

UNRAVELING THE DISCUSSION OF VOCAL ONSET:
STRATEGIES FOR THE CULTIVATION OF BALANCED ONSET
BASED UPON HISTORICAL AND CURRENT VOCAL PEDAGOGICAL
TEACHINGS.

by

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TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
II. EARLY THOUGHTS ON PHONATION	8
Ancient Greece- the 14 th Century	8
The 14 th – 17 th Centuries	10
The 18 th Century	13
III. THE 19 TH CENTURY	22
The Early 19 th Century	22
The <i>Coup de glotte</i>	28
Another Approach- Expiration and Vocal Attack	36
The Medical Community and the <i>Coup de glotte</i>	41
The Turn of the 19 th Century: Salvatore Marchesi	47
IV. THE 20 TH AND 21 ST CENTURIES	51
The Swedish/Italian School of Singing	52
Cornelius Reid and Proponents of the Natural Voice.....	58
The 1980's: McKinney, Dayme, and Miller.....	62
Clifton Ware and David Jones, Leaders of Modern Pedagogy	68
V. PRESCRIPTIVE EXERCISES FOR THE DEVELOPMENT OF BALANCED ONSET	74
Setting the Condition for Effective Listening	76
A. Listening	79
B. Setting an Efficient Auditory Feedback Loop	80
Preparing the Throat for a Balanced Onset	81
A. Stretching the Base of the Throat	81
B. Finding a Free, Low Larynx	83
C. Opening the Top of the Throat	85
D. Vocal Cord Approximation	88
E. Putting the Postures Together in a Vocalise	92
VI. ARTICULATORS AND VOCAL ONSET	94
A. Addressing the Root of the Tongue	95
B. Developing a Relaxed Jaw Position	98
C. Working with the Soft Palate as an Articulator.....	99
D. Using Consonants for Onset Practice.....	101
VII. BREATH SUPPORT AND ONSET EXERCISES	103
VIII. BRIDGING THE GAP BETWEEN ONSET PRACTICE AND REPertoire LEARNING.....	108

IX. CONCLUSION 111

BIBLIOGRAPHY 113

LIST OF FIGURES

Figure 1: J.B. Fauré, <i>La Voix et Le Chant</i> , (1886)	34
Figure 2: Giovanni Lamperti, <i>Die Technik des Bel Canto</i> (1905)	39
Figure 3: Delle Sedie, <i>A Complete Method of Singing</i> (1876)	41
Figure 4: Browne and Behnke, <i>Voice, Song, and Speech</i> (1883).....	42
Figure 5: Browne and Behnke, <i>Voice, Song, and Speech</i> (1883)	43
Figure 6: Henry Holbrook Curtis, <i>Voice Building and Tone Placing</i> (1896).....	45
Figure 7: William Vennard, <i>Singing, the Mechanism and the Technique</i> (1967).....	55
Figure 7.1: William Vennard, <i>Singing, the Mechanism and the Technique</i> (1967)	55
Figure 8: Berton Coffin, <i>Coffin’s Sounds of Singing</i> (1976).....	58
Figure 9: Domenico Corri, <i>The Singer’s Preceptor</i> (1810).....	79
Figure 10: Richard Miller, <i>The Structure of Singing</i> (1986)	80
Figure 11: Barbara Mathis, <i>Selected Vocal Exercises and their relationship to specific laryngeal functions</i> (1986).....	86
Figure 12: “Every Orange” Exercise (2017).....	91
Figure 13: J.B. Fauré, <i>La Voix et Le Chant</i> (1886).....	92
Figure 14: Barbara Mathis, <i>Selected Vocal Exercises and their relationship to specific laryngeal functions</i> (1986).....	96
Figure 15: Estelle Liebling, <i>Vocal Course for Tenor</i>	97
Figure 16: [ku] [gu] [ju] Exercise (2017).....	99
Figure 17: Allan Rogers Lindquest, <i>Lindquest Vocal Exercises #4</i> (2013).....	101
Figure 18: Abbigail Coté, [ri], [re], [ra], [ro], [ru] Exercise (2013)	102
Figure 19: Musical Notation of the Nickol Breath Squat	104
Figure 20: Allan Rogers Lindquest, <i>Lindquest Vocal Exercises #2</i> (2013).....	107
Figure 21: Ferdinand Sieber, <i>36 Eight-Measure Vocalises for Class or Private Practice</i>	108
Figure 22: [tu] [la] Exercise (2017)	110

I. INTRODUCTION

This paper is a study of pedagogical approaches for the cultivation of an efficient, balanced onset. The research will provide a historical survey of onset discussions from various pedagogical sources and conclude with a compendium of exercises which exemplify a systematic, prescriptive approach to balanced onset through development of an advantageous prephonatory throat posture and maintaining that posture with varied articulatory gestures and air pressure. Although the methodology I have used in this research could be applied to each aspect of vocal technique, I believe teaching the execution of an efficient onset has been especially controversial and, therefore, more elusive to today's teachers, warranting this in depth investigation.

"Vocal onset," refers to the instance in which sound production begins in the body and was first defined in scientific terms through the myoelastic-aerodynamic theory of voice production in 1957¹. The theory, a cornerstone of modern vocal pedagogy and therapy, defines the onset process in terms of air volume, pressure, and muscle elasticity. Vocal onset occurs when pressurized air released from the lungs meets adducted (closed) vocal folds, and then the vocal folds abduct (open) in a wavelike motion due to their muscular elasticity. The air moving through the narrow, abducted folds, or glottis, is faster than air above and below and, therefore, has lower pressure. This pressure difference creates a vacuum, sucking the vocal folds back together. Air pressure below the mechanism rises due to the adducted folds, and the system repeats. This process of abducting and adducting folds is the source of vocal sound. (Titze, p. 80-81)

¹Van Den Berg, J. (1958). Myoelastic-Aerodynamic Theory of Voice Production. *Journal of Speech Language and Hearing Research*, 1(3), 227.

Modern vocal pedagogues divide onset into three groups, the hard onset, the soft onset, and the balanced onset. A hard onset is often categorized as an exaggerated glottal stop, resulting in a percussive onset sound, and a soft onset is categorized as an exaggerated aspirate, resulting in a breathy onset sound. The term balanced onset refers to an onset sound between the extreme of the hard and soft onset, using the optimal amount of air pressure and vocal fold tension to produce an even oscillation at the folds in order to yield a full, clear sound. In addition to a beautiful tone, utilizing a balanced onset promotes vocal health and assists in efficient dynamic control and consistent phrasing. (Miller 1986, 4)

My interest in onset research began while surveying vocal pedagogical literature looking for a methodology to balance a breathy onset. I began to notice modern vocal pedagogical texts relied on the strategy of using an aspirate to cultivate a balanced onset; an exaggerated aspirate is prescribed to soften, or balance, a hard onset, a glottal stop to harden a soft onset, and an imaginary aspirate is used to practice a balanced onset. This method is often presented along with a description of the physiology of phonation and encouragement to build onset coordination through staccato vocalises. For example, commonly used texts by Meribeth Bunch Dayme, Ingo Titze, and James McKinney, all describe balanced onset in great physical detail, but provide few examples of exercises for cultivation beyond the use of an aspirate [h], or sigh to start the sound. This approach would not serve a student who has an overly breathy tone, and therefore, does not adequately prepare teachers to face the challenge of teaching a balanced onset. The sole focus on the vocal cords also fails to link action at the glottis with other important aspects

of onset, such as an aural imagination of pitch, an open throat, relaxed tongue, and efficient use of breath support, all of which can contribute to a balanced onset. Hoping to find an alternative to the aspirate methodology, I began to survey historical pedagogical texts.

Popular historical texts depict evolving descriptions of onset rather than descriptions of pedagogical method. Philip Duey's *Bel Canto in its Golden Age* identifies pedagogical tropes which informed the castrato tradition of singing in the 18th century. The cornerstone of these treatises, Pier Francesco Tosi's *Opinioni de' Cantori Antichi e Moderni*, described singing in terms of musical style and performance, with limited discussion on methodology, and provided the basis for many future treatises on singing. Tosi limited his discussion on phonation to the instructions "attack and sing notes in tune." (Tosi 1723, 19) John Potter and Neil Sorrell's *A History of Singing* discusses Tosi's focus on musicality and performance over methodology as a product of audience; the treatise was intended for singers and teachers with experience, suggesting a common understanding of technique at the time. (Potter and Sorrell 2012, 92) Tosi's omission of methodology and the ensuing treatises that followed his example, leave room for modern interpretation of traditional vocal technique and create a problem for modern teachers wanting to apply historical technical practice in the studio.

James Stark's *Bel Canto: A History of Vocal Pedagogy* attempts to bridge this gap between historical reading and application. Stark's text presents views of onset popular in the 19th and 20th century, and then uses scientific studies to determine which onset description is acoustically beneficial for singers. Stark's scientific evaluation of

traditional pedagogical concepts is rare and an important addition to the vocal pedagogy canon. However, Stark does not discuss any of the methodologies he used to physically create the onsets described in 19th and 20th century texts, and the reader is left to guess how Stark was able to create the sound he measured acoustically.

In the 1990's vocal pedagogues began strongly advocating for the use of scientific knowledge of the vocal mechanism in studio teaching. Harry Hollien, Oren Brown, and Rudolf Weiss state, "knowledge of science can serve to explain reality and may lead, in its turn, to application of techniques which are sound and effective."² Richard Miller argues a voice teacher needs "as much scientific information as he or she can get," in order to be an effective teacher, and goes on to suggest that knowledge of the vocal mechanism leads to the ability to diagnose and correct inefficiencies in vocal technique.³ While these discussions argue for application of scientific concepts in pedagogy, they fail to suggest how one could implement the concepts to studio teaching in a meaningful way.

This confusion over application of resources in the studio is evident in Barnes-Burroughs, Lan, Edwards, and Archambault 2008 self-report study on attitudes towards technology in the vocal studio. Barnes-Burroughs et al surveyed members of the National Association of Teachers of Singing across the United States, asking what tools were used in the studio, as well as how likely teachers were to adopt new educational tools in the future. The study reported 26.9% of teachers had no experience using anatomical models,

²Hollien, Harry, Oren Brown, and Rudolf Weiss. "Another View of Vocal Mechanics." *Journal of Singing* 56, no. 1 (Sep/Oct 1999):11-22.

³Miller 1996, 219

19.2% had no experience using any text references, and 5.8% had no experience using mirrors in lessons.⁴

These figures reinforce the notion that teachers, whether from scientific or empirical backgrounds, are teaching almost solely from their own personal experience. If the teacher is only able to demonstrate techniques suitable for his or her own vocal habits, students with different muscular instincts may struggle to understand application of pedagogical concepts and fail to make meaningful improvement. What can be the expected development and preservation of vocal pedagogical craft if members of a teaching association self report they do not use educational resources in their studio teaching? The study also implies alternative methodologies for onset cultivation beyond the use of an aspirate may exist. However, if these strategies are not published within the vocal pedagogical canon, these methods are in danger of being lost to the oral tradition of each vocal studio.

Some pedagogues, like Richard Miller, have attempted to marry scientific studies and methodology, producing prescriptive exercises to illustrate pedagogical theory. However, this approach seems to remain a rare trend as many current pedagogical sources disregard inclusion of varied exercises in favor of theoretical discussion. In *The Structure of Singing* Miller provides a series of spoken exercises to build vocal cord approximation which would help correct a breathy onset and discusses the importance of prephonatory tuning. The term prephonatory refers to muscular movement in the throat

⁴ Barnes-Burroughs, Kathryn, Lan, William Y., Edwards, Elizabeth, & Archambeault, Noël. (2008). Current Attitudes Toward Voice Studio Teaching Technology: A Bicoastal Survey of Classical Singing Pedagogues. *Journal of Voice*, 22(5), 590-602.

that happens in the 50-500 millisecond window between thought and execution of sound. These movements create the condition for a balanced onset. (Miller 1986, 2) Though Miller describes these various aspects of onset practice and development, he refrains from linking all these concepts together in a systematic methodology for onset development. It is up to the singer and teacher to discern how to apply the various onset concepts to the musical exercises Miller provides in his text.

Miller draws on 20th century scientific studies to discuss prephonatory tuning, but the concept of preparation for onset appears in earlier pedagogical texts with different terminology, such as, preparing with mental imagery of pitch, breath, and the posture of an open throat. Linking this preparation step with onset practice seems to have fallen by the wayside in favor of exercises that focus on vocal cord approximation and use of the aspirate. Using historical, scientific, and empirical resources, I will create a sequential, prescriptive methodology for onset development that links onset preparation with onset practice, providing alternative strategies to the aspirate approach.

The historical survey in the first part of this paper will provide context for the evolving understanding of onset and context for the confusion surrounding onset practice and identify any unifying trends in onset methodology. The exercises in the second part of this paper will directly link prephonatory postures with onset practice and model application of historical, empirical, and scientific resources discussed in the first portion of the paper. Though no text could ever substitute for a teacher, I hope these exercises will serve to aid studio teachers with onset pedagogy, further the discussion on onset

development and support the need for conversation on the creation, implementation, and publication of prescriptive exercises in vocal pedagogical texts.

II. EARLY THOUGHTS ON PHONATION

Part I of this paper consists of a historical survey of phonation studies and pedagogical theories regarding vocal onset. The purpose of this survey is to provide context for the evolving discussion of vocal onset, identify any unifying trends in onset theory, and identify methodologies that may be useful in the creation of exercises for the second part of the document. Stylistic expectations for onset production over the historical period will be discussed in an effort to discern the intended artistic product developed by these methodologies. The survey begins with early writings on the understanding of the human instrument and continues to current advanced scientific understanding of the vocal mechanism and how this understanding shapes the pedagogical methods used in studio teaching.

Ancient Greece - the 14th Century

Historical scientific record tells us that the human voice has fascinated scholars since, at least, the age of Hippocrates (460-370 BCE). Anatomists in the Hippocratic age were able to determine the voice's dependency on air moving through the throat and movement of the palate, tongue, teeth and lips (Duey 1951, 13). The philosopher Aristotle (384-322 BCE) wrote about the voice and singing in a variety of his works, providing scholars with a glimpse of both anatomical understanding and singing practices during his lifetime. Aristotle described the voice as sound created by "striking something else in a certain medium, and this medium is the air." (Duey 1951, 13) This concept of striking air within the human instrument to produce tone would remain the canonical description of voice production for centuries.

The first large stride in phonation study and understanding is attributed to the works of Galen of Pergamon (129-210 BCE). Writing between 150-200 BCE he is considered the “father of laryngology.” Galen was a practicing surgeon in the Roman Empire, and contributed to “almost every branch of medical science and medical practice known in his time.” (Gross 1998, 217). He created carvings that depicted the larynx in detail, naming the cartilages, and dividing the muscles of the larynx into intrinsic and extrinsic groups, based upon their actions. (Holmes 1885, 95-96) ⁵

Galen’s work contributed greatly to the basic understanding of nerves in relation to breathing and sound produced from the larynx. His most famous experiments in regards to laryngeal anatomy revolved around squealing pigs. While examining a confined, struggling pig, Galen severed the “recurrent laryngeal nerves that innervate the larynx,” which caused the pig to stop squealing but did not effect the pig’s struggling or breathing. (Gross 1998, 218) Galen then traced the nerves of the larynx, describing what is now known as the *vagus* nerve, in detail. He eventually linked the injury of nerves to loss of voice in human infants. (Gross, 1998, 218)

Galen eventually coined the term ‘glottis,’ meaning, “little tongue,” for the space between the vocal cords, because he believed the cords resembled the tongue or reed of a pipe. (Holmes 1885, 95-96) While Galen was unable to view the vocal cords in action, he did use his anatomical research to hypothesize the physiological production of pitch.

Based on the idea that the vocal cords resembled a reed, Galen hypothesized pitch was

⁵ Dr. Gordon Holmes (1845-1927) published "History of the Progress of Laryngology from the Earliest Times to the Present," in the *London Medical Press and Circular* in 1885, beginning in July and releasing epochs through the September issue. Holmes’s work was published in German and French. He also wrote works discussing hygiene and physiology of the voice.

created by a change of dilation in the space between the vocal cords, a wide space for low notes, and a small space for high notes. Though this theory was eventually disproven in 1714 by Antoine Ferrein (1693-1769), Galen's hypothesis of phonation and pitch was considered scientific fact and referenced in a variety of vocal treatises well into the late 18th century.

The 14th-17th Centuries

The rise of solo singing and solo song as an art form in the 14th and 15th centuries, coupled with a new tolerance of anatomical study, inspired a renewed interest in vocal anatomy, and an increased interest in what qualities determined good singing, specifically in performance. In fact, many of the maxims proclaimed in the 14th century remain cornerstones of vocal pedagogy today. Treatises during this time spoke of performance expectations, vocal registers, the desire to hear singers perform in tune, and lamented that singers of the time did not know how to practice. Unfortunately, discussion on actual sound production and ways to develop the voice in these treatises remain vague. Anatomical information was included but without real integration of anatomy and practice. Marchettus of Padua (1305-1319), for example, described the voice's formation through the six "natural instruments of the body," in his treatise *Lucidarium*:

First the breath proceeds from the lungs; second, it passes through the throat; third, it strikes the palate; fourth it is divided by the tongue so that it may be diversified; fifth, what a man pronounces is determined by the touching of the tongue itself against the teeth; sixth, it is controlled by the lips. (Duey 1951, 31)

Marchettus's comments were echoed by Theodoricus de Campo (dates unknown) in 1450, who wrote that vocal production consists of nine body parts, adding four teeth,

and each individual lip to Marchettus's list. This trend continued with Adam de Fulda (1445-1505) in 1490, who added language describing articulation to further Marchettus's concept of sound production, writing singers create sound by striking the teeth with the tongue, as one would strike a tortoise shell, striking the lips like cymbals, and allowing the throat to remain hollow, fueled by the "bellows" of the lungs. (Duey 1951, 32-33)

Historian Philip Duey cautions historians to remember that the scientific community had yet to develop understanding of vocal cord action when these treatises were published. (Duey 1951, 32) However, one can still gain a sense of the expected sound based on the language used by these teachers. It seems the voice was expected to be produced with exuberant, almost percussive, energy, creating a clear sound quality, hence the repeated use of the word "striking," across these writings.

As vocal music continued to develop in the 16th century, using more complex melodies and harmonies, a greater expectation of individual singing performance began to dominate vocal treatises. Performance expectations revolved around delivery of text and posture, and also began to include expectations of good intonation. Vocal masters referred to tone production techniques and anatomical structures as examples of proper style and good singing, but did not provide any methodology or suggestions on how to efficiently produce or practice producing a beautiful tone. For example, Biagio Rossetti (died c.1557), wrote in his 1529 treatise *Libellus de Rudimentis Musicas*, "the breath must strike the palate fully and the voice and breath must be emitted uniformly." (Duey 1951, 39) Rossetti added the concept of breath and tone uniformity, but the language of air striking the palate is the same language used in the 14th century. The inclusion of

exhalation for tone production is interesting due to Rossetti's intended audience. Rossetti was a priest in Verona who also served as cantor and organist. His treatise is written specifically for training choir singers and cantors, singers who would need to produce clear tones in a large cathedral space.⁶ One can infer Rossetti linked proper tone production with the ability to project the voice.

In 1562, Naples voice teacher and physician, Giovanni Camillo Maffei continued the use of anatomical terms as illustration in his *Discorso della Voce*. Maffei's treatise on singing begins with a description on the physiology of singing, largely drawn from Aristotle and Galen in what he calls the "natural science." (Duey 1951, 22) He described the action in the larynx writing, "The cartilage called *cimbalara* [the arytenoid cartilages] breaks and strikes against the air so minutely that the desired singing is produced by every one." (MacClintock 1979, 44) Maffei later reiterated this physiological point, in order to underscore a performance expectation, writing "Nothing should move while singing except the arytenoid cartilage." (Duey 1951, 23) Maffei's treatise was originally a letter to his master depicting singing practices of the time. He summarized the practices into "ten rules for singing," with musical exercises, and brief but clear discussions on tongue and jaw placement.

