

PRINCIPLES OF *APPOGGIO*: THE INTERRELATIONSHIP BETWEEN THEORY  
AND PRACTICE FOR TODAY'S YOUNG OPERA SINGERS

by

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*To Hye Jung and Clara*

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## INTRODUCTION

This study seeks to find the most effective strategy to perform *appoggio* technique in operatic singing. The Italian term *appoggio* is one of the most essential concepts pertinent to singers' breathing methods. Its advocates state that it ensures singers will maximize the potentials of proper inhalation and exhalation, which aid optimal phonation. Some regard the *appoggio* technique as the breathing method which the old Italian singers used. However, the term *appoggio* confuses many singers. First, there is a question of whether it is a concept or an actual technique. Many singers question whether it is tangible.

Once singers embrace it as a certain muscular strategy for optimal breathing, the literal connotation of *appoggio* becomes puzzling. One of the definitions of *appoggiare*, the verb form of *appoggio*, is "to support." Another meaning is "to lean," which is also adopted in voice teaching. Since leaning implies a physical action, singers are likely to have questions about what it means to lean with their body. I suppose that some singers confuse *appoggio* with techniques which induce reckless efforts to push out the surface of the body from the inside.

Thanks to recent scientific research, we have a better understanding of how breathing techniques contribute to the breath mechanism for singing. However, how to do the *appoggio* technique remains controversial. Young opera singers often struggle to find the correct application of their breathing technique even after years of study. Paul T. Klingstead summarizes the questions which the voice students of his generation had to face:

One teacher will tell you that... you must protrude your abdomen so that your diaphragm has room to operate. The next will contradict this... you should contract the muscles of the abdomen causing it to flatten. Another group will tell you to fill your lungs full of air and go ahead and sing. Their ideas of breath expulsion are just as divergent. One says... to push out the abdomen and use force in contradicting the muscles around the lower ribs. Another will tell you... you must forcibly flatten the abdomen and give a big push with the diaphragm. Still another suggests that you let the chest sink as breath is expelled, keeping a steady pressure upon the lungs with the rib

muscles... Is it any wonder that voice pupils get the idea that singing is an abnormal art and not founded on nature at all?<sup>1</sup>

The dilemma still applies to the voice students of current generation.<sup>2</sup> Even some of the most successful young singers reveal their lack of knowledge about *appoggio*. Why do we have such variances in teaching *appoggio* and breathing methods? Klingstead claims that the Italian masters, until the rise of vocal science around 1750, had almost unanimous opinions on breathing techniques. They asked their students to take a deep breath without noise or strain, and their muscles and organs would know how to support the voice. He believes that divergent scientific approaches to breathing methods are not as successful as the approach of the old Italian masters.

Although I agree with him that singers need to trust their bodies, I first wonder if a beginning singer would know how to take a deep breath without noise or strain. I also question if a deep and quiet inhalation is the only important aspect of respiration. There are many voice teachers and singers who think that the process of exhalation is as important as the process of inhalation. The higher demands for proper breathing techniques are due to the following factors which opera singers must face: 1) the increased size of the opera houses; 2) the extended range and length of the singing phrases; 3) the shift from the baroque pitch to the modern concert pitch; and 4) the emergence of male singing voices which in nature require a higher breath pressure than female voices.<sup>3</sup> These factors may have caused modifications of modern breathing techniques which allow singers to sing higher and louder.

How did breathing techniques change throughout the history? Which breathing methods do singers of our generation use? This study investigates various sources to find comprehensive answers. The first chapter will look into Richard Miller's classification of the German, English,

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<sup>1</sup> Paul T. Klingstedt, *Common Sense in Vocal Pedagogy As Prescribed by the Early Italian Masters* (Stillwater, OK: Edwards Brothers, Lithoprinters, 1946), 44.

<sup>2</sup> This assumption is based on the responses to the question #20 in the survey.

<sup>3</sup> Let us not forget that male roles in an opera were sung by castrati who had the voice of a boy and the lung power of a full-grown man.

French, and Italian schools of singing.<sup>4</sup> It is a perfect introduction to look over a wide range of different breathing techniques. After studying Miller's classification, a chronological investigation will discuss the earliest written sources by Tosi, Mancini, and other earlier teachers. It will reach later teachers such as Garcia, Lamperti, and their students who became some of the most famous voice teachers of their time. This concludes the second chapter.

In chapter three, the study will investigate modern pedagogical sources about breathing methods. Most of the authors of the written sources are American voice teachers, pedagogues, and scientists of the 20<sup>th</sup> and 21<sup>st</sup> centuries. Many of their books are used as textbooks for vocal pedagogy class throughout the United States. The investigation will focus on summarizing their opinions and making comparisons of their preferred methods.

