevant to the student's own performance objectives.⁵⁰⁷ Following each exercise there is a discussion of what was being undertaken, how it has been applied, and what the observer should specifically listen for. Cues are given to help the listener identify where and when important vocal events occur.

The videos record my work in the teaching studio and demonstrate how register modifications throughout the vocal range can be manipulated to elicit a particular sound, timbre, or vocal function that in conjunction with breathing and resonance strategies, allow the tenor to access a type of vocal production which can neither be characterised as pure falsetto nor full chest register. Some elements are essential to the development of the 'pharyngeal voice' while others, like articulation, provide support for its use. The videos do not in themselves constitute the research, but rather document the application of my research findings in practice. Some outcomes occurred organically within singing lessons,

⁵⁰⁷ Several of the students are not 'classical music singers' but agreed to take part in the study with the understanding that the 'pharyngeal voice' techniques would help them to develop their own musical interests, which range from liturgical music to stage musical to pop music.

while others are 'staged' to illustrate particular concepts. Because it takes time and exposure to identify the 'pharyngeal voice', the purpose of these recordings is to aid the observer to identify each distinct vocal element and to note its characteristics at varying stages of development.

Where it aids in the identification of certain important moments in the course of teaching, brief observations about vocal acoustics and physiological causes are given. References to vocal acoustics are deliberately kept as simple as possible and require no specialist knowledge. Images and some data are included to help the reader make comparisons which might otherwise be difficult to recognise.

Without an in-depth scientific study involving computer-aided voice analysis, which is beyond the remit of this investigation, it is not possible to demonstrate empirically what is happening acoustically or anatomically. Also, because of the intricacies of human phonation, any specific details of the anatomical workings would remain uncertain. So information is provided in such a way as to offer possible explanations and investigative pathways for subsequent research, not to provide scientific certainty.

The 'pharyngeal voice' is not limited in style and has a wide application in contemporary performance practice: it need not be reserved only for historical performance practice or solely in the classical genres and is potentially useful in a variety of contemporary music styles as well. For this reason, some of the examples are of non-classical voice use, and some of the students presented here sing a variety of music using the 'pharyngeal voice'. This reconstruction seeks to establish and support the development of the 'pharyngeal voice' as an element of contemporary performance practice by contributing to ongoing developments in modern vocal pedagogy.

Hypothesis

The general working hypothesis of this research has been that 'pharyngeal voice' is a phonation based in the falsetto register but that also has acoustic characteristics of the chest register and can be used to extend the usable range of the tenor voice as well as form the basis for the characteristic florid and piano singing styles of late eighteenth- and early nineteenth-century Italian *opera seria*. It is my conclusion that the 'pharyngeal voice'

involves greater vocal cord contact than basic falsetto register, thereby giving the voice stronger, richer harmonics. Those harmonics are modified through a specific resonance strategy and produce the effect of the high tenor voice.

By analysing some of its basic elements — chest register, falsetto register, vowel, timbre, etc. — it is possible to compare different sounds objectively. For example, the sound of a tenor singing in falsetto voice can be compared to his singing with ‘pharyngeal voice’ or chest voice to see how they differ. Once the singer has discovered the mechanical principles associated with producing the ‘pharyngeal voice’, and developed them to a significant degree, they can begin to manage his resonance strategies effectively and efficiently.

It is important for both student and listener not to confuse the falsetto voice with ‘pharyngeal voice’. While they are both produced with the same fundamental laryngeal setting, this does not mean they sound the same. Falsetto has specific laryngeal characteristics and, like chest voice, can be described as having two sub-settings: abducted and adducted.⁵⁰⁸ Illustration 7 below entitled ‘Vocal Schematic’ shows the four main settings of the larynx with both adducted and abducted versions of chest register on the right and falsetto register on the left, top and bottom respectively.⁵⁰⁹ In each case it is possible to see the amount of vocal fold closure for each glottal setting. The image shows that the closed falsetto has only a very small opening at adduction, which means there is much more contact between the vocal folds than in the open falsetto. It is a fundamental assumption that for the upper extension of the ‘pharyngeal voice’ adducted falsetto register is used.⁵¹⁰ The increased contact between the folds increases the number of higher chest register sounding (modal) components.

⁵⁰⁸ In the recordings found here, these may be referred to as open or closed, respectively to make the terms more ‘student friendly’. Herbst, ‘Membranous’, 2011, pp. 2253–62.

⁵⁰⁹ It also shows which muscles are dominant, but a discussion of the muscles does not add to a greater understanding at this point.

⁵¹⁰ For this to be tested it would require subjects to undergo laryngoscopy, which is beyond the remit of the research. Any such evidence referred to is based on electroglottograph (EGG), acoustic and audio analysis, some of which was carried out in Alexander Mayr’s work with Johan Sundberg.

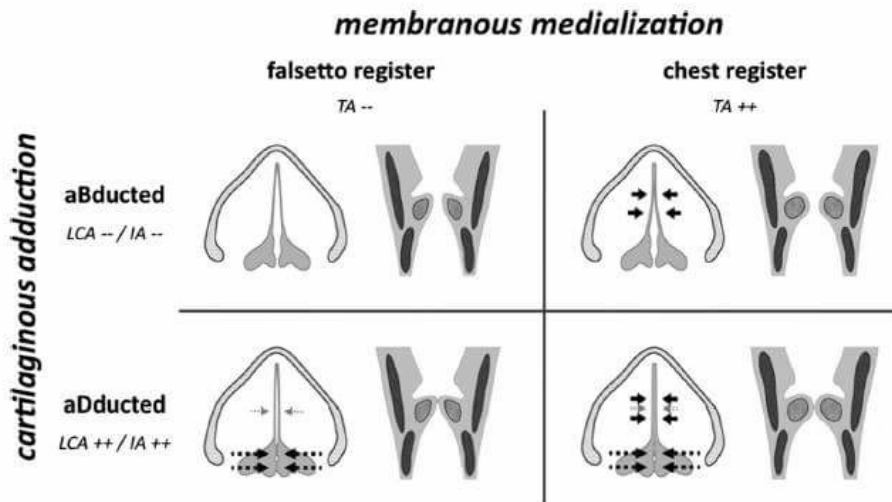


Illustration 18 – Herbst, *Vocal Schematic, 'Membranous'*, 2011, p. 2260

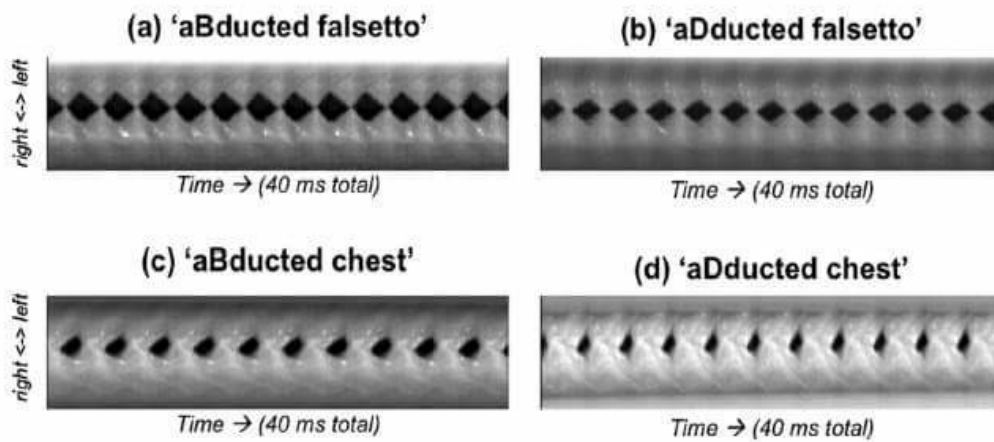


Illustration 19 – Herbst, *Vocal fold contact during singing, 'Membranous'*, 2011, p. 2256

Note that the configuration is different from the illustration labelled 'Vocal Schematic'

Pedagogical Method

I have divided the concepts of this vocal pedagogy into four general categories: respiration, registration, resonation, and articulation. As it is impossible to address any of these concepts in isolation, the vocal exercises used in the teaching are discussed in the most appropriate section. How they affect each of the other elements is also addressed. Many of the concepts or exercises may be familiar to singing pedagogues whose work is informed by nineteenth-century pedagogy, as they are derived from Garcia, Lamperti, and other writers. Certain exercises, like some of the arpeggios or pentatonic scales, are very simple and familiar to any singer in training, but the uniqueness of application and execution is pivotal. Furthermore, the way the exercises are approached is an outgrowth of traditional vocal pedagogy which may seem self-evident to some but not others, so I feel it is important to mark out the framework well. Any exercise misapplied is useless or, even worse, may do more harm than good.

Guiding Principles:

An essential component of the pedagogical method is what I refer to as 'guiding principles' which are overriding concepts that should be kept in mind at all times unless otherwise specifically indicated. They are few but critical in the reconstruction and are to be used as a litmus test for any exercise or practice. They are meant to set up an environment most well-suited to the development of the 'pharyngeal voice'. The individual principles are not ranked hierarchically but are all equally relevant and create a balanced system of vocal production. Some may be relative to different styles of singing or fall into general 'good singing practice' but no assumptions are made about tradition or background, so therefore each merits discussion. Exercises which have developed out of the guiding principles are grouped in the subsequent section.

Onset: (Coup de la glotte)

The first principle is a clean balanced onset described in Section I in the discussion of the *coup de la glotte*. The onset is the instance in which the vocal folds come into contact and begin to vibrate in the formation of a tone. The ensuing tone should be neither breathy

nor pushed into action. A neat and clear sound should emit from the folds with as little pressure or resistance possible, so as to allow ease of production but enough fullness that the tone does not lack resonance. It should have a strong fundamental frequency and clear partials (harmonics). This should be done without the help of the extrinsic laryngeal muscles (muscles outside the throat) and without squeezing inside the throat.

[Coup de la glotte Video Demo: Researcher](#)

These recordings focus on the simple act of feeling of the ‘neat articulation of the glottis’ described previously in the discussion of the *coup de la glotte* and the pedagogical narrative is taken precisely from Garcia’s explanations. The actions taken are meant only to bring gentle attention to the sensations which occur during onset and not to create undue pressure or conscious effort in the throat. The gentleness with which the *coup de la glotte* is expected is attempted by the students, with greater or lesser success.

Generally speaking, the *coup de la glotte* is a useful tool, but it requires attention and practice to enable the singer to find an effective gentle and balanced onset. I have continued to use it in the ‘pharyngeal voice’ pedagogy, but I am unconvinced of its usefulness with all students. If singers recognise its usefulness as a combination breathing-onset exercise - in order to produce it correctly the entire breath management system needs to be coordinated - then it is successful; otherwise it can bring unnecessary attention to the throat and cause more muscular engagement than it helps to mitigate. I find it helpful for relieving muscular tensions and balancing the onset of the tone.

Laryngeal Mobility

As was established in Section 1, laryngeal mobility was a key feature of vocal training developed before the nineteenth-century. In Garcia’s *École* (1840), his description of acceptable timbres is based principally on the laryngeal position.⁵¹¹ When discussing the mobile, relaxed, non-lowered larynx, it does not automatically imply a dramatically raised larynx, though historically this cannot be ruled out, as none of the treatises specifically rules

⁵¹¹ Garcia, *École*, (part 1: 1840, part 2: 1847), part 1, pp. 7–8.

it out. Nevertheless, a strongly raised larynx is not essential to the reconstruction. A mobile and relaxed larynx can be thought of as one that is suspended easily by the surrounding muscles without the intervention of internal or external muscular tensions. For singing the larynx might at times be a little lower than the normal spoken or resting position, but being flexible, the larynx has mobility and may rise during singing.⁵¹²

The Open Throat

The tone should not just be free, it should also be clear. A darkening of the sound by artificially ‘widening the pharynx’ or lowering the larynx does not aid in the development of the ‘pharyngeal voice’. Like the larynx, the pharynx must remain quiescent without undue conscious attempts to alter its shape. As Richard Miller says, ‘If one breathes deeply and silently through the nose, the pharynx assumes the proper spatial arrangements for singing, without the necessity for additional rearrangements.’⁵¹³ The natural state of the pharynx is relaxed and open. However for the development of the ‘pharyngeal voice’ the pharynx must be allowed to narrow slightly to adjust for the raising of pitch, but should not be squeezed.

This principal developed out of the discussion in Section I concerning Lamperti and the resonance in the ‘back of the head’, i.e., in the pharynx. It was noted that when the resonance is experienced in the pharynx, there tends to be a ‘slight use of the fauces’ that narrow and brighten the sound.⁵¹⁴ This brightness helps to increase the chest voice qualities of the sound and, combined with the focus of the vibration in the pharynx, give the ‘pharyngeal voice’ its name.⁵¹⁵ If the pharynx is thought of as adding brightness to the

⁵¹² See Harris, T. and Howard, D. *The Voice Clinic Handbook* (2 ed.), (Braunton, Devon: Compton Publishing, 2018); Jones, S. *Laryngeal Endoscopy and Voice Therapy. A Clinical Guide* (Braunton, Devon: Compton Publishing, 2016); Chalfin, D. ‘From ‘me’ to ‘we’: Stagecraft, performance and audience communication’, in Williams, J. and Williams, K. (eds.), *The Singer-Songwriter Handbook* (London: Bloomsbury Academic, 2017); Laryngeal mobility has become more important in vocal health, and at the ‘Voice Geek Conference’ 2018, Dane Chalfin, a previous director of the British Voice Association (BVA) and vocal rehabilitation coach, gave a presentation which highlighted the fact that singers with the most laryngeal mobility have the healthiest voices. This is not to say that the larynx is intended to move around with no particular function, but rather that a fixed laryngeal position, high or low, is less healthy than a mobile one, and that those who have mobile larynxes are less predisposed to vocal problems. For more on Dane Chalfin see www.vocalrehabilitation.com.

⁵¹³ Miller, R. *Securing Baritone, Bass-Baritone and Bass Voices* (Oxford Univ. Press, 2008) p. 30.

⁵¹⁴ The ‘fauces’ are discussed in Section I, see FN 178.

⁵¹⁵ Some like Alm. Lepelletier used the *voix pharyngienne* as the equivalent of head voice and falsetto. ‘Déjà les physiologistes avaient distingué ces variétés de phonation sous les noms inexacts de voix : de poitrine, de tête;

sound instead of darkness, the ‘pharyngeal voice’ is easier to develop. It is possible to sing with the ‘pharyngeal voice’ without the pharyngeal narrowing; however without such narrowing it is more difficult to develop, and the resulting sound has fewer chest voice components.

Concerning registers

The following two principles concern the experience of vibrations and resonances as well as how both mechanical and acoustical registers are managed.⁵¹⁶ A mechanical register change is when the singer moves from chest to falsetto or another mechanical adjustment affecting the production of the tone, and an acoustic register is when the changing harmonics interact differently with the vocal formants perceptibly changing the tone quality, even subtly.⁵¹⁷ Some singers experience no perceived registration shifts, and others experience upwards of seven or more. In my own singing, for example, I experience register changes including resonance shifts nearly every third or fourth throughout the vocal range. One school of thought is to even the voice out so that there are no perceivable shifts and the voice is one colour and timbre throughout, while the suggestion in this dissertation would be to experience the shifting and utilise the timbral variations of usable colours for musical interpretation.⁵¹⁸ My reconstruction is concerned with the latter concept more than the former.

*voce di petto, di testa; voix naturelle, de fausset; M. Bennati donne, aux sons de la première, le titre de notes laryngiennes ou du premier registre; à ceux de la seconde, celui de notes surlaryngiennes ou du second registre. Pour simplifier et préciser davantage, nous désignerons ces deux variétés phoniques par les dénominations de voix : 1° Laryngienne, 2° pharyngienne ; en faisant observer que nous comprenons, dans les dépendances du pharynx, la langue, les amygdales et le voile palatin au moyen desquels se trouvent effectués les sons de cette deuxième catégorie.’ Lepelletier, A. *Physiologie médicale et philosophique*, (4) (Paris: Germer Baillière 1833) p. 194; Bennati, F. ‘Anomalous Position of the Larynx During Singing’, *Edinburgh medical and surgical journal*, 41 (A. and C. Black, 1834); Bennati, F. *Recherches sur le mécanisme de la voix humaine* (Paris : Chez J. B. Baillière, 1832)*

⁵¹⁶ As was discussed in Section 1, there are both laryngeal, or mechanical, and acoustic registers.

⁵¹⁷ The singing voice is a composite sound made up of multiple harmonics that are resonated in different parts of the vocal tract. The interactions between harmonics and vocal tract resonances can have both positive and negative effects on the production and quality of voice. Please see Appendix 1: A brief introduction to vocal acoustics.

⁵¹⁸ For a discussion of the evolution of the modern singing voice which includes an explanation of the various approaches to registration and timbral unification see: Crutchfield, W. ‘Vocal Ornamentation in Verdi: The Phonographic Evidence’, *19th-Century Music*, 7(1) (1983): 3-54; Freitas, R. ‘Toward a Verdian Ideal of Singing: Emancipation from Modern Orthodoxy’, *Journal of the Royal Musical Association*, 127 (2002): 226-57; Gentili, B. ‘The invention of the ‘modern’ voice: changing aesthetics of vocal registration in Italian opera singing 1870–1925’ (Dissertation: Royal College of Music, 2009).

High-focused Voice (top-down registration)

Relevant Exercise: *Portamento*

This principle relates to how the registers are organised and experienced, as well as how that impacts the singer's relationship with the voice. The concept of a vocal scale can be used as a metaphor for how the relationships work. An upward scale moves from the darker, heavier low tones to the higher, brighter ones, bring up with it the colour and weight to the higher pitches. While taking weight up with the voice is not necessary, it serves the metaphor. If the converse is considered, a downward scale has its source in the higher pitches and as it descends becomes fuller and increases in warmth. For this principle of registration, the higher pitches should be thought of as the home base of the voice which is adjusted as the singer descends.

With this orientation, the registers are experienced as if they are slipping in from underneath rather something surmounted. During the practical investigation in the studio, it was found best to bring any register change as low as possible maximising the distance, or interval, across which the shift is performed. But when moving upward through a register change the converse is not true: instead, the singer should use the lowered shifting point experienced from the downward orientation. Keeping the registers low maintains a light and flexible voice but requires considerable 'body' and focus. It also removes much of the weight from the voice, allowing for a smoother transition to the lighter falsetto register, evening out the vocal qualities of each one.

Register Shifts

One problem with attempting to carry a register down below the natural transition point in a descending phrase is avoiding the dramatic register shift, the sense of needing to suddenly 'drop' the voice. The student must learn to resist dropping into the register and instead slowly shift. The register shifting point differential between a top-down and a bottom-up orientation could be as little as a semitone or as wide as a fourth, depending on

the individual and the registration event. The core message of the principle is to change registers low and to allow the voice to shift as many times as needed, and to observe but not to exaggerate the qualities of any given register. Developing an awareness of this principle requires significant breath control.

Low Subglottal Pressure

Because the 'pharyngeal voice' is based on the falsetto register, less effort is required to bring the vocal folds into action and therefore requires considerable attention to gentle breath flow and low breath pressure under the vocal folds. Too much breath pressure causes multiple, even contradicting problems, depending of the individual singer.

The student should feel as if the body is open as if inhaling, and never tight as if they are bracing their body as if to pick something up. The rib cage should, for the most part, remain free and flexible, and be allowed to move whether the singer is inhaling, exhaling, or even singing. The singer should be able to freely move their ribcage while singing, within reason, without negatively affecting the tone quality. Tension in the ribcage can cause pressure to build up under tightened vocal folds. The air should be allowed to move in a free, even, slow stream. There should be no sensation in the body of sitting down, closing off, or clenching because these actions serve to tighten the body in a way that is detrimental to the development of 'pharyngeal voice'. Based on this description, it might seem as if the 'pharyngeal voice' is a 'no support' vocal pedagogy. This could not be further from the case, and breath management for the 'pharyngeal voice' is in fact exhausting physically. Until the muscles develop it requires a great amount of effort to keep the air pressure low, and sometimes causes muscular pain in the back and abdomen. And, because of the low breath flow, it can even stimulate a sensation of 'suffocation'.