It is notable in retrospect these older vocal masters would use anatomical terms to describe the process of singing without actually writing in a methodology for tone production. Maffei's statement about only the arytenoid cartilage moving is a curious tactic to promote stillness in the body while performing, and his statement provides a

⁶ Peter Bergquist and Don Harrán. "Rossetti, Biagio." *Grove Music Online. Oxford Music Online.* (accessed April 1, 2017)

clear example of the fissure between anatomical understanding and pedagogical methodology. Up to this point in time traditional vocal technique seems to be a mixture of ancient scientific maxims and critical philosophies on the art of singing. From reading these treatises, one can almost sense the vocal masters are hungry for some sort of clear terminology to describe the process for creation of a consistent vocal sound.

Vocal pedagogy began to find a methodological focus in 1592, with Ludovico Zacconi's *Prattica di Musica*. Zacconi (1555-1627) addressed the need for skillful singers who could negotiate the large melodic intervals in the compositions of composers, Josquin and Obrecht. Zacconi suggested singers learn large intervals by listening to the interval repeatedly played on the lute. (Duey 1951, 42) This new focus on a mental understanding of pitch and accuracy of execution paved the way for the bel canto vocal masters and their ensuing vocal treatises on the art of singing. While these new treatises contained a variety of strategies for pitch development, discussions on the physical act of tone production remained superficial and scattered among intonation and breath concepts for another century.

The 18th Century

Pier Francesco Tosi (1653-1732) published his influential treatise *Opinioni de' cantori antichi e moderni* in 1723. Tosi was a well known castrato singer and composer, and while his treatise builds upon traditional maxims, like the ideas in Maffei's treatise, Tosi's specific address towards voice teachers is revolutionary. He provided musical examples, though he encouraged teachers to write their own, discussed strategies for developing good intonation through solfège, and provided detailed notes on style and

execution of ornamentation. Tosi did not specifically address phonation or laryngeal anatomy, but he did instruct the voice teacher to “do his utmost to make the Scholar attack and sound the Notes perfectly in Tune in Sol-faing.” (Tosi 1723, 19) He stated the voice “should always come forth neat and clear with out passing through the Nose or being choked in the Throat.” (Tosi 1723, 22) Although these references to sound production are vague, the succeeding treatises of the 18th century relied heavily on Tosi's work as a base for their own, and therefore, Tosi's contribution should be included in this historical look at phonation.

In 1741, French physician and teacher, Antoine Ferrein (1693-1769), disproved Galen's hypothesis of laryngeal action when singing. Ferrein studied glottal action on larynxes excised from dogs and discovered glottal action as we now understand it, by manually holding the glottis closed and blowing air through the larynx. (Holmes 1885, 121) This study culminated in Ferrein's *De la Formation de la Voix de l'homme*, which determined that the length of the glottis correlated to pitch, not the dilation of the glottal space, as Galen had hypothesized. Ferrein concluded that the voice was in fact a wind instrument and string instrument combined, with the air instigating sound, acting as a violin bow and the tension of the bands within the glottis acting as strings. (Holmes 1885, 121) Ferrein called the bands “vocal cords,” and vocal pedagogues have used the term ever since.

Though Ferrein's findings were widely disseminated, the new scientific perspective of phonation did not seem to impact pedagogical methods. Most treatises continued in the fashion of early texts on voice, supplying anatomical or scientific

theories of phonation as anecdotal imagery without a suggestion of implementation. One such example is Jean Blanchett's 1756 treatise, *L'art, ou les principes philosophiques du chant*. Blanchett (1724-1778) was not a musician, and the specific musical passages of his treatise are drawn from Jean-Baptiste Bérard's 1755 treatise *L'art du chant*⁷; some passages in Blanchett's work are in fact identical to Bérard's treatise. (Duey 1951, 135)

Blanchett was interested in the physical aspects of singing:

He (the teacher) should not only reflect upon his own organs but still more on those of his pupils and if he succeeds in understanding them he will cause the most inept student to sing with success. (Duey 1951, 135)

Blanchett is the first known writer to add anatomical pictures and scientific discussions to a treatise on the art of singing. Blanchett's work is also one of the first treatises to recognize Ferrein's discoveries on laryngeal action; Blanchett compared the pitch changes at the larynx to the shortening of a violin string. Though Blanchett referred to action in the larynx, he did not include laryngeal awareness in his thoughts on producing tone, instead advising singers to focus on proper breathing, which will lead to efficient movement of the larynx. (Duey 1951, 135) This deferral to breath and natural laryngeal action for efficient production of sound would become a major trend in tone production theory in the 19th and 20th century.

Giovanni Battista Mancini's 1777 treatise *Pensieri, e riflessioni pratiche sopra il canto figurato*, is another landmark pedagogical treatise from the 18th century. Mancini

⁷ Bérard was a leading opera tenor and voice teacher in Paris during the mid 18th century. His treatise is largely concerned with style and diction rules for the performance of French vocal music. Scholar Martha Elliott identifies Bérard's treatise as an important work defining French vocal style, similar to Tosi's influence on the Italian style of singing in the 18th century. (Elliott 54)

(1714-1800) was an Italian castrato who trained in Naples and Bologna but only achieved moderate success as a performer. He eventually solidified his reputation as a teacher, settling in Vienna as the imperial voice teacher for Maria Theresa, the last of the Austrian Habsburg rulers.⁸ Mancini's work builds upon Tosi's foundation but is more methodological and includes specific musical examples for development of vocal technique.⁹

Unlike Tosi, Mancini addressed phonation directly, as a function of breath technique, describing the relationship of breath to tone:

It is plainly apparent that in instructing the pupil to sing very loud, without using the art of producing the voice with moderation and graduating each sustained tone with that lightness of breath so necessary to place such a tone, he [the student] will not be able to perceive his fault. Singing instead, with moderation and great care, and under the direction and observation of a good teacher, it will be far easier to detect even the smallest faults of tone production, and consequently easy to correct them.
(Mancini 1967, 105)

Mancini further discussed the importance of continued practice of good tone production with the necessary breath:

This method, so essential in placing the voice, must not only be kept in mind, but it must be practiced when the pupil is already confident of himself in singing the scales and intervals, and in this way accustom himself very early to graduate and give the voice with all the rules that art requires. (Mancini 1967, 105)

While Mancini discussed the importance of a consistent tone production, how to develop the correct 'attack,' or initial emission of tone, must be gleaned from Mancini's

⁸ John Rosselli. "Mancini, Giovanni Battista." *Grove Music Online. Oxford Music Online*. Oxford University Press, accessed April 1, 2017,

⁹ Ibid

discussion on intonation. Mancini believed a student would develop the perfect attack and pitch if he or she began each note with the teacher singing as well. Once the student had achieved a confident attack, the teacher would begin to slowly diminish participation in each exercise. (Mancini 1967, 63) Mancini also advised teachers to inspect each student for deformities in the palate, teeth, tongue, and throat as deformities will lead to incurable, imperfect singing. (Mancini 1967, 55) This advice suggests Mancini believed the ability to achieve a clear, strong sound had something to do with physical disposition as well as concentrated study and that a student with physical deformities should be precluded from study.

Perhaps the most thorough discussion of phonation in a vocal treatise from this time is found in Agricola's *Anleitung zur Singkunst*, which was published in 1757 as a translation of Tosi's *Opinioni* with comments from Agricola on current music style, including practices for phrasing and ornamentation. Johann Friedrich Agricola (1720-1774) studied music with J.S. Bach and Quantz, eventually becoming a renowned composer, organist, conductor, and singing master.¹⁰ Along with musical comments on Tosi's *Opinioni*, Agricola's treatise discusses both Galen and Ferrein's theories of phonation and attempts to marry them into corresponding theories instead of contradictory ones. After an in depth discussion of both theories, Agricola cautioned voice teachers to proceed with scientific knowledge from the perspective of a singer and to keep teaching from experience:

¹⁰ E. Eugene Helm and Darrell Berg. "Agricola, Johann Friedrich." *Grove Music Online*. Oxford Music Online. Oxford University Press, accessed April 2, 2017,

While the natural scientists remain silent, it is up to us, who do not consider the organs of the voice from the point of view of the anatomies or physician but from the point of view of the singer, to decide whether Mr. Ferrein's discoveries through his many experiments are correct or not, as little can be said against his conclusions derived therefrom.
(Agricola 1995, 79)

Agricola's remarks on the importance of "teaching from experience," rather than depending upon scientific theories as a method for teaching, illustrates the continual debate between empirically and scientifically driven schools of vocal pedagogy over the validity of vocal scientific discoveries in the development of the singing voice. These remarks also depict the quandary facing working vocal pedagogues today regarding how to integrate modern scientific understandings of phonation into an effective methodology of vocal pedagogy.

Agricola's attitude towards a "natural" approach to sound production is echoed in writings by composer Jean-Philippe Rameau (1683-1764)¹¹ and singer Johann Adam Hiller (1728-1804).¹² Rameau wrote in his 1760 book, *Code de Musique Pratique*, "We can not do as we please with the larynx, windpipe, and glottis...we know, at least, that it is not necessary to allow them the freedom of following their natural movements." He continued, "if there is even a little concern about this glottal action, then there is pinching instead of dilation and that which one should feel at the opening of the throat is felt instead at the bottom." (Duey 1951, 136) Phillip Duey dismisses Rameau's remarks as

¹¹ Jean-Phillippe Rameau was a self-taught French composer, organist, and harpsichordist. Rameau's early musical success was as a theorist and teacher, eventually becoming Lully's successor as the dominant composer of French Baroque Opera. (Sadler and Christensen 2017 *Grove Music Online*)

¹² Johann Adam Hiller was a prominent music figure in Leipzig, Germany during the 18th century. Hiller wrote various works on music and the art of singing, performed as a singer, and wrote Singspiel Operas. (Abert and Bauman 2017 *Grove Music Online*)

ignorant of physiology, but Rameau's sentiment would become relevant in later schools of pedagogy. Hiller's writings were focused on musicality of pitch and rhythm and intellectual understanding of diction.¹³ Hiller alluded briefly to tone production, writing that a voice should come "freely from the chest," and instructed teachers to be mindful of mouth position, encouraging the lips, teeth, tongue, and palate to "get out of the way" of the sound. (Duey 1951, 133)

As we trace the history of vocal pedagogy and phonation by reading the treatises from the 18th century vocal pedagogy, it is important to remember the driving force behind these treatises was the instruction of the castrato singer. The course of study, which employed a slow pace and emphasized vocal agility, seemed to mirror the slow physical development, and musical capabilities of the castrato instrument. The castrati had smaller larynxes, which developed slowly over time and thus provided career longevity; castrati sopranos would often transition down to tenor over a lifetime. These physiological characteristics were also suited for the musical ornaments of the time, especially the *messa di voce*. (Duey 1951, 53) Although the castrati began to decline in number and popularity at the end of the 18th century, the hallmarks of their training remained cornerstones of future treatises. (Potter and Sorrel 2012, 144)

In summary, certain trends in pedagogy and 'attack' practice begin to emerge in this early historical survey. As solo vocal music evolved, teachers placed a great importance on both stylistic performance expectations and musicality. Performance standards discussed in these early treatises deal with facial ticks or grimaces and posture,

¹³ Anna Amalie Abert and Thomas Bauman. "Hiller, Johann Adam." *Grove Music Online*. Oxford Music Online. Oxford University Press, accessed April 1, 2017

which may seem removed from an onset discussion, but are actually quite relevant. An aligned body is necessary for a free vocal technique, and scientific studies in the 20th century would link facial grimaces with a faulty aural understanding of pitch. 20th century pedagogues, such as Cornelius Reid, built methodologies based on the idea that a singer who clearly, intellectually understands a pitch will sing the pitch free from unconscious physical tension.

The connection between understanding pitch and physical tension follows the period's emphasis on the musical development of each singer. As solo vocal music continued to employ more complex, virtuosic melodies, the treatises began to discuss methods for learning to execute difficult intervals and melodic gestures. However, at the turn of the 17th century the method used to develop a singer's musical ability seems to have shifted from a methodology built on a repeated listening of pitches, such as the method Zacconi employs in *Prattica di Musica*, to the use of solfège, which is discussed at length by Tosi, Mancini, and Agricola. These 18th century vocal masters encourage teachers to use solfège as their primary musicality focus before moving to vowel work. There are some inherent problems with this approach regarding onset and vocal technique. The singer would develop certain physical habits while singing solfège syllables and if any syllables were inefficient for singing, the teacher would have the arduous task of correcting these habits to ensure the singer is able to maintain a beautiful sound when working on vowels.

It is also clear from this early survey that pedagogues were interested in voice science and believed an understanding of the anatomical aspects of the voice would be

useful for singers. What remains unclear is how this information was intended for practical use. For example, Galen's theories on pitch change dominated vocal treatises throughout the 18th century, but it is doubtful voice teachers asked students to constrict their throats for higher pitches, as this would be uncomfortable and produce an unpleasing tone. Perhaps this practice led to the divide between scientific understanding of the voice and traditional methodologies, and a distrust of using new information in the studio. This attitude is highlighted by Agricola's comments on Ferrein's theories, which foreshadow the onset debate in the 19th century.

III. THE 19TH CENTURY

Some historians, such as John Potter, believe the pedagogical texts of the 19th century are a detailed continuation of the treatises of the 18th century. This commentary makes sense when reading Agricola and Garcia Jr., as discussion of vocal style and performance remain similar. However, there are some emerging discrepancies regarding the Italian empirical traditions Tosi and Mancini published, specifically regarding the use of solfège as a precursor to vocal development. Since mental understanding of pitch and physical preparation for singing are the vital components of a clean attack, this variation seems important to understanding attack discussions in the 19th century.

Garcia Jr. attempted to provide clear instructions for the physical preparation of the attack informed by scientific study of the human instrument. The implementation of new scientific understanding into empirical traditions of teaching sparked a passionate debate among vocal pedagogues which reached its zenith in discussions over the attack. The debate devolved into a semantical argument over a single term, which has surely compounded the confusion surrounding the desired, efficient attack and set the stage for further scientific studies in the 20th century.

The Early 19th Century

During the 18th century, Nicola Porpora (1686-1768), composer, singer, and teacher, was actively shaping the voices of the future. Though he never published a treatise on the art of singing, Porpora's students were so successful, and his teaching method so effective, that he would come to be known as a "central figure in vocal pedagogy," and eventually the greatest voice teacher of the 18th century. (Potter 2009,

90) Porpora's students included the famous castrati Farinelli and Caffarelli, soprano Mingotti, and composer Joseph Haydn. Porpora taught at all three conservatories in Naples, presumably in the castrati tradition, similar to Tosi. Porpora famously gave famed castrato Caffarelli a single page of exercises which once mastered rendered him able to sing any passage of music. (Potter and Sorrell 2012, 90) Though this famous page of exercises did not survive, Porpora's influence is traced through the work of his students, who would go on to publish important vocal pedagogical works and inspire the most influential vocal dynasty of the 19th century, the Garcia family.

Domenico Corri (1746-1825) published his treatise, *The Singer's Preceptor*, in London in 1810. Corri studied with Porpora in Naples from 1763-1767, and returned to Naples to conduct memorial concerts after Porpora's death.¹⁴ Corri eventually settled in London, working as a teacher and music publisher, and his treatise provides insight into Porpora's methods. Corri's book briefly discusses phonation, referring to Galen's theories of phonation and pitch and the dilation of the throat rather than Ferrein's modern understanding of the instrument and the constriction of the vocal cords. Corri stressed the importance of proper practice in developing the voice and a singer's intonation, believing many previous pedagogical texts had misunderstood the use of solfège in a singer's training, as solfège was meant to build musicianship not the voice itself. Corri referenced Porpora:

Improvement of the voice, he (Porpora) maintained, is best acquired by sounding the letter A . The position of the mouth in uttering this letter being most favorable to produce a free and clear tone. (Corri 1810, 8)

¹⁴ Peter Ward Jones, et al. "Corri." *Grove Music Online. Oxford Music Online*. Oxford University Press, accessed April 3, 2017

From this statement one can sense Porpora's conviction that development of the vocal instrument should happen concurrently with development of musicianship, not after a singer has mastered solfège. This approach was previously misunderstood from Tosi and Mancini's works, which urged teachers to keep singers on solfège for a long period of time before moving on to vowel work. Corri described the desired prephonatory, or prepared, condition for singers, advising singers to open the mouth sufficiently and take in as much air as possible with moderate quickness. Corri's comments on phonation are limited to this statement: "use it (breath) with economy and at the same instant sound the letter A." (Corri 1810, 11) This direction is followed by the first lesson which consists of whole notes moving by half step and sung with a *messa di voce* ornament on each note.

Corri's students produced treatises of their own, and interestingly, their approaches to phonation and onset differ from their master teacher. William Huckle published *Practical Instructions for the Cultivation of Voice* in 1820, a mere 10 years after his teacher's treatise was published. While Huckle followed many of Corri's rules for singing, he advocated the use of staccato for the development of attack and added the use of the consonant [l]. Huckle argued that from his experience the staccato work on [a] incites unwanted tongue movement, so he advised singers to practice attacks on staccato articulation of [la], to facilitate a better tongue position. (Huckle 1820, 19) Both the emphasis on staccato practice and the addition of a consonant are departures from Corri's methods. These changes also suggest a prescriptive approach based on a singer's individual need, and that Huckel understood a single method was not appropriate for every singer. He did not provide exercises with his practical advice, yet Huckle's adaptive

approach would manifest in future treatises, highlighting the highly individual nature of vocal study from teacher to teacher and student to student of the time.

Isaac Nathan (1790-1864), a philosopher and composer specializing in the preservation of Hebrew folk song, also studied with Corri and published his treatise on singing, *Musurgia Vocalis: An Essay on the History and Theory of Music and on the Qualities, Capabilities, and Management of the Human Voice*, in 1836. Nathan's text advocates an accelerated approach to vocal development through diatonic scales and address phonation through anatomical discussion, including an in depth discussion of the ear, and restatement of Galen's theories. Though Ferrein's studies had been published for over 90 years, Nathan's inclusion of Galen's philosophies suggests a continued resistance towards application of new anatomical knowledge in vocal pedagogy. Tone production is discussed as a product of proper breath management, with a focus on the inhalation based on each individual's own speaking habits.

Corri, Huckel, and Nathan provide a template for future approaches to onset development that would continue to be debated. Corri's approach, following the traditional practice of long tones sung on a single vowel, would remain a hallmark of many 'bel canto' pedagogues. Huckel's addition of a consonant and use of staccato would become a prominent approach in the 20th century, and Nathan's advocacy of singing development through speech practices would be advocated by the Lampertis in the 19th century. Huckel's and Nathan's illustrative approaches without accompanying vocalises would become a standard vocal pedagogical text format.

In contrast to the descriptive approaches published by Corri's students, another singer in Porpora's line was continuing Corri's format of a comprehensive treatise, including exercises and illustrative discussion. Manuel Garcia Sr. (1775-1832) published *Exercices pour la voix*, in French and Italian in 1822 with an English reprint in 1824. At this time the Garcias were already known as a great vocal family, and through Manuel Garcia Sr's method, would become one of the greatest dynasties in the history of singing. Manuel Garcia Sr. was born in Spain and enjoyed a career as a self taught professional singer when he began studying voice with Giovanni Ansani (1744-1826). Ansani was an Italian tenor and former student of Porpora. Though Ansani did not publish a treatise, documentation of his skills exists in the writings of Charles Burney (1726-1814), who called Ansani's voice, "sweet, powerful, even, and of great compass and volubility." Ansani was also known for his "forceful acting."¹⁵ Most scholars believe Ansani provided Garcia Sr. with the tone, performance technique, rigor and methodology that eventually turned all three of his children into stars of the vocal world. (Potter 2009, 45) Many of Garcia Sr.'s rules for singing are similar to rules discussed in Corri's treatise, suggesting a scholarly continuity from Porpora's method. Garcia echoed Corri's discussion on the development of solfège and musicality separately from vocal development. Garcia preferred his students sing improvised solfège in order to develop performance skills suited for each individual voice. His daughter, the esteemed Maria Malibran, explained this method in her memoirs and letters to Countess de Merlin:

¹⁵Dennis Libby. "Ansani, Giovanni." *The New Grove Dictionary of Opera*. Grove Music Online. Oxford Music Online. Oxford University Press, accessed April 2, 2017

Garcia would strike a chord and say ‘sing what you wish.’ The student would sing what suited their voice, character and style. He believed solfège then links with character and personality. This liberates the singer to follow the direction of his own taste without fear or hesitation. (Merlin 1840, 61)

Garcia Sr.’s method provides some confirmation of Corri’s claims regarding Porpora’s method of developing musicality and vocal strength concurrently. Garcia Sr. believed, probably from his own life experience, anyone could develop a strong voice through the right kind of practice. (Garcia 1822, 5) Like Corri, Garcia provided rules for singing and exercises to practice each rule. Garcia Sr.’s technique is built on the process of “preparing the throat” for emitting the tone with clearness and purity, and then swelling the note “gradually but boldly” via a *messa di voce* ornament to develop the full power of the voice. (Garcia 1822, 4) Garcia Sr. described preparation of the throat as a slow, silent breath with the mouth and throat open enough to stay out of the way of the voice. The singer is then to start the note gently. Garcia Sr. prescribed *messa di voce* ornaments in his first exercise, slowly working through the scale and then moving on to intervals. Unlike Corri, Garcia suggested performing each exercise on all the Italian vowels, beginning with [a], [e], and [i]. Garcia’s son, Manuel Jr, would further his father’s description of a prepared throat, and consequently, start a heated debate over the ideal vocal attack with his term *coup de glotte*. He would also become one of the greatest voice teachers of the 19th century.