The last chapter will finish with the research on breathing methods adopted by current opera singers. This chapter will analyze and compare breathing methods of twenty-six successful opera singers, who provided explanations of their breathing strategies through a personal interview. The complete survey questions and their answers are included in the appendices. These answers provide valuable information which allows this study to make a comparison between breathing techniques from the books and practical breathing techniques adopted by singers. In the end, the study will aim to find the optimal method of *appoggio* which individual singers can use.

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<sup>4</sup> Richard Miller, *National Schools of Singing: English, French, German, and Italian Techniques of Singing Revisited* (Lanham, MD: Scarecrow Press, 1997).

# CHAPTER 1: MILLER’S CLASSIFICATION OF BREATHING TECHNIQUES

Miller presents detailed classification of techniques in German and English schools. For French and Italian, he presents a single method for each school. The following is the table illustrating the techniques of four schools.

**Table 1 Miller's Classification of Various Breathing Techniques**

German	English	French	Italian
Low Dorsal Breathing	Upper Dorsal Breathing	Natural breathing	<i>Appoggio</i>
Low Diaphragmatic Fixation	Fixed Diaphragmatic Breathing		
Gluteal-Pelvic Contraction	Elevated Chest and Contracted Abdomen		
Epigastric Distention	Costal Arrest		
Hypogastric Distention			
<i>Stauprinzip</i> (Breath Damming)			
Induced Exhalation (Delayed Inhalation)			
Minimal Breath System			

Miller’s classification of breathing techniques covers a wide variety of maneuvers a singer can use. He states that each method is a tendency of the specific school and not limited to the singers of the region. He says, “Although recognizable characteristics distinguish national preferences and the techniques by which they are accomplished, no nation or region displays monolithic conformity in any area of vocal technique.”<sup>5</sup> He further explains the need for modification of regional techniques for a singer to meet international standards at the international performance scene. One may find his classification subjective because it is mostly based on his experience.<sup>6</sup>

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<sup>5</sup> Ibid., xiv.

<sup>6</sup> Miller tries to support his statements with extensive quotes from historical documents.

## German Breathing Techniques

German breathing techniques correspond to specific muscular strategies of the lower trunk. One of the most significant characteristics of the German breathing techniques is low breath, which is based on the observation that the largest expansion in the human body upon inhalation happens below the sternum level. Since they focus on abdominal distention (*Bauchausstütze*), some advocates agree with a few sensations which are either byproducts or motivators of the distention. Singers lower their chest because it is impossible for them to push out the lower trunk while maintaining the elevation of the sternum. They also embrace the tension in the lower torso caused by the voluntary expansion. They consider this tension to be helpful in delaying the upward movement of the diaphragm. The lowered position of the diaphragm brings the power and steadiness in the vocal instrument.<sup>7</sup>

### 1) Low Dorsal Breathing

The focus of this technique is on spreading the lower back to hold the mass of air.<sup>8</sup> Its advocates assume that singers can take the largest amount of air by enlarging the lower back because the diaphragm is attached most strongly to the inner side of the back.<sup>9</sup> They maintain that this technique is most effective to avoid the air rising. Miller claims that spreading the back does not increase the breath capacity.<sup>10</sup>

### 2) Gluteal-Pelvic Contraction

This technique is associated with pelvic support, buttocks support, and “the tilt and tuck method.”<sup>11</sup> Miller states that its advocates consider the intercostal muscles to be an important agent of inhalation, unlike the advocates of other German breathing techniques. On expiration, they will tilt the pelvis forward and tuck the buttocks under. This will also require squeezing the

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<sup>7</sup> Ibid., 22.

<sup>8</sup> Elizabeth Rado, “Breath Crisis in Relation to Breath and Resonance Control: I,” *American Music Teacher* 23, no. 5 (April-May 1974), 33-34.

<sup>9</sup> Frederick Husler and Yvonne Rodd-Marling, *Singing: The Physical Nature of the Vocal Organs* (London: Faber and Faber, 1965), 36.

<sup>10</sup> Miller, 23.

<sup>11</sup> Ibid., 24-26.

sphincter when high energy is called for. This technique corresponds to using the gluteal muscles and the rectus abdominis muscle for the process of exhalation. The advocates believe that these muscles slow down the upward motion of the diaphragm and make the voice stronger. Miller suspects their effectiveness. He further states that the tension in the lower torso will bring difficulty in breath emission. Too much tension in the lower torso can also make the sternum and ribs collapse. This will result in the decrease of the lung capacity.<sup>12</sup>

### **3) Low Diaphragmatic Fixation**

The advocates of the low diaphragmatic fixation technique try to control the position of the diaphragm by manipulating visceral pressures. Miller states that the voluntary action of holding the diaphragm has been confirmed to be unsuccessful by the fluoroscopic evidence.<sup>13</sup>