Keeping a low pressure at all times is important because there are many deleterious effects of pressure on the voice, which is why so much time is spent developing this particular principle. The first negative effect is a breathy tone which is highly damaging to the development of the 'pharyngeal voice'. In order to achieve a strong tone in the falsetto, the voice must be well adducted.

It has been a consistent observation in the practical investigation, that when a student is asked to aspirate the onset of a tone, he suffers a disruption in the functioning of the vocal process. For example, one of the students taking part in this research (tenor 2) was also working with another vocal coach. The coach was apparently impressed with the tenor's vocal abilities, but thought his onset was too harsh. So to remedy it he asked the student to aspirate his onset. Within 20 minutes the tenor had lost the ability to phonate properly. He also lost his body connection and became hoarse. He called me for an emergency singing lesson. It was necessary to work the vocal onset exercises to re-establish proper vocal balance and body connection. Aspirated tones have been one of the most counter-productive elements to the development of pharyngeal technique.

Flexible ribcage

A flexible ribcage is integral to low subglottal breath pressure and therefore rigidity within the ribcage can impede the development of the coordination needed to develop the 'pharyngeal voice'. Essentially, a flexible ribcage reduces the squeeze of the chest cavity and mitigates the possibility of using too much subglottal pressure. As a principle the flexible ribcage received a lot of focus in the practical investigation because of its importance in breath management. Students were advised that the ribcage should not be used like a bellows, blowing the air out against the vocal folds during singing. A different coordination is required to accomplish exhalation. The ability to open the ribcage is not universal. Many students find it difficult, and depending on their different predispositions, it may take months or even years to fully master.

An exercise, which I have named the 'expanded ribcage' exercise (Appendix 2), helps to make the student aware of their breathing, and to add mobility. Becoming conscious of mobility can trigger a new focus on breath and body coordination. For example, one student suffered from high breathing, mainly caused by anxiety. His shoulders and clavicles were in constant use for breathing and he was tight around the abdomen and seemed incapable of low abdominal breathing. The 'expanded ribcage' exercise not only allowed him to release the tension in the ribcage and to address his habitual anxiety breathing. His normal

breathing has now become low and relaxed. The ‘expanded ribcage’ exercise is significantly referenced throughout the exercise, so it is useful to be familiar with its attributes.

Low Abdominal Breath

Abdominal breathing is perhaps the most fundamental element in breathing management discussed in Section I. Lamperti described his method of breathing as movement of the abdominal region alone without aid or intervention from the shoulders or clavicle.⁵¹⁹ Garcia believed that abdominal breathing was essential, but that the singer should also make use of the lower rib cage to take in a full breath.⁵²⁰ Lamperti would have considered this to be lateral breathing, which is the result of a deep abdominal breath, and would likely have admonished against it. ‘Let him take the deepest inspiration he can, making use of the diaphragm and the muscles of the belly. Any effort about the chest-ribs in breathing must be absolutely and entirely avoided. It is here that the evil lies.’⁵²¹ It would seem that Francesco Lamperti did not want the singer to experience movement in the ribcage at all, but rather to breathe ‘past’ the chest using only the diaphragm and the muscles of the abdomen.⁵²² This is entirely possible, but is different to what is described by Garcia. Richard Miller describes how the ribcage and abdominal wall moves seamlessly with inhalation and exhalation.⁵²³ It would seem that he agrees more with Garcia than with Lamperti on how to breathe, but Miller certainly agrees with Lamperti on how to manage the breath.⁵²⁴

⁵¹⁹ Lamperti, F., *Art*, 1916, p. 24.

⁵²⁰ Garcia, *École*, 1847, p. 24, ‘Pour inspirer facilement, ayez la tête droite, les épaules effacées sans roideur, et la poitrine libre. Soulevez la poitrine par un mouvement lent et régulier, et rentrez le creux de l'estomac. Dès l'instant où vous commencerez à exécuter ces deux mouvements, les poumons iront se dilatant jusqu'à ce qu'ils soient remplis d'air. Les poumons qui se sont remplis graduellement et sans secousse gardent l'air sans fatigue et longtemps. Celle inspiration lente et complète est ce que les Italiens appellent *respiro*, par opposition a une inspiration légère, instantanée, qui ne donne aux poumons qu'un petit supplément d'air pour le besoin du moment. Celte inspiration, ils l'appellent *mezzo-respiro*.’

⁵²¹ Lamperti F. *The Art of Singing According to Ancient Tradition and Personal Experience* (London: G. Ricordi & Co., 1884) p. 56.

⁵²² Lamperti clearly indicates that abdominal / diaphragmatic breathing, where is his preferred method, “involves only with the lower body and does not include movement of the chest” therefore does not include the ribcage. The ribcage is implicated in ‘lateral breathing’ not abdominal breathing. He says that the body is kept tight and the pelvic floor is used for respiration. *Ibid.*, 20.

⁵²³ Miller, *Securing*, 2008, p. 19.

⁵²⁴ *Ibid.*, 20–1.

Low abdominal breathing is well accepted in modern singing practice, but some of the other elements may be less so. For this work, it is imperative that the singer develop the ability to move the ribcage independently of whether they are breathing in or out. They need to become familiar with and be able to use the pelvic floor, various abdominal muscles, 'floating' ribs, and muscles in the back for support. Students learn to disengage their intercostal and abdominal muscles which can cause the ribs to squeeze together increasing subglottal pressure. Many of the participants have found that the motions and coordination required in the reconstruction are counterintuitive, for example asking someone to engage their inspiratory muscles while exhaling – that is, expanding their rib cage while breathing out.

Conclusion

This list of principles is not exhaustive. It is meant to give the reader a general understanding of the environment in which the 'pharyngeal voice' is developed in the following demonstrations. Each principle sets up an expectation to guide the student along his path by offering a yardstick by which to measure their progress and interpretation of any given exercise. A student can begin to perform an exercise and refer to the list of principles to check whether or not their performance adheres appropriately for the reconstruction.

Introduction to the Students

Researcher – Tenore Serio

I have used myself as the primary test subject and performed every experiment, technique and exercise working out the most effective methods, each of which I subsequently revised throughout the course of my practical research. Over the course of 10 years, my voice developed an upper extension of a sustainable fifth, light emission coloratura and a well-controlled mezza voce and pianissimo in the upper register. My range is currently from sustained B flat to g'' flat (a'' flat, if touched on quickly), not produced in pure falsetto, also called 'whoop timbre'.

Student 2 – Contraltino

Student 2 is a tenor in his early thirties who worked with me over a period of four to five years but has not had continuous lessons since 2016. He is not a classical singer but has a degree in musical theatre, with training in singing, acting, and dance. When he began taking part in the practical research, he could only sing about an octave and a third from d natural to f' natural. Sometimes he could push out a g' natural but it was neither usable nor reliable. He would often switch or crack into falsetto. After his development of the 'pharyngeal voice', he gained an upper extension of over an octave at the top, taking him to a sustainable a'' flat (demonstrated in the recordings), and gained a third at the bottom of his voice. The vocal quality of his upper register is in line with the historical descriptions of contraltino and is bright and piercing. His high c'' natural sounds almost like full chest voice and has often been mistaken for belting. Since undertaking this training, he has sung in musical on a world tour and continues his career in musical theatre in the United States.

Student 3 – Tenor Serio

Student 3 is a tenor in his late thirties who joined the practical research with no background in music and no previous training in singing or music. He could not sing anything to speak of but could match pitch. He did not have anything that one might consider a

'range' as he could only phonate about a fifth or sixth from b flat. He had serious difficulty phonating above f sharp. After three and a half years taking part in the practical study, he can phonate over three octaves from C natural to a'' flat without resorting to whoop timbre and has an exceptional dynamic range. Because his goal is to learn standard repertoire, in the past year we have moved away 'pharyngeal voice' training as it was only used to increase his range and to sing with ease. It should be noted that like Nourrit, when Student 3 began to sing in full voice the 'pharyngeal voice' became more difficult, and he now finds it nearly impossible to perform the exercises. There are recordings of him from 2016 using the 'pharyngeal voice' and videos from 2019 where he struggles with its production.

Student 4 – Contraltino

Student 4 is a tenor in his mid-thirties who took part in the practical research for a little more than one year. He had had some previous classical training from a good teacher but did not attend a conservatoire or have a musical background, but he is very musically engaged and sings often. His voice can be characterised as light and piercing. As he was proficient with his falsetto, modifying the sound to develop the 'pharyngeal voice' was relatively quick and he assimilated technique without difficulty. He has since been able to sing up to a'' natural in the 'pharyngeal voice'. He continues to sing regularly but does not study.⁵²⁵

Student 5 – Tenore Serio

Student 5 is a musical theatre tenor in his mid-twenties and sought specific training in *bel canto*. He participated in the practical research for two years and had two lessons each week. His voice is loud, metallic and is what would be considered 'belted'. His range was from about B flat to f' natural. He could strain to g' natural. Due to his volume, range and difficulty in the upper register, his teachers categorised him as a baritone. The training with me required him to change his breath management and registration entirely. By the end of his course of lessons he had added over an octave to his upper extension to a

⁵²⁵ The day of his video session, he had arrived from Spain at 6am and came directly to the Royal College of Music for the recording session so was not in top form. I also believe the gravitas of being on camera at the conservatoire took its toll on his performance.

sustainable a'' flat that he can use in repertoire such as *Gethsemane* from Jesus Christ Superstar (Webber) which requires a sustained g'' natural. He also gained access to a chest voice sound for his g' natural to c''. In the recordings, strong chest voice participation in the sound is notable. He sang most of the exercises in full voice until he was able to release into 'pharyngeal voice'. He has since taken up a place on a bachelor's degree course in musical theatre, and currently studies as a tenor.

Student 6 – Contraltino

Student 6 is a tenor in his late twenties. He has been taking part in the practical research for five years. He had no previous musical or formal classical vocal training but had received some training in singing Jewish cantorial music. His voice was not very loud and at the onset of participation he could only sing comfortably to g' natural or a' flat and could not really sing much below B flat. He was able to integrate the techniques quickly and very soon developed a chest voice sound to high c'' natural. He now can sustain to f'' natural and potentially higher. In one of his recordings below he demonstrates a range of three octaves and a third to from E natural to g'' sharp. He tended, however, to overweight the voice, which caused him difficulty. He can also sing lower than before to about E/F natural. He has the typical high tessitura of a *contraltino*. He currently performs as the cantor at a major London synagogue and continues to study with me.

Student 7 – Contraltino

Student 7 is a tenor in his mid-thirties who sings Jewish liturgical music. He joined the research later than the other tenors, in June 2019, but his voice responded well to the training and has, because of the relative naturalness of his voice, has been able to learn to use the 'pharyngeal voice' in exercises. He has not yet integrated it into his repertoire but can vocalise to a'' flat. Using the resonance tuning intrinsic to the 'pharyngeal voice', he has increased the power, projection, and ease of his vocal performance.

Techniques and Exercises:

This set of techniques and exercises follow the method that I developed through the course of the practical investigations. The reconstruction of the 'pharyngeal voice' with a variety of different student singers is presented according to the typical development which might have occurred during sessions in the investigation. As this method is partially an outgrowth of nineteenth-century performance practice and pedagogy, some elements will be quite familiar to modern practitioners. Where this is the case, the specific relevance to the 'pharyngeal voice' is discussed, and those which have been deemed to be 'generally accepted knowledge' are not discussed in depth. Those not specifically used for the 'pharyngeal voice', but are nonetheless necessary, are referenced in the appendices. The elements are grouped according to the previously described categories of respiration, registration, resonance, and articulation. There is a significant overlap in the categories, but the development follows a logical path from breath control to phonation, followed by exercises to develop register coordination, which organically leads to exercises for resonance (and vibration), all of which are supported by a brief discussion on articulation. Each of these exercises was worked through with the participants, because ensuring the common starting, technical knowledge and foundation, and progress was essential to eliminating variations in background and preconceived ideas. It was also important to re-establish a baseline technique to compensate for any previous training.

Respiration: Breath Management & Support

For the purposes of this discussion, the concepts of vocal support, breath support, or *appoggio*, are addressed under the heading of breath management. There is no consensus among voice professionals on breath management or support, and it is common to hear what seem to be entirely antithetical views on breathing and how to support the voice, from bringing in the abdominal muscles when singing, to pushing them out, from opening the ribcage to closing it firmly or letting it hang, from pushing down into the pelvic floor, to raising it. Rather than trying to find absolute alignment with historical approaches and modern ones, I present only what has been found in the research from Section I and what I have discovered to work through the practical investigation. For example, if gentle and

extremely low-pressure air flow is not attained, the ‘pharyngeal voice’ will be difficult to develop and learning to maintain awareness of the airflow rate is essential to managing the ‘pharyngeal voice’. In certain circumstance the resistance posed by the vocal folds in ‘pharyngeal voice’ is so minimal that any pushed or uneven flow will result in the voice breaking inadvertently changing pitch or even register.⁵²⁶

Appoggio

Breath management is the overarching term used in this work, but the concept of *appoggio* is a specific term used to describe the way in which the breath is managed in singing. According to the Cambridge Italian-English dictionary, *appoggio* translates as ‘to lean or to support’; it is more or less a synonym for another word used in vocal terminology, *sostegno*, or ‘sustain’, which is used more frequently with the students, and indicates the slow gentle inward movement of the abdomen during exhale which aids in maintaining the even airflow.

Francesco Lamperti describes *appoggio* as a process in which the inspiratory muscles ‘strive to retain the air in the lungs’ against the action of the expiratory muscles, which creates a ‘balance of power’ known as the *lutte vocale* or ‘vocal struggle’.⁵²⁷ Richard Miller clarifies his take on Lamperti as ‘*appoggio*’ is a specialised method of breath management based on the prolongation of the postures that inhere in the inspiratory gesture and the retarding of the expiratory gesture.’⁵²⁸ He also defines it as a technique that ‘induces coordination among large, flat abdominal muscles of the anterolateral wall and the thoracic cage.’⁵²⁹

Through these definitions it can be understood that the student needs to use the inspiratory muscles of the back and sides to counter the force of the exhalatory muscles to slow down the movement of air and to reduce the pressure pushed against the vocal folds.

⁵²⁶ Because the references to the postures found in the breathing exercise, before embarking on exercises specific to the ‘pharyngeal voice’ it is imperative to acquire an understanding and coordination described in the ‘expanded ribcage’ exercise, which all of my students learn to do as part of basic training and can be found in Appendix 2.

⁵²⁷ Lamperti F., *Art*, 1916, p. 25.

⁵²⁸ Miller, R. *On the Art of Singing* (Oxford Univ. Press, 1996) p. 77.

⁵²⁹ Miller, *Secruing*, 2008, p. 185.

There are various different ways that this can be accomplished but this work focuses on the methods found to be most suitable to the development of the 'pharyngeal voice' in practice. During the practical research for this section, I attempted to use both the static but free (Lamperti) ribcage and the movable (Garcia) ribcage and found that for the usage with the 'pharyngeal voice', the movable ribcage was more successful.

If a given student finds another method of breathing easier, there is no fundamental reason to assume that the 'pharyngeal voice' cannot be developed using it. However, generally I have chosen to side with Garcia. The exercises below help to develop both a free and flexible ribcage, because in the end, I have found that the most detrimental element to the development of the 'pharyngeal voice' is one that tightens and squeezes the air in the thorax increasing subglottal pressures. The air should feel as if it is moving slowly and not as if it is being pushed out of the lungs, but rather held inside with the feeling of gently inhaling against the outflow of air. This actually gives the sensation of inhaling with the body, but only enough to mildly oppose and mitigate the strong exhalatory forces but not to override them. The student eventually develops a pronounced awareness of the muscles of the back and sides along the lower ribs and spine.

Breathe into the Back

Exercise 1

To experience an engagement of the inspiratory muscles of the back, inhale against the closed mouth and nose to activate them without any air moving. The ribcage can be felt trying to open and lower floating ribs in the back engage as well as feeling some muscles just under the ribcage in the back. These are typically the muscles being used to develop this coordination.⁵³⁰

⁵³⁰ This exercise was developed based on a description by Garcia which follows in the section 'From Breathing to Phonation'.

Exercise 2

Sitting normally in a chair, the student wraps their arms around themselves quite tightly. They then lean over and rest their torso on their lap. This posture stops the student from being able to breathe in any way except 'into the back'. The student is then asked to try to breathe as normally as possible while sensing how the constriction forces the respiration into the back and how it engages the lower ribcage, especially the floating ribs.

The student can move from this position to a bent over standing position while maintaining the 'back breathing'. Then they should release their arms and allow them to slowly fall towards the floor. Then, as long as they can maintain the sense of breathing into the back, they should slowly inhale and begin to stand up keeping the sensation at all times. Once standing, they should practise breathing with the same awareness. The feeling should be integrated into the 'expanded ribcage' exercise and slowly introduced to vocalising.

Coupled with abdominal breathing, back breathing becomes the standard for breath management for this project. The balance between abdominal and back breathing should be practiced so as to develop an awareness of how to balance the two in singing. Some phrases need more abdominal movement and others more back. The only way to decide how to manage the breath is through experience and practice.

From Breathing to Phonation

Once phonation is established in the following exercises, there will be one more ribcage exercise that integrates phonation and ribcage expansion, but it makes more sense to discuss it after phonation. I consider these to be essential breathing exercises that prepare the student for the gentle type of onset required for falsetto register phonation. They are derived from Garcia's discussion of breathing, including his admonition to 'close the mouth so as to give the passage of air a thin opening' which obstructs the airflow slowing the breath and increasing both awareness and effort.⁵³¹ Developing upon his concept of closed mouth breathing, I modified common breath control exercises into

⁵³¹ Garcia, M. *École de Garcia. Traité complet de l'art du chant en deux parties. Première partie, 3e édition. Par Manuel Garcia,...* (1re partie. 3e édition) (Paris: E. Troupenas et Cie: L'auteur, 1851), p. 21, 'Les deux premiers, savoir l'aspiration et l'expiration lentes, seront pratiqués plus régulièrement, si on ferme Presque la bouche de manière à ne livrer au passage de l'air qu'une mince ouverture.'

functional exercises for the 'pharyngeal voice'. I find that their mastery is critical for the 'pharyngeal voice' work without which the subsequent and more difficult exercises may not be possible. Each exercise is performed on a sibilant [s] and/or [z]. It is preferred that the exercises be performed with the suspended feeling from the 'expanded ribcage' exercise.

The subsequent three breathing exercises bring awareness to the action of the respiratory system and manage airflow. They are not difficult, but when practiced consistently create a foundation upon which to build further awareness and control to breath management. I have found that most students are able to perform them successfully, and typically find them to have a generally positive affect on their awareness. Further along in the exercises, concepts of how to exhale present themselves in the videos generally during phonation. At points I can be heard saying, 'just exhale' which is a specific instruction relating to activating the physiological experience of exhaling, rather than supporting the voice. The naturalness of the 'exhale' helps to release tensions and sublimates conscious control of 'supporting the voice,' turning over the actions to the brain.

Exercise 3.A

The first exercise is performed on [s]. The student should take a reasonable breath, and while in the suspended position of the 'expanded ribcage', they should begin to make a gentle [s] and even sound. The student should not try to push the air out but instead should attempt to make it as quiet and even as possible by activating the feeling in the ribs and back as discussed. They should also attempt to keep stream of air moving for as long as possible.

[Exercise 3.A Video Demo: Researcher](#)

It is rare that anyone has difficulty with this exercise. Both the following students are able to produce the [s] with very little resistance. Student 3 demonstrates, however, that sometimes evenness can be difficult to achieve when his heartbeat is audible in the sound. He is instructed to gently open his ribcage, which should allow the diaphragm to descend further preventing the intervention of the heartbeat. On his subsequent attempt he is able to perform the [s] successfully without his heartbeat affecting his exhale.

[Exercise 3.A Example: Student 4](#)

[Exercise 3.A Example: Student 3](#)

Exercise 3.B

This exercise is identical to the first except that it is performed on the voiced [z]. The [z] requires slightly more air to engage phonation than the [s] but the objective is the same. Find the easiest version on [z] an easy pitch and maintain it evenly for as long as possible. It should be a clear sound that is not made softer by allowing more air through but rather is made softer through more *appoggio*.