The Coup de glotte

Manuel Garcia Jr. (1805-1906) studied under his father, Garcia Sr. and performed as a baritone in his early teens. Some scholars believe Garcia Jr. studied with Ansani as well, which would explain certain castrati traditions included in his *New Treatise on Singing*. (Stark 1999, 4) After touring with an opera group, Garcia Jr.'s voice began to fail. His vocal problems developed from singing large operatic roles during puberty which lead to his retirement from performing at the age of 24. After his performance career, Garcia Jr. began working in army hospitals, studying the larynx while working on neck wounds. (Stark 1999, 4) When Garcia Sr. passed away in 1832, Garcia Jr. took over the vocal training of his two sisters, Maria (Malibran) and Pauline (Viardot), who both became famous mezzo sopranos in the mid-19th century. Garcia Jr. accepted a post at the Paris Conservatory in 1835, and hoping to secure his position, published the first portion of his treatise on singing in 1840.

The Paris Conservatory, under the direction of Luigi Cherubini, was devoted to maintaining the vocal arts through publication of treatises, thereby solidifying the French and Italian technique. (Stark 1999, 5) When Garcia Jr. took his post, Alexis de Garaudé (1779-1852) had just published his *Méthode Complète de Chant*. Garaudé had studied voice with famed castrato, Girolamo Crescentini, and Garaudé's work largely follows the castrati traditions of the 18th century, while also including anatomical discussion of the breath mechanism. (Stark 1999, 4) Historian James Stark believes Garcia Jr. felt pressure to solidify his position at the Paris Conservatory, and so he drew upon his anatomical knowledge to set his treatise apart from Garaudé's work. The small paragraph discussing

the attack turned into a pedagogical revolution, which Stark calls, “the moment when science and singing collided together.” (Stark, 1999, 4)

Garcia Jr. had developed the laryngoscope, based on dental mirrors used early in the century and was the first person to view the vocal cords during the action of singing as opposed to the study of cords excised from the body. (Stark 1999, 4) The laryngoscope was revolutionary but not perfect, as the entire mechanism could not be seen, especially if a singer was performing high pitches. Garcia Jr. acknowledged this limitation, and his theories of phonation and singing evolved throughout his life as science provided clearer understanding of vocal physiology.

Garcia Jr’s treatise largely builds upon his father’s work, rearranging the order of exercises, specifically the *messa di voce*, to avoid fatiguing the student. Although he reordered the exercises, Garcia Jr. encouraged the teacher to rearrange the exercises as each teacher saw fit for each individual student. (Garcia 1840, 9) He continued his father’s notion of preparing the throat, but attempted to discuss the preparation in greater detail, basing his description on his studies with his laryngoscope and coining the term *coup de glotte*, or ‘stroke of the glottis,’ to describe the action of the glottis during the proper attack. (Garcia 1840, 7)

Garcia Jr. described the preparation of the throat for a good attack as the vocal cords closed together, which results in an explosion of air from below the glottis. Garcia Jr.’s treatise suggested practicing this preparation on the [a] vowel with a gentle sound over long tones. Once the student had mastered the [a] vowel, Garcia Jr. advised moving on to the other vowels, beginning with open vowels and adding closed vowels later. He

also prescribed the [e] vowel for students who have difficulty finding enough *pinch* or closure at the glottis. Garcia Jr. argued this *pinch*, or gentle contraction of the glottal muscles, produces a strong, brilliant tone. (Garcia 1840, 7)¹⁶

Garcia Jr. likened the motion of the glottis during the attack to the articulation of a [p] with the lips and suggested students use the sensation of coughing to find the cords with sensation. He then cautioned singers that the actual stroke of the glottis is delicate and not like a cough. (Garcia 1840, 7) Unfortunately, even with this disclaimer, Garcia Jr.'s attempt to describe the actions of the vocal cords with the terms "cough" and "p" lead to a great deal of confusion, and eventually, controversy, over the actual level of activity in the articulation of the glottis.

Despite the ensuing controversy over the term *coup de glotte*, Garcia Jr.'s influence on the practice of a correct attack remains strong even today. His students disseminated his theories well into the 20th century. Pauline Viardot (1821-1910), Garcia Jr.'s world renowned sister, referenced Garcia Jr.'s throat preparation, sans the term *coup de glotte*, in her 1897 methodology *An Hour of Study*. Viardot stated:

The note should always be attacked accurately and boldly with out any sort of sliding but similar to a note struck on the piano; without forcing it from the chest, contracting the throat, or anticipating it with an aspiration which produces the bad effect 'Ha'. (Viardot 1897, 1)

The level of contraction in the throat remained an elusive element of Garcia Jr.'s *coup de glotte*, and provided the basis for further debate. However, Garcia Jr.'s original purpose for the term was to describe a prepared throat with closed vocal cords, avoiding

¹⁶ "Le *pincement* tres-prononcé de la glotte sera le correctif à la faiblesse que nous venons de signaler." (Garcia 1856, 6)

noise from air or scooping, and maintaining an open throat with the production of the [a] vowel. In this light, one can see Viardot's comments follow her brother's technique. Viardot's allusion to the piano as a metaphor for the force in the attack is found in treatises written by fellow students of the Garcia Jr. school. It is clearly an attempt to describe the throat's prephonatory setting, and resulting clean attack, in a meaningful, transparent way.

Mathilde Marchesi (1821-1913), one of Garcia Jr.'s students and fieriest supporters, discussed the *coup de glotte* at length in her methodologies. She explained "the glottis must be closed an instant before *Expiration* commences; in other words, it should be prepared." (Stark 1999, 15) Marchesi linked a strong vocal onset to a strong vocal phrase.

If the *Vocal Cords* are not firmly and evenly closed throughout their entire extent at the instant that the air commences to escape from the lungs, the lips of the glottis being unable to fully contract during *Expiration*, the sound will be weak and hoarse. The firmer and more complete the approximate of the lips of the glottis, the more resistance they will offer to the air which escapes from the lungs, and the less air it will take to set the *Vocal Cords* vibrating. (Stark 1999, 15)

Stark credits Marchesi as the first pedagogue to realize the effect of good vocal attack on an entire phrase, and hence, the true importance of attack in vocal technique development. This idea would be echoed by later pedagogues including Richard Miller, Meribeth Dame, and Alan Rogers Lindquest in the 20th century. Marchesi and her students would continue to vehemently defend Garcia Jr.'s *coup de glotte* as a best practice for quality singing.

Julius Stockhausen (1826-1906), another of Garcia Jr's students, was an important figure in the German vocal tradition and a major proponent of German Lied. Like Viardot, Stockhausen described Garcia Jr.'s *coup de glotte* without using the actual term:

The vocal attack is produced by the lips of the glottis being closed, and then a moderate explosion or expulsion of air taking place through the glottal chink. It must be distinct and decided, but free from harshness. The degree of firmness depends on the expression intended. (Stark 1999, 16)

Stockhausen continued the use of vague, almost contradictory language, referencing a 'moderate explosion' that is 'free from harshness' to describe the action of the glottis, but also furthered the description by qualifying the degree of firmness in the glottis as an aesthetic choice. This inclusion seems to harken back to Garcia Sr.'s emphasis on each singer's character. Stockhausen also commented on the effect of deep connection at the glottis on an entire phrase, promoting a consistent 'activity' at the vocal cords once sound begins. He furthered his discussion on onset by advising singers to lower the larynx for a glottal onset. This idea of a lowered larynx is seen in Garcia Jr's later works when Garcia Jr. wrote that the [a] vowel should begin at the base of the throat.

Emma Seiler's 1884 book, *The Voice in Singing* provides another example of Garcia Jr.'s students' attempts to describe the *coup de glotte*. Seiler (1821-1886) was dedicated to the craft of vocal pedagogy and studied with as many masters as possible, including Garcia Jr. She was equally dedicated to the study of various sciences. (Coffin 1989, 49) Professor de Bois-Reymond, a member of the American Philosophical Society, described Seiler as "a lady of truly remarkable scientific attainments." He continued:

Prompted by a spirit of philosophical inquiry, not frequently met with her sex, she has made herself entirely acquainted with all the facts and theories concerning the production of the human voice. (Seiler 1884, 9)

Seiler's book is scientifically comprehensive and the narrative is dense. *The Voice in Singing* includes a large reprinted portion of Garcia Jr.'s treatise and a discussion on Helmholtz's work on frequencies as it applies to singing.

Though Seiler studied voice and harmonics from a variety of scientific disciplines, her discussion on the attack is largely empirical. She argued that the ability to "always strike the true pitch fully and clearly," was important and required concentration from both student and teacher. She described the attack as a "touch of the voice," which is a "very distinct, quick, elastic touch." Seiler argued the correct touch of the voice has a great deal to do with voice placement. (Seiler 1884, 109-110) Seiler's work provides an amalgam of vocal schools, and while Seiler was deeply interested in scientific research, like her teacher, Garcia Jr. and empirical teachers of the past, she believed imitation was the only true way to teach. (Coffin 1989, 54)

While Garcia Jr. and his pupils were proponents of the *coup de glotte*, they were not the only advocates of a pedagogical method that focused on firm cord closure for a good vocal attack. Discussion on the "stroke of the glottis," is included in J. B. Fauré's, 1886 work, *La Voix et le Chant*. Though J.B. Fauré (1830-1914) did not study under the Garcia family, he was active in Paris during the mid 19th century and must have been aware of the discussion on phonation and attack. Fauré was known for his lengthy singing career, which he attributed to his methodology and a strong focus on a correct vocal attack. (Keeping and Prada 2005, 286) *La Voix et le Chant* is a thorough

methodology that includes detailed discussions on pedagogical concepts paired with corresponding vocalises. Though he did not credit Garcia Jr., Fauré used the term “glottal stroke” to describe the desired onset. Fauré argued aspirate attacks are inefficient as they waste breath, and, in his opinion, “makes instantaneous production with correct pitch impossible.” Fauré reasoned the glottal stroke is the best practice because the articulation allows vowels to take on “qualities like consonants.” He advised singers to practice attacks boldly but not aggressively and compared glottal action to the touch of a piano key and a bow against a violin string. (Keeping and Prada 2005, 36) Fauré was building upon reoccurring themes from previous treatises without actually providing any clearer direction. He did provide musical exercises, utilizing the open [ɔ] vowel instead of the bright Italian [a], as Fauré feels the [ɔ] is neither “dry nor hard.” (Keeping and Prada 2005, 36) Like Corri’s students, Fauré advised practicing attacks on staccato notes, first with breath between each note and then in one breath.

Figure 1: J.B. Fauré, *La Voix et Le Chant*, Attaque du Son, Soprano Et Contralto¹⁷



¹⁷ *The Voice and Singing*, Keeping and Prada 2005, 37

This excerpt is an attack exercise for soprano or contralto in Fauré's method. Fauré creates time for the student to prepare the throat by sounding the piano four beats before the singing begins. Though the rests are notated as sixteenths, the singer is to begin the exercise very slowly. The succession of attacks is to be repeated "as often as necessary," and the student is advised to select any note in the chord she is comfortable with.¹⁸ (Keeping and Prada 2005, 37)

Another popular pedagogue of the late 19th century, Ferdinand Sieber (1822-1895), described a preparation for onset akin to Garcia Jr.'s *coup de glotte*. Sieber did not study with the Garcia family, but his lineage is within the Italian line, having studied voice with famed Verdi baritone Gorgio Ronconi. Sieber was an extremely popular pedagogue in Berlin, and considered one of the last proponents of the "Old Italian School" of singing. In fact, in 1895 *Werner's Magazine* called Sieber, "the greatest living exponent of the old Italian mentor of voice-culture." (*Werner's Magazine* 1895, Vol 17)

Sieber's main published work is a methodology built on short, eight bar exercises using the Italian syllables [da], [la], [be], [me], [ni], [po], and [tu]. All of these vocalises are melodic, rather than scale driven, exercises. In 1880 Sieber published his short book on vocal pedagogy, *Katechismus der Gesangskunst*, in which he described his method of "tone formation," or vocal onset. Sieber wrote, "every tone should be delivered at once,

¹⁸ Fauré's method was translated into English by Francis Keeping and Roberta Prada in 2005. Fauré provides the same exercise, in different pitch ranges, for each voice type. The attack figure is then applied to progressively difficult vocalises, first with longer exercises consisting of short and long tones, and then within vocalises that combine sustained and melismatic music passages.

pure, and clear, and free from any co-sounding noise.” (Sieber 1880, 20) He followed this description with the following instructions:

The singer should hold the breath at the moment when he intends to strike a tone, and close the glottis. By this means he will avoid too voluminous exhalation (as the air is accumulated below the vocal chords (sic) and will flow out in smaller quantities), and, at the same time, gain a good attack of tone. (Sieber 1880, 20)

Sieber briefly and simply alluded to Ferrein’s theories of pitch change in the larynx and advocated for a thorough mental image of timbre to help achieve a good attack, stating:

A tone will sound clearer and purer in proportion as the singer has realized in his mind more or less distinctly the sound to be produced, and in proportion as he controls the prolonged sound according to this pre-conceived ideal tone. (Sieber 1880, 21)

This notion of a mental sound image would become a major focus in future attack approaches and studies in the 20th century.

Another Approach - Expiration and the Vocal Attack

While Garcia Jr. and his pupils were attempting to find the appropriate language to describe articulation at the glottis for the perfect attack, other pedagogues were advocating an onset controlled strictly by breath pressure, the most famous of these pedagogues being the Lampertis, father and son. Francesco Lamperti (1813-1892) taught at the Milan Conservatory from 1850 to 1875, publishing vocal exercises and a treatise during his tenure.¹⁹ Lamperti Sr. produced some of the finest singers of the century and

¹⁹ Elizabeth Forbes. "Lamperti, Francesco." *Grove Music Online. Oxford Music Online.* Oxford University Press, accessed April 2, 2017

scholars like James Stark consider Lamperti Sr. a beacon of the oral tradition of Italian singing. (Stark 1999, 43) Lamperti did not believe in the integration of science into the voice studio. Though his treatises included brief discussions on vocal anatomy and physiology, the scientific passages are borrowed from other texts and presented as reference material, without musical comment.

Though Lamperti singers were known for their great quality of tone, he did not describe the attack or tone production in great detail. He advised singers to prepare to sing with the same language used by most pedagogues of the 17th and 18th centuries:

The mouth should be smiling, the lips should be drawn sufficiently tight to merely show the upper row of teeth, that the sound, striking on a hard surface, may vibrate with greater intensity, and thus give a ring and brilliancy to the voice. The tongue should remain extended in order to leave the largest possible space in the mouth, and that the throat may be easy and open. (Lamperti 1890, 9)

Lamperti's description is similar to preparation descriptions from Tosi through Garcia Sr. Lamperti omitted any further discussion on vocal attack beyond, "attack a note with the greatest possible clearness, with a pure and correct intonation, and sustaining it to the full extent of the breath." (Lamperti 1890, 8) This omission of detail provides insight into Lamperti's belief that proper breath management would elicit the best tone and phrasing, and not a firm attack. He went on to describe the process of strengthening the tone, first beginning with a strong tone and eventually executing a *messa di voce* as an advanced student. Here Lamperti and Garcia Jr. agree that the *messa di voce* is fatiguing and should be practiced once proper, consistent phonation is established. Lamperti's description of the ideal tone consists of an "open quality," produced "by

following the directions given with reference to position and respiration, and opening the throat with the vowel A.” Lamperti solidified his position that the breath combined with a controlled phonation creates beautiful tone, rather than only articulation at the throat, stating:

It is also of the very utmost importance that the voice emitted should be less in force than the force of breath which supports it; this will render the singing more natural, even and spontaneous, and will also convey to the audience a feeling of security and pleasure. (Lamperti 1890, 9-10)

Like the Garcias, the Lampertis would continue as a pedagogical dynasty with the work of Francesco’s son Giovanni Lamperti (1839-1910). Giovanni was taught by his father at the Milan conservatory, later joining the faculty before moving on to teach in Dresden and Berlin. (Stark 1999, 43) Unfortunately, father and son did not get along; both men were described as temperamental and jealous. Giovanni Lamperti published works of his own, including *Die Technik des Bel Canto*, and his method was further documented in English by his student, William Brown, in *Vocal Wisdom: Maxims of Giovanni Battista Lamperti*.

Giovanni Lamperti also attributed a solid tone and efficient attack to proper breath support. He explained, “The act of tone-production is in ‘contrary motion’ to that of breath taking.” (Lamperti 1905, 9) Lamperti Jr. advised ‘tone- attacks’ should be attempted after breathing exercises and under supervision of the teacher. Lamperti Jr. used the same language as his father to describe preparation for singing, advising that the body is to be erect with relaxed shoulders and throat muscles, and the head thrown “slightly back.” His ‘tone-attacks’ are to be practiced with an open throat, in the middle

register, on the syllable “la.” (Lamperti 1905, 9) The addition of the [l] consonant is a departure from Lamperti Sr.’s approach.

Lamperti Jr. wrote, “Beauty and power of tone depend upon a correct tone-attack, but also on the resonance of the voice both in chest and head.” (Lamperti 1905, 10) While Lamperti Jr. acknowledged the importance of a good attack, he, like his father, did not prescribe instruction beyond that of an open throat. Lamperti Jr. did offer [le] as an alternative to [la] for some singers, as Garcia Jr. had also noted.

Figure 2: Giovanni Lamperti, *Die Technik des Bel Canto* ²⁰



While Lamperti Jr. did not discuss the tone-attack in great detail, he did discount Garcia’s method, stating:

The 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. (Lamperti 1905, 10)

Historian James Stark believes this denouncement of the *coup de glotte* stems from misunderstanding Garcia’s terminology due to the violent undertones of the word “coup,” which suggests a glottal action similar to a plosive. (Stark 1999, 15) The Lampertis were not the only teachers denouncing the *coup de glotte* in favor of a breath

²⁰ Figure 2 is the vocalise which accompanies Lamperti Jr.’s instructions on attack practice. (Lamperti 1905, 10)

based approach. Vocal pedagogue Enrico Delle Sedie also advocated this breath focus for the correct attack.