### **4) Epigastric Distention**

Epigastric distention is one of the major German breathing techniques. Its advocates put outward pressure on the upper abdominal wall from the point of inspiration until the end of the sung phrase. They practice with a cummerbund, corset, or belt against their belly to create more force to push against. The advantage of this technique is the use of the muscles in direct contact to the diaphragm which may delay its ascent. However, Miller points out that the outward visceral pressure tends to lower the sternum and ribs, a similar deficiency of other German breathing techniques.<sup>14</sup>

### **5) Hypogastric Distention**

Hypogastric distention is a technique in which the focus is to expand both the lower abdominal wall close to the pelvic floor and the upper abdominal wall. The advocates believe that they can achieve a better control of the diaphragm with the use of lower abdomen. This technique also induces the collapse of the sternum and ribs. The posture of a singer becomes close to so-

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<sup>12</sup> Ibid.

<sup>13</sup> Ibid., 26.

<sup>14</sup> Ibid., 27.



called “gorilla posture.”<sup>15</sup> There may be an ineffective “compensatory muscular action”<sup>16</sup> at the point of inhalation after singers push out the lower abdomen during exhalation.

### **6) *Stauprinzip* (Breath Damming)**

Breath damming is a technique named by George Armin, a notable German vocal pedagogue.<sup>17</sup> It uses the muscular tension experienced in a groan or grunt to create breath retention and high subglottic pressure at the glottis. The muscular tension starts from the lower trunk and goes all the way to the neck as the pressure increases. They aim to use the groaning utterance (*Stöhlaut*), created by this muscular tension, as the source of primal power turning into a musical tone. Miller states that this technique is adopted mostly by Heldentenors.<sup>18</sup>

### **7) Induced Exhalation (Delayed Inhalation)**

Induced exhalation technique allows an intentional breath emission before the phonation starts. Its alternative name, delayed inhalation, refers to the other half of the technique in which singers keep singing instead of taking a new breath when they are low on breath. The purpose of the technique is to avoid any tension below the larynx by the accumulated breath. The advocates lower the chest after the intake of breath, and they force the ribs and the abdominal muscles inward and downward upon exhalation. It is the key to resist the impulse for a new breath to become a master of this technique. Miller expresses concern that this technique can result in noisy and forced inhalations. This technique is in direct opposition to the sterno-costal-thoracic technique, which are the characteristics of the English breathing techniques.<sup>19</sup>

### **8) Minimal Breath System**

Along with the induced exhalation technique, the minimal breath system is a technique which reacts against too much glottal pressure used by other German breathing techniques due to the excessive distention of the abdominal wall or lower back. The core of the technique depends

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<sup>15</sup> Ibid., 28.

<sup>16</sup> Ibid.

<sup>17</sup> Georg Armin, *Von der Urkraft der Stimme*, 3rd ed. (Lippstadt: Kistner & Siegel) n.d.

<sup>18</sup> Miller, 28-29.

<sup>19</sup> Ibid., 29-30.

on taking a smaller amount of breath than one would normally take to avoid over-filling the lungs. This technique is based on the research by the French researcher, Raoul Husson. He assumed that no airflow is required to initiate the vibration of the vocal folds since it is done by the nerve impulses.<sup>20</sup> The advocates of the minimal breath technique often sing with the lowered chest position, and they give the importance to the lower trunk.<sup>21</sup>

### **English Breathing Techniques**

According to Miller, the use of upper back, costal function, and diaphragmatic positioning are among the significant characteristics of the English school.

#### **1) Upper Dorsal Breathing**

Influenced by William Shakespeare,<sup>22</sup> some teachers in the English school advocate expanding the upper back area in breathing. They teach their students to raise the ribs with the back muscles. Shakespeare claims:

How high should we breathe? As high as possible without giving up the freedom and elasticity of the points of the shoulders. Within these limits we should feel an ample expansion at the back, especially under the shoulder-blades, but the chest should be raised very little.<sup>23</sup>

Shakespeare adds that the breath sensation must be as low as possible in front of the torso and high up in the back with the muscles being interlocked under the shoulder-blades. This technique is based on the assumption that the *trapezius* and *latissimus dorsi*, two powerful muscle groups which cover most of the back area, play an important role in breathing by raising the ribs and contracting the diaphragm. However, Miller maintains that this technique cannot avoid clavicular breathing.<sup>24</sup>

#### **2) Fixed Diaphragmatic Breathing**

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<sup>20</sup> Science proves this wrong.

<sup>21</sup> Ibid., 30-31.

<sup>22</sup> Born in 1849, William Shakespeare was a tenor and a student of Francesco Lamperti. He became a voice professor at the Royal Academy of Music in 1878.

<sup>23</sup> William Shakespeare, *The Art of Singing* (Boston: Oliver Ditson, 1910), 11.

<sup>24</sup> Miller, 32-35.