[Exercise 3.B Video Demo: Researcher](#)

As a voiced consonant, the [z] provides an added set of difficulties. Maintaining even phonation is still the priority but finding the minimum airflow without losing phonation can be difficult. Both students below have difficulty managing the low-pressure airflow while keeping the sound consistent. In this instance practice is the only teacher.

[Exercise 3.B Example: Student 4](#)

[Exercise 3.B Example: Student 3](#)

Exercise 3.C

The third exercise alternates between [s] and [z]. I find that this exercise is best started with the [z] because the student is immediately able to determine the minimum air pressure, but if they prefer to start with [s] that also works. Once the student has established phonation with the [z] they should begin to alternate between [s] and [z] at one or two-second interval.

As demonstrated in the sound file, the objective is to make the transition quickly and easily with no stuttering or stammering. The [z] should feel as if it is simply turning on and off. It should be a very clean sound with a distinct differentiation. There should also be no extraneous movements in the body between the phonated [z] and the un-phonated [s]. An

absolute minimum of activation in the core may be sensed but there should be no visible movements associated the change in phonation.

This exercise is also used as a diagnostic because it can identify any muscular inventions in the onset. While most students have little difficulty with the exercise, some, as is demonstrated below, may have an irregular variation in the onset with difficulty managing the variable air pressure required to keep the [s] and the [z] balanced. This manifests in trouble initiating the [z] or maintaining a stable tone. The exercise is very good for tuning the awareness of the onset and flow rate of the breath.

[Exercise 3.C Video Demo: Researcher](#)

In the examples below, both students have mild difficulty with the exercise. Student 4 has difficulty managing the variable airflow rates respective to [s] and [z] while Student 3 has a 'jitter' in the sound as well. Opening the ribcage slightly is helpful in regulating the airflow as well as helping to focus the breath movement lower into the body. The [z] being voiced, requires more air pressure than the unvoiced [s], but excess engagement (closure) of the ribcage during the [z] phonation increases the subglottal air pressure leading to a forced [s] then the glottis is released. The student needs to vary the airflow to create and even resultant sound.⁵³²

[Exercise 3.C Example: Student 4](#)

[Exercise 3.C Example: Student 3](#)

Vocal Fry

Exercising using so-called 'vocal fry' is ubiquitous and used by voice teachers and speech pathologists alike in order to relax laryngeal tension, but these exercises were specifically developed during the practical investigation for application to the 'pharyngeal voice'. Principally, the vocal fry is a register unto itself. It is associated with the laryngeal position M0 usually called 'pulse register'.⁵³³ It is also known as creak and *strobass*

⁵³² This exercise was difficult for me at first and took practice to perfect. It was pivotal in my development towards success with the 'pharyngeal voice'.

⁵³³ Henrich, N. 'Mirroring the voice from Garcia to the present day: some insights into singing voice registers', *Logoped Phoniatr Vocol*, 31(1) (2006): 3–14, p. 10.

registers.⁵³⁴ A tone is considered to be in pulse register when its fundamental frequency is lower than 70-Hz.⁵³⁵ A frequency this low is most likely be perceived as having no real fundamental in the tone because ‘glottal pulses are perceived as individual events rather than a continuous auditory stimulus’.⁵³⁶ It would seem to the listener that they are hearing individual ‘events’ or closures of the vocal folds that sound a bit bubbles or a very low growl rather than a tone. It is precisely these individual ‘events’ that the exercise encourages the student develop.

[Vocal Fry Audio Demo: Researcher](#)

As with the previous phonation exercise, the vocal fry is also used to make the student aware of a very thin and small vocal phonation. The exercises allow the student to access a very light perceived phonation and extend it throughout the vocal range up to the highest ‘notes’. It also sets up a muscular awareness that is built upon in the subsequent exercises, not just the series of Exercise 4, but is also used in tuning coordination for the upper registers of the ‘pharyngeal voice’. This coordination will be seen specifically in the video demonstration for Exercise 14.C when demonstrating how to perform the exercise in the high register. The vocal fry addressed here must be a very gentle closing of the folds, not a squeezed or effortful push. There should be neither a sense of air pressed against the folds nor air leakage causing a breathy sound.

The first step is to approach the vocal fry from the ‘expanded ribcage’ exercise position then the vocal fry as comfortably and evenly as possible with no speeding up or slowing down of the pulses. The student should be able to hold the vocal fry for several seconds without strain or discomfort. If the student is comfortable making the pulsed sound, then they can begin the exercises which encourages them to modify it in two different ways.

⁵³⁴ Ibid., 5.

⁵³⁵ Ibid., 7.

⁵³⁶ Titze, I. ‘A framework for the Study of Vocal Registers’, *Journal of Voice*, (2)3 (1988): 183–94, p. 183.

Exercise 4.A - Slow it down

The first exercise is to slow down the pulses to as slow as possible opening the ribcage and increasing the feeling of *appoggio*. This should reduce the air pressure to an absolute minimum. As the student slows the pulses, they should endeavour to keep the pulses as even as possible. After much practice, the student should feel as if they could almost count the number individual pulses. This exercise does not only help the student to create focus in the voice but trains the student in a very controlled breath stream. One warning about this exercise: it can induce a sensation of suffocation. As with the 'expanded ribcage' exercise, it is important to become accustomed to the feeling slowly, but caution is important.

[Exercise 4.A Video Demo: Researcher](#)

Once again, coordination is key to the successful performance of this exercise. It requires the student to open their ribcage to lower the breath pressure, otherwise when attempting to reduce the flow, the student will instinctively constrict the throat which increases the pressure. The sound of constriction is distinctively different that the free and slow movement of air. This exercise requires significant practice and may at first leave the student with the sensation of breathlessness.

In the example below, the student performs the exercise fairly well but has a little difficulty with the slowest pulses, which is to be expected. He is advised to 'brighten the sound' which indicates a brighter vowel such as [a] as opposed [ə] (similar to the u in 'put') and to possibly add nasalance both of which aid in the coordination. While entirely possible to perform this exercise with jaw relaxed and closed, it is noticeable that the student's mouth is not very open which, under these circumstances, probably indicate a mental focus on the throat. The vowel [a] would have created a brighter sound hopefully taking attention to the vowel sound rather than the feeling in the throat.

[Exercise 4.A Example: Student 4](#)

Exercise 4.B - Up and Down

Once the vocal fry is successfully established, the student should imagine as if they are singing up and down their range. This exercise encourages movement in the sound, sensations and the larynx as the sound becomes brighter and darker. The vowels shift significantly as will the movement of the larynx and mouth. Some students experience pulses in different parts of the head and neck just as if they were singing. The exercise helps with laryngeal mobility essential and informs the student of the modifications that the vowels and vocal tract go through pivotal to the 'pharyngeal voice'. The experience developed in the vocal fry exercises are used universally throughout training.

[Exercise 4.B Video Demo: Researcher](#)

Unlike many other students, Student 4 is able successfully to perform the exercise at the first go, even though exclaiming 'That's complicated'. My conclusion is that because student 4 has a well-developed falsetto and innate laryngeal mobility his performance of the exercise was relatively natural. But for those with greater muscular development, tension or rigidity in the laryngeal morphology or even functional differences from maintaining a lowered larynx position which causes limitations in their mobility while phonating.

[Exercise 4.B Example: Student 4](#)

Exercise 4.C - Fry to Tone

The third exercise is to practice moving from the pulse register to a tone and back again. It will establish a simple and gentle tone and the basic feeling for the 'pharyngeal voice'. It sets up coordination and the mechanical awareness for the next exercise which is often the first experience for many where the student can access the 'pharyngeal voice' and upper extension without being conscious of having done so. The tone used for this exercise should be gentle, low and never pressed always keeping in mind the exercise series 3 and 4. The student should move back and forth between sustained pulses and a low sustained tone. The relative pitch is unimportant if it is comfortable. The objective is to make a gentle tone and the transition as smooth as possible.

[Exercise 4.C Video Demo: Researcher](#)

Most of the students have been able to perform this exercise successfully. The video shows one who is indeed able to perform the action, but rather than maintaining the open body posture and low breath pressure that has been established, he has a tendency to create tension in the throat and press the sound. In this instance it is important to return the student to the basics of the breathing and encourage low breath pressure.

[Exercise 4.C Example: Student 4](#)[Exercise 4.D - Concentric Circles](#)

The final exercise of the vocal fry group takes models exercise 4.B and C but while phonating. The actions are similar, and by this point in the development should have set up a coordination that allows the student to at least phonate without undue pressure. The actions will allow the student to access all vocal registers up to their highest tones and should instinctively engage the requisite bodily coordination for the upper extension of the 'pharyngeal voice'. If this is not the case, that will be developed further along. Interestingly, this exercise rarely encourages students to phonate in pure falsetto or whoop timbre.

As always, the student should begin with the 'expanded ribcage' position. Once the fry to tone exercise is established and comfortable, without regard to pitch, the student should begin to raise and lower the pitch up and down in concentric circles always returning to the lowest pitch. The student may return to pulse after each 'circle' if desired, but this latter step is not necessary. This should feel very similar to the second exercise and there should be no sense of effort or push at all. Vocal quality is irrelevant. Adding some nasalance and using the *sostegno*, moving in the abdomen or raising the pelvic floor, in the higher pitches make them much easier and should release the rib cage and any stress on the voice. A greater sense of air flow may be experienced in the upper extension above c'' natural or d'' natural. Letting go of expectations and physical tensions is important. A sense of laryngeal mobility should be encouraged, and the larynx should not be rigid or rise overly high. Vowels should be allowed to modify (migrate) as needed and there should be no sense of pushing or strain. This exercise is very often taken well above high c'' natural to f'' natural or g'' natural.

[Exercise 4.D Video Demo: Researcher](#)

It is noticeable that Student 4 did not return to pulse register but instead pressed the sound to limit the air flow, just as in the previous exercise. This resulted in him raising the 'pitch' of the vocal fry and losing the inherent benefit of the exercise. This constriction limits the 'pharyngeal voice' and makes it very difficult to work with but does not preclude the student from accessing it. Student 3 was appropriately returning to pulse register however was using a much heavier phonation than Student 4 which precluded his accessing the 'pharyngeal voice'. It is noteworthy that he needed to open his mouth quite far which most likely indicates that his larynx was depressed. This in itself would increase difficulty of accessing the 'pharyngeal voice', and is not consistent with the coordination of the vocal fry exercises.

[Exercise 4.D Example: Student 4](#)[Exercise 4.D Example: Student 3](#)*Expanding while Vocalising*

As briefly touched on earlier, once phonation is established through the vocal fry, the student needs to integrate ribcage movements into vocalising, especially for the upper extension. The objective is to slowly open the ribcage during phonation without allowing the ribcage to collapse or increase the subglottic air pressure. The instinct is to allow the ribcage to close as the air moves out, but opposition to this motion is achieved by slowly opening the ribcage using the coordination set up through the 'expanded ribcage' exercise.

Exercise 5

Starting on a comfortable note, the student hums up and down a three-tone or pentatonic scale while slowly opening the ribcage over the entire scale. The first mistake is that although students open the ribcage while going up the scale, they start closing it while descending. Another common mistake is to begin to close the ribcage once half of the breath has been expelled. At this point the student should begin to increase their *sostegno*

(to move in their abdomen or to raise their pelvic floor) just like in the previous exercises. These movements should counter the desire to collapse the ribcage. Avoiding collapsing or squeezing like a bellows is the main objective. The objective is the movement, not the destination. The maximum expansion of the ribs is not meant to be achieved. So, if the student is getting to their maximum expansion before the phrase is finished, they are opening too quickly and need to expand much slower. The ribs should be in very slow motion while phonating and the student should avoid pressing against the ribs at the extremes, because doing so is just as detrimental to breath management as squeezing the ribcage closed.

If the humming is successful, the student can move onto vocalised vowels, but if he is having difficulty, he can repeat a simple chant in his mind during the hum or aloud during the singing. The phrase 'I expand my ribcage while I sing' can be used with one syllable on each note in the pentatonic scale expanding through the entire phrase.

Having successfully coordinated the vocalising, the student can begin to practice on simple vocal lines. These should not be overly difficult or complicated so that the student can keep his mind on mobility rather than worrying about the music. If the student is confident, he can move onto progressively more difficult music, all the while learning how the coordination affects his singing and making adjustments. The teacher should be able to guide the student on the appropriate integration with the *appoggio* and how the two are complementary.

Conclusion

Because of the interdependency of breath and phonation there are several overlaps in the exercises. As shown with the vocal fry, the exercises build one upon the others and strengthen various types of coordination that have been developed. To make the most progress, exercises such as the 'expanded ribcage' and the vocal fry should be practiced every day. Once the standing 'expanded ribcage' exercise is achieved, it can be practised nearly anytime or anywhere. This type of breathing should gradually become integrated into the natural way of breathing. It is important to be secure with the breathing exercises, but it is possible to move into other exercises such as the onset exercises of the section on

Registration before they are automatically the default. But because of the compounding difficulty progress through the exercises should be cautious. These exercises provide a good basis for understanding how the air flow should be gently managed. The elements are important in the subsequent discussion of registration. Without proper breath management, registration is very difficult and could preclude access to the coordination required for the 'pharyngeal voice'.

Registration and Resonation

As defined in Section I, registers are essentially a group of consecutive tones which have a similar quality produced with similar mechanical principle. This definition can be augmented to include tones which are produced with the same resonance strategy. For example, if a tenor is singing an upward scale at some point the second harmonic [H2] moves above the first formant [F_1] changing from open [$H1 \ \& \ H2 < F_1$] to closed timbre [$H1 < F_1 < H2$].⁵³⁷ The passing of H2 over F_1 would be experienced as an acoustic registration event. While these tones may or may not be produced by the same mechanical principle, they can be considered to be in different registers because they have a different vocal quality and or resonance strategy. It could also be argued that the lower part of the scale was in chest voice (chest register) and the closed tones could be in the middle voice or even the upper depending on the pitches and relevant vocal qualities.⁵³⁸

Exercises which help to identify and develop concepts of registration make the student aware of both laryngeal mechanism changes as well as acoustic register events (i.e. when a harmonic passes a formant) in the development of the 'pharyngeal voice'. These acoustic registration events can often feel very similar to mechanical ones. Many students are unaware of the differences and what effect they have on the voice and its qualities. Therefore, the exercises in this section help to develop awareness and coordination in the student by making him aware of the experience of each register, how those registers interact with one another, and how to negotiate those interactions. The exercises help to develop awareness and control of the falsetto register, to develop the strength and glottal closure to produce stronger and higher harmonics, as well as to integrate the 'pharyngeal voice' into the chest voice. While not absolutely necessary for every student, I have found a basic understand of these principles to be invaluable to understanding the 'pharyngeal voice'. The exercises develop both open and closed timbres.

⁵³⁷ For a more in-depth discussion please see: Appendix 1: A brief introduction to vocal acoustics.

⁵³⁸ Acoustic analysis can help to demonstrate more clearly what interactions there are between formants which would inform the discussion of registers.

Onset Exercise: Coup de la glotte

Because all subsequent phonation is dependent upon the onset, it is important that it be correct for the entire phonatory process.⁵³⁹ It is a direct product of the theory of Garcia's *coup de la glotte* in practice with some influences concerning resonance from Lamperti, discussed in Section I.⁵⁴⁰ This exercise is the first 'deliverable' produced by the practical research. As was made clear in Section I of this dissertation, alongside the portamento exercises found later in this section, they are some of the most effective exercises not only in terms of the 'pharyngeal voice' but also for the general development of the singing voice.

The onset exercises balance breath pressure with resonance and laryngeal position. They are fundamental to phonation and without which the progress to understanding and training the more complex issues of registration would not work as efficiently. Combining the awareness and coordination developed with the phonation, vocal fry exercises and breath management, the students are encouraged to begin to produce a basic music tone using only the thin falsetto setting of the voice.

The tone being developed with this exercise is the basis for the 'pharyngeal voice'. The student is discouraged from engaging directly with the full chest register and must maintain a light resonant tone with no sense of push which also may feel to have very little 'body'. The fullness of the chest register is removed to facilitate access to the 'pharyngeal voice', but the onset is tuned to give the vocal folds a clear bright and ringing onset with the falsetto setting. It is this combination of elements that prepare the student to develop the 'pharyngeal voice'.

There are two essential onset exercises that have been developed based on this research. Both exercises function similarly and have the same onset coordination. These exercises are both performed on the [ng] sound which is the sound as in fishi[ng] or E[ng]lish. There are different ways to produce the sound. Some have a smaller, narrower pharynx and others make use of a more relaxed pharynx. Depending on the needs of the student either can be used. Typically, the narrower pharynx is more successful in the beginning and the student can move on to the relaxed pharynx once a proper onset is

⁵³⁹ The Italian language is resplendent with glottals. All Italian vowels and the mode of speech relies heavily on glottals.

⁵⁴⁰ See p. 60.

established. In terms of maintenance, these exercises are both performed near the beginning of a vocal warm-up. In performance of the first version of the exercise, the pharynx is allowed to narrow slightly in the ascending keys. The second version is performed with a more relaxed pharynx (which is how they are presented), but it is up to the student to make sure the onset is correct and subsequently adjust the pharyngeal space.

The basic onset follows the sound of the [ng] which has a nasal component. It can be performed with the mouth closed in a hum, but it is usually more successful with the open-mouth hum. That is where the mouth is open with jaw is relaxed, the teeth and lips are parted but the tongue is raised in the back of the mouth closing of the space into the buccal cavity which allows the hum to be focused in the nasal cavity.

The first sound of the onset is performed, again, from the 'expanded ribcage' position, as a simple hummed [ã] in the pharynx. If this is not comfortable the vowel can be modified to the nasal [æ] or [i]. But the words should be pronounced clearly in the mind with a distinct but subtle glottal onset, as with any Italian vowel. Typically starting the exercises on c natural is adequate, but the point is success and comfort not dogmatic adherence to a prescribed scale.

The objective of the exercise is to produce a clear and clean onset that adheres to the principle set out earlier in the section. For each exercise the onset vowel [ã], [æ], [i] etc. is pronounced multiple times typically at least three times to make sure that the onset is correct. The number of times is unimportant, the objective is to produce it as many times as necessary to find the desired onset. Once the correct onset is achieved, the student should immediately produce the notes of the exercise in the exact position without changing the feeling. Along with balancing onset and phonation, exercise 6 and 7 aid in setting up the 'top down' orientation discussed previously. Together they help to manage the coordination which I describe in Section I as carrying the registers down to make the chest register less dominant and increase vocal cord closure of the head voice. Also, the slight 'use of the fauces', or the narrowing of the pharynx, is evident in both the demonstrations and the examples, as this is part of the coordination required for the 'pharyngeal voice'. When practiced, this exercise helps not only negate some effects of a pressed or heavy tone, but also reinforces the expansion in the back and ribcage, which is why I sometimes refer to this exercise more as a breathing exercise than a singing one.

Exercise 6

For the first exercise the student should use the above method to find the proper onset and then immediately produce a three-tone scale up and down in one beat. Each of the three tones should feel the same in nearly all ways and the student should not have the feeling of singing up and down a scale or that the notes change positions, resonance or colours. There should be a complete unity and ease in the tones. The student should perform the exercise in progressively higher keys ascending by semitones until they feel as if the onset is becoming difficult or the notes are no longer able to maintain their similarities. At which point, the student should descend by whole tones. If the student narrowed the pharynx as they ascended, the sensation of having been higher in the voice should be maintained as they descend to the lower pitches. The voice should not be allowed to 'drop'. Instead the smallness of the voice should be encouraged but the pharynx should be allowed to relax and the rib cage to expand. Once the student has returned to the lower pitches the pharynx should be relaxed, the ribcage should be open with a strong sense of the *appoggio* and the student should have a sensation as if the voice is suspended from the upper notes.