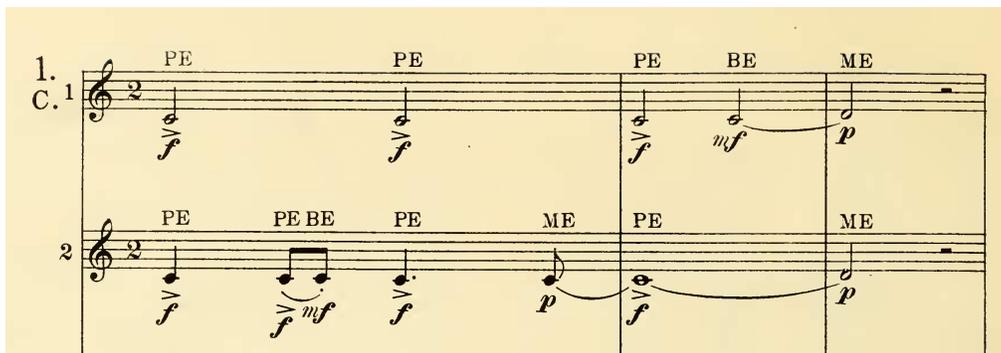
Enrico Delle Sedie (1822-1907) was a Verdi baritone who also taught at the Paris Conservatory. He published two works on singing in 1876, and 1886, and these works were consolidated into the text, *A Complete Method of Singing*, published in 1894. Delle Sedie attempted to address singing concepts both in scientific and practical terms; his treatise describes the vocal tract, acoustic properties of sound, including fundamental frequencies, gravity, and timbre, and vowel modification. This discussion on vowel modification would lay the ground work for future pedagogues, like Berton Coffin, who were interested in acoustic science and its application to singing. Delle Sedie instructed singers to attack notes on [a] and provides in depth instruction on the attack. His method falls squarely into the breath focus of the Lamperti school

Attack the vocal chords (sic) resolutely with a slight expiration predicting a dry sound of the vowel A and as soon as sound is produced, slacken the movement of expiration as much as possible but with out tension.
(Delle Sedie 1876, 9)

Delle Sedie's thoughts on the vocal attack are included in a lesson on blending of registers, which could explain the idea, "slacken the movement of expiration," in his description of the attack. Further discussion on vocal attack in Delle Sedie's work greatly resembles Garcia Jr.'s *coup de glotte*, which Delle Sedie called a "shock of air passing through the glottis." (Delle Sedie 1876, 10) Like Garcia Jr., Delle Sedie also described the vocal cord action as similar to the articulation of [p] at the lips., but he builds upon Garcia Jr.'s work to describe the action at the glottis for different dynamic levels. Though

this initial description sounds similar to Garcia Jr., upon closer look, one can see Delle Sedie is using consonants to provide a reference for the amount of air needed to execute an attack at the appropriate dynamic level, a [p] articulation at the glottis for *forte* sounds, a [b] articulation for *mezzo forte* sounds, and an [m] articulation for *piano* sounds. (Delle Sedie 1876, 10) Delle Sedie follows the approach preferred by Corri, the Garcias, and Lampertis, providing the following exercise to practice the attack, which begins on long tones and gradually moves to more complex rhythmic figures.

Figure 3: Delle Sedie *A Complete Method of Singing*²¹



The Medical Community and the *Coup de glotte*

Though Garcia Jr.'s *coup de glotte* was revered by some members of the voice community, other members of the scientific community vehemently opposed it. Dr. Louis Mandl (1812-1881), was a consultant at the Paris conservatory, and argued the *coup de glotte* was actually a plosive at the glottis and, therefore, harmful. Mandl began to promote a *simultaneous attack* as a healthier alternative to the *coup de glotte*. The

²¹ This is the first exercise in Delle Sedie's *A Complete Method of Singing*. The exercise is presented with seven variations. (Delle Sedie 1876, 11)

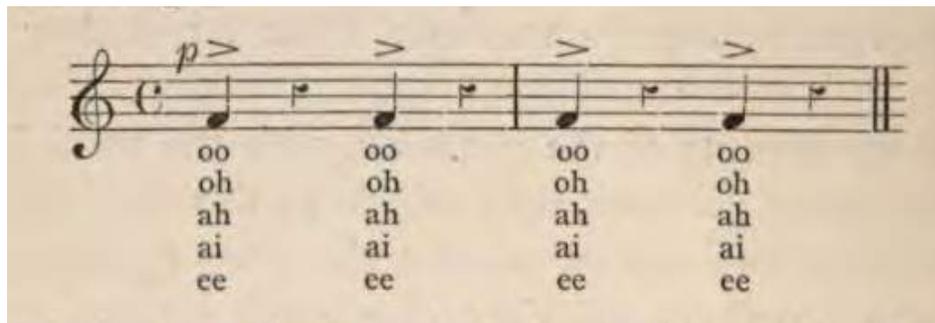
simultaneous attack involved initiation of air flow and closure for the glottis at the same time. (Stark 1999, 16)

This trend towards a *simultaneous attack* continued with Lennox Browne and Emil Behnke's *Voice, Song and Speech* in 1883. Browne and Behnke's book is a comprehensive scientific look at the process of singing and includes a section advising teachers how to use the laryngoscope in lessons. The lengthy chapter on the attack begins with the championing of practicing a good vocal attack:

The reader who has carefully given his attention so far will at once see the importance of devising a set of exercises which shall call these opening and closing muscles [of the vocal cords] into play, thereby making them powerful, and bringing them under the control of the will.
(Browne and Behnke 1883, 195)

Browne (1841-1902) and Behnke (1836-1892) provided two exercises for development of a good vocal attack. The first exercise is similar to exercises published by JB Fauré.

Figure 4: Browne and Behnke *Voice, Song and Speech*, Attack Exercise ²²



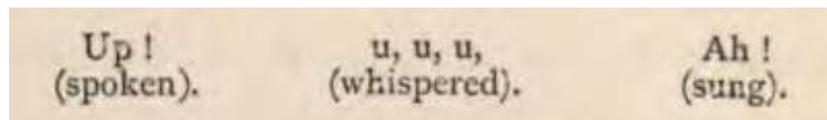
²² (Browne and Behnke 1883, 197)

This exercise includes the instructions:

Attack the tone firmly and clearly, avoiding alike the *check* of the glottis and the *glide* of the glottis. This is often a matter of great difficulty, requiring much patience and perseverance on the part of the teacher as well as on that of the student. (Browne and Behnke 1883, 196)

With their instructions, Browne and Behnke had created three categories of vocal attack, the aspirate attack or ‘glide of the glottis,’ the hard attack, or the ‘check of the glottis,’ and the ‘simultaneous attack,’ or the preferred attack. These three categories of vocal attack, would continue, in different descriptions through the 20th century. Browne and Behnke also provided an exercise to move students away from an aspirate attack. Similar approaches are seen in both vocal pedagogical and phonetic texts of the 20th century.

Figure 5: Browne and Behnke *Voice, Song and Speech*, Attack Exercise ²³



This exercise includes the instructions:

Pronounce vigorously the word “up.” Then *whisper*, but still very vigorously and distinctly, three times the vowel *u*, as you just had it in the word “up.” Immediately afterwards *sing* “Ah.” (Browne and Behnke 1883, 196)

Browne and Behnke advised singers to practice the exercises in their speaking range and then moving up the scale in semitones, careful to avoid “over-crowding the

²³ Ibid p. 35

lungs with air.” Browne and Behnke determined that Garcia Jr.’s *coup de glotte* was misconstrued and that the term actually describes a *simultaneous attack*.

The correct ‘attack’ of a tone corresponds with those prompt and simultaneous actions of the breath and the vocal ligaments described on p. 162 as the ‘shock of the glottis.’ (Browne and Behnke 1883, 197)

Stark believes Browne and Behnke did not understand Garcia’s technique, and due to the immense popularity of their book, irrevocably corrupted the definition of *coup de glotte*. (Stark 1999, 16) This new definition of *coup de glotte* as *simultaneous attack* was furthered by the work of Sir Morell Mackenzie (1837-1892), a well known throat doctor in England. Mackenzie’s *The Hygiene of the Vocal Organs*, builds upon Browne and Behnke’s work defining the *coup de glotte* as an, “exact correspondence between the arrival of the air at the larynx and the adjustment of the cords to receive it.” (Mackenzie 1890, 11)

While Mackenzie, Browne and Behnke were redefining the *coup de glotte*, another doctor was actively campaigning against the practice. Henry Holbrook Curtis (1856-1920) was a doctor who treated singers at the Metropolitan Opera company in the late 1800’s. Curtis felt the *coup de glotte* was the source of most vocal problems. His 1896 book, *Voice Building and Tone Placing, Showing a New Method of Relieving Injured Vocal Cords by Tone Exercises*, includes musical exercises drawn from other vocal pedagogues, along with discussion on the anatomical and acoustical principles of good singing. Though Curtis’s book is full of scientific details, his approach was actually one of the first examples of the “no-effort,” (referring to no-effort in the throat) school of voice, writing:

1. Singing should be done with the least possible effort.
2. No excessive external muscular contraction should interfere with the natural play of the thyroid and cricoid cartilages (the larynx) during tone production.

He continued:

7. The facial muscles and the muscles of the neck should not involuntarily contract during tone production.
8. The tongue and soft palate should be relaxed, except in the employment of the necessary muscular action required in articulation and tone modification. (Curtis 1896, 140)

Curtis viewed the *coup de glotte* as glottal plosive and likened the attack on vowels [a] and [i] to articulating a [p] or [b] consonant with the lips. He argued that adding an [m] is the best way to “reduce” the “shock” of the glottis and provided exercises on [mɑ] as an example of proper attack practice. (Curtis 1896, 142)

Figure 6: Henry Holbrook Curtis *Voice Building and Tone Placing*, Attack Exercise ²⁴



Curtis referenced Garcia Jr. briefly in his book, including a reprint of a Garcia Jr. vocalise, but did not discuss Garcia Jr. with his comments on the *coup de glotte*. Curtis criticized the *coup de glotte* as the source of most vocal problems and provided instructions for correcting the gesture. Curtis instructs singers to hum, with the mouth closed, preceding the sound with a slight puff of air through the nose. The singer then moves on to singing the “maw” exercise by first imagining the syllable, and then:

²⁴ (Curtis 1896, 142)

bring forward the tone, almost saying it, until we feel conscious of the vibration upon the lips; at the same time the position of the initial tone should not be changed. (Curtis 1896, 154)

This practice regimen continues with the idea of “placing” the tone at the lips on various pitches and culminating in singing repertoire on the [ma] syllable. Though Curtis used the [a] symbol, he is advocating for a sound like Fauré’s prescribed [ɔ], which is a departure from the bright Italian [a] vowels depicted in earlier treatises.

Curtis’s critics included Mathilde Marchesi’s daughter Blanche Marchesi (1863-1940), a successful mezzo-soprano and voice teacher. Blanche Marchesi argued Curtis, who was not a singer, was missing the key element of technique:

They [Curtis and his followers] could not distinguish between the hitting and closing of the glottis, and at once decided to condemn every method that allowed singers to make their vocal cords meet when emitting sounds.” (Stark 1999, 16)

It is important to note many of these “medical” vocal texts were not written by actual singers, and the authors had little empirical evidence to support their techniques. At the end of the 19th century, two distinct approaches to singing began to emerge based upon debates over the vocal attack, the “no effort”²⁵ and the “local effort”²⁶ school. While the “no effort” school is associated with an “anti-voice science attitude,” the true focus of the school was to eliminate attention to the throat muscles and encourage reliance on

²⁵ While the “no effort” approach was a common trend during the later part of the 19th century, the actual term “no effort” was not created until 1932 by playwright and critic George Bernard Shaw. Shaw was against both science and Garcia Jr.’s *coup de glotte* and some critics believe Shaw’s fierce criticism of singers stemmed from his failed attempts at a singing career. (Stark 1999, 19)

²⁶ The “local-effort school of singing” was first coined by American voice teacher and author Edmund Meyer in 1897. Meyer felt conscious manipulation of the throat muscles were “relics of barbarism.” (Stark 1999, 19)

natural sound produced from conscious thought of pitch. This approach continues today, but, as seen with Curtis's work, the "anti-science" label is misleading, even in the 20th century. Cornelius Reid, for example, a 20th century pedagogue who promotes the "no effort" approach, references various scientific studies in his pedagogical texts.

Conversely, the "local effort" school became synonymous with voice science, but again, this label is misleading. The "local effort" referred to conscious manipulation of extrinsic and intrinsic musculature in the throat, such as lifting the soft palate, tactics which are used by both scientific and empirical pedagogues today.

The Turn of the 19th Century: Salvatore Marchesi

Salvatore Marchesi (1822-1908), was a student of both Garcia Jr. and Francesco Lamperti. His 1902 book *A Vademecum for Singing-Teachers and Pupils* is a comprehensive look at the Italian school of singing. Marchesi studied with Lamperti as a young man and was already a successful operatic baritone when he began studying with Garcia Jr. in London in 1850. In London, he met his future wife, the famous singer Mathilde.²⁷ Salvatore Marchesi's text provides an interesting look at the Italian school of singing, referencing ideas from Tosi through Garcia Jr. Marchesi described the desired vocal attack at length and argued the merits of the *coup de glotte*. Like Curtis, Marchesi included his discussion on the attack as a factor of voice placement and advises students to use a slightly darkened Italian [a] vowel for proper tone development. (Marchesi 1902, 11) This approach echoes J.B. Fauré's method from earlier in the 19th century. Marchesi attempted to clarify the term *coup de glotte* by describing the action of the glottis as

²⁷ Elizabeth Forbes. "Marchesi." *The New Grove Dictionary of Opera*. Grove Music Online. Oxford Music Online. Oxford University Press, accessed April 2, 2017

strokes rather than oscillations. He argued that the glottis performs a series of “strokes” in speech, and therefore, prolongation of the closed portion of the stroke leads to a strong, prolonged sound in singing. Marchesi stressed that this closure should happen without any effort, while the tone is emitted. (Marchesi 1902, 12) Descriptively, Marchesi is walking the line between the “local-effort” and the “no-effort” schools with his definition of the *coup de glotte*.

Marchesi staunchly argued in favor of the *coup de glotte*, providing strong evidence for scholars like Stark who argue Garcia Jr’s term was greatly misunderstood and subjected to a bevy of superimposed definitions.

We must make the pupil understand that the action of the glottis in setting the sound (the stroke of the glottis) is a normal, and not an *extraordinary, accidental function of the vocal organism*, which henceforth must be subordinate to his will, instead of being an unconscious act, as occurs in pronouncing the difference vowels in speaking. Of course, the bringing together and the tightening of the edges (lips) of the glottis must not be exaggerated by extraordinary compulsion on attacking the sound in singing, but must be accomplished in a smooth way, as in speaking. (Marchesi 1902, 19)

Marchesi’s remarks show the totality of his education. He refers to Garcia’s “pinch” by using the language of tightening while also advocating Lamperti’s preference for enunciation. Marchesi advocates for regular, careful practice, following Porpora’s ideas which were disseminated in Corri and Garcia Sr’s works, and harkens back to Tosi with remarks on musical analysis. Perhaps Salvatore Marchesi’s remarks hold the key to the true compass of the bel canto vocal technique. Marchesi did not include vocalises in his book; however he did publish progressive vocalises separately. Unlike his wife’s

compendium of vocalises, Salvatore Marchesi's vocalises follow the Vaccai²⁸ tradition of using poetry instead of vowels or solfège.

The debate over physiological components of the attack in the 19th century set the stage for the scientific studies devoted to understanding attack in the 20th century.

Despite passionate commitment to a throat or breath preparation for the attack, few pedagogues provided a concrete methodology to practice the physical gestures necessary for executing a proper attack. Brown and Behnke are a rare example, as they attempted to continue the discussion Garcia Jr. started with his term *coup de glotte* by isolating the intrinsic muscles of the throat and prescribing exercises to strengthen and coordinate the musculature of the throat. Unfortunately, other pedagogues were not inspired to build upon Brown and Behnke's process oriented approach to attack. Salvatore Marchesi, for example, provides a comprehensive description of the desired attack, but does not provide a strategic methodology that will slowly develop the habits of an efficient attack. The singer is expected to understand the description which will lead to effective singing. This system is very similar to the treatises of the 16th century.

Methodology increasingly takes a back seat to scientific description. There is little discussion of musical development in vocal courses, which rely on exercises in the Tosi tradition, rather than provide examples of strategies to develop a singer's musical ability and artistry from the Porpora tradition. As the focus turns away from how to sing, to what

²⁸ Nicola Vaccai (1790-1848) was an Italian composer and singer, who relocated to England after his works failed to commercially compete with Bellini. In 1833 Vaccai published *Metodo Pratico di Canto Italiano* in both Italian and English. Hoping to keep his bourgeois clientele, Vaccai set texts by Metastasio to teach singers musical skills, in line with the castrato tradition without the use of solfège. (Potter and Sorrell 2012, 102)

singing is, the emphasis and process of preparation for the attack becomes increasingly muddled and Brown and Behnke's vocal cord approximation approach becomes the dominant methodology for onset practice through the 20th and 21st century.

IV. THE 20TH AND 21ST CENTURIES

Pedagogical texts in the 20th century are inundated with scientific descriptions of the physiological aspects of singing. These discoveries provide an excellent picture of the human instrument, but often fail to integrate into methodological practice. The pedagogical theme from the 16th century that conceptual understanding of the science behind singing will translate to best physical practice of singing remains, resulting in a deeper fissure between scientific and empirical traditions. A returned emphasis to intellectual understanding of pitch and the physical correlates which result from this conception of pitch begins to emerge in the mid 20th century, creating another divide in pedagogical methods for an efficient attack, as some pedagogues stress a mental preparation while others stress a physical preparation. I believe executing a balanced onset requires both mental and physical preparation and the narrowing focus on one aspect of preparation in the 20th century has compounded confusion over onset practice today.

Pedagogues who stress a physical preparation provide prescriptive exercises to develop aspects of vocal technique, while other scientific and conception based pedagogues rely on previously published vocalise. The purpose of this final survey is to identify effective methodologies from both the conceptual and physical approaches to vocal attack and combine them with strategic exercises in the second part of the paper.

The Swedish/Italian School of Singing

Vocal pedagogues basing their approach on scientific research made a large impact on the pedagogical community in the 20th and 21st centuries, largely due to studies which helped further illustrate the physiological and acoustical properties of the three onset categories established in Browne and Behnke's *Voice, Song and Speech*. The synergy of scientific understanding of the voice and practical application of that knowledge into methodologies to develop the singing voice, continues to evolve today. One of the strongest examples of this synergy is found in the Swedish/Italian School of singing, which rose to prominence at the turn of the 19th century.

The Swedish/Italian school began with the work of Julius Günther (1818-1904), a tenor and vocal pedagogue working in Stockholm in the late 1800's.²⁹ One of Günther's students, Dr. Gillis-Bratt (d 1928), solidified the efficacy of the school's methodologies and techniques, through the training of successful singers, such as Kirsten Flagstad, Joseph Heslop, and Jussi Bjoerling. Dr. Gillis-Bratt was a scientific and musical scholar, having already become a throat specialist and practiced pianist before he began studying voice with Günther. Gillis-Bratt eventually left Sweden to study voice with Manuel Garcia Jr. in Paris, and his studies abroad included psychology with Sigmund Freud in Vienna. (Lindquest, 1948, 2) Gillis-Bratt used his varied skill set to analyze the Italian disposition for singing, concluding the Italians were great singers because they had:

a perfect inbred speech pattern in their language which developed pure vowels and correct phonetic and articulatory action; good anatomical conditions in posture, inherited from largely peasant stock; perfect

²⁹ Elizabeth Forbes. "Günther, Julius." *The New Grove Dictionary of Opera*. Grove Music Online. Oxford Music Online. Oxford University Press, accessed March 15, 2017

psychological conditions for singing—they were emotionally alive and responsive, with happy disposition, the type we now call extroverts. (Lindquest, 1948, 2)

Gillis-Bratt returned to Sweden and sought to integrate the Italian approach into the Swedish school of singing, specifically the influence of the five cardinal Italian vowels into the twelve vowels of the Swedish language. He published *Speech Communication Physiology from a Pedagogical Standpoint* in 1908, establishing a strong connection between medical study and the bel canto philosophy of teaching. Gillis-Bratt's student and colleague, Oscar Lejdström, published *Vocal Health and Tonal Beauty* with his wife, an otolaryngologist, in 1928, drawing on his experience studying with Gillis-Bratt. The fusion of otolaryngology with the Italian school of singing created the methodologies attributed to the Italian/Swedish school, which produced some standard characteristics across different voices, namely a 'ping,' or high singer's formant ³⁰ cluster, in all vowels coupled with a deep, round timbre, vocal strength and longevity.