Fixed diaphragmatic breathing advocates the combination of intercostal and diaphragmatic breathing. David D. Slater introduced this technique in *Vocal Physiology and the Teaching of Singing*,<sup>25</sup> a preparatory source for faculty candidates at the Royal College of Music and the Royal Academy of Music. One should inhale only to the point when a slight expansion occurs right below the sternum. Otherwise extreme abdominal distention will impede a free movement of the ribs and the expansion of the chest. Immediately afterwards, the abdomen should be pulled in, and the chest should be raised and expanded. These movements support the diaphragm by fixing its position.<sup>26</sup>

### **3) Elevated Chest and Contracted Abdomen.**

This technique attempts to take a condensed breath by using the strong muscles of the thorax. Unlike the previous method, the sternum and ribs are raised, and the abdomen is pulled in from the point of an inhalation to the end of an exhalation. The physical position to achieve this breathing method resembles the posture of a bodybuilder or someone trying to lift a heavy object. The advocates state that this technique is effective for breath retention. Miller admits that the rigidity in the abdomen will delay the upward movement of the diaphragm. However, he believes that it will hinder the freedom of breath mechanism.<sup>27</sup>

### **4) Costal Arrest**

Costal arrest is a technique which seeks to prolong the distention of ribcage during the complete cycle of respiration. By using the intercostal muscles, its advocates make conscious attempts to prevent the lowering of the ribs, which happens as the lungs start to deflate. Miller acknowledges the advantage of this technique since the intercostal muscles are in direct

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<sup>25</sup> David D. Slater, *Vocal Physiology and the Teaching of Singing: A Complete Guide to Teachers, Students and Candidates for the A.R.C.M., L.R.A.M., and All Similar Examinations* (London: J. H. Harway), n.d.

<sup>26</sup> Miller, 35-36.

<sup>27</sup> *Ibid.*, 36-37.

relationship to the breath mechanism. However, its advocates often fail to observe the total coordination of the entire torso.<sup>28</sup>

### **French Breathing Techniques**

Miller finds a less systematic approach to the breathing techniques in the French school. He describes their technique to be close to natural breathing. Teachers in the French school who teach natural breathing believe that the breathing act for singing should be no different from the breathing act for speaking. They claim that no individuals have failed to breathe since they were born and thus, breathing for singing should be as instinctive as it can be. They often advocate that the shape and character of the phrase should determine the breath. Miller contradicts their ideas as he says, “what appears to be natural to one singer will not be the same breath approach which comes naturally to another.”<sup>29</sup> He finds that some French singers sing with less vocal energy because of their breathing techniques, which are likely to become a clavicular breathing.<sup>30</sup>

### **Italian Breathing Techniques**

Miller states that there is much more uniformity within the Italian school about their teaching of breathing. The Italian school is against both the German and English techniques; one advocates outward abdominal pressures with lowered chest and the other advocates fixing the intercostals or diaphragm. He introduces *appoggio* as the representative Italian breathing technique.

Miller defines the *appoggio* technique as an “encompassing sterno-costal-diaphragmatic-epigastric breathing,”<sup>31</sup> which uses the muscular balance or antagonism between the muscles of inhalation and exhalation to stabilize the breath pressure. A proper posture is an important outset of *appoggio*, which requires the slightly elevated sternum. When the sternum and the intercostal muscles are well poised, singers can maintain the expansion of the ribs and delay the upward

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<sup>28</sup> Ibid., 37-38.

<sup>29</sup> Ibid., 40.

<sup>30</sup> Ibid.

<sup>31</sup> Ibid., 41.

movement of the diaphragm without much effort. Miller quotes Francesco Lamperti who describes the sensation of *appoggio*:

To sustain a given note the air should be expelled slowly; to attain this end, the respiratory muscles, by continuing their action, strive to retain the air in the lungs, and oppose their action to that of the expiratory muscles, which, at the same time, drive it out for the production of the note. There is thus established a balance of power between these two agents, which is called the *lutte vocale*, or vocal struggle. On the retention of this equilibrium depends the just emission of the voice and by means of it alone, can true expression be given to the sound produced.<sup>32</sup>

Using the *appoggio* technique, singers can avoid any rigidity because they do not force the muscles of their body to do unnatural activities. Miller states that singers may experience expansion in various areas of the body, but it is a reaction, not a voluntary movement. The elevated sternum does not raise or collapse at a significant level during the process of respiration. The ribs also stay in the elevated position, but they may come in slightly after finishing a long phrase. There may be some notable expansion around the side wall and the rear side of the lowest ribs. Compared to other breathing techniques, *appoggio* involves an entire body expansion rather than a local expansion.<sup>33</sup>

Silent breath is an element of *appoggio*. Miller states it is “a mark of identification.”<sup>34</sup> *Appoggio* also allows an inhalation to be quick or slow, not limited to a single manner. Overall, Miller considers *appoggio* to be the most non-violating technique to the natural function of a human body and the most efficient of all breathing techniques.<sup>35</sup>

In conclusion, Miller provides a valuable insight to the breath mechanism and breathing methods. Some may argue with Miller’s classification because they see the values of other breathing techniques. They may also think of the *appoggio* technique in a different way. Thus, it is important to study how earlier voice teachers taught breathing methods, especially Francesco Lamperti, who used the term *appoggio* for the first time in the history of voice pedagogy.