Exercise 6



Example 17 – Exercise 6

[Exercise 6 Video Demo: Researcher](#)

In this exercise Student 4 demonstrates the two most common mistakes when performing this exercise. One is a pressed tight or heavy glottal attack, the second being an aspirated type of phonation. The exercise is designed to encourage a neat clean onset which is the basis for the continued phonation. The student should not need to aspirate the

phonation, but because the onset is pressed, the student will either use pressed phonation or will need to aspirate to loosen the closure resulting in a variation in the entire process. Because Student 4 is much more comfortable in head voice and falsetto, and those registers typically require looser glottal closure, he was able to mitigate somewhat, though not entirely, the pressed aspect of the onset by moving to the higher tones. In doing so the quality of the sound brightened and became more focused, which would improve access to the 'pharyngeal voice'.

As in the previous exercise, Student 3 maintained the somewhat heavy lower vocal posture during the onset and was unable to perform the three-tone scale as prescribed. He also however was able to perform the task more adequately in head voice. In the second video example of Student 4, he was able to mitigate the lower pressure of the voice using the descending phrase to maintain the head voice setting, but the voice still lacked ease and resonance. There is a distinct difference between the sound he is making and what I am demonstrating that can only be defined accurately with closer vocal analysis. But it can be described as somewhat brighter, freer, and with slightly more space in the throat, most likely the epilarynx rather than the pharynx.⁵⁴¹

[Exercise 6 Example: Student 4](#)

[Exercise 6 Example 2: Student 4](#)

[Exercise 6 Example: Student 3](#)

[Exercise 6 Example: Student 7](#)

[Exercise 6 Example: Student 2](#)

Many of the students find it difficult to perform the *coup de la glotte* with the requisite gentleness and, as is demonstrated in the examples below, often over-engage with the throat. In the examples below, Student 7 manages to find a mostly balanced onset, but Student 2 and Student 4 demonstrate two of the most common difficulties. At first, Student 2 seems to have a constricted pharynx and epilarynx region while Student 4 is over-engaging and creating a heavier-than-desired onset. In order to highlight the difference between a lower position ascending in key and the 'top down' orientation, which is achieved through

⁵⁴¹ My instinct is that singer 3 had a constricted epilaryngeal area, but a laryngoscope is necessary to confirm.

the exercise, I have juxtaposed Student 2 performing only two examples in the same key from different orientations. A greater sense of space and ease can be heard in the second iteration, which occurs during the descent from the upper keys. It is this sensation of space and balanced onset that is developed and maintained as a general rule for the ‘pharyngeal voice’. It should be immediately be applied in exercise 7 to expand the intervals over which it is practiced.

Exercise 7

Maintaining the suspended position set up by the previous exercise – relaxed pharynx possibly with slightly narrowed ‘fauces’ described by Lampert – the second exercise is performed in the same manner. ‘Breathing up’ through the nose into the sensation produced in the descent of the previous exercise [6], the students again produce the same series of onsets; however, this exercise is based on a major triad.⁵⁴² It is important to adhere to the same expectations of evenness. This requires more *appoggio* and a relaxed space in the pharynx. So, the student should use the concept of breathing up to prepare the pharynx for the onsets.

The onset exercises encourage a full body coordinated phonation. The breath should be experienced as settled in the body and mildly held back with the *appoggio* but moving gently with the thin stream of air used in phonation. Once the onset is properly tuned and coordinated, registers become more relevant. The following discussion describes how registers affect the development of the ‘pharyngeal voice’.

Exercise 7



Example 18 – Exercise 7

⁵⁴² For a fuller description of ‘breathing up’ please see Appendix 3: Breathe Up.

[Exercise 7 Audio Demo: Researcher](#)

Following on from the previous exercise, Student 3 is able to adjust the shape of the vocal tract somewhat to get closer to performing the exercise more successfully. In what I describe in the video as ‘the suspended position’ this exercise balances out the head and chest register and mitigates his instinct to press. The end goal is not to over-narrow the pharynx. But sometimes if the student is unable to release the tension of a depressed larynx, narrowing the pharynx slightly can help negate the strain and release into falsetto register.

[Exercise 7 Example: Student 3](#)

Registers and the 'Pharyngeal Voice'

As discussed in Section I, the voice is most often divided into three basic registers: chest, falsetto/medium, and head. The boundaries of those registers vary depending on the individual, but Garcia places the entry to the falsetto of the *contraltino* voice at d' natural. But it was his 'Table of Human Voices' in which he included all voice types, where he puts the lower boundary of medium voice (falsetto) at A natural, that encouraged me to investigate changes in the very low part of the voice. It led me to ascertain that there is indeed a small shift in that area of all the male voices involved in this study. This includes my own and others with whom I have worked outside the study.

I looked for confirmation in other more recent pedagogical texts and found Richard Miller indicates that the *tenorino* begins the first passaggio at e' natural, which is a whole tone higher than Garcia, and that he has a second passaggio beginning at a'.⁵⁴³ Miller describes the *passaggio* of the *tenore leggero* as being a semi-tone lower than the *tenorino*, and the lyric tenor at d', which is where Garcia puts the *contraltino*.⁵⁴⁴ It is safe to say that since there is no precise agreement on where the *passaggi* are, it is because they are ultimately based on individual biology and vocal tract resonance strategies.

As I worked with different voices, I discovered that there is indeed some type of registration in the lower middle of the voice. And if it is addressed in a particular way, which is demonstrated through exercises, it sets up the voice for a slightly different type of experience. The 'pharyngeal voice' is a little easier to achieve and by entering the middle voice quite low, it allows for a smoother transition. It also upholds the top-down principle and of shifting registers at the first opportunity, as previously discussed. It was not until later in the research that I came across Richard Miller's graph of the voice, where he puts the entry into the lower middle register quite low.⁵⁴⁵

⁵⁴³ Miller, *Tenor*, 1993, p. 9.

⁵⁴⁴ *Ibid.*, 10–11.

⁵⁴⁵ *Ibid.*, 4.

FIGURE 1.1. Schematic design of graduated registration activity in the tenor voice. The *passaggi* indicate a lyric tenor.

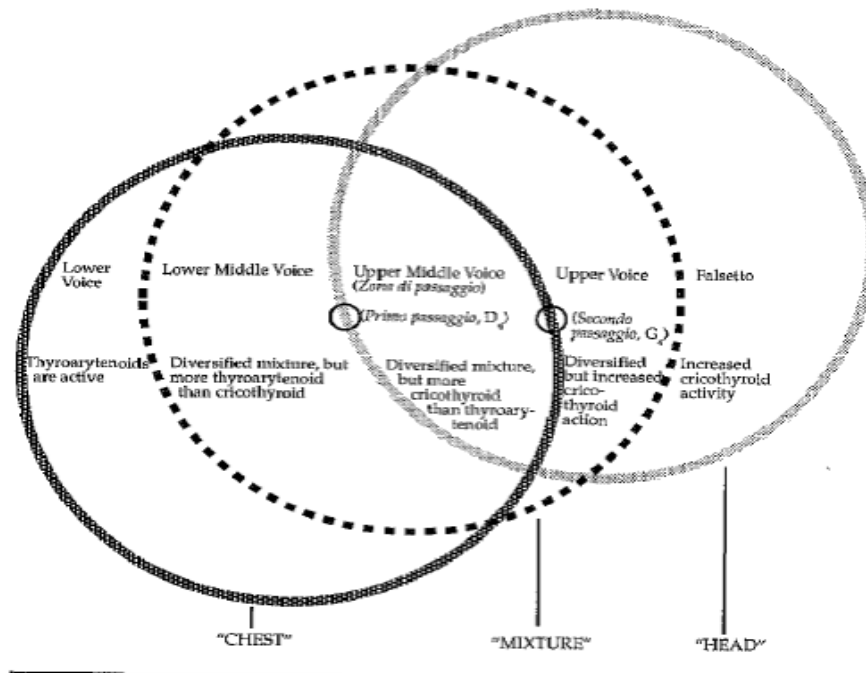


Illustration 8 – Miller, 'Registration activity of the tenor voice', *Tenor*, 1992, p. 4

Illustration 9 demonstrates Miller's idea of how the tenor voice is constructed, and gives general boundaries for registration events. Miller shows three registers, if 'mixture' is to be considered a register. It may coincide with Garcia's falsetto/medium voice. Miller names only muscular interactions, but it is possible to identify four different shifts and five zones of the voice. The lowest area of the voice is reserved as chest. When I compared the above to Garcia's unified voice staff, it seemed reasonable to align the 'medium voice' of Garcia with the 'mixture' asserted by Miller. When working with the students, I had indeed indicated a register event around A in the lower voice. This led me to adopt a register concept for the 'pharyngeal voice' whereby only the lowest unmodified and unmixed area of the voice is considered pure chest register. Once the student has modified past the first registration event, I use the term 'lower middle'.

I have found that if the first register event is successfully managed, the 'pharyngeal voice' is much easier to develop and will have a brighter, more piercing quality. When the shift was avoided by the participants, there usually occurred a slight acoustic or tuning

anomaly which quickly resolved itself, but the ‘pharyngeal voice’ production was less successful. In such cases the ‘pharyngeal voice’ would have the qualities of looser adduction and took on a more falsetto-like quality. It is beyond the remit of this study to determine if the shift is only mechanical, but simple observation indicates a minimal upward laryngeal movement.⁵⁴⁶

The First Register Event [FRE]: the tongue exercises

While there is little need to focus on the ‘pharyngeal voice’ itself in the lowest register, the connection to the highest notes must already begin to be established. Also, while the ‘first register event’ (FRE) can be dealt with differently than discussed here, the student is more likely to maintain a stronger connection to the modal voice, than to develop a coordination required for the ‘pharyngeal voice’. In illustration 8 above, Miller indicates that above the FRE is a form of mixed voice of both thyroarytenoid [TA] and cricothyroid [CT] muscular coordination rather than pure thyroarytenoid activity.⁵⁴⁷ Based on illustration 8, it would appear that as the CT muscles become active above the FRE the student is moving into a type of mixed voice production. If the FRE is managed differently than with this method, I conclude, based on the study, that the voice remains more TA dominant, and access to the ‘pharyngeal voice’ becomes reduced or postponed as a viable option. Depending on TA activity and breath management the ‘pharyngeal voice’ can be eliminated as an option altogether.⁵⁴⁸

The location of the FRE is quite low and relatively easy to deal with, but the ease with which it is crossed is disproportionately important to the development of the pedagogical method. As the ‘expanded ribcage’ exercise is the foundation for breath control within this method, the successful management of the FRE became the foundation for the registration theory of the ‘pharyngeal voice’. Because of the ease with which the FRE is overcome, some students had no difficulty while others needed significant focus on the event and have subsequently integrated versions of the exercise below into their ongoing daily routine.

⁵⁴⁶ The observed movement is not enough to categorize it within the current vocal paradigms, and it is best left to future research.

⁵⁴⁷ Ibid., 4.

⁵⁴⁸ This helps substantiate my earlier suggestion that as the chest voice is used more forcefully, the falsetto and head voice become more difficult.

While I have not identified any specific reference point in the voices for the FRE, it will typically occur within lowest sixth of the voice and for my students, usually within the zone of a fourth f to b flat. No student experienced the FRE above b flat, but the area of the lower and upper *passaggi* were correspondingly somewhat higher. Student 2 had the highest FRE at b flat, and he also had the highest *passaggio* at f' to a' and at with an extension to top a'' natural could sustain the highest pitch in 'pharyngeal voice' without resorting to falsetto timbre.⁵⁴⁹

To identify specifically where the FRE occurs in an individual voice, the student needs only perform pentatonic scales with the open mouth humming on [ng]. The student should not sing full out or press the voice but should perform the scale gently almost as if speaking. As the student ascends the scale a distinctive resonance or tuning anomaly will typically occur. This could be caused by the activation of the CT muscles triggering intonation difficulties. Once the location is identified the student performs the exercise to become aware of the shifting and to develop FRE coordination.

Exercises which require the student to stick out their tongue at coordinated moments while singing have been pivotal in training the FRE encouraging flexibility and the tilting of the larynx, the activation of the cricothyroid muscles which help to lengthen and thin the vocal folds allowing for entry to the falsetto register. I have developed three variations of the exercise each used to help the student to accommodate the FRE.⁵⁵⁰ Because the exercises are all conceptually the same, and the order of the notes is not important, only two of the variations are presented.

Once the location of the FRE is determined, starting in pure chest register the student sticks out their tongue each time an interval crosses the FRE pitch location and then return to its natural position when descending again to the starting pitch. The first exercise consists of four consecutive exercises that can be used without stop to make one long exercise. If the FRE, or tongue tension, was identified as an issue for a student, it was suggested that

⁵⁴⁹ At the beginning of training he also had difficulty singing below e, but after two years of training he became capable of singing c natural. The differences in registration could also indicate that the higher the FRE is experienced, the higher each of the subsequent registration shifts are, consequently affecting the entire range.

⁵⁵⁰ These exercises are also exceptionally helpful when dealing with tongue tension.

the tongue exercises become the first vocalise in their warm-up because the coordination for the ‘pharyngeal voice’ is set up from there.

Exercise 8: Tongue 1

Exercise 8

Example 19 – Exercise 8

[Exercise 8 Audio Demo: Researcher](#)

There are a couple of elements which are important to these exercises which are demonstrated in the example from student 5. Unlike most of the exercises, with the significant exception of the ‘Deep [u] Exercises’, the tongue exercises do not require the student to search for a resonant sound. In fact, that can undermine the efficacy of the exercise causing squeezing, or nasality. The starting tone of the exercise is a resonant [e] however when the tongue is pushed out of the mouth when crossing the FRE the sound needs to migrate to a schwa sound, losing all of its resonance.

[Exercise 8 Example: Student 5](#)

In the example from Student 5 both mistakes are heard. This is partially because, as a musical theatre student, his instinct is to over-engage with the chest register and raise his larynx. Because of significant tongue tension, he was unable to adjust to the FRE and move into any mixed sounds. Eventually, though not on recording, he was able to stop squeezing and release the tongue. Unfortunately, the student struggled with nasality during the exercise which also reduces its effectiveness.

[Exercise 9: Tongue 2](#)

This exercise serves the same function as the previous exercise but has a different expression. It is a little more advanced because it requires the student to know where their FRE occurs and keep it in mind throughout the exercise. In it, the tongue is stuck out only in the portion of the scale above the FRE but is left at rest for tones below the FRE. Unfortunately, there are no successful recordings of this exercise.

Exercise 9

Example 20– Exercise 9

[Exercise 9 Audio Demo: Researcher](#)

The 'Whoa' Exercise

The 'whoa' exercise is produced very much like any typical 'siren' exercise over a triad or octave arpeggio, but the distinctive sound is what makes the difference. In the examples it is produced in both open and closed timbres. Most often at first the student is incapable of producing the closed timbre closed timbre 'whoa', and the open timbre is much more accessible. Produced correctly this exercise can be taken to as high as f'' natural or g'' natural. This is a relatively 'aggressive' exercise but has helped many of the students access the upper extension of the 'pharyngeal voice' and to increase vocal mass to the falsetto register. Initially, chest register in open timbre forms the basis of the sound, but as the voice gives way to the closed (adducted) falsetto register, the 'pharyngeal voice' can be revealed. It is very likely that the larynx will rise at some point and discouraging this can cause difficulty and even injury.

This exercise produces a sound which is not in itself musical and is rather harsh. It can be used in rock singing, but not in classical music which is why this exercise is used for revealing and strengthening the 'pharyngeal voice', but the resulting sound can be modified to produce beautiful, effortless and artistic vocal tones.

Exercise 10: 'Whoa'

[Exercise 10 Audio Demo: Researcher](#)

This exercise is both effective and popular with the students. Its effectiveness is demonstrated in how successful they are able to accomplish the task and access the upper extension of the 'pharyngeal voice'. What should be noted in the examples, is that students are encouraged to shift the timbre of their voices as needed and uniformity of timbre is actively discouraged. Some prefer an open timbre (Students 2, 3 and 5) while others (Students 6 and 7) use a more closed timbre.⁵⁵¹ The timbral differences of the open and closed timbre are striking, but it's also important to note from Section I that both timbres are expected and are therefore relevant to the 'pharyngeal voice'. Each of the tenors here are using the version of the 'pharyngeal voice' most relevant to their voices and repertoire.

Student 2 performs the exercise very well in open timbre to high a'' flat in 'pharyngeal voice' with little difficulty. The timbral shifts in his voice are evident at 13 seconds, 19 seconds, 25 seconds and 33 seconds. At 22 seconds the student is asked if they are comfortable and he responds that he is. Then at 32 seconds the student has a slightly less bright tone than expected so is reminded that he needs to change his support from the ribcage to lower body. This is shorthanded in the video as 'a little of that settling down feeling'. The change in vocal quality is immediate and noticeable, the student however briefly lost control of the intonation which is not uncommon and is easily recovered.

[Exercise 10 Example: Student 2](#)

Student 6 also performs the exercise exceptionally well to a'' flat (perhaps slightly under pitched), but he executes it in a closed timbre. As he begins in the key of D major and

⁵⁵¹ Singers 2 and 5 are both musical theatre singers whereas singers 6 and 7 are Jewish cantorial singers and look for a more 'classical' sound.

his first *passaggio* is e' natural his voice can be heard to close from immediately after onset. Student 7 also uses closed timbre and has a similar vocal quality to Student 6. He also vocalises to a'' flat in this exercise. As he is the newest student to the research, so in his recording, it was necessary to use both the 'Deep [u]' octave arpeggio Exercise 14.A as well as Exercise 10. His voice responds well to closed timbre tones.

[Exercise 10 Example: Student 6](#)

[Exercise 10 Example: Student 7](#)

The previous three tenors were each *contraltino* voices, as is the next one. Student 4 typically has good access to the 'pharyngeal voice' but on recording day was having difficulty because of fatigue and nerves. While attempting the exercise, he can be heard squeezing the throat to make the sound. Under normal circumstances, he would not have difficulty, but circumstances being what they are he was having problems. I believe these factors lead to his persistent tightness. However there is something important in the video of this exercise. When he is attempting perform the octave interval, he visibly pulls back his head and neck. He does not seem to be able to find space for the tone: I believe this is because his larynx is already artificially high. As was discussed in Section I, an overly high larynx is as problematic as a depressed larynx. In the video, it looks as if at the onset on the tone his larynx is already up under his jaw line. Therefore there is nowhere for the larynx to go and he is forced to pull back on the larynx, in order shorten the vocal tract. I would not be surprised if he was engaging his pharyngeal constrictor muscles which pull the larynx back towards the spine.⁵⁵² In this case, stretching exercises and those which encourage the larynx to descend would be used to release the tension.

[Exercise 10 Example: Student 4](#)

There is a similar action visible in the example from Student 3. The larynx visible moves backwards towards the spine to aid in phonation. In his case, it would seem that he is not actively engaging with the falsetto register therefore the larynx is forced to behave abnormally. To adjust for this, I attempt to get him to close the timbre as Students 6 and 7

⁵⁵² <https://www.ncbi.nlm.nih.gov/books/NBK539752/> accessed 03/10/2019

do, by using the term ‘cover’, which should stabilise the larynx and begin to engage with the falsetto register. This was unsuccessful as he tried to make a heavier sound by pulling the voice to the back, only resulting in a crack. As will be seen with his example of exercise 14.A he was able to access the ‘pharyngeal voice’ in closed timbre.

[Exercise 10 Example: Student 3](#)

The next three videos provide important information on the nature of the ‘pharyngeal voice’ and its function. As was previously noted, Student 5 exhibited difficulty with a high larynx in open timbre. Often his voice was ‘too open’ and he needed to engage with his falsetto register more. Much like the last two students in this exercise, his larynx was rising too far when performing this exercise. However, we added in multiple falsetto exercises each lesson, which are basic to any vocal training, and he practised them regularly. In Example 1, he can be heard struggling with the exercise at 5–15 seconds, then I demonstrate very quickly and suddenly at 20 seconds the voice begins to enter ‘pharyngeal voice’ for the first time. This kind of sound is often quite harsh, and it takes time and training for the student to make the sounds musical. It will also be used to develop the *mezza voce* and a buoyant *piano*. Other important aspect of these recordings is the obvious difficulty with which Student 5 has descending back to chest voice once released into ‘pharyngeal voice’. At 2’45” he can clearly be heard sing a strong *f*” natural which has obvious chest (modal) components but which becomes a pale thin sound on *f*’ natural. There can be no doubt that it is a separate register from chest. It is precisely this difficulty, connecting the two registers, that is exploited in the development of the *mezza voce* and high *piano* singing. When training the *mezza voce* and the *piano* the upper register is carefully controlled and brought down while deliberately not changing registers. This is discussed further in the *portamento* exercises 17A & B.