As in the Italian tradition, Gillis-Bratt's methodology builds on past treatises. Posture is addressed first, and individual artistry is emphasized early on in practice. He believed in a firm cord closure that did not involve a "glottal shock." (Lindquest, 1948, 2) Since Gillis-Bratt studied with Garcia Jr., one can assume Gillis-Bratt worked on the *coup de glotte* technique; the idea of firm closure that is also gentle resonates with past arguments in favor for Garcia Jr's technique. Gillis-Bratt instructed students to "speak the vowel at the larynx with firm glottic closure," and he did not "tolerate an aspirate attack," calling the aspirate a "leaking breath." (Lindquest, 1948, 2)

³⁰ Definition of Singer's formant from Titze

The Swedish/Italian school's concepts had a major impact on American vocal pedagogues through the teachings of Allan Rogers Lindquest (1891-1984). Lindquest was born in Chicago, Illinois to Swedish parents and achieved moderate success as a tenor, studying with many teachers, including famed tenor Enrico Caruso. In 1938, Lindquest traveled to Sweden to study voice because he was "curious as to why Sweden was producing so many great singers in proportion to its small population ." (Lindquest, 1948, 2) Lindquest returned to the United States when Hitler invaded Poland, and gradually became a very influential member of the American voice pedagogical community. Lindquest was a founding member of the National Association of Teachers of Singing (NATS), the American Association of Teachers of Singing, and the Music Academy of the West, and his students include William Vennard, Berton Coffin, and David Jones. (Mathis 2006, 1) While Lindquest only published a few articles, his methods and exercises are included in Vennard and Coffin's famous pedagogical texts.

William Vennard (1909-1971) was an American singer and pedagogue known for his work in voice science. His 1967 text *Singing, the Mechanism and the Technique* is an example of scientific synthesis with vocal pedagogy, advocated by the Swedish/Italian school. Though often referred to as a radical, Vennard's exercises are grounded in pedagogical tradition. He provided graphic representations of singing, anatomical pictures, and descriptions of prescriptive vocal exercises, rather than notated vocalises.

Figure: 7.0 and 7.1 William Vennard *Singing, the Mechanism and the Technique* 1967 ³¹

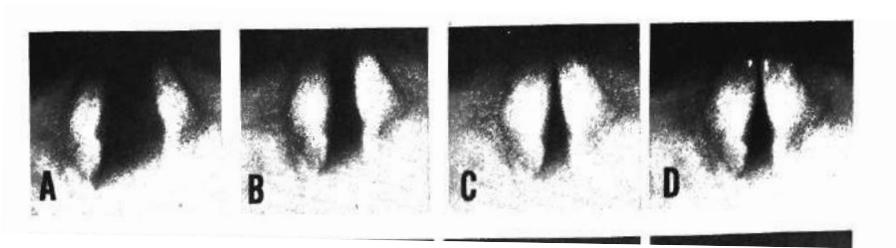


Figure: 7.0 depicts an attack executed with an aspirate with incomplete glottal closure.

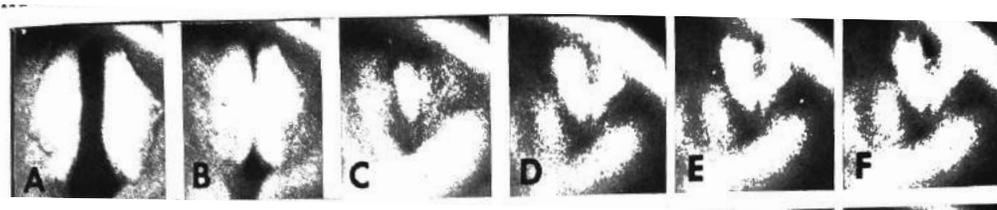


Figure: 7.1 depicts an attack executed with a glottal plosive.

Vennard's chapter on vocal attack is extensive and includes a discussion on contemporary theories of phonation, including a long discussion on the Bernoulli effect. Vennard concluded the difficult challenge in attack practice is related to the mental focus of the singer, questioning whether the singer should focus on initiating an exhale or initiating the action of the vocal cords. (Vennard 1967, 38) This question continued to arise up to the present day.

Instead of answering the question of whether the singer should focus on the exhalation or action of the vocal cords, Vennard provided examples of strategies to practice efficient attack from both perspectives. For students wishing to focus on the exhale, Vennard advised the use of an "imaginary aspirate" or "imaginary h" which, in his opinion, builds upon the Bernoulli effect's natural occurrence in phonation. For

³¹ (Vennard 1967, 42)

students with a breathy attack and in need of a glottal action focus, Vennard advised use of a vocal fry or “scrape,” rather than a glottal plosive, which Vennard said “leads to more tension.” This “glottal scrape” is credited to Lindquest and Gillis-Bratt and was deemed useful for singers with too much aspirate in their attack, but is not appropriate practice for high pitches. Vennard argued that the imaginary aspirate is the coordinative onset Garcia Jr. was describing with the *coup de glotte* term. (Vennard 1967, 44)

Vennard continued his discussion of the vocal attack with a description of exercises designed to “find a tone that is midway between breathiness and tightness,” telling students to “flood the tone with as much breath as possible,” and use the tone “as firm resistance as necessary in the valve.” He clarified his thoughts with the use of staccato exercises, advising students to “think of the glottis as closing smartly over the breath stream, producing a clear, clean stroke.” This language is strikingly similar to Marchesi’s language from earlier in the century. Vennard prescribed four staccato tones followed by a long tone. This exercise is paired with a “yawn-sigh,” which utilizes the “imaginary h.” (Vennard 1967, 211)

While Vennard was combining scientific graphs and anatomical pictures with pedagogical tactics, another one of Lindquest’s students was blending acoustical science and vocal pedagogy. Berton Coffin (1910-1987) was a renowned vocal pedagogue and historian. His 1976 work *Coffin’s Sounds of Singing*, quotes maxims from his teacher, including Russian soprano Paola Novikova and references exercises used by Lindquest. The text contains a detailed chromatic vowel chart to illustrate the acoustic advantages of vowel modification as well as to provide the singer with a road map of what tessitura to

use for specific exercises and which vowel modifications to use on specific notes for maximum vocal resonance. While the chart appears scientific in nature, the actual exercises discussed in Coffin's text are much more empirical in nature, relying on previously published exercises from other pedagogues and personal experience.

Coffin's discussion on attack is brief and relies heavily on precepts he learned from Novikova. These precepts vary in nature from philosophical, such as, "Attack is for you, then everything else is for the audience, not one vowel wild," to instructional, such as:

Inhale, wait, then attack. The 'wait' after inhalation is to let the breath take possession of all the spaces it can in the body. (Coffin 1976, 22)

Novikova advocated mental practice, a flexible abdominal movement, and uses the traditional maxim of "drink the voice," with the language, "inhale and then imagine you go back the same way with the breath in your attack." (Coffin 1976, 23)

Coffin's own contributions to attack exercises are less instructional than other parts of his work, and his method relies heavily on Garcia Jr.'s approach. Coffin redefined the *coup de glotte* as a soft attack and advised students to focus on exhaling to begin tone. Coffin argued further an emphasized "stroke" at the glottis leads to percussive attacks. Coffin seems to be attempting to describe the delicate nature of the *coup de glotte* term, but his approach is confusing. In contrast to the idea of a soft approach, Coffin later mentions a firm cord closure in his resonance building exercises, advising students to "place the vocal cords together by imagining you are grunting." (Coffin 1976, 244)

Coffin included attack exercises in his sample vocalise regimen after simple siren and “yawn-sigh” exercises, a sequence that follows the Lindquest methodology. The actual attack exercises are drawn directly from Garcia Jr., using an alternation of the [a] and [E] vowel on repeated tones. (Coffin 1976, 132)

Figure 8: Berton Coffin *Coffin's Sounds of Singing*³²

VOCALISE FOUR

Beginning on the vowels "ah" and "eh" as in the words "alma sempre,"
 attack the vowels on Note #7. Proceed by half-steps to Note #15

. These attacks "will bring out all the ring of the voice. The
 a ε a
 notes must be kept full and equal in force. This is the best manner
 of developing the voice. At first, the exercise must not exceed two
 or three minutes in duration" (Garcia 1894, p. 14).

Cornelius Reid and Proponents of the Natural Voice

As Vennard and Coffin were breaking new ground in scientific properties of the singing voice, another pedagogue was actively campaigning against the inclusion of scientific efforts in methodical vocal pedagogy. Cornelius Reid (1911-2008) was known for his modern readings of 18th century vocal treatises and his firm belief that imitation and tradition remain the solely appropriate method for voice development. Reid was born and raised in New York City and began his music studies as a boy soprano in the Trinity Church Choir School. After four years of assisting Dr. Douglas Stanley, Reid established

³² This exercise appears in the suggest sequence of vocalises for both female and male voices. (Coffin 1976, 132)

a private studio in New York and began teaching his method of singing, which was based on his understanding of the vocal treatises of the 18th and early 19th centuries.

Reid fiercely believed scientific knowledge that was not directly applicable to musical practice was “useless” for students. (Reid 1975, 3) It is important to note Reid did not believe the act of scientific study on the voice was useless, as insights provided by science could help teachers understand the mechanism. But he believed detailed scientific information included in lessons and pedagogical texts was misleading and often took the place of what he held to be proven pedagogical techniques.

Reid’s contribution to modern vocal pedagogy is undeniable. Many of his beliefs were considered very controversial. In fact, his last published article was rejected from the *Journal of Singing* due to his aggressive critique of voice scientists’ ability to inform the teaching of singing, and misconceptions scientific study had inflicted upon singers.³³ Despite this controversy, Reid’s focus on breath and the mental aspect of an attack, what is known today by Richard Miller’s term prephonatory tuning, influenced many pedagogues of the late 20th and early 21st centuries.

As one might expect, Reid used a great deal of empirical language to describe the vocal attack. In his 1950 text, *Bel Canto: Principles and Practices*, Reid discussed the importance of a successful attack for overall quality of singing, specifically with the idea of uniting the registers into an “even” voice, stating:

In listing other general rules for guidance in joining the registers, it is important to be sure that the initial attack is perfect. This means that the

³³ Article and discussion of reception are found on Cornelius Reid’s website: <http://www.corneliusreid.com>

vowel, pitch, and volume must be established instantaneously. A tentative approach is fatal. (Reid 1950, 102)

Reid's comments echo back to the 18th century treatises' language around "striking" the tone neatly and in tune. Reid went into further detail regarding the perfect attack as a product of efficient breath management, arguing:

Tension evenly balanced and maintained as in a correct manner of breathing leads to a precision of attack, ie., the instantaneous sounding of a definite pitch, vowel and intensity, otherwise impossible. All noise, breathiness and other impurities are simultaneously eliminated. (Reid 1950, 153)

This focus on breath echoes the Lamperti approach. Reid did not advise singers to think about action at the glottis. In his next book, *The Free Voice*, published in 1965, Reid continued to describe the breath's importance in a successful attack. He advised students to prepare the attack physically with a relaxed breath, and tense only for phonation, arguing "phonation should occur at the same time the estimated amount of breath needed has been taken," and prescribed rhythmic breathing exercises to achieve this coordination. (Reid 1965, 98) Unfortunately, Reid did not provide detailed instructions for these exercises, so modern readers are left to guess at his approach.

Perhaps Reid's greatest contribution to the pedagogy of the vocal attack is his advocacy of mental preparation. The idea of prephonatory tuning, or intellectual understanding of a tone and preparation of the throat has been included in vocal treatises since the Renaissance, but it was not until Corri's work in 1810 that scholars began to differentiate the development of musical skill from the development of the voice. Reid

argued proper breath management and intellectual understanding of pitch are equally important for a successful attack, stating:

This (instantaneous sound from breath) is one important aspect of the attack. Equally important is the fact that a clear mental picture must first be formed of the exact tonal pattern to be followed. The pattern itself need only include the basic ingredients of tone, the pitch, the intensity and vowel quality. (Reid 1965, 96)

Reid concluded that the “instantaneous reaction to a predetermined tonal pattern” allows the vocal mechanism to operate in a spontaneous fashion, creating quality from the involuntary response of the vocal cords. (Reid 1965, 96)

This notion of instantaneous, natural sound fueled by a mental image recurs in later pedagogical texts of the “natural” or “primal voice” movement. Though authors like Stephen Smith and Oren Brown do not cite Reid directly, their instructions resemble his approach closely. Under the banner of a “natural voice,” pedagogues like Oren Brown promote tone emitted from the involuntary response of the vocal cords. Brown’s popular book *Discover Your Voice*, published in 1996, presents detailed anatomical information about the voice for reference, but encourages students to build the voice from basic, primal sounds, such as a baby cry. Though the book appears much more scientific than Reid’s work, the pedagogical aim for the development of the attack is actually quite similar. Students are to use utterances, such as, “huh,” and “uh oh” from an emotional mindset to initiate an involuntary response and then slowly add pitch. (Brown, 1996, 39) While the students are not focusing on a pitch production, they are instigating sound in a spontaneous way with instantaneous breath, which seems in line with Reid’s approach.

Another modern pedagogue who advocates spontaneity is Stephen Smith. Smith's popular book *The Naked Voice: A Wholistic Approach to Singing*, uses empirical descriptions of attack that appear to be a metaphorical treatment of Reid's concepts. Smith described vocal attack as a "spontaneous combustion" that occurs in the throat when spontaneous thought meets excited exhalation. He suggested the singer attempt to create spontaneous combustion on a variety of notes across registers to develop consistent onset. (Smith 2007, 45) The term combustion would probably not have sat well with Reid, who argued for a balance of tension in the body as opposed to a burst of energy, but the mental impetus for sound falls squarely into Reid's pedagogical philosophy.

The 1980's: McKinney, Dayme, and Miller

Though Reid sought to distance vocal pedagogical methods from scientific voice study, his focus on the "mental picture" of a tone and its effect on the attack would be furthered in pedagogical texts of the 1980's. These texts include detailed scientific explanations of singing and some include methodologies. Importantly, language for vocal attack shifts from the term *attack* to the term *vocal onset*. Reid cannot be solely credited with interest in the mental aspects of the onset, and the focus of simultaneous breath and sound, but his work certainly contributed to interest in developing a scientific understanding of prephonatory tuning and scientific qualification of the ideal, balanced attack.

James McKinney's 1982 text, *The Diagnosis and Correction of Vocal Faults* provides a more comprehensive approach to the ideas of attack in Reid's books.

McKinney (1921-1998) advocates many times for the student to “think first,” and “picture the tone,” and argues students who want to achieve a clean attack, free from scooping and/or sliding, “must hear the pitch mentally before singing.” (McKinney 1982, 81) McKinney provides strategies for cultivation of the soft onset, which he deems as the true “balanced onset.” Prominent, contemporary voice scientists, like Ingo Titze and Johan Sundberg would agree with McKinney, that a balanced onset is slightly more soft, or air driven, than hard, or muscular driven. (Stark 1999, 17)

McKinney’s prescriptive exercises for attack are similar to Reid’s instruction, beginning with breath focus and then directing the singer to “start the tone without conscious physical effort.” (McKinney 1982, 82) McKinney’s instructions for strengthening a tone produced from an overly breathy onset, however, are not as detailed as his exercises to soften a hard onset. McKinney advised students to find cord closure by thinking of humming and advises teachers to correct breathy sound by asking for a louder sound or by pretending to lift something. (McKinney 1982, 92) The imagery of lifting an object would close the cords due to the brain’s natural impetus to close the airway and protect the spine when lifting something heavy. McKinney cautioned teachers not to take these approaches too far, as they can lead to damaging tension in the throat. (McKinney 1982, 92) McKinney’s work provides a strong example of the puzzle facing teachers who are attempting to correct or develop an efficient onset. There appear to be numerous examples of exercises for loosening tension in the vocal mechanism, but how do teachers effectively help students bring their vocal cords together?

As vocal science continued to thrive, more and more textbooks began to rely on scientific description of vocal onset without accompanying strategies for development of an efficient onset. A strong example of this trend is seen in *Dynamics of the Singing Voice* by Meribeth Bunch Dayme (b. 1938). *Dynamics of the Singing Voice*. Dayme's book was also published in 1982 and is now in its fifth edition. *Dynamics of Singing* provides comprehensive descriptions of singing, pairing empirical language with scientific study, but does not include practical exercises for implementation of the concepts. Dayme's detailed discussion on vocal onset begins with a definition of the desired, efficient attack:

The ideal attack is one in which the breath begins to flow gently and is followed by a precise momentary closure of the vocal folds which meets this stream of air. When correctly done, this attack is crisp, clear, and without tension. (Dayme 1982, 70)

Dayme's instruction to begin the attack with a gentle flow of breath follows the modern consensus of the 1980's that a soft attack is desired over a hard attack. She discussed the confusion over onset terminology and likens the actual meaning of Garcia Jr.'s *coup de glotte* to Vennard's 'imaginary h' approach. She argued in favor of prephonatory tuning as well, stating, "in well-coordinated singing, the vocal muscular system is pre-tuned in response to this mental concept several milliseconds before phonation." (Dayme 1982, 71) Dayme seems to agree with Reid's philosophy that the majority of preparation for tone production should happen in the mind, and not in the throat, and follows this description with a discussion on the neuroscience behind singing.

While Dayme's work is comprehensive in its illustration of the physiology of the mechanism, there are some confusing contradictions. For example, her instructions for

the ideal attack begin with an exhalation that brings the cords together, but Dayme's scientific evidence from various speech studies advises a preliminary muscular tension in the throat balanced against air flow. Dayme also discussed the need for the contraction of the adductor muscles of the larynx against an expiratory force to continue a long tone. If one agrees with McKinney, that the vocal onset will determine the quality of the phrase, attempting to adjust the tension in the larynx while singing could be detrimental. On the other hand, Garcia Jr. advocated for a continual glottal “pinch” in after vocal onset to maintain good tone, and argued the preparation of the glottis, with firm cord closure makes the continued “pinch” possible. Dayme, like Reid, did not provide examples of vocalises in her discussion, so the reader is left to guess at the proper implementation of these concepts. One could draw a conclusion that Dayme’s discussion on cord closure echoes McKinney’s approach of telling a student to “sing louder” to induce stronger cord closure.

A new master pedagogue emerged in the 1980s at the Oberlin Conservatory of Music. Richard Miller (1926-2009) began his musical training as a boy soprano in Ohio. After World War II, Miller returned to the United States and received a Master’s degree in Musicology at the University of Michigan before leaving to study in Rome as a Fulbright scholar. After a brief performance career in Switzerland, Miller returned to the United States and began his career as a teacher. At the Oberlin Conservatory, where he taught for over forty years, Miller founded the Otto B. Schoepfle Vocal Arts Center, a voice laboratory that studies voice production and provides audio and visual feedback for singers. The lab was the first of its kind in a music school. Miller wrote a variety of books

on singing, over a hundred articles for various voice journals, and became a major, international pedagogical voice at the forefront of both voice science and vocal pedagogy.³⁴

Miller's 1986 *The Structure of Singing* is a comprehensive work that integrates anatomy, vocal science studies, and pedagogical exercises. *The Structure of Singing* stands apart from other pedagogical texts of the time because the book is intended to be a reference for physiological and acoustic aspects of singing, and provide a method for achieving a desired sound. In this sense, Miller's work is akin to the treatises of the 19th century.