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<sup>32</sup> Francesco Lamperti, *The Art of Singing* (New York: G. Schirmer, 1890), 25.

<sup>33</sup> Miller, 41-44.

<sup>34</sup> *Ibid.*, 43.

<sup>35</sup> *Ibid.*, 41-44.

## CHAPTER 2: TEACHING OF EARLY EUROPEAN VOICE

### TEACHERS

#### Before Tosi

Many scholars of the history of singing have stated that they found almost no written sources which explained breathing methods before 1600. Among the written records of important voice teachers, such as Caccini (1551-1618), Bovicelli (1594-1646), and Mazzocchi (1597-1646), Klingstedt claims that there are no references about the instructions on breathing techniques. During this formative period of *Bel Canto*, most teachers did not pay much attention to the breath mechanism. They believed that the best way to learn how to breathe was to produce the perfect tone first and then observe how breath was taken, not the other way around.<sup>36</sup>

Duey makes a similar observation. He claims that breathing was treated in a simple relationship to singing before 1600. Caccini mentions the importance of breath control in his famous *Le Nuove Musiche* (1602), but he does not provide much information on the methods.<sup>37</sup>

#### Italian Sources

##### Pier Francesco Tosi (1654-1732)

Pier Francesco Tosi was one of the greatest Italian teachers in the early *Bel Canto* period.<sup>38</sup> Unfortunately, his writings do not include any discussions or advice on breathing methods.<sup>39</sup> Italian written sources of this period focus on the proper spots to take a breath in the music.<sup>40</sup>

##### Giovanni Battista Mancini (1714-1800)

The importance of breathing methods was first acknowledged in depth by Giovanni

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<sup>36</sup> Klingstedt, 8.

<sup>37</sup> Philip A. Duey, *Bel Canto in Its Golden Age: A Study of Its Teaching Concepts* (New York: King's Crown Press, 1951), 74.

<sup>38</sup> For more information on Tosi, see Berton Coffin, *Historical Vocal Pedagogy Classics* (Lanham, MD: Scarecrow Press, 1989), 1-5.

<sup>39</sup> Pier Francesco Tosi, *Observations on the Florid Song*, 2nd ed. (New York: Johnson Reprint, 1968).

<sup>40</sup> Duey, 74-75.

Battista Mancini, also known as Giambattista Mancini.<sup>41</sup> He was one of the last Italian voice masters who continued to teach in the old empirical method at the time of emerging voice science.<sup>42</sup> He claims that an elevated chest with a well-developed thorax has the potential to make a large amount of sound. He considered the chest strength to be the most important element of breathing. There is no mention of other body parts, such as the abdomen, back, or diaphragm. He invented the exercises for his students to develop their chest stamina, which was necessary for some of his younger pupils:

To make this rule easy for those whose chests are not so strong and for those who cannot hold the breath so long, the solfeggio should be written of only two notes in each measure, and they must be two "Minime" giving to it a slow movement, so that the voice may have time to expand; the student must not take breath between the first and second note.

I conclude that even if a student were found with a very strong chest, he must nevertheless be treated with the same precaution, and in order to favor the further development of the chest, he may be allowed to sustain the notes longer only when mature age has strengthened his organs of the voice.<sup>43</sup>

Another significant characteristic of Mancini's teaching on breathing is the economical use of breath. He asserts that the art of 'holding back the air' is one of the most important techniques of respiration. While he does not yet provide a clear explanation on how to hold back the air, it becomes one of the most important concepts of respiration in the 20<sup>th</sup> century and today.<sup>44</sup>

### German Sources

Scholars found no direct references to breathing methods or instructions in German sources between 1612 and 1797.<sup>45</sup> Johann Friedrich Agricola's translation of Tosi's *Observations on the Florid Song* is an important source on the art of singing, but it has little to say about

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<sup>41</sup> Ibid., 75-79.

<sup>42</sup> Mancini was a pupil of a famous teacher, Antonio Bernacchi, who was the founder of his singing school at Bologna. Among his star pupils were Senesino and Crestini, two of the most famous castrati of their time. They were both favorites of Handel. Along with Farinelli, they defined the golden era of castrati. For more information on Mancini and Bernacchi, see Coffin, 6-7.