When hearing sounds like this, there is always the fear that damage is being done, or that the student is straining.⁵⁵³ In his final recording, he explains what it feels like to him. He

⁵⁵³ Personally, I have been using these sounds in teaching for up to nine hours each day for ten years and have not had any issues. I have seen several otolaryngologists, and each have remarked that my vocal folds are perfect. Dr. John Ruben of the Royal National Throat, Nose and Ear Hospital remarked more than once that my vocal folds are ‘beautiful’ perfectly white, straight, and without any sign of oedema or damage. <https://www.uclh.nhs.uk/OurServices/Consultants/Pages/ProfJohnRubin.aspx>

indicates 'it's not too hard' actually. He goes on to describe that the sound is focused initially but the resonance seems to expand as he goes higher. Student 6 has also indicated that the upper extension of the 'pharyngeal voice' is easy and does not cause strain. For many, they are easier than singing full voice c'' natural.

[Exercise 10 Example 1: Student 5 No PV](#)

[Exercise 10 Example 2: Student 5 PV](#)

[Student 5 Explaining](#)

Alternating Intervals

I developed this exercise while working with students in the studio during the practical research; it is not based on any particular historical source, but rather is inspired by some of the repertoire requirements discussed in Section II. It is necessary for 'pharyngeal voice' students to learn to move through the voice and up to the highest register without adding vocal weight. Often, as is observed in exercise 10, tenors sometimes bring a heavier chest register-based sound into the singing which would be at odds with the coordination being set up for the 'pharyngeal voice'. By encouraging the student to feel significant shifting between intervals, rather than evenness, they were able to maintain the integrity of the vocal principles required for the 'pharyngeal voice'.

Learning to manage the different register shifts is integral to developing the 'pharyngeal voice'. Any difficulty is easily detected as it disrupts the characteristic smoothness of the 'pharyngeal voice'. By making the student aware of and able to observe the different shifts in the voice through ascending and descending through an arpeggio, he is able progressively to lighten the voice as it ascends the alternating intervals. This exercise encourages laryngeal mobility and self-awareness. It is not meant to produce a beautiful sound but rather to help him find freedom of registration. The student is encouraged to drop vocal weight and continue to thin the folds up to the highest register. This allows the upper register of the 'pharyngeal voice' to be emitted freely and clearly with diminished vocal weight but with a strong piercing quality. The voice can achieve great volume, but because of its lightness, can also produce a striking *pianissimo* and *coloratura*.

[Exercise 11 Video Demo: Researcher](#)

Exercise 11 is not the easiest for students to understand because it requires self-awareness, self-guidance, confidence and a good ear. Unfortunately, what is demonstrated often with this exercise, despite its inherent usefulness, is a lack of practice. In each of these recordings the students struggle with intonation, understanding where they are in the chord, breathing and how to proceed. The first example with Student 6 provides some explanations of how the exercise works and how to build up the intervals. He manages to accomplish the exercise and I lead him directly on to exercise 15 B to integrate what he has done. Student 4 has difficulty remembering the exercise at first but eventually it allows him to reach into the upper extension of his 'pharyngeal voice' to g'' natural.

[Exercise 11 Example: Student 6](#)

[Exercise 11 Example: Student 4](#)

Student 3 struggles as well. There is an obvious rigidity in his larynx and as he is compensating for a lack of resonance with nasality, which causes a low intonation and difficulty in registration. This example illustrates the exaggerated shifting and vowel modification required to achieve the goals of the exercises. I encourage him to use the *coup de la glotte* exercise to find the gentler balanced onset, with some success. He eventually gets to thin the voice a bit but remains heavy even in his mixed voice.

[Exercise 11 Example: Student 3](#)

Octave Arpeggio [ma]

This exercise is one of the most efficient at helping a student develop access to the 'pharyngeal voice'. It encourages him to use a light and focused tone as well as to engage with lower body support quite strongly. The objective is to avoid using any aspirated phonation on the nasalised consonant [m]. To do so, the coordination is unlike typically used in full voice singing. The soft palate will remain low and the velopharyngeal opening to the sinus may remain open. The area behind the velopharyngeal opening should not be

arched high and the pharynx should remain relaxed but not widened. It is imperative that the tongue and jaw remain relaxed during the entire process. There is no need to increase space in the jaw, mouth, or pharynx, in fact the space may need to reduce slightly.

The resonances of the tone will seem to be quite high and bright while the intensity of the tonic will diminish noticeably. The tone will be in 'pharyngeal voice', but it will not have a finished musical quality. This exercise is specifically used to develop the coordination of the 'pharyngeal voice' and integrate the tone production with breath support.

Exercise 12

The exercise is performed entirely as triplets over an octave arpeggio with the top tone repeated four times. As mentioned, the tongue, jaw, and pharynx should each be relaxed. There is also some scope for nasality which will be eliminated through further study. When done correctly the voice feels as it becomes progressively smaller as the exercise ascends. The starting vowel is typically [a] but the vowel will modify to a more open vowel like [æ] above b' flat and [ɪ] as the pitch rises. The pharynx should be allowed to take on the requisite shape of the tone with no regard for vowel consistency, and the larynx should be allowed all necessary freedom. The vowel will become increasingly nasalised in the higher pitches. The student is encouraged to take the exercise as high as possible which is typically to f'' natural, g'' natural, or even higher.

Exercise 12

The musical notation for Exercise 12 is written on a single staff in treble clef with a 4/4 time signature. It begins with a bass clef symbol (an '8' in a circle) on the first line. The melody consists of an ascending octave arpeggio: G4, A4, B4, C5, D5, E5, F5, G5. The notes are grouped into three triplets, each marked with a '3' above a bracket. The syllable 'ma' is written below each note. The first triplet (G4, A4, B4) is on the first line. The second triplet (C5, D5, E5) is on the second line. The third triplet (F5, G5) is on the third line, with the final 'ma' note on the fourth line. The piece ends with a double bar line.

Example 22 – Exercise 12

[Exercise 12 Video Demo: Researcher](#)

Similarly to exercise 10 (the 'Whoa'), exercise 12 is quite successful at slimming down vocal mass and aiding in shifting into the 'pharyngeal voice'. What follows is the discussion of the recordings. The first two examples, both *contraltino* tenors, demonstrate easy facility with the exercise and little resistance in the voice. Student 4, even though is suffering from tension, manages to access the 'pharyngeal voice' but he is still experiencing vocal distortions. His larynx is still very high. Typically, in a vocal lesson we would have work more in pure falsetto, as well as the previous strategies mentioned. Again, using pure falsetto exercises assist in restabilising falsetto register dominance. As these recordings were made around the time student was gaining access to his 'pharyngeal voice', they show how the voice sounds when it is resisting shifting into the desired coordination. It is possible to hear him negotiating full voice, mixed voice, falsetto and 'pharyngeal voice'. With Student 3 even though the larynx is still moving up and back, he manages to access the 'pharyngeal voice'.⁵⁵⁴ The goal would be to relax the larynx and the squeeze to warm up the voice and relieve the tension.

[Exercise 12 Example: Student 7](#)

[Exercise 12 Example: Student 2](#)

[Exercise 12 Example: Student 4](#)

[Exercise 12 Example: Student 5](#)

[Exercise 12 Example: Student 3](#)

⁵⁵⁴ The movement of the larynx is reminiscent of Lamperti's description of laryngeal movement, but I doubt it was meant to be this extreme.

Resonance Strategies: Resonation, Vibration & Vocal Timbre:

Resonance strategies can be understood as the development and exploitation, consciously or otherwise, of the interactions between the vocal formants and the harmonic series through the subtle manipulation of the vocal tract.⁵⁵⁵ The ‘pharyngeal voice’ is the interaction between the falsetto register and favourable resonance strategies which allow the falsetto register to take on some qualities of the chest voice and to have stronger contact between the vocal folds.⁵⁵⁶ The exercises help to develop an awareness of how the ‘pharyngeal voice’ feels and sounds at different stages in its development. In the beginning the ‘pharyngeal voice’ can lack power, consistency and be devoid of tonal beauty but significantly extends the range. It can also add flexibility, coloration, and ease of vocal production to the adjacent registers.

The exercises to understand how resonation functions in the voice can be difficult and often tedious because it takes time for the student’s ear to adjust to what it needs to hear. Frequently, I find that students are overly reliant on the fundamental and neglect some of the higher harmonics which are used in the development of the ‘pharyngeal voice’. They can also focus on hearing warmth inside their heads. This can lead the student to emphasise the incorrect harmonic, causing difficulties in registration and unwanted tensions. To help counteract this, exercises are used that force the student to alter the resonance strategy in order to remain in tune against varying chord changes. Other exercises, such as the vocalizing on ‘ng’ help to reinforce the inner awareness of vocal colour, vibration, and to set up favourable vocal tract alignment, or as in the vowel progression exercise, to help distinguish how vowels are formed in the vocal tract and to aid in the understanding of open and closed timbres. Some of the registration exercises also have uses in resonation instruction.

Several concepts for registration have already been introduced. Open and closed timbre, pharyngeal space, vocalising on [ng], and some resonance tuning. What is covered

⁵⁵⁵ For a more in-depth discussion see Appendix 1: A brief introduction to vocal acoustics.

⁵⁵⁶ Mayr, A. ‘Die voce faringea, Rekonstruktion einer vergessenen Kuns’ (Dissertation: Kunstuniversität Graz, 2014) especially ‘3.2. Studie: Strömungsglottogramm- und EGG-Parameter in den Stimmregistern: Modal, Falsett und voce faringea’, pp. 92–127.

here are exercises that help the student to develop a stronger awareness of the how the resonances interact in the vocal tract, and how that affects registration and vowels.

The first exercise helps to develop an awareness of vowel modification or vowel migration. Vowel modification ‘involves the intentional reshaping of the vocal tract from habituated speech postures’ which might be described as *active* vowel modification as opposed to ‘passive’ vowel modification which occurs not because of vocal tract reshaping, but through the changing relationships of the harmonics of the pitch and stable vocal tract formants.⁵⁵⁷ Vowel modification allows the student to become comfortable with the progression of vowel migration towards the ‘pharyngeal voice’.

The typical migration is from an open [a] on a low pitch through a series of rounded vowels like [ɔ] (as in ‘thought’ in received pronunciation) through a deep [u] then into the highest register as a nasal unrounded [i] pronounced something like ‘lip’.⁵⁵⁸ Regardless of the starting vowel, all vowels inevitably move closer to the same vowels in the highest notes. It is also important for the development of the ‘pharyngeal voice’ to allow the vowels to continue to close, and not to reopen them after *passaggio*. The following are standard exercises that have been modified in their application to elicit the ‘pharyngeal voice’, so the resulting sounds may vary considerably from expectations.

Deep [u]

During the practical investigation I found that using a very deep [u] vowel helped to stabilise the voice in such a way that I was able to move into the falsetto setting without releasing too much glottal closure. The concept that is being explored here was developed into exercises that isolate a particular sound in the voice that leads directly to the ‘pharyngeal voice’ and engages with the body in a significant way.⁵⁵⁹

The deep [u] exercises are some of the most difficult for the students to achieve but can also be the most helpful. It took me three months to be able to produce sound correctly and most of the tenors have only ever performed it correctly a handful of times. The

⁵⁵⁷ Bozeman, Practical, 2013, pp. 17 & 25.

⁵⁵⁸ Garcia, *École*, (part 1: 1840, part 2: 1847), Part 2, p. 2.

⁵⁵⁹ These exercises contribute significantly to the development of the mezza voce as well.

objective of this exercise is to produce an [u] that is not particularly resonant. It could be better described as [ə] which is a neutral vowel pronounced like the 'oo' in foot. The [ə] vowel being round provides more impedance to the air. The slowed air increases reactance in the vocal tract and therefore vocal cord closure. The higher and greater closure increases the number of partials and brings the head voice into the 'pharyngeal voice'.

For this exercise it is most helpful first to perform some falsetto exercises of any variety (by imitating a countertenor) to encourage the shifting of the larynx into falsetto position. It is not important if the exercises are adducted or abducted falsetto, supported closed falsetto or open. Because those exercises are not unique to this research there is no need to discuss them specifically but singing in falsetto for about few minutes should be enough.

The exercises below are used to set up a falsetto-based coordination without resort to narrowing the pharynx. The coordination will be strengthened in other exercises. Each one uses the same sound and encourages bringing the head voice down as far as possible. Finding the correct [ə] is imperative and the student should under no circumstances attempt to 'place' the voice or find resonance as this can encourage unwanted compensation within the pharynx or larynx. The exercises are performed slowly keeping the tone even at all times however the vowels will migrate.

Exercise 13: 'Vowel Modification' Scale

This exercise consists of a simple upward octave scale in which the vowels are actively encouraged to migrate according to the above description, with the anticipation that passive migration will occur in the future once coordination is established. Individual vowels remain located in their relative pitch area of the voice and modify away and back again. For example, a clear [a] can be produced below the FRE but may begin to modify above it, and as the voice reaches e', the vowels round and then close no matter what the starting note. If the starting note is e' then the starting vowel will be rounded from the onset and then become closed. This will occur in reverse in descending scales.

For the ‘pharyngeal voice’, the voice is allowed to cover heavily and then move through to the falsetto setting.⁵⁶⁰ Covering the voice in this way produces a very small dense [u] sound that maintains a mild chest connection but helps to develop a stronger closure, which once developed increases the partials and produces a much stronger richer tone quality that resembles chest voice much more.⁵⁶¹

Exercise 13



Example 23 – Exercise 13

[Exercise 13 Audio Demo: Researcher](#)

[Exercise 13 Video Demo: Researcher](#)

In the first example below, Student 3 is guided through the basic vowel modification of the exercise. He starts on a well-formed closed [i] then to [e] and to [a]. The open [a] poses a greater difficulty for him because, as is the point of the exercise, he needs to close the vowel in passaggio the move towards an [u] and then [ø] sound. He has difficulty adjusting but eventually manages it. He accesses his head voice but as it is new, he has a squeezed pharynx. He does however manage to get to ‘pharyngeal voice’ around 1’02”. In the second example which was made two years later, he is adjusting to a deeper sound, but is still pressing the voice and making it heavy. He is encouraged to let some air through to relax the vocal folds and release some of the chest register connection, as well as to avoid pulling the voice backwards or squeezing the pharynx as he had previously done. He does however manage to modify his vowels for the exercise, but because of the weight has difficulty releasing into the ‘pharyngeal voice’. The exercises are modified for him because

⁵⁶⁰ The ‘heavy cover’ is not used in performance. It is solely used as part of the exercise in the attainment of the goal.

⁵⁶¹ Mayr, ‘Rekonstruktion’, 2014, pp. 121–7.

for some time he needed to focus on the FRE and most notes needed to start below that so he could shift out of chest. I think the gravitas of being in a professional recording studio took its toll on him as well.

[Exercise 13 Example: Student 3](#)

[Exercise 13 Example: Student 4](#)

With Student 4, the exercise demonstrates a difficulty once again getting the larynx into the correct position. Around 30'' I attempt to help the student adjust the larynx with a slightly deeper closed front [i] vowel but his response is a more open [I] vowel. Several times I attempted to engage with his head voice, or falsetto register, to get the larynx to shift. When he breathes the larynx descends but returns to a high position for phonation.

Typically, this exercise has a high success rate, but I thought demonstrating the difficulties might be more enlightening. Once established, the [ø] or [u] is used to perform the following exercises throughout the voice.⁵⁶² Below are three exercises whose application are meant to solidify the [ø]/[u] and unify the falsetto register portion of the 'pharyngeal voice' as a distinct phenomenon which will be unified to the chest register later. The heaviness of the deep [u] of the previous exercise, if it was successful, is released in these exercises, as it serves no further purpose. The objective will be to maintain the deep [u] feeling and sense of connection to the body, especially the ribcage and back, without the vocal weight or need for excessive engagement of the throat. The shape of the vowel and appropriate breath management is enough to maintain this aspect of the 'pharyngeal voice'. The vowel will shift significantly through the scale which will also begin to close typically from d' or e' natural and above.⁵⁶³ These exercises have a disparagingly high rate of difficulty which took three months for me to master. If the student cannot perform these exercises, the 'pharyngeal voice' can still be developed; it will however suffer mildly with confident *piano* singing and the *messa di voce*.

These exercises are to be performed maintaining a gentle un-constricted vocal tract allowing the vowel to modify from [u] on the bottom to [ø] in the middle of the range. As

⁵⁶² The actual vowel used is dependent upon several factors including pitch.

⁵⁶³ This should not be confused with open timbre.

the scale enters the highest pitches, some nasality or degree of velopharyngeal opening is expected and helpful. As the voice reaches the upper extension the vowels will continue to modify to [ɨ] and [ɨ̃] and the voice will seem to diminish in size, but as it reaches a' and above the voice become clear in timbre and the head register will take on a piercing quality.

Exercise 14.A Octave arpeggio

The octave arpeggio on any vowel is a fundamental of vocal pedagogy, but the importance is in how it is executed. This is a simple exercise to be performed quickly, with very little vocal weight, in order to establish an awareness of the vowel's modifications and breath management. Start in a comfortable area of the voice and raise the key by semitones.

[Exercise 14.A Audio Demo: Researcher](#)

Very much like exercise 10, this exercise is quite successful in reaching the upper extension of the 'pharyngeal voice'. In the first example, the student has difficulty with the [u] because the vowel is already closed, so when entering *passaggio* it will tend to become heavy. This causes difficulty with intonation. The student is advised to un-round the vowel and to open it. When opening the vowel is difficult, he is instructed add nasalance and brightness to the voice instead which works. Since the [u] was less successful, a different closed vowel, [i], was substituted and worked much better. He used a warm rounded [i] around 43" it is possible to hear the 'pharyngeal voice' beginning to emerge.

[Exercise 14.A Example1: Student 2](#)

[Exercise 14.A Example 2 \[i\]: Student 2 \[i\]](#)

The next two examples perform the exercise in a similar way. They begin with a slightly open [ə] which covers naturally to the [u] when the student moves into the *passaggio*. Because they each begin with an open vowel, they pass through the *passaggio* with a closed vowel and then reopen above into 'pharyngeal voice'. Both students sing well into their upper extensions. At 1'22": in the example with Student 6, he slips into a pure

false sound. This occurs because he neglects to sufficiently open his mouth to keep the first formant above the fundamental and he inadvertently slips into ‘whoop timbre’.⁵⁶⁴

[Exercise 14.A Example: Student 6](#)

[Exercise 14.A Example: Student 7](#)

The example with Student 7, is important in how it clearly demonstrates register shifting and how important the correct vowel is to developing the correct sound. He starts with a slightly too narrow vowel and is encouraged to sing a less resonant deeper [u]. He successfully produces the ‘pharyngeal voice’. Once he is expected to sing into the upper extension, he is offered a description to remind him of his physical or acoustic experience with the registration. Because the relevant arpeggio is in D Major, he is required to shift immediately in the first interval to D sharp. He is told that the tone ‘goes back’ towards the pharynx for the a’ natural, and not ‘forward’, then to enter the upper extension the subsequent instruction is to maintain the same sensation in the pharynx and to ‘breathe through’ the tone, using about ten percent more air flow, which will then release into the upper extension of the head register. The tone will then be encouraged to take on more nasalance to aid in resonance and projection which will also discourage moving into a pure falsetto whoop timbre.