Miller described three classifications of vocal onset; the soft onset, the hard attack, and the balanced onset. He defined the soft onset as an aspirate onset in which the singer, "consciously feels the flow of breath before vocal sound." Miller defined the hard attack as an onset that "encompasses the glottal catch, glottal click, glottal plosive, glottal shock, and *coup de glotte*." Miller described the attack as "folds adducted before phonation," with "greater pressure" in the cords. He furthered his description of these two onsets with the tendency by each for muscular response; hard attacks tend to create hyper-function of the laryngeal muscles, while soft onset tends to promote hypo-function of the laryngeal muscles. Miller's third classification of onset, the balanced onset, is an onset in the middle of the hard attack's hyper function and the soft attack's hypo function. Miller described the vocal fold posture of the balanced onset as having a "narrow slit," a description similar to Garcia Jr.'s original representation. (Miller 1986, 1)

³⁴ Miller's biography referenced from the OBF website: <https://new.oberlin.edu/conservatory/departments/voice/vocal-arts-center/>

Miller instructed teachers that cultivating a balanced onset takes approaches from the hard attack and soft onset perspective, depending on each student's physical habits. Students who have too much air in the onset will benefit from hard attacks, while students utilizing too much muscle in the onset will benefit from aspirate approaches to onset. Most of the exercises Miller puts forth in the practical portion of his writing on onset utilize the idea of an inaudible [h]. Miller followed the J.B. Fauré approach, beginning with staccato tones and slowly progressing to long tones. He did not provide a specific vowel, but advised teachers to begin on the front vowels, [i], [e], and [E], before moving to [a], [u], and [o]. (Miller 1986, 11)

A key component of Miller's writing on onset revolves around the scientific factors of prephonatory tuning, described through data collected from electromyography. Miller referenced a study by Faaburg-Anderson, describing the prephonatory tuning position of the vocal cords:

The intrinsic laryngeal muscles assume the position and degree of tension necessary for production of a tone of a certain pitch even before the actual phonation. (Miller 1986, 2)

Miller furthered this description, using information from a study performed by Wyke which determined the cords' posture for 50 to 500 milliseconds before air begins in phonation. (Miller 1986, 2) Though rooted in science, these studies simply reinforce the emphasis of the mental connection to tone and onset Cornelius Reid advocated in the middle of the 20th century. The similarities between Reid and Miller's pedagogical approach continue when Miller stated:

If prephonatory tuning is exact, the correct onset will be experienced. Awareness of onset can be expected, but the onset does not resemble the glottal click of the hard attack. (Miller 1986, 5)

Miller concluded his remarks on vocal onset with goals for the students:

The singer must feel subjectively that the aspirate sound has been eliminated, and that the flow of breath and the emergence of tone occur simultaneously. (Miller 1986, 14)

The idea of sound emerging with the breath simultaneously seems to be the overarching goal of onset or attack in most vocal pedagogical texts from the 19th and 20th centuries. As time has progressed, terminology for this sound goal has evolved, aided by descriptions of the neurological comments for sound production, but practical approaches towards onset have remained the same. The throat should be prepared in some fashion, either with the breath, with the muscles of the larynx, or with the imagination, before sound can be produced.

Clifton Ware and David Jones, Leaders of Modern Pedagogy

Pedagogical tactics for balanced onset development continue to evolve in the 21st century. Pedagogues Clifton Ware and David Jones provide examples of modern approaches towards our understanding of onset production. Clifton Ware began his career as a tenor soloist, completing his doctoral degree in music at Northwestern University. Ware taught at the University of Minnesota Twin Cities for 37 years, and his 1998 book *Basics of Vocal Pedagogy*, is a widely adopted pedagogical text used at the college and university level. Ware refers to his method of teaching as “Efficient and Authentic Voice Technique,” which places an emphasis on developing the individual sound of each singer

through simple technical concepts and a holistic approach. Ware continues to conduct workshops on vocal pedagogy around the world today. (Ware 2017, 1)³⁵

Ware follows Miller's classifications of vocal onset, but uses different terminology, defining three types of onset as aspirate (soft), pressed (hard), and coordinated (balanced). Ware describes aspirate onset as a "combination of noisy airflow and flutelike tone." He advises students with breathy voice sounds to focus on "whining" or "moaning" sounds and a focus on resonance building exercises as opposed to specific onset exercises. (Ware 1998, 106) Ware defines pressed onset as a combination of high subglottal pressure and strong auditory force at the vocal folds. Coordinated onset is defined as singing on the breath, and Ware borrows the "stroke" language from the 19th century, writing:

One should imagine singing with a light stroke on the thin edges of the folds, avoiding a heavy, pressured use of the full body of the folds.
(Ware 1998, 107)

Ware likens the coordinated onset to the pedagogical trope of "singing on the breath." He calls coordinated onset "flow-phonation," which utilizes "a small separation of the vocal process." This idea is in line with Miller's description of a "small slit" in the cords. Ware advises singers to maintain the "sensation of inhaling throughout the act of vocalization," to keep the throat open and the palate lifted. This imagery is consistent with the notion of "drinking the voice." Ware also discusses the notion of prephonatory tuning, but not to the extent of previous pedagogical texts. He attributes this posturing to

³⁵ Ware's biography referenced from his website: <http://www.clifware.com>.

“muscle memory of pitch,” using Dayme’s research to support his argument. (Ware 1998, 106-107)

Ware’s exercises illustrate his advocacy for simplicity, using English words like “hi,” and, “hello,” on gestures that resemble the yawn-sigh exercises popular in the earlier 20th century. Ware advises building the voice on the soft dynamic, which is a departure from many methodologies, and extends onset work to staccato and marcato exercises on five note scales and arpeggios. (Ware 1998, 107)

David Jones’s method provides a striking contrast to the pedagogical texts from the 20th and 21st century. Jones began his career in Texas, eventually traveling to Santa Barbara, California to study with Allan Rogers Lindquest. Jones has published articles for various journals and consistently posts articles on vocal pedagogy to his website, and his first book publication is expected this year.³⁶ While other pedagogues describe their methodologies in scientific terms, Jones takes an empirical approach, relying on personal experience and exercises documented by other singers and colleagues. Jones continues to work as a pedagogue all over the world, maintaining voice studios in New York and Amsterdam.

Jones references Lindquest in his writings on vocal onset, calling the preferred onset “the perfect attack.” The perfect attack occurs with “the vocal cords gently closing after inhalation,” met with “a slight ‘grunt’ at the lower lumbar muscles.” Jones provides a variety of tactics to develop the correct amount of cord closure, referencing Lindquest’s approaches of “feeling the vowel form at the vocal cords,” speaking the words “every

³⁶ Jones’s biography referenced from his website: <http://voiceteacher.com>

orange,” to feel healthy approximation, also using “uh-oh,” and eventually moving towards a five tone exercise on [E] and [a] to make sure the cords are “sealed.” (Jones 2017)³⁷

Jones’s articles are usually formatted the same way, with the pedagogical concept couched in descriptive language for the desired sound, rather than a description of minute physiological aspects of sound. This approach follows the empirical tactics put forth by pedagogues like Sieber, Liebling, and Reid. Concept descriptions are followed by references to the concept from noted singers, examples of students facing vocal difficulties, and how the concept corrected the vocal fault. Articles end with examples of exercises specific to each concept. While Jones’s approach is clearly empirically driven, he presents his ideas in a scientific format, providing historical background and evidence to support to his methodology.

The Lindquest sequence of exercises, disseminated at David Jones’s Teacher Mentoring Program in 2013, was studied in conjunction with vocal therapy by Barbara Mathis in her 1986 dissertation, *Selected vocal exercises and their relationship to specific laryngeal conditions : a description of seven case studies*. Therapists found that singers suffering from a variety of ailments, including nodules and paralyzed vocal cords, were able to develop better phonation and, in some cases, reverse damage by following the exercise sequence every day. Mathis’s work marks a new trend in voice science as investigation begins to turn from what the physiological aspects of sound are, to how

³⁷ Jones, 2017, “Breath Management in Singing.”

specific vocal practice can help or hinder a singing technique, providing a record of success for one methodology from the “old world” of singing.

In summary, the historical discussion of vocal onset hinges upon two major facets of vocal technique: how one sufficiently prepares the throat for singing and how one executes a sound based on that preparation. The conversation on onset has now transcended the boundaries of empirical and science schools, as both empirical and scientific approaches seem to agree that the preparation, i.e. prephonatory, phase is vital for the execution of an efficient, balanced onset, but disagree on what constitutes appropriate preparation. In this sense, the perpetually debated *coup de glotte* seems more like an attempt to describe the physical correlation of mental prephonatory tuning, further studied by voice scientists in the 1980s, rather than an actual method of onset production. This leaves modern pedagogues with the puzzle of how to train singers to prepare the throat in an effective way.

Despite controversy over the amount of preparation in the throat, pedagogues agree breath support, or subglottal pressure is a key factor in vocal onset. This recurrent theme in pedagogical texts suggests breath exercises should be mingled with onset practice, in addition to general breath exercises for singing phrases. Yet, most methodologies present breath support as a separate concept, and provide breath exercises separate from vocalises to practice onset. Hopefully future pedagogical texts will provide clearer examples of how to blend concepts when creating exercises for students that address onset and breath in a holistic manner.

Based on this survey, the aspect of vocal onset that needs the most attention in our composite pedagogical literature, and would provide the most advantageous opportunity to combine and practice different facets of vocal onset is the prephonatory setting or preparation of the body for onset. By following Brown and Bhenke's model of deconstructing vocal technique into specific physical gestures, I will craft exercises for the development of each physical gesture of onset, including the open throat, relaxed tongue root, application of breath, and vocal cord approximation. This approach will go beyond Brown and Bhenke's vocal cord approximation practice and provide a more comprehensive methodology for onset development, addressing both mental and physical aspects of onset practice. Once the prephonatory setting is solidified, the singer will be able to execute onset vocalises with greater accuracy and efficiency, which will lead to a synergy of technical and artistic practice.

V. PRESCRIPTIVE EXERCISES FOR THE DEVELOPMENT OF BALANCED ONSET

From the literature survey in Part I of this paper, I was able to infer that conscious preparation has been a unifying thread in onset pedagogy throughout history. However, the conscious preparation for onset has evolved from a comprehensive approach to a narrow focus on a singular aspect of onset. Many pedagogues follow Brown and Behnke's strategy of vocal cord preparation or focus on preparation of breath, using Lamperti's appoggio gesture, or aural imagination, following Reid's advocacy for mental preparation of pitch and tone. I seek to combine all these aspects of preparation in a sequenced, comprehensive methodology for beginning singers.

Scientific study has provided a neurological and physiological picture of the most efficient onset, with an expected 50 milliseconds of time between thought and execution of pitch. (Miller 1986, 2) Given the agreed importance of preparation for onset, it is interesting texts do not include more exercises to help singers prepare the throat outside of the 50 millisecond window. I will follow Brown and Bhenke's example of deconstructed vocal technique and extend the 50 millisecond window between conception and execution by focusing on developing each element of a balanced onset. I will then go beyond Brown and Bhenke's approach by layering those elements to develop a comprehensive prephonatory throat posture that is optimal for executing a balanced onset. This posture will then be introduced into onset practice, with the goal of maintaining the prepared posture during various articulatory movements and against varying degrees of air pressure. The sequence will isolate a specific technical issue, such

as a throat stretch, practice the physical posture of a throat stretch, equate the stretch with a sound goal, and then execute the sound in the most efficient manner possible.

Consistent, balanced onset will be achieved when the advantageous prephonatory setting, appropriate air pressure, and independent movement of articulators are mentally associated with the desired sound goal of a clean, clear vocal onset. The association of this physical correlate with a sound goal will be strengthened by use of passive “listening postures.”³⁸ Combining this mental imagery of pitch with a physical preparation will address the various technical aspects of onset in a holistic way and the deconstruction of technical concepts and eventual reassembly of technique for onset will help promote strategic practice for other aspects of vocal technique. The final grouping in the sequence applies onset practice to repertoire learning, modeling strategic practice beyond a vocalise. The aim of this final step is to empower students to combine technique and repertoire practice outside of the studio.

³⁸ The term “listening posture,” comes from Tomatis’s 1988 text *The Ear and the Voice* which documents Tomatis’s research on the connection between the ear and the physiology of singing. (Tomatis 2005, 60)

Setting the Condition for Effective Listening

The ear's function is an obviously vital component of effective singing, and the focus of ear training is mentioned by pedagogues dating back to the 14th century. Despite the fact the ear is a vital component of singing technique, modern ear training or aural imagination is often relegated to theoretical study rather than practiced in the voice studio. This grouping makes sense from an educational standpoint; however, in my experience, the removal of aural imagination from the voice studio leads to technical vocal issues later which have nothing to do with a singer's ability to understand pitch. Many singers who are also fine musicians have issues with scooping at the onset of pitch, straining at the onset of a pitch in a difficult range, or creating strange physical gestures, such as a facial grimace, when singing. Pedagogues in the 14th century understood these practices should be avoided, and now that we have a better understanding scientifically of the human instrument, a concerted effort to address listening postures and link those postures with vocal technique should be included in studio teaching, especially with beginning singers. The connection of the ear and singing goes beyond an intellectual understanding of pitch and is a complex process which is still being studied by scientists today.

Alfred Tomatis's *The Ear and Singing* provides valuable insight into this connection. Tomatis was a French ornithologist who helped pioneer the studies in psychoacoustics. Tomatis's work resides in the idea that "the voice can not contain more than the ear can hold." (Tomatis 2005, 61) His work on the neuromuscular connection

between the ear and singing provides insight to the importance of maintaining space for active listening practice in the voice studio. Tomatis found that the nerves which control the middle ear also control the facial muscles and the platysma (a thin muscle that connects the shoulder, throat, and mouth), while the nerves that inform the outer ear also control the muscles of the mandible. This connection is vital for singers to understand, as the mandible and face are important articulators which shape resonance and also afford effective diction.

It follows that when someone is singing the ear will monitor and modify the vocal mechanism to maintain or create a desired sound and should the ear experience an interruption in this feedback loop, the mechanism will alter. This same process occurs with the anticipation of sound. Linguists have studied this phenomenon with impediment experiments, finding that impeding the ear will distort the sound, but impeding the body will not, as the ear will initiate motor equivalence to produce the desired sound.³⁹ This finding means singers will inherently distort their technique to achieve a desired sound, possibly choosing a sound production technique that is detrimental. Here we see the value of listening exercises in the studio that go beyond a musical understanding. Singers must know how to listen to appropriately monitor their sound output and must adopt listening postures when learning music that set the condition for good singing. The following exercises are designed to help address listening postures for learning music and direct

³⁹ Pascal Perrier and Susanne Fuchs studied motor equivalence in speech production in 2015. The focus of the study revolves around perception of speech when the speaker must change articulation to be understood, usually due to some physical impediment. (Redford 2015, 226-228) The existence of motor equivalence supports Tomatis's argument that the ear can distort articulators in singing.

listening while singing for a more efficient audio feedback loop. Singers are often directed not to listen to their sound while singing. However, this process is dangerous as it's difficult to collaborate or be certain of pitch without active listening. Tomatis describes the ideal listening posture as seated, with legs dangling, and a relaxed neck. (Tomatis 2005, 70) While a relaxed neck is desirable, disassociating listening from the rest of the body will make execution of pitch with proper breath support difficult later. To avoid this problem I consistently pair listening with technical posture development. Though this process applies to an entire musical phrase, the condition has to be in place for onset practice to be effective, due to the ear's neuromuscular influence over the vocal mechanism.

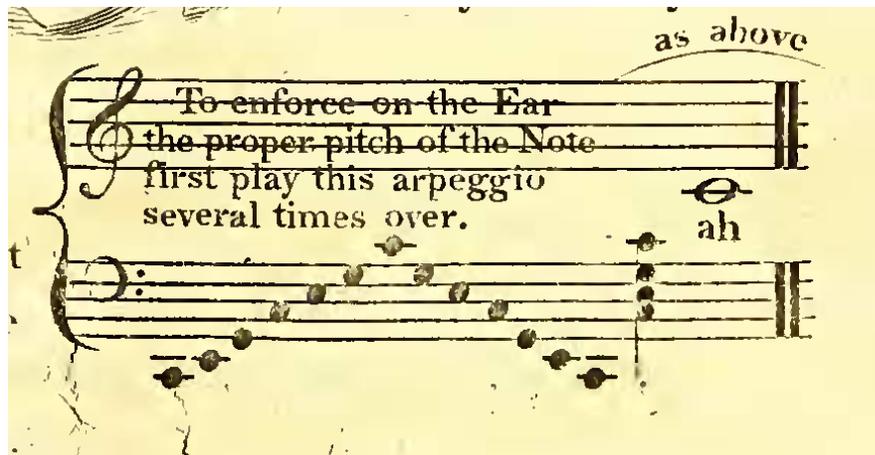
The ratio of three listenings to one execution seems to work well with most students. Some students will try to sing along instead of listening to a musical passage, which should be avoided. This practice can also lead to approximation while listening, (creating the physical gestures of singing without actually phonating), which also defeats the purpose of listening first. The goal is to create a cognitive understanding of the musical phrase that is free from tension in the throat before singing begins. This methodology is in line with Cornelius Reid's philosophies as well as the methods described in Zacconi's 16th century treatise. While this process may seem obvious to experienced singers and teachers, I have found many beginning and intermediate students often skip this step in practice, leading to musical mistakes and vocal faults which could have been avoided with better musical understanding.

A. Listening

Taking time to listen before initiating sound was previously documented in Corri's 1810 treatise *The Singer's Preceptor*. Corri's first exercise in his methodology involves a long tone produced after an arpeggio to "enforce on the Ear the Proper pitch of the Note." Corri advises teachers to play the arpeggio multiple times before asking the singer to perform the pitch.

This approach emphasizes the important link between understanding pitch and onset. By repeating the arpeggio multiple times, the singer is able to slowly move from a relaxed listening posture to the prephonatory posture. The simplicity of the exercise is also beneficial for beginning students.

Figure 9: Domenico Corri, *The Singer's Preceptor*⁴⁰



While this exercise promotes the necessary process of linking listening and the prephonatory posture, the exercise may be too simple for older, beginning singers who will tire of the simple pitch component. The same philosophy is employed in the next

⁴⁰ (Corri 1811, 14)

sequence, with a slightly more complex musical phrase. The process can be modified for any musical phrase and applied to development of an advantageous listening posture which supports an efficient prephonatory throat posture. For the following sequence, I will refer to a simple two bar phrase from Miller's *The Structure of Singing*, to model how this process can be applied to any piece of music.

Begin with a cleansing breath and then play the musical example, asking the student to just listen while gently exhaling. Repeat this step. On the third listening, ask the student to listen while gently exhaling and feeling the balls of the feet ground into the floor. The teacher should listen for humming or held breath from the student and repeat the listening step if the student is not actively listening.

Figure 10: Richard Miller *The Structure of Singing*⁴¹



As the singer continues to develop a relaxed listening posture, the lack of vocal cord approximation or muscular tension associated with an intellectual understanding of pitch will set the condition for a strong prephonatory throat posture.

B. Setting an Efficient Auditory Feedback Loop

Now that the student has a mental picture of the musical phrase, have the student sing the phrase with an ear modification sequence.

⁴¹ (Miller 1986, 15)

Begin by singing the phrase with one hand cupped behind the right ear, and the other hand cupped in front of the mouth.⁴² The singer will hear his or her sound as though they were amplified. Remove the cupped hand in front of the mouth and repeat the phrase. Now, place both hands, palms out, in front of the ears and sing the phrase. Finish the sequence by singing the phrase without an ear modification. The coupling of an efficient listening posture and efficient auditory feedback loop will help defuse tension associated with onsets in higher pitch ranges or difficult intervals.

Preparing the Throat for a Balanced Onset

An open throat is the hallmark of brilliant singing and a common concept in pedagogical texts. The following exercises are sequenced for beginning singers in order to address each portion of the throat and systematically build the strength of the open throat posture while developing a correlation between the open throat and the listening posture. Though these exercises are presented in sequence for beginners, teachers are encouraged to create their own sequence based on each specific student's needs.

A. Stretching the Base of the Throat

Stretching the base of the throat is an important part of developing a resonant instrument, as an anchored base at the throat encourages a free larynx and optimal air pressure while singing.

I. Sliding Sounds

This exercise was modeled at David Jones 2016 Teacher Mentorship Program in San Francisco Ca. Jones advised students to mimic the sound of a “car engine.” I find the

⁴² Tomatis identified the right ear as the dominant ear for singers and the ear that should be focused on when developing listening postures. (Tomatis

“engine” description often produces a grunt reflex in the throat for beginning singers and, therefore, advise using the term “sliding sound” to avoid excess tension in the middle of the throat.

Ask the singer to make a sliding sound on a neutral vowel. Then ask the singer to place his or her fingers lightly on the base of their throat above the color bone and instruct the singer to gently repeat the sliding sound. The singer should feel the muscles of his or her throat open into their fingers. Once the singer can feel the muscles of the lower throat open, ask the singer to repeat the sliding sound and consciously extend the muscles of the base of the throat into the singer’s fingers.

II. Using a Straw to open the Base of the Throat

Engineer and voice scientist Ingo Titze advocates for this practice, and the exercise has found its way into vocal science studies and vocal therapy practices.⁴³ Using a straw equalizes breath pressure across the entire instrument and the practice also helps develop the active, downward stretch of the extrinsic laryngeal muscles and their linkage to the sternum support in a gentle way.