<sup>43</sup> Giambattista Mancini and Pietro Buzzi, *Practical Reflections on the Figurative Art of Singing* (Boston: R. G. Badger, 1912), 112.

<sup>44</sup> See 60 of this document.

<sup>45</sup> Duey, 82-83.

breathing methods. The only German authority who discusses breathing methods is Johann Baptist Lasser, who emphasizes the economy of the breath. Duey summarizes the opinions of Lasser by saying:

Air should not be inhaled rapidly nor with noise and the singer should then be very economical with the same, exhaling only so much as is necessary for the loudness or softness of the tone. By means of this the lungs will gradually become able to hold and retain more air than before, and the singer will subsequently be able to sing longer and more with one breath.<sup>46</sup>

The breathing techniques of the German school had not yet diverged into different methods. Duey claims that most German voice teachers of the period were dependent on the Italians in their methods of teaching, as witnessed from Agricola's translations of Tosi. German voice teachers of the period such as Mattheson or Hiller acknowledged in their treatises that the Italian method of singing was superior.<sup>47</sup>

## **French Sources**

### **Jean Blanchet (1724-1778)**

In his writing on respiration, Blanchet demonstrates his knowledge of the breath mechanism in relation to the functional movements of the respiratory organs, such as lungs, mouth, nose, glottis, trachea, and the diaphragm.<sup>48</sup> Later on, he asserts that singers should raise and enlarge the chest in a way that the abdomen can swell for a proper inhalation. With this method of inhalation, the entire lungs can be filled. Upon exhalation, the inhaled air should be let out with more or less force corresponding to the desired volume and the character of singing.<sup>49</sup> These breathing strategies appear to be distant from the French natural breathing, but rather closer to Miller's *appoggio* technique.

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<sup>46</sup> Ibid.

<sup>47</sup> Ibid., 88-89.

<sup>48</sup> Jean Blanchet, *L'art ou les Principes Philosophiques du Chant*. 2nd ed. (Paris, A. M. Lottin, 1756), 8-9.

<sup>49</sup> Ibid., 26.



### **Bernardo Mengozzi (1758-1800)**

In his treatise *Méthode de chant*, Mengozzi provides more detailed instructions on how to breathe compared to other treatises written around the same period. It appears that his approach to the breath mechanism is also different from Miller's reference to the French natural breathing. He states that breathing for singing is distinguishable from breathing for speaking. When taking a breath, he advises singers to flatten the belly and make it straight up. The chest should inflate and advance in the meantime. Upon exhalation, the belly must return slowly to its natural state. The chest is lowered in proportion to the movement of the belly to preserve the air as long as possible.<sup>50</sup> Overall, this method uses the opposite movement of the abdomen upon the inhalation and exhalation compared to Blanchet's method. His breathing strategies have similarities to the techniques of the English school, which involve the contracted abdomen during inhalation.

### **English Sources**

Like German sources, English singing treatises before 1800 have little to say about breathing methods. The Italian singing method was influential in the English school. Similar to Mancini, they acknowledge the importance of chest endurance for singing. In English literature for singing, the words 'breast' or 'chest' are often substitutes for the word 'voice'.<sup>51</sup>

### **Teachings of the Garcia School**

#### **Manuel Garcia I (1775-1832)**

Many scholars acknowledge the Garcia family's contribution to the evolution of vocal pedagogy and science. They were also successors of the Italian *Bel Canto* school of singing. Manuel Garcia I studied with Giovanni Ansani, a renowned singer of his time and a pupil of one of the greatest Italian masters of the *Bel Canto* era, Nicola Antonio Porpora.<sup>52</sup>

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<sup>50</sup> Bernardo Mengozzi, *Méthode de chant du Conservatoire de musique: contenant les principes du chant, des exercices pour la voix, des solfèges tirés des meilleurs ouvrages anciens et modernes et des airs dans tous les mouvemens et les différens caractères* (Paris: Impr. du Conservatoire de musique, 1804), 2.

<sup>51</sup> Duey, 87-88.

<sup>52</sup> Coffin, 14.

Garcia was more famous as a singer than a teacher.<sup>53</sup> He left one treatise, *Exercices Pour La Voix* (1830), but he does not talk about breathing methods. His only suggestion relating to breathing is to inhale slowly. He advocates that the body position must be straight with the shoulders carried in the back. This position allows the voice to become clearer, stronger, and to be at more ease.<sup>54</sup>

### **Manuel Garcia II (1805-1906)**

Among the treatises of Manuel Garcia II,<sup>55</sup> *Hints on Singing* (1911) comprises the most detailed definitions and descriptions of breathing techniques.<sup>56</sup> Garcia adopts his father's rule on posture.<sup>57</sup>