[Exercise 14.B Descending arpeggio](#)

The objective of this exercise is to bring either the ‘pharyngeal voice’ or the head voice as low as possible before shifting into chest voice. It follows on from the *coup de la glotte* exercises and is implicit in the *portamento* exercise. Finding the correct vocal quality on the starting tone is pivotal, and often difficult. It is performed *legatissimo* from a comfortable f’ natural or f’ sharp descending one octave all the time bringing the ‘covered’ falsetto register (head voice) [ø] sound down toward [u]. Having reached the lower tonic, the voice descends a fourth on a bright open [a] vowel bridging into chest register and then back to the [u] in the falsetto register. This exercise is to be repeated, performing each

⁵⁶⁴ There are other possible physiological descriptions of the sound heard, but that would require further investigation and would be beyond the current remit of the dissertation.

subsequent key a semi-tone lower, all the while taking the falsetto register lower and lower until either the chest register notes are out of range or the falsetto register can no longer be maintained on the tonic. This exercise is also useful for integrating the ‘pharyngeal voice’ into the chest register.⁵⁶⁵



Example 24 – Exercise 14.b

[Exercise 14.B Video Demo: Researcher](#)

This exercise was the first in this video recording session to positively engage the falsetto register for Student 4. The location of the larynx is notable and seems to be stable. His mixed voice falsetto register is well-balanced and has vibrato. When he shifts into chest voice there is some pressing, but he still manages to return to the falsetto register successfully. Student 3 manages to engage with the falsetto register but is less successful overall with exercise. One element that is noticeably missing is the openness in the body and activation of the ribcage. He is in a collapsed stance and unable to support falsetto register.

[Exercise 14.B Example: Student 4](#)

[Exercise 14.B Example: Student 3](#)

Exercise 14.C: 1-2-3-2-1

Possibly the most difficult of all the exercises, this one requires intense control and gentle release into the falsetto register. Having gained control of the falsetto register [ə] descending, this exercise creates a slow ascent while integrating the feeling of going lower in the voice. In a slow tempo and *legatissimo*, using the [ə] vowel from b natural or c' natural, perform a simple scale of 1 – 2 – 3 – 2 – 1 and without breathing descend a semitone and repeat a total of six times, at which point a breath is taken and six more are

⁵⁶⁵ See the section below ‘Integration Exercises’, p. 329.

repeated (a semitone lower). At this point while maintaining the feeling in the throat, a breath is taken and the exercise is repeated from the octave, which is now a semitone higher than the previous starting pitch. During the breath at the bottom of the exercise, in order to attain the octave, there is a sense of moving slightly back in the throat rather than up.⁵⁶⁶ There is no attempt to place the voice. All the work is done by vowel and breath management alone. If it becomes too difficult to maintain the tempo during the exercise it may be increased slightly. The exercise should only be taken as high as the vowels can maintain an evenness without sudden muscular interventions. Once above *passaggio* it becomes necessary to narrow the pharynx slightly to avoid the alto sound of the upper falsetto register. This action increases the tenor voice quality and gives the ‘pharyngeal voice’ its name. The experience of this is very much linked to the vocal fry exercises and the *coup de la glotte* exercises. This is demonstrated in Video Demo 3.

Exercise 14C

Example 25 – Exercise 14.c

[Exercise 14.C Video Demo 1: Researcher](#)

[Exercise 14.C Video Demo 2: Researcher](#)

⁵⁶⁶ This is likely an active opening of the pyriform space. Discussed with Kerrie Obert at the Voice Geek Conference 27 & 28 April 2019. Kerrie Obert MA-CCC/SLP, is a Speech Language Pathologist and Clinical Voice Specialist with over 20 years' experience in teaching voice. Ms. Obert holds degrees in both speech language pathology and musical theatre performance. She worked for nearly 20 years at The Ohio State Univ. where she performed thousands of endoscopic exams and treated singers who had vocal damage. See Gates, R., Forrest, L., and Obert, K. *The Owner's Manual to the Voice* (Oxford Univ. Press, USA, 2013); Obert, K. and Chicurel, S. *Geography of the Voice: Anatomy of an Adam's Apple* (Estill Voice Training Systems International, 2005). For more information on Kerrie Obert visit: www.capital.edu/academics/faculty/kerrie-obert/.

Without exception this has been the least successful exercise but is still extremely useful. It is unsuccessful because of its difficulty and therefore students are less likely to practice, so improvement is minimal. In the example with Student 5 the exercise is attempted with more or less success in terms of vowel modification. However the student exhibits tension in the tongue, and possibly larynx, which stops the exercise from working properly. Between examples one and two an attempt is made to find the correct sound using pure supported falsetto, and then moving into a mixed head voice sound. I used Isaac Nathan's description on how to find the 'pharyngeal voice' by starting in falsetto and moving to [a] but in this case his [a] over engaged and switched directly into chest voices. So, in example two, he is shown trying to move from a mixed voice [a] to the [ə] vowel in 'pharyngeal voice' which is the desired vowel for the exercise.⁵⁶⁷ Unfortunately, even though the same sound is sought, Student 4 is unable to reproduce it and the larynx once again rises.

[Exercise 14.C Example: Student 3](#)

[Exercise 14.C Example: Student 5](#)

[Exercise 14.C Example 2: Student 5](#)

[Exercise 14.C Example: Student 4](#)

Accessing the Upper Extension of the 'pharyngeal voice'

The upper extension of the 'pharyngeal voice' is probably the most interesting component of the whole project. As was suggested in Section II, the vocal quality was most likely more similar in timbre to the tenor voice than that of a modern countertenor. The practical research on this aspect took several years to develop and the technique is an outgrowth of the set-up of the voice as a whole. While it is possible to teach a modern tenor, especially a *tenor leggero*, to use the upper extension of the 'pharyngeal voice', it requires adjustment of the entire voice which can be integrated and used at will, which may not have been an option for in the early nineteenth-century tenors. Many elements of the 'pharyngeal voice' are usable by the modern tenor, but its use requires an approach that undermines certain 'conventional' standards such as lowered larynx, widened pharynx and timbral uniformity.

In order to keep the tenor sound in the voice without the benefit of chest voice, I found it was necessary to work to alter certain resonances of the conventionally trained voice. When entering the falsetto-based head voice the sound would typically change into more of a countertenor sound than that of a tenor. A greater amount of air would seem to pass through the vocal folds as the voice moved into the 'whoop timbre' than was needed for the middle voice. I surmised that a brighter sound would need to be maintained, and began to think about the clear/open timbre discussed in Section I. I also considered Lamperti's suggestion to keep the 'buzz' of the voice in the pharynx. This led me to consider the space in the pharynx as a bright space rather than a darkened space. Would the clear/open timbre need to be maintained up into the extension or would the voice need to close? Two different types of exercises were used to explore the question: the 'whoa' exercise and the 'deep [u]'.

The 'whoa' exercise, which is based on Garcia's open timbre, causes the voice to open progressively and maintains what seems like a much greater chest connection than in falsetto. The voice is encouraged to lighten and brighten as it ascends. Once the voice rises into head voice around d' flat the voice thins and in order to continue to phonate may spread uncontrollably, which can be mitigated by adding some nasality. As described by Garcia, the larynx will rise significantly at this point. This method of reaching into the upper

extension was successful, but was found to be difficult to sustain, more so for the *tenore serio* than for the contraltino.

A second method for accessing the upper extension was developed by allowing the voice to close rather than open.⁵⁶⁸ The difficulty that was immediately apparent was that the voice developed a heavy chest-dominant sound that flipped uncontrollably into a falsetto voice ‘whoop timbre’. It was at this point I began to investigate the use of Garcia’s ‘rounded timbre’ which is somewhere in between the open and closed timbres. He says that in the rounded timbre the larynx sits

‘a little lower than that for the clear timbre, and the soft palate rises moderately, the ‘sound column’ straightens out a little and hits the middle of the palate. Then the voice is emitted brightly, but more *rounded* [my emphasis] than in the clear timbre. The voice will lose some brightness but gain some roundness, if the soft palate is raised a little more, so as to leave only a slight communication with the nasal cavities. In this circumstance, the column of air, which is very slightly inclined, strikes in front of the palatal arch.’⁵⁶⁹

What is interesting about this description is that its efficacy is predicated on the passage to the nasal cavities being open in clear timbre. When using the rounded timbre, the palate rises but still allows ‘communication with the nasal cavities.’ A reasonable assumption is that this configuration works for the middle voice to upper registers of the voice. But I also found that nasalance, and slight access to the sinuses without nasalance, helped to encourage singing in the upper extension as well. Garcia wanted the sound to vibrate in the front of the palate for the middle voice which is analogous to Lamperti. However Lamperti also insisted that there be a vibration which was consistent in the back towards the pharynx (what he called ‘resonance’) which was allowed to move. Conceptually I took this to mean that there should be the sensation of vibration in the pharynx and in other parts of the head and they were not mutually exclusive. In order to explore the pharyngeal vibration, I used several standard exercises on ‘ng’. The rounded timbre combined with the ‘ng’ position of the tongue provided the most suitable configuration for developing the ‘pharyngeal voice’

⁵⁶⁸ See Section I and Appendix 1: a brief introduction to vocal acoustics for a description of closed timbre.

⁵⁶⁹ Garcia, *Ecole*, 1847, p. 16, ‘Lorsque le larynx prend une position un peu plus basse que pour le timbre clair, et que le voile du palais se soulevé médiocrement, la colonne sonore se redresse un peu et va frapper contre le milieu du palais. Alors la vois sort éclatante, mais plus arrondie que dans le timbre clair. La voix perdra de l’éclat et gagnera de la rondeur, si la voile du palais de relevé davantage encore, de façon à ne laisser qu’une légère communication avec las fosses nasales. Dans cette circonstance, la colonne d’air, qui est à peine inclinée, va frapper au-devant de l’arcade palatine.’

including the upper extension. But once the head register is developed the tongue can assume a more relaxed position.

Because the voice was in the rounded timbre a 'pure' vowel was difficult to maintain. As the voice would close, the [a] vowel would modify towards [ɔ] exactly as expected based on the discussion of vowel modification above and in Section I. As pitch continued to rise the vowels continued to modify towards [i] and [i] demonstrated in the exercises above. As I moved higher the voice maintained a brightness but reduced chest participation. After moving into the head register, increasing nasalance maintained the 'chest' voice sound and took on a veiled quality which once developed became piercing and tenor-like. Observation showed that as this was occurring the pharynx would narrow somewhat into the upper register. If the narrowing was exaggerated the sound would become pinched and throaty, but if relaxed can be reasonably attractive.

Breath management for the upper extension is dependent upon many factors but is mainly affected by the dynamic, and how open or closed the sound is. If the sound is gentle, somewhat closed in timbre but not pressed forward, an open ribcage and a raised pelvic floor keeps the voice free and light. If, however the dynamic is more towards *forte* and needs more resonance, the student can have the sense of using the abdominal region and pressing down into the pelvic floor. This sound will have much more of a *squillo* or 'ringing' quality to it.

Integration Exercises

The head register is not easily integrated with the full voice and requires close attention and skill: if not handled carefully, the register shift is abrupt and obvious. Many of the tenors discussed in Section II were known for their ability to affect a smooth transition from chest to head. For this reason, I developed exercises designed to address the difference in registration. There are several exercises used to integrate the 'pharyngeal voice' into the chest voice. The first encourages use of the closed supported falsetto and is based on a simple octave arpeggio. There are several exercises found in Garcia's work that

concern the uniting of registers, so it is not necessary to repeat them here.⁵⁷⁰ Instead, I will discuss exercises that I developed specifically to integrate the upper extension into the falsetto and chest register. The first of these (15A) is used to develop coordination between the falsetto voice and chest register which will be invaluable when progressing to integrating the head voice.

Exercise 15.A

The student should begin on a low note, but high enough to have access to a full supported falsetto voice ('whoop' timbre): typically e natural is good. With a single breath, begin with a clear chest voice [a] and sing up the triad in open timbre but then for the upward fourth from the dominant to the octave smoothly switch from open chest to a fully supported whoop timbre [u]. The procedure is reversed exactly on the way down. The student needs to bridge back to the chest voice [a] from the octave to the dominant. The exercise should be performed in this way as high as possible. The objective is a seamless transition with no crack.



Example 26– Exercise 15.a

[Exercise 15.A Audio Demo: Researcher](#)

[Exercise 15.A Video Demo: Researcher](#)

This exercise requires careful control and coordination. It is another one of the exercises that students did not typically enjoy and therefore avoided. It is more difficult than some of the other bridging exercises but is worth the effort. In the example below,

⁵⁷⁰ Garcia suggests changing registers on a single tone, then alternating tones and then to intervals. Garcia, *École*, 1847, pp. 28–9.

Student 4 bridges between registers successfully. I think with greater practice and attention to his laryngeal position it would be of great benefit.

[Exercise 15.A Example: Student 4](#)

Exercise 15.B

This exercise can only be attempted once the upper extension is in place and reliable. It is also used to integrate the ‘pharyngeal voice’ into the chest register. Most of the repertoire from Section II uses downward coloratura, so this exercise starts high and finishes low. The exercise is a top down arpeggio-based exercise that becomes progressively lower, but always starts above b’. It is a free-form exercise much like Exercise 11 ‘alternating intervals.’ The typical first interval is typically b’ to d’’ sharp. The intervals then alternate down finding where the intersection is between the registers occur using the deep [u] coordination and vowel modification tract.

Exercise 15B

Example 27 – Exercise 15.b

[Exercise 15.B Audio Demo: Researcher](#)

Most of the recordings are successful in that each of the tenors are able to integrate the ‘pharyngeal voice’ into the chest voice from above. Except for Student 6, the students

felt the need to squeeze to access the upper extension which indicates that they had not yet found relative ease with starting in the upper extension.

[Exercise 15.B Example: Student 2](#)

[Exercise 15.B Example: Student 6](#)

[Exercise 15.B Example \(range demo\): Student 6](#)

[Exercise 15.B Example: Student 3](#)

Training Elements: Messa di voce and Portamento

Messa di Voce

The *messa di voce* as discussed in Section I was an integral part of historical *bel canto* training. The *messa di voce* encourages the development and coordination of breath management and registers. It also helps to encourage the student's ability to control the 'pharyngeal voice' and be able to integrate more seamlessly into the chest voice. As Lamperti and Garcia urged the student to perform the exercise differently, Lamperti wanted the exercise performed in one register only, but Garcia allows for the changing of registers during its execution, I expect the student to be able to do either depending on the musical interpretation.⁵⁷¹ The *messa di voce* is typically performed on a single note to begin with but is also be practised up and down scales.

Exercise 16.A: Single tone

[Exercise 16.A Video Demo: Researcher](#)

The example with Student 4 demonstrates its use as a technical exercise and shows how he can use it to unify the register. It is not used to disguise the timbre changes, but rather to smooth the transition.

[Exercise 16.A Example: Student 4](#)

Portamento

I developed this exercise from comparing the various historical texts discussed in Section I: *Portamento*.⁵⁷² At its most basic, the exercise consists of a downward pentatonic scale, but the benefit is in the application. It coordinates breath management, *appoggio*,

⁵⁷¹ Garcia, *École*, 1847, pp. 60–2.

⁵⁷² See p. 96.

registration, and even resonance tuning. It can be physically tiring but should not be vocally exhausting.

Included here are two variations that are used to develop coordination between registers, resonance tuning, and breath management. The objective is to produce the portamento completely evenly. Starting on the dominant, in the 'expanded ribcage' position, slowly descend the pentatonic scale. There can be no shifting, no variations, and no dropping of registers. The vibrato must always remain even, especially when singing through the microtones between the notes of the scale. There can be no sliding or slurring and no skipping. Each exercise is to be performed on a single breath.

The student then performs the exercise on progressively lower keys, always feeling as if they are starting in the original position from the dominant in a major, because the exercise becomes more difficult the lower it goes. The experience is one of extreme breath control. The sense of *appoggio* is magnified as the scale descends, and if performed correctly the ribcage stretches on its own.

Exercise 17.A: Dominant to Tonic

[Exercise 17.A Audio Demo: Researcher](#)

As is demonstrated in the examples, the most common mistakes with this exercise are the loss of vibrato between tones and the dropping from one register to the lower. Both students forget to, or cannot maintain their vibrato during the legato. There are a couple of ways the students are advised to maintain the legato in the microtones: one is to speed up the vibrato and the second is to lift the tone (sharpen slightly but imperceptibly). Another option is to imagine thirty-second notes running between the tones. When practised, these help to give more freedom and control. In order stop the voice from dropping in to the lower register, whichever it happens to be, the student should keep the tone focused high,

and use the feeling of expansion in the ribcage which is developed in the 'expanded ribcage' exercise and is expected in most of the exercises.

[Exercise 17.A Example: Student 2](#)

[Exercise 17.A Example: Student 4](#)

In the example performed by Student 2, it is possible to hear the shifts in the intervals and how the student reacts to the interval that are more correct than others. In the first downward pentatonic scale, he performs the first scale degree fairly well. In it there is the essence of the *portamento* though he is not yet able to keep the vibrato free and running. He sustains the tones with vibrato but removes it as he moves between pitches. The interval between scale degrees four and three is not perfect but there is legato: however, an audible shifting of the tone can be heard. Scale degree three to two shows the typical 'dropping' of the tone that this exercise is designed to help, and the movement from scale degrees two to one is not ideal. The second time the student attempts the exercise, the interval between scale degrees five and four has improved, but he immediately 'drops' from degree four to three, which he recognises and then starts over. He then repeats the scale again, but still has audible drops between the pitches. During the session he is offered several suggestions to improve performance of the exercise. He is encouraged to keep the air flow even, to think about the vibrato running like 32nd notes and to speed it just a bit as he 'lifts the tone' and swells into the interval creating a small *messa di voce*.

[Exercise 17.B: Arpeggiated](#)

This exercise was designed to integrate the middle and upper registers using the 'pharyngeal voice'. It encourages the student to balance out registration in *passaggio* with the higher tones because it requires the students to pass evenly from the first interval of a fourth and finally to the octave arpeggio all while maintaining fidelity to the *portamento* aesthetic. It involves releasing and reengaging diverse muscles in the larynx and coordinating them with breath management. Unlike the previous example, this exercise goes higher in key rather than lower.

Exercise 17B

Exercise 17B musical notation, showing two staves with treble clefs and 8va markings. The first staff is in B-flat major (two flats) and 4/4 time, with a '4' above the staff. The second staff is in D major (two sharps). Both staves contain a sequence of notes: a half note followed by a quarter note, then a quarter note followed by a half note, then a quarter note followed by an eighth note, and finally a quarter note followed by an eighth note. The first two pairs are beamed together. The last two pairs are beamed together and marked with a '3' above them, indicating a triplet. The piece concludes with a double bar line and a key signature change to D major.

Example 28 – Exercise 17.b

[Exercise 17.B Video Demo: Researcher](#)

Repertoire Examples

The two examples below are brief excerpts of repertoire that the students have used for public performances. These examples represent how the students apply the techniques of the ‘pharyngeal voice’ to their own repertoire, but there is a clear parallel to the repertoire studied in this dissertation.⁵⁷³ As they are not classical performers, they are performing repertoire that is relevant to their careers. The first recording in each set represents the excerpt as written, and the second with an *ossia*, a'' flat and f'' natural respectively.

Student two performs an excerpt from ‘Is Anybody Listening?’, a song from *Ten Commandments: The Musical* (2004) (music by Patrick Leonard and lyrics by Maribeth Derry). As written the score requires e'' flat and in the *ossia* he sings to a'' flat.

117
8
God, if you hear us send some-one

123
8
ah

128
8
is a - ny - bo -

132
8
dy listen - ing

Example 29 – Patrick Leonard, ‘Is anybody Listening’, *Ten Commandments: The Musical* (2004), measures 117–35

[Example Rep 1: Student 2](#)

⁵⁷³ Full versions of the scores is provided in Vol. 2: Repertoire.

[Example Rep 1 Ossia: Student 2](#)

Student 6 performs a Hebrew liturgical piece, 'V'chol hachayim' (a Raymond Goldstein concert setting for Cantor and piano by David Kusevitsky). This piece requires the performer to sing florid passages to d'' flat and sustain high c'' natural, but the Student 6 interpolates a high f'' natural in the second version.