Hum through a straw into a glass of water, maintaining consistent bubbles in the water. Begin with tones in the speaking register and gradually increase the pitch compass of the exercise.⁴⁴

⁴³ Guzman et al 2013 study on vocal tract and glottal function during and after use of a straw used computerized tomography (CT) to assess physical conditions of singing when the vocal tract is impaired. CT results showed less contact quotient (muscular adduction) and higher subglottal pressure during straw use and after straw use as opposed to singing without impediment. Singers also had a “more prominent singer’s/speech formant cluster.”

⁴⁴ Video of the exercise can be seen at <http://www.voicecouncil.com/reset-your-tired-tense-voice-like-magic/>

III. Onset Practice

The goal of the exercise is to have the student feel the base of the throat open with the initiation of sound and continue to stretch for the duration of the sound. This feeling should eventually become part of the prephonatory throat posture.

Perform the following exercise either with a moaning sound or singing through the straw, focusing on an extension of the lower extrinsic laryngeal muscles.



B. Finding a Free, Low Larynx

I. Using Inhalation

Focus on laryngeal movement can be dangerous, as some singers will have a tendency to force the larynx down with swallowing muscles of the throat. Most pedagogues agree that the larynx needs to lower for optimal singing. This focus began in the mid 19th century with the advent of the modern operatic tenor.⁴⁵ The most common tactic for achieving a proper laryngeal position at the onset of sound revolves around the inhalation process.

The singer places his or her fingers lightly on the front of the larynx or Adam's apple. The singer is then provided with imagery to incite an inhalation which completely abducts the vocal cords. Popular images are

⁴⁵ The first tenor to sing a chested high "c" was Duprez. His ability to maintain the chest register so high was attributed to the lowering of the larynx, and opened the door for execution of more dramatic, declamatory voice writing, such as Wagner's works, throughout the 19th century.

smelling a rose and inhaling as though surprised. The fingers will detect a slight lowering to the larynx.⁴⁶

This inhalation step is crucial for execution of an efficient onset, as suspension of the feeling of inhalation often helps a singer maintain an open throat. This feeling of a free, lowered larynx is the basis for Ware’s discussion of onset or the 19th century description of “drinking the voice.” (Ware 1998, 106-107) Building this feeling in conjunction with the open base of the throat as the prephonatory setting will create the condition for the most efficient posturing of the glottis when imaging a pitch. This posture can also deter singers from taking in too much air.

II. Onset Practice

Now the singer can combine the two gestures to develop a beneficial prephonatory throat posture. Perform the following exercise with a silent [h] sound. The silent [h] sound resembles the feeling of fogging a mirror. I have found the instruction of fogging a mirror as an effective tool for beginning singers.

The singer should begin with their fingers lightly placed on the larynx to detect any upward movement during the gentle exhale. If the larynx remains relaxed, during exhalation, instruct the singer to mover their fingers down to the base of the throat to make sure the lower extrinsic muscles are still stretching. Once the singer can maintain the posture, repeat the exercise on the sliding sounds.



⁴⁶ While this exercise comes from my personal notes, similar approaches are found in multiple pedagogical texts.

C. Opening the Top of the Throat

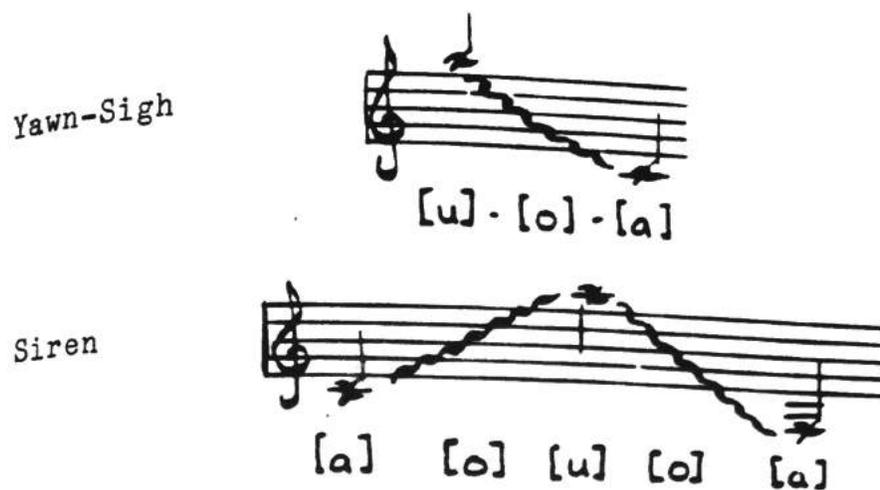
Discussion regarding an open oral pharynx or top of the throat is found in most pedagogical texts. Popular imagery used to achieve this stretch includes the “inner smile,” and the “soap bubble on the back of the tongue.” The inhalation exercise from the previous section can also be an effective tool for building this stretch. However, some singers will not respond to imagery tactics. The following exercises are presented as examples of physically driven prescriptive exercises singers can use to open the throat.

I. Incipient Yawn

This exercise is a popular tactic used to open the throat. However, the exercise can present some problems. Richard Miller discusses the drawbacks of the incipient yawn at length in *The Structure of Singing* and advocates against using the incipient yawn as a method for opening the throat, stating: “all too often the incipient yawn develops into a full-blown yawn,” which creates tension in the throat that prohibits a free sound. (Miller 1986, 58) Teachers using this language to promote an open throat should watch for signs of throat, jaw, and tongue tension and listen for a distorted sound during yawn-sigh vocalise. I have found yawning exercises can be effective for developing general kinesthetic awareness of the throat and can assist in developing an independent tongue root when paired with a tongue stretch, but yawn exercises are not effective in strengthening specific areas of the pharyngeal cavity on command. The following sequence uses a yawn gesture to work towards the muscular control necessary for a successful incipient yawn execution.

Instruct the singer to yawn, asking him or her to pay attention to the extended feeling at the back of the mouth. Ask the singer to repeat the yawn, this time monitoring the movement of the tongue. During a yawn, the tongue will often contract backwards as the jaw extends down and forward. Instruct the singer to yawn a third time, this time stretching the tongue forward and out of the mouth and the jaw gently back towards the ears rather than towards the sternum. This gesture often takes practice to coordinate. When the singer feels he or she can begin the yawn without an immediate contraction of the tongue and jaw, they are ready to focus on the incipient yawn. Ask the singer to begin a yawn gesture, but stop when he or she feels any tension in the tongue or squeezing of the eustachian tube (the ear popping sensation). Finally, pair this incipient yawn stretch with a yawn-sigh or siren vocalise.

Figure 11: Barbara Mathis, *Selected vocal exercises and their relationship to specific laryngeal conditions*.⁴⁷



I find yawn-sighs which begin on a high pitch difficult for beginning singers, as the onset requires greater breath control. Thus, sirens tend to promote more consistent onset for beginning singers.

⁴⁷ These exercises credited to Rogers Allan Lindquest. (Mathis 1986, 124)

II. Pressure Point:

Lightly apply pressure at the base of the nose, above the upper lip, than inhale. This pressure point will encourage a backward stretch of the oropharyngeal wall and a lifted velum.⁴⁸

III. Palm Inhale:

The singer holds his or her hand palm down and horizontally at the opening of the mouth and inhales gently over the hand, careful not to gulp for air.⁴⁹

IV. Using a Teaspoon:

The origin of this exercise is attributed to the studio of Richard Nickol.⁵⁰ The exercise helps stretch the back of the oropharyngeal wall and move the palate up and away from the tongue. Teachers should note, this exercise can be difficult with singers who have a prominent gag reflex. Variations of this exercise can be found with straws, however I find the spoon the most effective tool to help maintain a stretch in the oropharynx.

Instruct the singer to place the handle of the spoon flat against the middle of the body of the tongue, careful not to depress the tongue. Ask the singer to inhale. The singer should feel the back wall of the oropharynx stretch away from the spoon handle. Instruct the singer to maintain this space while gently exhaling over the spoon. On the second inhale, ask the singer to make a moaning sound, moaning into the space behind the spoon.

⁴⁸ From my notes taken during the 2013 David Jones Teacher Mentorship Program

⁴⁹ Ibid

⁵⁰ Richard Nickol was an operatic tenor and successful musical theater performer who maintained an active voice school, The San Francisco Academy of Performing Arts, in San Francisco until his death in 2012. Nickol was a proponent of Salvator Marchesi's work.

IV. Onset Practice

Instruct the singer to perform the following onset exercise, alternating between a silent [h] and a moaning sound. I advise using a physical monitor, such as fingers at the base of the throat or singing over the palm, for kinesthetic learners and a mirror for visual learners. Visual learners should be instructed to alternate their focus as they perform the exercise. Auditory learners will benefit from an feedback loop modification, such as cupping the hand behind the ear, if the teacher deems appropriate. Since this sequence is designed to develop an optimal prephonatory setting, the singer should focus on the feeling in the throat, before executing the exercise, so the exercise should be performed at a slow tempo.

Perform the exercise four times, focusing on an open stretch in the oropharynx before exhaling or moaning. Then perform the exercise four times, focusing on maintaining an open stretch in the oropharynx on the half note.



D. Vocal Cord Approximation

Now that the singer has begun to develop a kinesthetic awareness of the open throat and to strengthen the muscles necessary to maintain the open throat posture while singing, the singer is ready to move on to more precise sounds than a moaning sound. I have found vocal cord approximation exercises as the most effective method to deter pitch scooping, unintentional aspiration, or breathy tone at the onset of sound. Richard

Miller discusses vocal cord approximation in *The Structure of Singing*, and provides the following sequence of exercises, which are based on glottal stops.

Repeat the spoken sequence “HA HA HA HA HA” several times, slowly and deliberately as a phrase unit, lingering over the initial aspirated [h] of each syllable. It is possible to sense when breath passing over the vocal folds is followed by sound that results from vocal fold approximation. (Miller 1986, 5)

Repeat the spoken sequence “UH, UH, UH, UH, UH” several times, slowly and deliberately as a phrase unit, lingering over the initial glottal plosive [ʔ]. One can sense the moment at which the glottis has been sufficiently released to produce phonation. (Miller 1986, 5)

Repeat the spoken sequence “AH, AH, AH, AH” several times, slowly and deliberately as a phrase unit, imagining a brief [h] before each syllable but not allowing it to take on audibility. Strive for the subjective feeling that with the beginning of the phrase the process of inhalation has not been altered; there should be no sensation of breath expulsion (although, of course, airflow commences), and no sensation of breath moving before tone. (Miller 1986, 5)

Phonetician J.C. Catford provides a variety of speech exercises to develop vocal cord approximation in his 1988 book *A Practical Introduction to Phonetics*. He prescribes the following exercise for cord closure:

Make a series of quiet coughs; that is, a series of glottal stops [ʔ] [ʔ] [ʔ] ... Now, make the closure for [ʔ], but don't release it; hold it for some time. In order to make the beginning and end of the period of glottal closure clearly audible, begin with a momentary exhalation, [h], which is abruptly cut off by the closing of the glottis, thus, [hʔ]. Then release the glottal closure again into an exhalation, [ʔh]. Now produce the whole sequence again a number of times, [hʔh] [hʔh]... progressively increasing the duration of the [ʔ]-closure until you are sure that you are able to hold the glottal closure for 5 seconds or longer. (Catford 1988, 24)

Catford provides a “test” to see if the glottis is actually closed by closing the glottis with the [ʔ], opening the mouth, and then tapping the side of the throat. If the

glottis is closed, the tap will produce a clear pitched sound. This sequence is an example of a modern, more detailed version of Browne and Behnke's original speaking exercise for onset.

Catford's sequence seems more effective for developing *control* over vocal cord approximation while Miller's approach seems more effective for developing the *sensation* of vocal cord approximation. The control is important to keep singers from scooping into the pitch. Beginning singers would benefit from working through Catford's sequence to develop control over cord closure and then move on to Miller's exercise to transition to phonation on a vowel sound. This control of cord closure during phonation is a modern approach to Delle Sedie's notion of "slackening" the cords.⁵¹

Miller's sequence is also determinant on feeling a plosive of air and then attempting to vary the plosive pressure through repeated utterances, which assumes a student with a high kinesthetic awareness. Pedagogue Clifton Ware uses physical sensations to develop approximation, advising students to imagine humming or initiating a sneeze to close the cords. I have also heard instruction to "close the airway" as though one is holding their breath, but I find that direction builds too much compression in the throat, resulting in a pressed onset.

While these exercises are very helpful for developing the physical posture of the cords for an efficient onset, I have found no discussion about how to link the spoken sensation to a singing sensation, that will result in a clean, clear resonant tone. Allan

⁵¹ Delle Sedie advises singers to imagine forming the consonants [p], [m], and [b] at the glottis to coordinate the control, or "slackening," of the cords. (Delle Sedie 1876, 10)

Rodgers Lindquest moves a step beyond the plosive approach and uses a complete phrase to develop cord approximation, advising singers to speak the words “every orange while feeling the vowels form at the larynx,” (Jones 2017) but this method still falls short of linking the sensation with sung tone. I advise using an approximation exercise like Catford’s to develop the sensation of vocal cord approximation and then linking that sensation to a vocalise as in the following: sequence.

After the singer has developed awareness of vocal cord approximation, instruct the singer to speak the phrase, “every orange,” while monitoring the base of the throat. The singer should feel a stretch at the base of the throat along with the impulse of speech. Next, play a single pitch, in the singer’s speaking register and instruct him or her to prepare the throat, as though they will sing, while listening to the pitch. This step is used to link the vocal cord approximation feeling to the prephonatory tuning posture. Now instruct them to sing “every orange” on the pitch.

The singer should focus on a clean continuation of sound despite the rests. The prephonatory throat posture should open for the initial inhale and gently stretch through each sound. Though the singer is performing short sounds, there should not be a hard glottal stop at the beginning of any pitch. Once the singer is able to perform the exercise on a single note, slowly ascend in pitch through the middle register. Finish the exercise on a triad.

Figure 12: “Every Orange” Exercise

The figure displays two musical staves in 4/4 time, illustrating the 'Every Orange' exercise. Both staves begin with a treble clef and a 4/4 time signature. The first staff shows a sequence of notes and rests: a quarter note 'e', followed by three eighth rests, a quarter note 'very', followed by three eighth rests, and a quarter note 'orange'. The second staff shows a similar sequence: a quarter note 'e', followed by three eighth rests, a quarter note 'very', followed by three eighth rests, and a quarter note 'orange'. The lyrics are written below the notes and rests.

E. Putting the Postures Together in a Vocalise

Now that the singer has worked to anchor sound at the base of the throat, free the larynx, open the oropharynx, and bring the vocal cords together, the singer is ready to move on to a more complex vocalise.

Figure 13: J.B. Fauré, *La Voix et Le Chant*⁵²

SOPRANO AND TENOR

The musical score is titled "SOPRANO AND TENOR". It consists of three staves: a vocal staff for Soprano and Tenor, and a piano accompaniment staff. The key signature has two sharps (F# and C#) and the time signature is common time (C). The vocal line begins with a rest, followed by a series of short, staccato notes. The first four measures are marked "(attack using the glottal stroke)" and the remaining six are marked "(same attack without a breath)". The piano accompaniment is marked "(short)" and consists of chords and single notes. The score is in common time (C).

Fauré's *La Voix et Le Chant* has many exercises devoted to onset development, but lacks a concentrated focus on developing the postures of the throat before singing. By moving the singer through the previous sequence of exercises that prepared the throat, the singer will likely execute Fauré's exercise above with more clarity of pitch and consistent throat posture. I suggest that the teacher plays the first four measures of the exercise three times, allowing the student to develop an accurate intellectual conception of the half step and proper listening posture. The exercise should be performed slowly. On the inhalation instruct the singer to feel the oropharynx open, using a physical monitor if necessary, and have the singer focus on maintaining this stretch while singing the short [ɔ] sounds,

⁵²*The Voice and Singing*, Keeping and Prada 2005, 41

gradually adding a lower throat focus as the singer moves towards the long tone. The focus on maintaining the posture will assist the singer when he or she moves into the second phrase, which is sung on one inhale instead of nine separate inhales in the first phrase. The teacher must listen for any scooping or grunting during the first phrase. If the singer scoops to the pitch or bears down on the onset, return to the sung “every orange” phrase, and then continue on the single vowel.

VI. ARTICULATORS AND VOCAL ONSET

Tomatis's work illuminated the connection between the ear, pitch conception, and the articulators used to create speech. The four main articulators are the tongue, the lips, the mandible, and the soft palate. This is a vital concept for singers to understand; if any conception of a pitch results in a physical correlation, such as a grimace in the face or tight tongue, the onset of the pitch will probably not be clear or efficient. Singing without a physical grimace has been a recurring theme in pedagogical texts since the early 1600's, but what was first conceived as a performance standard, may actually have roots in the prephonatory portion of onset. While the ear can influence the body, the body can also contort to produce a desired sound result. Linguists have studied this phenomenon by obstructing articulators, such as with a bite block, and have found the body is able to contort to produce a desired sound result despite an impediment.⁵³ Therefore, singers are able to produce pleasing sounds even with a tongue or jaw tension and an inexperienced teacher, listening for a specific sound, may not be able to identify the inefficiency in techniques due to the sound produced. This notion is compounded by the fact that singers use language, which requires a variety of articulatory postures that must occur without impeding the sound of the voice, so singers must be able to execute a balanced onset with a variety of articulatory postures in addition to the throat posture. The following exercises are designed to build articulator strength and independence while maintaining the open throat necessary for an efficient onset.

⁵³ (Redford 2015, 226-228)

A. Addressing the Root of the Tongue

The tongue can often tighten as a means of support for the voice or as a muscular reflex of lowering the larynx. In order for prephonatory tuning to be a successful precursor to vocal onset, the tongue must react independently of the vocal mechanism and not respond to the mental imagery of pitch. The notion of keeping the tongue and teeth out of the way of tone is prevalent in the earliest of vocal pedagogical texts, and therefore, tongue position should not be skipped in onset development and practice. The first exercise in this sequence will focus on the root of the tongue, portions of which attach to the hyoid bone and can directly affect onset production.

I. The [ŋ] posture:

This exercise is drawn from the Lindquest regimen⁵⁴ and from the writing of singer Lilli Lehman, who describes the [ŋ] posture in her 1902 book, *How to Sing*. The author has used Lehman's discussion and a vocalise by Lindquest to develop the physical posture of a relaxed tongue root and open throat. This posture should be independent of the stretch in the middle tongue. A flexible tongue allows greater facility when articulating vowels and consonants. Once the physical posture is achieved, the singer is ready to execute the vocalise.

Create an [ŋ] posture with the middle of the tongue, as though articulating the word 'sing.' The back of the tongue should remain in contact with the upper molars. Using the pressure point or mental imagery exercises, practice inhaling through the nose with an open throat and lowered larynx

⁵⁴ Lindquest's [ŋ] exercises are found in both Barabra Mathis's 1986 doctoral dissertation, and Margaret Forrest's 1984 doctoral dissertation.

with the tongue in the [ŋ] posture. The singer should begin to feel a stretch in opposing directions, as the larynx gently stretches downward and the tongue stretches forward.

Maintain this stretch while gently exhaling through the nose. Once the singer's tongue finds a relaxed stretch over a long exhale, introduce the onset rhythmic exercise, first with inhales on each rest, and then again with lifts on each rest, completing the exercise on a single breath.



When the singer can execute the exercise in a single breath with a relaxed tongue root, redirect the singer's attention to the base of the throat. The singer should feel the muscles stretching at the base of the throat. Have the singer repeat the exercise again, directing their attention to the oropharynx. The singer should feel the back of the throat stretching away from the arched tongue. When the singer feels the open throat around the stretched tongue during an exhale, the singer is ready to move to the following vocalise. The goal of the exercise is to maintain the tongue posture at the base of the throat while allowing the middle of the tongue to remain flexible. The front of the tongue should fall forward to produce the [a] sound at the end of the phrase.

Figure 14: Barbara Mathis, *Selected vocal exercises and their relationship to specific laryngeal conditions*.⁵⁵



⁵⁵ Mathis 1986, 124

I encourage the teacher to follow the listening posture procedure with this vocalise, so the student has the opportunity to conceptualize the pitches and continue developing their default listening posture.