We see the first classification of breathing techniques with Garcia. He classifies breathing techniques into three types: 1) abdominal, 2) thoracic or intercostal, and 3) clavicular. Clavicular breathing is identified by the upward movement of the upper thorax, such as the collarbones and the shoulders. Garcia describes it as the product of any kind of compression that prevents the expansion of the low ribs. A typical characteristic of intercostal breathing is the expansion of the chest and the ribs, while abdominal breathing is identified by abdominal expansion. However, there is a slight difference in Garcia's interpretations. During the early stage of inspiration, which is more or less a partial breath, the stomach protrudes a little as the diaphragm contracts down slightly. Garcia calls this early stage of inhalation abdominal breathing. He states that one cannot

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<sup>53</sup> Manuel Garcia I was a famed tenor of his time, whose voice possessed flexibility and agility and was most successful in florid style of singing. He was described by his own son as not a voice builder for developing the voice, but as a great singer who could communicate his secrets of great singing. For more information on Garcia, See Coffin, 13-14.

<sup>54</sup> Manuel del Pópulo Vicente Rodriguez Garcia, *Exercices Pour La Voix: Avec Un Discours Préliminaire* (Paris: Petit, 1830), 4.

<sup>55</sup> Manuel Garcia, *A Complete Treatise of the Art of Singing: Complete and Unabridged* (New York: Da Capo Press, 1975); Garcia, *New Treatise on the Art of Singing* (London: Cramer, 1870).

<sup>56</sup> Garcia, *Hints on Singing* (London: Ascherberg, Hopwood & Crew, 1911).

<sup>57</sup> Manuel Garcia II inherited the Italian method of singing from his father. He desired to find the scientific proof on the vocal mechanism and invented the laryngoscope, in order to see the glottis acting upon singing. His scientific method of teaching appealed to many singers and voice teachers of his time and he became one of the most influential figures in voice teaching. While he taught famous singers, such as Jenny Lind and Adelina Patti, his students Julius Stockhausen and Mathilde Marchesi became famous teachers themselves.

reach the full capacity of the lungs by abdominal breathing because the ribs cannot move freely yet. At the next stage of inspiration, the diaphragm contracts completely while the ribs are raised, and the stomach is drawn in. In this manner, the lungs can freely move towards all directions, from side to side, front to back, and top to bottom. Garcia only approves this complete process of inhalation, which he calls thoracic or intercostal breathing.<sup>58</sup>

Garcia considered regulating the correct pressure of the air from the lungs to be one of the most crucial elements of singing. He disapproved of a weak, hurried, noisy breath, and taking a breath with raising the shoulders. These faulty qualities were believed to hinder the steady control of the exhalation. He claimed that they could be remedied by breathing slowly and deeply with the glottis opened.<sup>59</sup> Another observation was that singers get rid of too much air at once in the beginning of a phrase after a full inhalation, which should be done in the opposite manner. Therefore, the phonation must start with less air pressure and increase it gradually corresponding to the character of the phrase.<sup>60</sup>

### **Mathilde Marchesi (1821-1913)**

Marchesi and Stockhausen, two of Garcia's star pupils who became the preeminent voice teachers of their time, offer contrasting instructions on their breathing techniques to those of their teacher. Marchesi uses the same classification as Garcia; except that she uses the term diaphragmatic breathing as an interchangeable term for abdominal breathing. She maintains that diaphragmatic breathing is the only plausible breathing method among the three types. By breathing diaphragmatically, the lungs can be expanded at the base and can receive the greatest amount of air. She considers other breathing techniques to be not in accordance with the natural mechanism of respiration and potentially harmful. She encourages female singers to avoid

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<sup>58</sup> Ibid.

<sup>59</sup> Ibid., 5.

<sup>60</sup> Ibid., 13.

wearing a corset because it forces them to breathe in the manner of intercostal breathing.<sup>61</sup> Upon exhalation, singers should work on the closing of the glottis in order to provide more resistance to let out the air slowly.<sup>62</sup>

### **Julius Stockhausen (1826-1906)**

Stockhausen, in his treatise *A Method of Singing*, offers only a short paragraph in describing his breathing methods; however, it is interesting to find that he used both diaphragmatic and rib (intercostal) breathing:

For the repose of the larynx, diaphragm and rib breathing is indispensable. Clavicular breathing (which raises the collar bone) draws the larynx rapidly down and lets it rise with equal suddenness when the voice is emitted. The restless state in which the larynx is thus kept is fatal to the development of the voice and to technique in general. Diaphragm breathing is sufficient for the quick or half breath (*mezzo respire*), but for the full breath (*respire pieno*) rib-breathing is indispensable. Breathing through the nose is very favourable to the repose of the larynx, and it furthers, at the same time, the activity of the diaphragm. The respiration must be noiseless, except, perhaps, occasionally to express great emotion.<sup>63</sup>

He does not explain the physical strategies to perform each breathing method. I assume that his methods are similar to Garcia's method since the intercostal breathing is thought to take a larger amount of air.