67

ha - tov shi-m-cho u-l-cho no - e

70

72

l' - ho dos

Example 30 – David Kusevitsky, 'V'chol hachayim': a Raymond Goldstein concert setting for Cantor and piano,

measures 67–76

[Example Rep 2: Student 6](#)[Example Rep 2 Ossia: Student 6](#)

Conclusion

In this research project I set out to discover to what extent I could determine and then reconstruct in practice the characteristics of the 'high operatic tenors' of the early nineteenth century who, on the basis of the surviving notated repertoire, had a technique which enabled them to sing in some cases from bass up to notes lying, more or less in the soprano range with great power, flexibility, projection, and legato, and without recourse to the vocal adaptations made during the later nineteenth century that more or less constitute 'modern' operatic technique. Without recordings upon which to base the investigation any reconstruction is naturally constrained, as historical 'ear-witness' accounts of the way that singers sounded can only be reliable up to a certain degree. No two listeners, after all, will experience a voice, or describe it, in the same way. However, I believe that within these historiographical limits it has been possible to achieve my overall objective.

Section III demonstrates the first steps in mapping out how historical teaching elements might be translated into a contemporary pedagogical context. It also provides a small set of snapshots of elements of my own teaching practice as I have been putting this method into practice over a number of years. I did not have access to conservatoire trained students who were willing to subject their techniques to an untested methodology with no guarantee of success. So, what might have been a potential drawback, has actually resulted in the advantage that I am working with either complete beginners or those not singing at a professional level in classical music performance: they therefore have no pre-conceived notions about 'classical' singing and so are not limited by having learned 'modern' post-Garcian operatic style. In practice this has meant that they had few or no difficulties with concepts of laryngeal flexibility, did not try to 'darken' the sound, or in any other way had they decided what they 'should' sound like. In this way what is observed in the various clips is the application of a series of historically derived fundamental vocal elements with untrained students. In this way, I may have been better able to get closer to a historical style of pedagogy than I would have had I been dealing with the kinds of confusion that arises with students who have undergone previous 'mainstream' training.

Treatises tend to confirm that in the eighteenth and nineteenth centuries most of the effective information about the pedagogy of singing was orally transmitted, just as it is today. Students essentially learn best by imitation and certainly not simply by reading books. Treatises served for the most part as supplementary materials for 'live' tuition, and of course also supplementary income for their writers, at best providing students with access to basic information that they can use at home. Given that there were no recordings of any singer in the era with which I am concerned, learning through imitation would have been impossible without someone able to demonstrate the techniques and provide the necessary inspiration to the student.

The task I set myself required that I discover, or in certain conditions create, an acoustic world with quite different aesthetics and presuppositions to those of contemporary operatic singing, based on idiomatic descriptions, many originally written in different European languages. Translating such descriptors as 'bright', 'dark', 'powerful', 'strident', 'veiled' and many other subjective terms into an actionable real-world pedagogy taught in English has naturally not been straightforward. Only by supplementing language with direct demonstrations of key concepts in the voice studio is it possible to transmit such concepts to students.

I feel, nevertheless, that I have been able to isolate some key elements of early nineteenth-century teaching pedagogy that have shed light on my research questions. Naturally there is a great deal that can never be recovered. I have needed to fill in much information with research-informed conjecture. It was necessary to make fundamental decisions about the real-world acoustic traces of voices that ceased to exist the moment the original singers stopped singing, and also about the application of techniques that might bring such sounds back to life through the voices of present-day singers. It is for this reason that I propose this dissertation as only one possible outcome of a historically informed approach to reconstructing vocal pedagogy. That said, I have created a methodology that answers in the affirmative the questions I set myself at the start. It has not hitherto been believed that tenors could be taught to sing the hugely demanding repertoire of composers such as Donizetti or Bellini in this way, but rather that it could only be left up to nature and inspiration. I have provided a method upon which a successful pedagogy could be founded.

When I started this investigation, I had hoped to come across some ‘otherworldly’ sound that was both ravishing and awe-inspiring; but the voice of man is what it is. There are only so many adequate sounds that we are capable of making that allow the performance of the surviving notation, and these are defined by our cultural aesthetics. The beauty of *bel canto* is ultimately in the performance and the skill of the singer and the ear of the listener, both of whom are conditioned by the contingencies of their cultural worlds. What I have provided is a toolbox of skills which students may employ to practise their art.

The students with whom I work are only able to advance relatively slowly, as they are not training full time as part of conservatoire music curriculum. Nevertheless, they all acquired a set of techniques that allowed them to perform the requisite vocal elements, more or less successfully. In terms of a complete reconstructed curriculum, what can be said is that the proposed techniques are healthy and clearly demonstrate efficacy without strain or difficulty.

Each student who participated in the experiments had a very distinctive voice and developed at their own pace and level. While the ‘pharyngeal voice’ has a unique quality in itself, its sound remained fundamentally idiomatic to each of the students; no two sounded alike when singing with the technique. While three of the students are shown to be able to sing up to a” flat, Student 2 has a very bright projected tone, and Student 6 and 7 have a softer more ‘veiled’ quality to the tone, which may possibly be more like Rubini, if the descriptions quoted in Section II are to be believed. All three learned to sing in *mezza voce* and also to reach the extreme high notes. *Fioratura* and the portamento are, as is attested to by the writers in Section I, two of the most difficult aspects to learn in training. This is not to say that my students were not able to execute these effects at all, but they would require more perseverance and practice than most were willing to dedicate to the attainment of something which, despite my protestations, seems quite inconsequential to their current musical aspirations.

This has been a very productive exercise in bringing rigorous academic standards to bear on performance practice, and vice versa, in applying real-world practice to bear on the study of the history of singing. This thesis helps to push historically informed singing practice into the mid-nineteenth century, and it is my hope that it might help to hold contemporary performance to account. Whether we like the sounds that these tenors are

making or not, it cannot be denied that they are producing a sound quality that seems to fit the requirements described in the historical record. I am happy with the results of this initial study and suggest the method set out here could be the ‘missing link’ between the tenor and the castrato, ‘lost’ sometime in the early nineteenth century. It may never be possible to re-establish the ‘pharyngeal voice’ fully as a legitimate option in *bel canto* singing, because in order to achieve a level of accomplishment equal to the repertoire that survives it would require a new generation of singers to be trained purely in this method. While there are many self-proclaimed ‘historically informed’ performers and musicologists who pay attention to the pre-nineteenth century, pushing the boundaries of its sound aesthetic to 1850 will inevitably ruffle more than a few feathers both in the firmly entrenched world of opera and in conservatoire vocal faculties.

This research has suggested ways of close reading vocal repertoire, based on the practical, embodied nature of wielding the human singing voice, and invites a re-assessment of some firmly held beliefs about early-nineteenth century vocal aesthetics. It also has the potential to further the study of historical singing pedagogy. Modern professional singers, conductors and audiences might initially respond negatively to ‘historically informed’ performance styles being applied to Rossini, Bellini and Donizetti. However, as with other historically informed performance practice exercises, there could also be an entirely new group of people brought into the *bel canto* era. Contemporary operatic performance practice of *bel canto*, is, by and large essentially ‘adulterated’ by the *verismo* vocal style that superseded it. But as crude and inappropriate as it is for the ‘refined’ *bel canto* repertoire it is clearly not going away any time soon. But perhaps when people hear how historically informed voices perform the repertoire as it was written for a group of singers who were entirely innocent of the vocal technique that developed in the last decades of the nineteenth century, many will be thrilled and astounded as those who had heard it for the first time nearly 200 years ago.⁵⁷⁴

Such approaches as mine could possibly also allow a reassessment of the nature of castrato singing, as it is clear that many of the building blocks for pharyngeal singing were derived from castrato technique and, in some cases, taught to tenors by castrati. In turn,

⁵⁷⁴ See also: Gentili, ‘Invention’, 2009; Dent, E. and Dean, W. (eds.) *The Rise of Romantic Opera, Dean* (New York: Cambridge Univ. Press, 1976).

this could contribute to a reconsideration of the modern countertenor voice and its place in the HIP pantheon. Until the mid-nineteenth century the high tenor represented a perfectly normal vocal range. There was in fact a ubiquity of high tenors who serviced not just the major metropolitan opera houses but also the many regional and provincial theatres, where the music of Rossini, Donizetti, Bellini and their contemporaries were the rage for a number of years. These days 'high tenor singing' has become a rarefied field, practised mostly by young collegiate-trained tenors who use the range mainly in Renaissance and Baroque choral music, and are often not able to continue to sing very high notes with ease much beyond their twenties. A reliable and healthy pedagogy that enables a new generation of singers to sing the original operatic repertoire in its original keys with fully mature 'real' tenor vocal technique would be a sensation. The 'pharyngeal voice', as has been shown, also has potential applications beyond classical music. It has been shown to be useful in most contemporary musical styles including pop, rock, and musical theatre. It is also quite applicable in Jewish cantorial singing.

Having established the efficacy of the 'pharyngeal voice' in male voices, I also began to apply it to training female chest voice singers. Some of my students are able to cover almost their entire ranges in what sounds like chest voice. One soprano could even sing higher in 'pharyngeal voice' than in head voice. Students have used the technique to perform in contemporary and traditional musical styles, including Arabic and Japanese folk music.

The application of these pedagogical tools to the female voice raised questions about the historical female voices who replaced the *castrati*, sometimes referred to as the *primo musico*. What vocal quality did they use? Why were they used? Was it perhaps because they could sing in the 'pharyngeal voice' with greater ease than 'pharyngeal voice' tenors? Might that indicate that the *castrati* who taught the great generation of 'pharyngeal voice' tenors sang with the same or a similar vocal quality to female 'pharyngeal voice's?

This dissertation provides only the opening salvo, a shot across the bow, in what could be a long and potentially contentious discussion. It is a possible, if not probable, historical reconstruction of a lost instrument. As we cannot reconstruct historical singers, and historical instruments only to a certain degree, how both singers and composers in the early nineteenth century used these instruments will never be certain. However, I can say for sure

that there is the possibility that the sounds of a lost vocal type are susceptible to reconstruction, based on historical principles.

Appendices

Appendix 1: A brief introduction to vocal acoustics.

Much of the information here is summarized from Ken Bozeman's book *Practical Vocal Acoustics*. It remains one of the most accessible books on the subject and is a reliable resource for non-scientists. The basic elements needed to understand vocal acoustics as they apply to this dissertation are explained in as accessible terms as possible. As the research itself does not rely on acoustic or scientific analysis, it is included here as an Appendix in order not to distract from the main arguments of the dissertation. The basic sound parameters referenced are the standard harmonic series, vocal formants, and contact quotient (CQ). These elements should be enough to help identify essential differences between the pharyngeal voice, falsetto, and chest register when the ear alone is insufficient.⁵⁷⁵

All tones are made up of a series of multiple frequencies, the composite of which makes up the quality of the of the given tone. Most musicians would be familiar with the harmonic series, the fundamental frequency (tonic) and its harmonic components above the fundamental. This progression of frequencies including the tonic, or fundamental frequency, divide into progressively smaller intervals of dramatically reducing energy. Harmonics are also generated in the vocal tract as a result of phonation. For example, the tonic or fundamental frequency is referred to as H1 [$1f_0$] because it is the first harmonic of the sequence. H2 [$2f_0$] is the second harmonic and is the octave above the fundamental. H3 [$3f_0$] is a fifth above H2 [$2f_0$], H4 [$4f_0$] is a fourth above that and two octaves above H1 [$1f_0$], H5 [$5f_0$] a major third above H4 [$4f_0$], H6 [$6f_0$] a minor third above H5 [$5f_0$], and so on. Harmonics above H6 [$6f_0$] are typically too high to interact with the natural resonances of the vocal tract, and therefore have little significant impact on the discussion.⁵⁷⁶

⁵⁷⁵ Bozeman, Practical, 2013.

⁵⁷⁶ It is important to note that nomenclature for formants and harmonics is currently in flux. For further reading see Titze, 'Toward a consensus', 2015. Higher harmonics do make an audible contribution, though it is not clear that we actively tune for that. I would not at all be surprised to see considerably higher harmonics, above the piriform notch (4000-6000Hz) in a spectrogram of pharyngeal voice. If pharyngeal narrowing is used to close the piriform sinus, you get harmonics all the way up, to as high as 18,000Hz which would be very bright sounding.

These natural resonances of the vocal tract (formants) interact with the source sound of the vocal folds and together produce the harmonic series.⁵⁷⁷ For each pitch sung the voice produces a specific set of harmonics, often referred as partials (part of the sequence). These harmonics have a particular strength based on, among other things, which laryngeal setting (register) is being used by the singer: chest or head (falsetto). Chest has a lot of thick vocal fold contact and produces a rich harmonic series that has significant energy in the upper harmonics and often has more harmonics in the audible range. Falsetto will generally produce a weaker set of harmonics than chest.⁵⁷⁸ The lower harmonics interact with the different resonances of the vocal tract. They can be thought of as individual parts, or resonances, that combine to form the voice.

Vocal formants are the natural resonances of the vocal tract and vary according to its shape.⁵⁷⁹ As the vocal tract changes during phonation, for example of different vowel sounds, so do the resonance frequencies of the formants. Different parts of the vocal tract, for example the larynx, the tongue, jaw, lips, pharyngeal space, sinuses, and so on contribute in some way to the resonance frequency of the vocal formants. The interactions are intricate therefore demonstrating this in terms of the underlying physics is far beyond the remit of this dissertation. Voice scientists have numbered the key vocal formants F_1 , F_2 , F_3 , etc., from lowest to highest rather like the harmonic series. According to Bozeman 'There are only three to five formants low enough in frequency and strong enough in intensity to be of great aural significance.'⁵⁸⁰ These frequencies however are not in a fixed ratio to each other in the same way as the harmonic series, but rather have a ratio to the length of the

⁵⁷⁷ Bozeman, K. 'Personal Interview', 17 June 2020, 'The most recent understanding of this is that the harmonics so not arise individually from the vocal folds as sine tones, rather are implied to be embedded in the complex pressure wave form that arises. In other words, we do not actually understand the physical mechanics of how harmonics arise. But the waveform can only be modeled or reconstructed by adding sine tones together. And the brain, we assume, decodes that complex wave as a set of harmonic frequencies. So for all practical purposes we can operate as if they arise from the vocal folds. The vocal folds don't subdivide into multiple vibrational modes each creating a harmonic. A single pulse generates a noise. As soon as you have periodically repeating pulses (a pitch), harmonics arise. This evolving understanding is probably irrelevant to your research.'

⁵⁷⁸ Bozeman, Practical, 2013, pp. 6–7.

⁵⁷⁹ *Ibid.*, 11.

⁵⁸⁰ *Ibid.*; Bozeman, K. 'Personal Interview', 17 June 2020, 'I now realize that some higher formants do contribute to our percept of the sound, but I am still skeptical that that affects resonance tuning in classical singing. A possible exception might be very high treble voices. It would be interesting to research this with pharyngeal voice signals. Such formant would only be in very high, thin /i/-like timbral land. Think florescent light noise.'

vocal tract itself. This means that if the vocal tract can be selectively altered to resonate or dampen different frequencies, therefore altering the formant frequencies.

Vocal formants respond efficiently to movements within the vocal tract. F_1 and F_2 are the most responsive and are primarily responsible for the differentiation of vowels.⁵⁸¹ Where the internal space is narrowed by the tongue hump, lip shape etc., has the greatest influence on F_1 and F_2 frequencies. The lowest formant F_1 is the largest and reflects the shape of the entire vocal tract and determines the depth or fullness of the voice. F_2 is the second lowest and is affected among other things by the position of the tongue; it has an impact on vowel clarity and the 'upper resonance strategies of men'.⁵⁸²

The frequencies at which the formants resonate are higher or lower depending on the way different structures are shaped within the vocal tract during phonation. If the vocal tract is lengthened by a narrowing near the front caused by closing the jaw, or lowering the larynx, this causes F_1 to fall, or to resonate at a lower frequency, and consequently interacts with a different harmonic arising from the voice source (or vocal fold vibration). A narrowing near the back of the vocal tract, for example by movement of the pharynx, causes a higher F_1 but a lower F_2 . 'Lip rounding lowers both formants, especially the first, and lip spreading raises both formants, especially the first.'⁵⁸³ The interactions of the two formants have a distinct impact on the perception of the *chiaroscuro* balance in the voice.

The most relevant formant / harmonic interactions are those implicated in the timbre of the voice. Simply put, they help to describe the sounds of the voice as they relate to the timbres typically associated with male or female voices, or open and closed vocal qualities. Both timbral and open / closed qualities are best seen when viewed on a spectrographic representation of the sound. The timbre most associated with the operatic soprano and the counter tenor is sometimes called *whoop* timbre, and the timbres most closely associated with the operatic tenor are *open* or *closed* timbres and, most unfortunately if not apropos, *yelled* timbre.⁵⁸⁴ The two timbres which concern the 'pharyngeal voice' the most are *open*, *closed*, and *rounded* timbres as discussed by Garcia. Language such as 'whoop' and 'yell',

⁵⁸¹ Ibid., 12.

⁵⁸² Ibid., 15; Bozeman, K. 'Personal Interview', 17 June 2020, 'We now know from Ian's work that the spectral one color of all vowels other than /u/ and /o/ is provided by F_2 , hence vowel clarity and definition.'

⁵⁸³ Ibid., 13.

⁵⁸⁴ Ibid., 21–4.

although in some ways rather emotive, do help to describe the type of interactions heard by the ear, without referring to voice types, gender, or stereotypical cis-gender descriptive language such as feminine or masculine. The chart below helps to make how F_1 and F_2 interact with the different harmonics to produce the distinct timbre differences.

1 Whoop Timbre	$F_1 = H1 [F_1] = [1f_0]$
2 Closed Timbre	$H1 [1f_0] < F_1 < H2 [2f_0]$ (tenor resonance strategy of $F_2 = H4 [4f_0]$ or $H5 [5f_0]+$)
3 <i>Rounded Timbre*</i>	$F_1 = H2 [2f_0]$ (Convergent filter, F_1 raised with lip rounding possible pharyngeal narrowing.)
4 Yell Timbre Coupling	$F_1 = H2 [2f_0]$ (divergent voice filter) <i>Clear timbre</i>
5 Open Timbre	$H1 [1f_0] \& H2 [2f_0] (H3 [3f_0] \dots) < F_1$ <i>Clear timbre</i>

Table 1 – Vocal Timbre Descriptions

The chart is designed to maximise how the first formant, F_1 , interacts with individual harmonics to demonstrate how the timbre is perceived by the ear as it interacts or passes different harmonics. F_1 resonating the same frequency as the fundamental ($H1 [1f_0]$), is perceived as ‘whoop’ timbre, most closely associated with the soprano or modern counter tenor.⁵⁸⁵ When the first formant (F_1) is moved above the fundamental but is not high enough to resonate the second harmonic ($H2 [2f_0]$) (which is an octave above), this is referred to as ‘closed’ timbre. For our discussions it is most closely associated to the tenor voice when it passes into or above the passaggio. In closed timbre the first formant is not close enough to a harmonic to resonate, so it loses power and the voice can sound duller. In

⁵⁸⁵ Bozeman, K. ‘Personal Interview’, 17 June 2020, ‘Harmonics pass through formants when singing the same vowel (same formants) on different pitches (changing harmonic set). Formants pass through harmonics when singing the same pitch (same harmonics) on different vowels (changing formants).’

this case the trained tenor will compensate by tuning the second formant (F_2) to resonate with the nearest harmonic, typically $H_4 [4f_0]$, $H_5 [5f_0]$ or higher, to facilitate projection.⁵⁸⁶ At this point I omit the rounded timbre and discuss it below, because it is more important to understand the general interactions before hypothesising.

If F_1 is once again raised so that instead of being in between the first and second harmonics, it comes into range of resonating with H_2 , yell timbre is achieved. This timbre is bright with a clear penetrating ringing quality. This is achieved by raising the first formant by narrowing the throat and opening the mouth. If taken too high in pitch it can turn into a scream. But, at lower pitches it retains its bright penetrating characteristic. If the pitch is significantly low enough, there will be two or more harmonics below the first formant. This is called open timbre.