II. [m] Exercise:

If the [ŋ] posture is too difficult for the singer to maintain without tension or a loss of space at the back of the mouth, the following exercise can be a helpful adaptation. Moving the tongue completely out of the way promotes independence of tongue root and maintenance of the open throat space, while still utilizing the air pressure equalization attributed to other sonorant exercises. This exercise is adapted from the following Estelle Liebling breath management exercise.

Figure 15: Estelle Liebling *Vocal Course for Tenor*⁵⁶



Adapted exercise: keep the tongue out of the mouth while forming the [m] around the tongue. Make sure the jaw is free and not biting onto the tongue. Sing the exercise, imagining an [a] vowel, and monitor any tongue movement back towards the mouth. When the tongue is relaxed and forward, place the tongue back into the mouth and sing the exercise as written.⁵⁷

⁵⁶ (Liebling 1956, 31)

⁵⁷ Coté 2017

B. Developing a Relaxed Jaw Position

As discussed in the incipient yawn exercise, jaw and tongue tension will often occur when stretching the throat. Just as the singer must develop an independent tongue stretch, the singer must be able to control the jaw independently from the tongue. A common occurrence is a chewing motion in the jaw when articulating consonants. The following sequence is designed to promote a relaxed, neutral jaw position and then to maintain that jaw position while executing consonants formed with the tongue and lips.

I. The Hanging Jaw

Instruct the singer to look up at the ceiling and gently inhale through the mouth. The jaw should assume a relaxed position during the inhale. Ask the singer to maintain the jaw position as he or she exhales. Instruct the singer to gently elongate the back of the neck, returning the head to the normal singing position, while keeping the jaw in the same position. The jaw should now gently hang down and back.

II. The Face Posture Monitor

Some students will need support to maintain a hanging jaw. In this instance, using a physical monitor will help make the singer aware of unwanted jaw movement or tension. The following monitors provide varying degrees of support for the jaw. Teachers should not use these holds when working with singers who suffer from severe Temporomandibular Joint Disorders (TMJ).

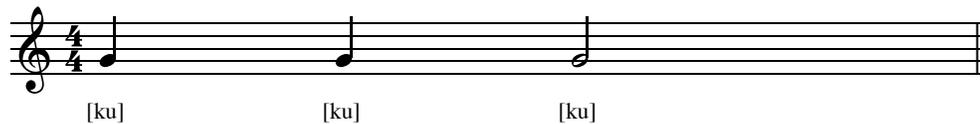
Instruct the singer to make an “L” shape with his or her thumb and forefinger. Place the tip of the finger gently underneath the lower lip and the thumb against the sternum. Ask the singer to articulate the following consonant sequence with the face posture monitor. The singer will feel unwanted jaw movement against the finger and can work to relax the jaw while using the back of the tongue to articulate the exercise.

[ku] [gu] [ju]

When the singer can articulate the sequence with a relaxed, hanging jaw, instruct the singer to perform the following exercise on each syllable, once with the face posture monitor and once without.

If the movement of the jaw against the forefinger does not provide enough feedback for the singer, try the following face posture monitor with the same vocalise. Place the pulicue of the hand (the area that connects the thumb and forefinger) gently under the bottom lip. Bring the forefinger and thumb gently into the cheeks, cradling the jaw down and back towards the ears. Care must be taken not to aggressively depress the jaw.

Figure 16: [ku], [gu], [ju] Exercise



C. Working with the Soft Palate as an Articulator

Often movement of the soft palate is discussed in terms of vertical space with instruction to “lift” the palate while singing. This lift is an important part of the prephonatory posture and is practiced with the oropharynx stretch in the open throat portion of this sequence. However, the palate should not completely seal off the oropharynx from the nasopharynx at the onset of sound in all situations. Perhaps the singer needs to articulate a French nasalized vowel at the beginning of the phrase or a word that begins with [m], or begin a sound on a high pitch at a very high dynamic. In this instant, a small thread of air will need to move into the nasopharynx, requiring a flexible palate that can slightly lift and lower at command. The following exercises are

designed to address the palate as an articulator and strengthen the singer's ability to adjust the palate position as part of their prephonatory posture.

I. Using a Straw to Develop Palate Flexibility

I have used this exercise in studio lessons, a vocal pedagogy class, and a diction class. Students found the exercise difficult at first, but valuable when vocalizing and later transitioning to literature. The straw provides a safe apparatus for the singer to practice the delicate movement of the palate by deterring a grip in the throat due to the equalization of the air pressure across the instrument. I adapted this exercise from the straw work discussed by Ingo Titze

Begin gently phonating through a straw into a cup of water while plugging the nose. This will cause all of the air to leave through the mouth. The singer should focus on maintaining bubbles in the cup. Instruct the singer to inhale and then fill the nasal cavity with air while also exhaling through the mouth. Since the nose is plugged, the singer should feel light pressure at the nostrils while maintaining the bubbles in the cup. This step may take multiple attempts to achieve. When the student can fill the nasal cavity while also humming bubbles into the cup, have the singer unplug their nose and try to maintain a small air flow through the nose. This will help the student feel the slight space at the palate necessary for more advanced onsets.

II. The [ŋ] Posture for Palate Flexibility

The same exercise used to stretch the tongue can be used to encourage a flexible palate. Lindquest uses a sniff to open the nasopharynx. I advise using a gentle snort, or snore sound to flap the palate. In order to achieve the purpose of this exercise, the singer must be encouraged to inhale a small amount of air, a popular instruction is to inhale a "thimble's worth" of air.

Figure 17: Allan Rogers Lindquest, *Lindquest Vocal Exercises #4*⁵⁸



D. Using Consonants for Onset Practice

Consonants have been a documented part of onset practice since William Huckle's 1820 treatise. Huckle advised use of [l] before the [a] vowel to remove tongue tension from the onset. These exercises tend to be effective as the tongue is involved in articulating the consonant instead of producing a tone. However, relying strictly on this exercise does not prepare singers for initiating phrases on a vowel and teachers should refrain from relying solely on one consonant for onset practice. Huckle described the use of an [l] but did not discuss using other consonants, which would use different articulatory gestures to start the sound. Therefore, teachers who prefer onset exercises with consonants should encourage singers to practice onset with every vowel and consonant combination to achieve a consistent balanced onset. With this aim in mind, one should develop the prephonatory posture and tongue flexibility before working consonants into onset practice. Care must be taken to redirect the singer's attention to the prephonatory throat posture once the articulators are producing clear, rapid consonants.

⁵⁸ *Lindquest Vocal Exercises* is disseminated in the David Jones's Teacher Mentorship Program. This example was part of the exercises presented in the 2013 Mentorship Program.

The following exercise is an example of strategic onset practice that employs consonants. This exercise can and should be used with each consonant. I call the sequence an “alphabet game.” In this case, the [r] is used to maintain a consistent exhale and flexible tongue tip while maintaining the prephonatory throat posture.

Keeping his or her fingers on the larynx, instruct the singer to declaim [ri] [rE] [ra][ro] [ru], taking time to rest between each syllable. The singer will feel which vowels cause the tongue to lift the larynx and which vowels allow the larynx to remain relaxed and free. Once the singer is able to maintain the relaxed laryngeal position on each syllable, he or she should sing the syllables on a descending five note scale, with staccato and legato gestures.

Figure 18: [ri], [re], [ra], [ro], [ru] Exercise

The figure consists of two musical staves, both in 4/4 time and using a treble clef. The first staff shows a descending five-note scale: G4 (quarter note), F4 (quarter note), E4 (quarter note), D4 (quarter note), and C4 (half note). Below each note is a syllable: [ri] under G4, [re] under F4, [ra] under E4, [ro] under D4, and [ru] under C4. The second staff shows the same descending five-note scale, but with a dot placed below each note, indicating staccato articulation. The syllables [ri], [re], [ra], [ro], and [ru] are placed below their respective notes.

VII. BREATH SUPPORT AND ONSET EXERCISES

Breath support is a fundamental component of vocal technique and production of the air pressure needed to support the voice at various pitches and dynamic ranges consists of diverse muscular gestures and proper body alignment. These components of breath support are beyond the scope of this paper. However, the purpose of this research is to provide an example of onset practice integrated with various aspects of vocal technique. Maintaining the prephonatory throat posture while employing strong support is vital to avoid a hard, grunt-like onset, which can eventually lead to vocal injury.

I.. The Four Count Breath:

This exercise appears in different variations in pedagogical texts and masterclasses. The source of the exercise seems to be the Garcia Family. Garcia Sr. described a quiet, gentle inhale that does not disturb the phrase, and Garcia Jr provided exercises that instruct the student to slowly inhale and exhale over “a few seconds,” to feel the fullness of air in the body.⁵⁹

The following exercise links breath support with vocal cord approximation. It is important for the singer to bring the cords together with minimal tension in the throat. For this reason, I suggest a “pause” instead of “hold.” Counts are added to provide concrete structure and should be altered based on the student’s needs. For example, if a student tends to inhale too much air try having the singer inhale for two counts instead.

Inhale for four counts. Pause the action of breath for four counts. Exhale for four counts. Repeat the exercise and during the pause, instruct the

⁵⁹ The idea of pausing at the end of inhalation is also seen in works by Sieber and Liebling. Sieber instructs a pause at the end of inhalation to close the airway, in a *coup de glotte* manner, while Liebling advises a pause to allow for mental preparation of pitch.

student to relax the throat and try to feel the open space of the oropharynx and the base of the throat. The student may feel that his or her airway remains open during the pause section. As the singer repeats the exercise, instruct the singer to bring the cords together as though they will say “orange” on the pause. This should allow the singer to feel the closure of the cords against the air pressure below the glottis.

Linking the production of tone to this breath impulse is in line with Lamperti's philosophy of onset development. Asking the singer to gently approximate the cords against the air pressure is in line with the Garcia tradition. In this sense, this simple breath exercise addresses both facets of onset development philosophy.

II. The Onset Breath Squat:

Once the student has begun to feel the muscles of exhalation and their connection to a gentle action in the throat, one can use this exercise to build the correlation of breath support with a relaxed throat, or the equalization of muscular tension discussed in various pedagogical texts. While the idea of a breath squat is popular across various pedagogues, the origin of this particular exercise is attributed to the studio of Richard Nickol.

Inhale and slowly, bend the knees, allowing the lower back to expand and the pelvic floor to drop. Straighten the knees and exhale in three intervals, two short and one long, pausing between each straightening to feel resistance at the back and under the sternum. Be sure not to fully straighten the knees until the end of the exhale. Balance this resistance with an open throat as you exhale.

Figure 19: Musical Notation of the Nickol Breath Squat



Nickol began the exhalation portion of this exercise on a [ʃ] or [s] with students.

Pedagogues like Lindquest and Jones advise using the voiced consonants [v] or [z]

instead of [ʃ] or [s] to help balance subglottal and laryngeal muscular pressure while also transitioning to a singing posture in the throat. Teacher's should listen for constriction in the throat and tongue during the consonant portion of the exercise as a constriction on a consonant signals greater constriction in the throat when practicing vowels.

Once the singer is able to practice the exercise with a relaxed tongue and open throat, the singer can begin to practice on pitch. Nickol would use intervals of a fifth, octave, and two octaves to perfect onset at different pitches. This strategy is in line with Stephen Smith's advice to practice onset across the vocal range, however Nickol's approach is more strategic and safer. Intervals of a fifth and octave are often too difficult for beginning singers, so I usually begin on a single pitch, followed by intervals of a third, and then a triad. Octaves and sixteenths should only be practiced by advanced singers and will initially require a deep squat to displace tension from the throat during onset of a high pitch.

In contrast, Miller does not advise the juxtaposition of long and short sounds until short sounds are mastered. Both the Fauré and Miller exercises are presented as vocalises and not specified as a breath focus. (Miller 1986, 15) Rather, the support, or what Clifton Ware calls the "breath hookup," is supposed to develop as a result of the successful execution of the onset exercise. By adding the breath step, students can focus directly on support as a means to a successful onset as opposed to a byproduct of a musical gesture.

III. Belly Push-ups

Pedagogues, such as Clifton Ware and Allan Rogers Lindquest, use panting exercises to help develop the breath mechanism independently of sound. These same

exercises can be used in conjunction with onset exercises to develop a supported, balanced onset. Panting simulates the process of inhalation and exhalation, while also allowing the upper epigastric area to remain flexible and buoyant. It is important to pair breath squat exercises with panting exercises to avoid a locked solar plexus. Miller warns teachers that many beginning students will pull this area in towards the spine when executing a short onset. The following exercise is an example of a prescriptive strategy to isolate the gesture in the epigastric area before executing an onset vocalise.

Instruct the singer to lie face down on the floor, with some sort of resistance object placed between the solar plexus and the floor. The object could be the singer's hand, a pillow, or a small stress ball. The singer then proceeds to incite the laugh reflex, exhaling in short, rapid, successive [s]. Singers will feel a leaning and releasing against the resistance object. Care must be taken not to lean aggressively, as an aggressive distention can lead to a locked solar plexus and tension in the throat.⁶⁰

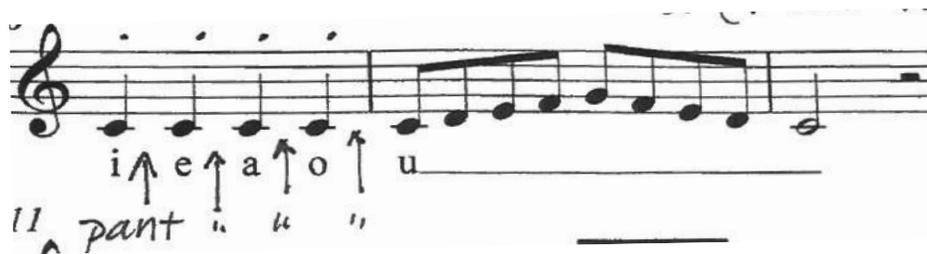
The use of an [s] can incite a creeping tension in the tongue. I find practicing the exercise on a laughing gesture to be more effective than Nickol's [s]. Also, if the singer experiences lower back tension, the exercise can be practiced lying on the back, knees up to protect the lower back, instead of the stomach. A resistance object, such as the singer's hand, a tissue box, or a book, placed on the singer's upper epigastric area is an effective monitor. The singer repeats the laugh reflex, paying careful attention to tension in the body and slowly attempting to balance the tension in the belly against a relaxed feeling in the throat. Nickol advised students to attempt 30 seconds of rapid [s] and then rest for at least a minute. 30 seconds seems to be aggressive for beginning students so alternating 10

⁶⁰ This exercise is credited to Richard Nickol.

[s] articulations with 10 seconds of rest is more effective. A strong transition from the [s] is a [ha] syllable.

Once the singer can articulate the [s] and [ha] syllables the singer is ready to move on to a vocalise. The point of the exercise is to practice appropriate air support without locking the solar plexus. Once the singer feels flexibility in the thorax, the teacher should redirect the singer's attention to the throat. Including a brief pause after each bout of panting is an effective way to reinforce an open throat over the engagement in the body that creates air support.

Figure 20: Allan Rogers Lindquest, *Lindquest Vocal Exercises #2*⁶¹



Aside from the addition of panting, this sort of onset exercise appears in works by Fauré and Miller. Most modern pedagogues seem to agree this rhythmic pattern is the most efficient way to develop flexibility in the instrument and precision with onset, as opposed to the older methodology of beginning with long tones seen in treatises by Tosi, Corri, and the Garcias and methodologies created by singers such as Pauline Viardot and Mathilde Marchesi.

⁶¹ *Lindquest Vocal Exercises* is disseminated in the David Jones's Teacher Mentorship Program. This example was part of the exercises presented in the 2013 Mentorship Program.

VIII. BRIDGING THE GAP BETWEEN ONSET PRACTICE AND REPERTOIRE LEARNING

The previous sequence of exercises isolated different facets of prephonatory posture and sought to combine the development and preservation of the prephonatory onset posture with other aspects of vocal technique. The same strategy can be used to build balanced onset execution in repertoire. A strategic teaching approach that connects technique practice with repertoire learning promotes effective practice outside the studio. I have found this approach empowers students and challenges them to devise their own strategies for integrating technique and repertoire, taking charge of their own vocal development. In my experience, this attitude leads to more productive lessons and lasting improvement. The following sequence uses an eight bar vocalise by Ferdinand Sieber as the repertoire.

Figure 21: Ferdinand Sieber, *36 Eight-Measure Vocalises for Class or Private Practice* ⁶²

FRED. SIEBER, Op. 92.

1.

da me ni po tu la be da me ni po
sol la si do mi re do si la sol fa

dolce

da me ni po tu la be da me ni
la si do re fa mi do si re do

⁶² (Sieber 1908, 2)

The first step is to develop an intellectual understanding of the music, listening to the melody with the relaxed, passive throat of the listening posture. Once the singer has a mental understanding of the music and text, the student should sing through the piece. Difficult onsets for the beginning singer will emerge in this first performance. Noting what precedes and follows each difficult onset will help in devising an effective practice plan to integrate efficient onset into the execution of the piece. Since the phrases in this example all begin on the same vowel, the singer can begin with an exercise that alternates between a [d] and [l] articulation. The author advises beginning on one note, so the singer can focus on maintaining the prephonatory posture while articulating the consonants. The singer should perform the exercise in one breath with lifts on each rest.

$\frac{4}{4}$ | ♩ ♪ | ♪ ♩ | ♪ ♩ ♪
 [da] [la] [da]

Some beginning singers will unconsciously add an [n] before the [d] syllable. I believe this involuntary, anticipatory sound is a product of onset, as the singer does not trust the sound to begin after articulating the [d]. The four-count breath exercise can help deter this inefficient onset.

Next I would instruct the singer to practice the transition between the first and second, and third and fourth phrase. The downward step in the passaggio register could lead to unwanted tension if the ear modifies the singer's prephonatory tuning posture.

Figure 22: [tu] [la] Exercise



This exercise begins a sixth below the actual pitches in the vocalise and should be repeated, ascending in key, until the singer sings at least a second higher than the actual pitches in the vocalise. By surpassing the actual pitches, the singer will likely experience a stronger throat posture when singing the actual pitches. The singer is ready to sing the piece again. If new onset difficulties present, the same strategic method for technique practice should be employed.

IX. CONCLUSION

Though the evolving scientific descriptions of vocal onset have caused debate within the pedagogical community, the methodological strategies for onset development have remained the same. Vocal masters agree onset of sound should be prepared through mental imagery or physical action and that the sound should begin in an accurate, artistic manner, leading to the proper execution of a musical phrase. The debate of vocal cord approximation in the 19th century led to a narrow focus in the 20th century and the use of an aspirate or imaginary aspirate as the cornerstone methodology for balancing an onset today. The aspirate strategy is a useful tool, but does not provide a complete methodology for onset development. Modern pedagogues must reinstate a comprehensive approach to preparation and onset execution.

By deconstructing the complex technique of a balanced onset into small prephonatory gestures and then slowly linking those prephonatory gestures with more complex aspects of onset technique, singers can experience consistency in onset practice and performance. This comprehensive approach also empowers singers to take ownership of their technique through a deeper understanding of concept application and strategic practice. The prescriptive nature of the exercises in part two of this paper provide excerptible tools for singers looking to strengthen a specific aspect of onset practice, and for teachers in search of more onset methodology options than an aspirate or imaginary aspirate. The advocacy and efficacy of prescriptive exercise creation has been promoted by Pier Francesco Tosi, William Huckle, the Garcia family, and Richard Miller. However,

this practice needs further integration into pedagogical training to create a lasting, trusted methodology that ensures a continuation of pedagogical excellence and beautiful singing.

I hope the example of prescriptive exercises for onset in the second portion of this paper will be useful to voice teachers in all communities and also inspire teachers to use pedagogical resources to write their own prescriptive exercises for various aspects of vocal technique, addressing each singer's learning style, physical habits, and technical ability. This practice will promote a studio experience that helps each singer advance with a comprehensive understanding of onset technique and practice, and empower teachers to preserve pedagogical craft for the future of the art of singing.

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Notes:

Coté A. (2017) notes from private study with Richard Nickol and David Jones.