The third timbre, which has been discussed in relation to Garcia in Section I is the *rounded* timbre. This timbral quality is not discussed in the Bozeman's text, nor is it addressed in other vocal science texts that I have referenced, so I offer to explain it in the best way possible. Garcia described *rounded* timbre as only slightly modified from the *clear* timbre. In this case, though they are not the same, they are associated with the open and yell timbres. Garcia did not have access to a spectrograph of the voice, so he would not have been able to 'see' his timbres and therefore understand their obvious differences as is possible today. Rather, he had to rely on his and his students' ears. With the rounded timbre, as Garcia says, the larynx is slightly higher than in the darkened timbre and slightly lower than that of the clear timbre.⁵⁸⁷ I suggest that the rounded timbre would be associated with the so-called 'yell timbre' ($F_1 = H_2 [2f_0]$), but also with second formant boost.

The last element involved in the discussion describes the degree of vocal fold contact during vibration. That is, how much of the vocal folds are touching during the closed phase of phonation (the so-called 'closed quotient' (CQ)). The CQ helps to demonstrate which register and how much vocal fold mass is being used in a given sound. As mentioned, the

⁵⁸⁶ Ibid., 11–25.

⁵⁸⁷ At his point it might be important to differentiate between the modern timbres and those of Garcia because he allowed for more movement in the larynx than a pedagogue today would accept. For that reason, when discussing Garcia, I use his terms, and when discussing modern terminology, I use the contemporary versions.

vocal folds are closed much more strongly in chest voice. So, a higher closed quotient would indicate more vocal fold contact. The CQ is measured by placing electrodes on either side of the larynx that send an electrical current through the vocal folds. When the folds are closed, a circuit is completed, sending the information back to the programme. It is quite harmless and there is no sensation or discomfort involved. The resulting percentages demonstrated by Alexandre Mayr, give an insight into how the 'pharyngeal voice' relates to the overall vocal mechanism, and which register is in fact being observed.⁵⁸⁸

⁵⁸⁸ Mayr, *Voce faringea*, 2018, particularly Section 3.3.3. Resultate.

Appendix 2: 'Expanded Ribcage' Exercise

For this research, one of the most important foundation breathing exercises is what I have called the 'Expanded Ribcage' exercise. Though there is no extant historical evidence for the exercise or its having been attributed to the great castrato Farinelli, Richard Miller indicates that the exercise was given to him by his teacher Nicola Porpora. According to Miller, the exercise has come down through an oral tradition which says that each day Farinelli performed this exercise multiple times.⁵⁸⁹ I have used the exercise not only in the development of the 'pharyngeal voice', but for every singer and voice type. It has become instrumental in the development of the core principles of this research particularly low subglottal breath pressure.

This is a controlled breathing exercise that has three distinct phases: inhalation, suspension, and exhalation. The exercise can be done lying down or standing, but at first it is advisable to begin by lying on your back with your knees elevated and a small pillow under the head so that the spine is elongated, and the curve of the back is not arched. It is fine to lie on the floor or a comfortable surface. One hand should be placed on the lower abdomen to feel its motion during respiration, and the other placed so the side of the ribcage to monitor the movement of the ribs. The hands should be used whether lying down or standing until the coordination is assured.

The first step is to breath slowly experiencing the rise and fall of the abdomen during respiration. Then begin to slow down the breathing creating a regular period of breath, by counting the number of seconds which pass, making both the inhalation and exhalation cycles the same length all the time making sure that ribcage does not close during exhalation. The student should either count silently in their head or use a metronome to maintain even counting because sometimes the student will vary the speed of their counts depending of the amount of air they have and how difficult the experience is. Once secured of the even period of the inhalation – exhalation cycle, a third phase of breathing should be introduced between the two, suspension.

⁵⁸⁹ Miller, *Securing*, 2008, pp. 25–7, Miller gives a good description of the exercise, and how to integrate it into singing. I have however adjusted it somewhat to focus on maintaining a gentle open feeling in the ribcage, by not allowing it to collapse during exhale. The entire exercise is performed with the ribcage slightly suspended.

The suspension phase of the exercise is possibly the most important. It becomes the point from which singing begins and forms an important reference point for breath management. During suspension, it is imperative that the breath is not held. The glottis must remain open during each phase and throughout the entire exercise. At no point should the student attempt to hold their breath by closing off the glottis. Closing the glottis renders the exercise useless. Once the suspension phase is introduced the breath adequately suspended, exercise can begin to take shape.

Step 1: Take a slow complete inhale over the desired first count (4, 5, 6...).

It is fine to inhale through the nose or mouth if the glottis remains open and all phases remain completely silent. As the diaphragm is the principal inspiratory muscle, the lower abdomen should not be tight. It should be allowed to release as inhalation progresses. The abdomen should be felt to expand with the one hand and likewise the ribcage with the other. The inhalation should be full but not so far as to feel choked with air. The inhalation should be even and not hurried at the beginning or end, but the breath rate should take place over the entire inhalation period, and the singer should try to experience the activation of the back in the breath cycle. Breathing in through slightly pursed lips can increase the sensation in the body.

Step 2: Suspend breathing without holding the breath for the same count.

Once the inhalation is complete, suspend the breathing cycle maintaining the sensation of inhaling. It is best to feel as if the tongue, jaw, and throat are relaxing so as not to integrate any tensions into the exercise. In the suspension, try to maintain the connection to the inspiratory muscles of the back. It is be important to identify them and use them deliberately as described with *appoggio*. Sometimes gently rolling the head or moving the shoulders (and upper body if standing) can also help to maintain relaxation and distract from the discomfort of suspending respiration for long periods of time. Once the desired time has elapsed, begin to slowly exhale.

Step 3: Exhale gently and completely over the same count.

Begin to exhale silently, slowly feeling the abdomen moving back and in as it contracts. Breathe out fully but once again keep the rate even and do not rush the air at the beginning or end of the exhale. But this time do not allow the ribcage to close at the end of the cycle and keep the inhalation muscles of the back active but not stiff. Focus on the movement of the abdomen alone allowing the ribs to stay floating during the exhale.

Step 4: Repeat

Once the exercise has been mastered in principle, the time should be extended to the point where a full breath cycle takes place over 30–40 seconds. It should be done two or three times in a cycle without pauses in between unless this is too difficult. Then it would be important to use lower numbers and build up. Richard Miller indicates that to transition to a singing posture, the 'expanded ribcage' exercise should be done first lying down, but then seated, kneeling, and then standing.⁵⁹⁰

Once standing, I like to advocate a slightly more advanced coordination of the exercise. All the principal aspects remain the same, except that during the inhalation phase the student is encouraged to allow the release of the abdominal to coincide with the descent of the diaphragm to such an extent that there is no sensation of inhaling. The experience can be disconcerting at first, but after some practice it can be done with a sense of calm.

The 'expanded ribcage' exercise can elicit many negative reactions from the body and mind and it is important to be prepared. One of the major experiences, is that of suffocation. Moving the air in and out so slowly can create the sensation of suffocation and has triggered many negative reactions. It is important to reassure oneself that it is possible to breathe at any time, and that there are only a few seconds before the next cycle. If the sense of suffocation is too great, it is important to use lower numbers until it can be readily dealt with.

⁵⁹⁰ Miller, *Secruing*, 2008, pp. 137–8.

Appendix 3: Breathe Up

This procedure is used to feel the relaxation of the throat and tongue and consists of a slow breath through the nose that is used to ensure that the entrance to the sinus cavities are open and the throat is fully relaxed. The first step is to relax the tongue and jaw as much as possible before the breath. Then inhale slowly through the nose only, this time the pharynx and glottis can relax as much as possible without closing off. When the suspended feeling has been reached, it is important to sense the relaxation and release of the throat but also to notice the feeling in the pharynx. It should have a neutral feeling with no sense of stretching open or closing. This exercise is simple, but the neutral shape of the pharynx is important to the development of the 'pharyngeal voice', because tensions in the pharynx and throat will be at odds with its coordination. A more advanced option is to begin breathing through the nose immediately feeling inspiration into the back and maintain that feeling while relaxing the throat. It can also be combined with the 'expanded ribcage' Exercise.

'Breathing up' is often used in my teaching, especially when using the high extension of the 'pharyngeal voice'. While it has similar principles to the first version, this one has a slightly different mechanics and emphasis. How breathing-up is applied to the high notes is covered in other parts of the dissertation, but it is important understand the principle as it pertains to breathing. Much like the above example, the student should breathe gently through the nose to open the space and set up the appropriate resonance space, but because the student is breathing for a higher note in the upper register, the tongue is slightly higher in the back and the nostrils may dilate a bit. Often when breathing-up for a high note, the student might raise their eyebrows, but there is no need to discourage this action.

For this action, students should be attempting to open the passage through the velopharyngeal opening (opening to the nasal cavities above soft palate) and this time keep the space open and the palate down. Keeping the VF port open with the uvula retracted will add nasalance but, in this register, any sense of nasality is less perceptible. The tongue should also remain in a slightly higher position so that it is out of the throat. This position encourages mobility of the larynx but does not cause it to rise very high. The tone that is

produced is not particularly strong initially, but it is brilliant. It is important to remember the feeling of the relaxed tongue, jaw and pharynx when breathing.

Appendix 4: Media Direct Links

1. Coup de la glotte Video Demo: Researcher <https://youtu.be/p4YQn2BXeCs>
2. Exercise 3.A Video Demo: Researcher <https://youtu.be/7FbeMzmwhio>
3. Exercise 3.A Example: Student 4 <https://youtu.be/-xTdwNTyVhc>
4. Exercise 3.A Example: Student 3 <https://youtu.be/4ehKlepNKSI>
5. Exercise 3.B Video Demo: Researcher..... https://youtu.be/Ece12U_3xDg
6. Exercise 3.B Example: Student 4 <https://youtu.be/1USZ-WYOSJA>
7. Exercise 3.B Example: Student 3 <https://youtu.be/mFvfh-nGpSE>
8. Exercise 3.C Video Demo: Researcher..... <https://youtu.be/fdMmBzliFd4>
9. Exercise 3.C Example: Student 4 <https://youtu.be/9dsMvsRw4G4>
10. Exercise 3.C Example: Student 3 <https://youtu.be/Tz6cIMi-ofc>
11. Vocal Fry Audio Demo: Researcher <https://youtu.be/9cIJQavzhvg>
12. Exercise 4.A Video Demo: Researcher https://youtu.be/_7oZkRjVKRY
13. Exercise 4.A Example: Student 4 <https://youtu.be/SH3G0yyGJsw>
14. Exercise 4.B Video Demo: Researcher..... <https://youtu.be/lu73AaPDUmc>
15. Exercise 4.B Example: Student 4 https://youtu.be/gJ_zYMOcdY8
16. Exercise 4.C Video Demo: Researcher..... https://youtu.be/fQ81hyV_Ulg
17. Exercise 4.C Example: Student 4 <https://youtu.be/HccRUuroHtc>
18. Exercise 4.D Video Demo: Researcher <https://youtu.be/tBsXtFgXzVc>
19. Exercise 4.D Example: Student 4 <https://youtu.be/FjzBqmNhGrc>
20. Exercise 4.D Example: Student 3 <https://youtu.be/NKTqPT465sQ>
21. Exercise 6 Video Demo: Researcher..... <https://youtu.be/5Rv5X9SX7II>
22. Exercise 6 Example: Student 4 <https://youtu.be/jQpnkfhaK0g>
23. Exercise 6 Example 2: Student 4 <https://youtu.be/9Qd-CzVy8sA>
24. Exercise 6 Example: Student 3 <https://youtu.be/X1KXnSwRMjY>
25. Exercise 6 Example: Student 7 <https://youtu.be/Cvica7RRkXc>
26. Exercise 6 Example: Student 2 <https://youtu.be/WLR6kZZMvMM>
27. Exercise 7 Audio Demo: Researcher..... <https://youtu.be/OqVNGIIgYBY>
28. Exercise 7 Example: Student 3 <https://youtu.be/vPmmwUD0Pyo>
29. Exercise 8 Audio Demo: Researcher https://youtu.be/szRgm_q1BGQ
30. Exercise 8 Example: Student 5 <https://youtu.be/8eSau3-TPvA>
31. Exercise 9 Audio Demo: Researcher..... <https://youtu.be/MLSxlpNq2A4>
32. Exercise 10 Audio Demo: Researcher..... <https://youtu.be/w2PQhiSFrN4>
33. Exercise 10 Example: Student 2 https://youtu.be/wv_q9ZEqKS4

34. Exercise 10 Example: Student 6 <https://youtu.be/agUWitg11JA>
35. Exercise 10 Example: Student 7 <https://youtu.be/nohOuhwMCFY>
36. Exercise 10 Example: Student 4 <https://youtu.be/-fRIEhIQfrl>
37. Exercise 10 Example: Student 3 https://youtu.be/4-OoJ_1UOu0
38. Exercise 10 Example 1: Student 5 No PV <https://youtu.be/x360enXjxOg>
39. Exercise 10 Example 2: Student 5 PV <https://youtu.be/7w0EDLjCqTU>
40. Student 5 Explaining <https://youtu.be/lpgg6Z18qT0>
41. Exercise 11 Video Demo: Researcher <https://youtu.be/Pjkd07mSAA>
42. Exercise 11 Example: Student 6 <https://youtu.be/i4MCW3-LeJc>
43. Exercise 11 Example: Student 4 <https://youtu.be/wmDKrdc5pjk>
44. Exercise 11 Example: Student 3 <https://youtu.be/UISyORg5ILO>
45. Exercise 12 Video Demo: Researcher <https://youtu.be/MNIg9vcXz9o>
46. Exercise 12 Example: Student 7 https://youtu.be/sXRKampqh_U
47. Exercise 12 Example: Student 2 https://youtu.be/Q_ZFdU91xoY
48. Exercise 12 Example: Student 4 <https://youtu.be/1752qq2l5Ro>
49. Exercise 12 Example: Student 5 <https://youtu.be/KXRIGUufjos>
50. Exercise 12 Example: Student 3 <https://youtu.be/wKrathBX1Po>
51. Exercise 13 Audio Demo: Researcher <https://youtu.be/z3F-biE-Eb0>
52. Exercise 13 Video Demo: Researcher <https://youtu.be/PviLSuNHfvY>
53. Exercise 13 Example: Student 3 <https://youtu.be/sXulpq59Tn0>
54. Exercise 13 Example: Student 4 <https://youtu.be/vqOah6fnjFE>
55. Exercise 14.A Audio Demo: Researcher <https://youtu.be/FZFCopJYEPI>
56. Exercise 14.A Example1: Student 2 https://youtu.be/_CWKEVKRFvk
57. Exercise 14.A Example 2 [i]: Student 2 [i] <https://youtu.be/MhBd2T9GA6o>
58. Exercise 14.A Example: Student 6 <https://youtu.be/v11IcH2JTtE>
59. Exercise 14.A Example: Student 7 <https://youtu.be/9OtBgm3tOIM>
60. Exercise 14.B Video Demo: Researcher <https://youtu.be/g7FXA9xAllc>
61. Exercise 14.B Example: Student 4 <https://youtu.be/-oP7iNjslt0>
62. Exercise 14.B Example: Student 3 <https://youtu.be/dyllI74RgqBk>
63. Exercise 14.C Video Demo 1: Researcher <https://youtu.be/A96XSTExrEk>
64. Exercise 14.C Video Demo 2: Researcher <https://youtu.be/FXiU-0tLh9Q>
65. Exercise 14.C Example: Student 3 <https://youtu.be/ws6bfmm1Q0s>
66. Exercise 14.C Example: Student 5 <https://youtu.be/yi31jl3LXns>
67. Exercise 14.C Example 2: Student 5 <https://youtu.be/bmOq3i-MJQ0>

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68. Exercise 14.C Example: Student 4 <https://youtu.be/ywbPPa1yzCo>
 69. Exercise 15.A Audio Demo: Researcher <https://youtu.be/p3Esi64FKnU>
 70. Exercise 15.A Video Demo: Researcher <https://youtu.be/l5xtsEgexbg>
 71. Exercise 15.A Example: Student 4 <https://youtu.be/9MoCsCBvx8g>
 72. Exercise 15.B Audio Demo: Researcher <https://youtu.be/MkNXLO4L5NA>
 73. Exercise 15.B Example: Student 2 <https://youtu.be/CYfbm0JJG1A>
 74. Exercise 15.B Example: Student 6 <https://youtu.be/TfJhYMjv2zg>
 75. Exercise 15.B Example (range demo): Student 6 <https://youtu.be/9yLrr7Wr91Q>
 76. Exercise 15.B Example: Student 3 <https://youtu.be/OE72v4Ndehw>
 77. Exercise 16.A Video Demo: Researcher <https://youtu.be/t0FGzMprlME>
 78. Exercise 16.A Example: Student 4 <https://youtu.be/LkC53DKQjrQ>
 79. Exercise 17.A Audio Demo: Researcher <https://youtu.be/6PrnIEAN6Dw>
 80. Exercise 17.A Example: Student 2 https://youtu.be/_18CIAfJWnI
 81. Exercise 17.A Example: Student 4 <https://youtu.be/-4sMi9POkoQ>
 82. Exercise 17.B Video Demo: Researcher..... <https://youtu.be/80iFnN90UKE>
 83. Example Rep 1 Student 2 <https://youtu.be/CJfY5qUu-6I>
 84. Example Rep 1 Ossia Student 2 <https://youtu.be/a0cfvd29VRc>
 85. Example Rep 2 Student 6 https://youtu.be/G3Nc_Rrur74
 86. Example Rep 2 Ossia Student 6..... <https://youtu.be/SVBNXDHEAko>

Appendix 5: Scores (Vol. 2)

This list acts as a Table of Contents for the scores held in Vol. 2. (All works are Bookmarked)

0. Mozart, W. A. 'Vado incontro al fato estremo', *Mitridate, re di Ponto*, [Act III.iii, No. 20; 1–109].
1. Rossini, G. 'Cessa di piu resistere' (Almaviva), *Il barbiere di Siviglia, ossia L'inutile precauzione*, [Act II.xi. No. 19; 1–177].
2. Rossini, G. 'Deh! troncate i ceppi suoi' (Norfolc), *Elisabetta, regina d'Inghilterra*, [Act II.x; No. 9; 235–398].
3. Rossini, G. 'Sposa amata', (Leicester) *Elisabetta, regina d'Inghilterra*, [Act II.xii; No. 10; measures 48–197].
4. Rossini, G. 'Deh, scusa i trasporti' (Norfolc), *Elisabetta, regina d'Inghilterra*, [Act II.xiii; No. 11; measures 1–136].
5. Rossini, G. 'Ah sì, per voi già sento' (Otello), *Otello, ossia Il Moro di Venezia*, [Act I.i; No. 2; 1–172].
6. Rossini, G. 'Che ascolto!' (Roderigo), *Otello, ossia Il Moro di Venezia*, [Act. II.i; No. 6; 1–136].
7. Rossini, G. 'Ah vieni, nel tuo sangue' (Duet/Trio), *Otello, ossia Il Moro di Venezia*, [Trio: Act II.vii; No. 8; measures 1–129].
8. Rossini, G. 'Balena in man del figlio' (Pirro), *Ermione*, [Act I.iv; No. 6; 1–269].
9. Rossini, G. 'Reggia aborrita!' (Oreste), *Ermione*, [Act I.iii; No. 4; 1–176].
10. Bellini, V. 'A tanto duol' (Fernando), *Bianca e Fernando*, [Act. I].
11. Donizetti, G. 'Da quel dì' ... 'Ah! Così nei ridenti' (Percy), *Anna Bolena*, [Act I Sc. xi; no. 3].
12. Donizetti, G. 'Vivi tu, te ne scongiuro' ... 'Nel veder la tua costanza' (Percy), *Anna Bolena*, [Act II Sc. iii; no. 10].
13. Bellini, V. 'Prendi: l'anel ti dono' (Elvino), *La sonnambula*, [Act. I; No. 3; 73–273].
14. Rubini, G. B. 'Twelfth Lesson', *Twelve Lessons in Modern Singing for Tenor or Soprano*.
15. Rossini, G. 'Qu'entends-je? Pamira!' ... 'Grand Dieu faut-il qu'un peuple qui t'adore' (Néoclès), *Le siège de Corinthe*, [Act III; Nos. 10 & 11 - Choir & No. 11 - aria] (Italian).
16. Rossini, G. 'Asile héréditaire' ... 'Amis, amis, secondez ma vengeance' (Arnold), *Guillaume Tell*, [Act IV.i & ii] (Italian).

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