### **Herman Klein (1856-1934)**

Herman Klein, an English pupil of Garcia, introduces his breathing method in detailed manner in his essay.<sup>64</sup> He advocates the abdominal breathing; however, his method is similar to

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<sup>61</sup> Marchesi used the term lateral interchangeably with intercostal, whereas Garcia used thoracic. I suppose that she wanted to emphasize the lateral movement of the ribs which takes place with the intercostal breathing.

<sup>62</sup> Mathilde Marchesi, *Theoretical and Practical Vocal Method* (London, 1890; repr., New York: Dover Publications, 1970), xi-xii.

<sup>63</sup> Julius Stockhausen, *A Method of Singing* (London: Novello, 1884), 2.

<sup>64</sup> In his essay *The Bel Canto*, Klein claims that the scientific breathing method is the foundation and the apex of the whole vocal structure, but it is often neglected and misunderstood. He believes that teaching the correct breathing technique is what differentiates good and bad teachers. His quotation of Maria Celloni, "Chi sa respirare sa cantare" [Eng. 'He who knows how to breathe knows how to sing', translated by Klein], proves his utmost interest and firm belief on the importance of breathing technique. He opposes using simple imagery, such as "inhale the perfume of flowers" or even as simple as "take a deep breath." He also disagrees with "breathing in or out from the waist" or protruding the abdomen in order to force the descent of the diaphragm. These comments help us to understand how breathing was

that of Garcia, who calls his technique intercostal:

One seldom hears talk of abdominal breathing. It is this filling of the lowest part of the lungs by the expansion of the stomach which not only flattens the hidden diaphragm, but prepares for its contraction when the stomach is drawn in and the ribs are raised, thus giving the necessary impetus for the expulsion of the breath by muscular pressure from below the middle of the body, not from the region of the chest.<sup>65</sup>

Similar to Garcia, Klein also advocates two stages of inhalation which at first, flattens the diaphragm with the expansion of the stomach and then draws in the stomach to contract the diaphragm. During the second stage of inhalation, the ribs are also raised as a reaction to the abdominal tuck. It is difficult to call his technique abdominal breathing since the term is used for an inspiratory method which allows the abdominal expansion. Garcia and Marchesi used each term in a more appropriate manner.

Nevertheless, the justification for his technique is useful. After the lungs are completely filled through the first stage of inhalation, he maintains that the second stage of inhalation creates the upward pressure above the stomach, which helps the steadiness and purity of tone.<sup>66</sup> The difference between Garcia and Klein is that Garcia used the second stage of inhalation to maximize the amount of air inhaled, whereas Klein thought of it as a preparatory action to provide impetus for required breath pressure. Modern voice pedagogues may call it as a ‘suspension,’ a transitional stage between an inhalation and exhalation.<sup>67</sup> Only then does it make sense that Klein called his breathing methods abdominal.

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taught in his time by other voice teachers. It is worthwhile to notice that he was familiar with the idea of excessive abdomen distention, the characteristic of the German school, according to Miller. Based on this example, the technique might have been taught in England or New York, where Klein lived and taught voice. See Hermann Klein, *The Bel Canto, with Particular Reference to the Singing of Mozart* (London: Oxford University Press, 1923), 20-22.

<sup>65</sup> Ibid., 21.

<sup>66</sup> Klein further explains that the second part of the inhalation will get rid of unnecessary tension and teach how to control breathing action from the area of the diaphragm. According to him, the chest will be utilized as a vessel, in which the air can be pressed into, to create ‘compressed air.’ Enrico Caruso describes his breathing technique in a similar manner in his essay. See Luisa Tetrazzini and Enrico Caruso, *Caruso and Tetrazzini on the Art of Singing* (New York: Dover Publications, 1975), 53-54.

<sup>67</sup> James C. McKinney, *The Diagnosis & Correction of Vocal Faults: A Manual for Teachers of Singing and for Choir Directors* (Long Grove, IL: Waveland Press, 2005), 48-51.

The method of both Garcia and Klein is most similar to the fixed diaphragmatic breathing of the English school. It is plausible to assume that they contributed to the foundation of the English breathing techniques, considering the fact that both Garcia and Klein taught in London for a long period. Slater includes Garcia's *Hints on Singing* on the list of references in his *Vocal Physiology*.

### **Evaluations**

The Garcia school exhibits interesting diversities among the methods of its members. Manuel Garcia II was an advocate of intercostal breathing which incorporated expanding the abdomen, immediately followed by pulling-in of the abdomen and raising the chest upon inhalation. To be more specific, he was an advocate of the mixture of abdominal and intercostal breathing which Klein also approved. On the other hand, Marchesi was a proponent of diaphragmatic breathing, who thought of intercostal breathing as a violation against the natural breathing mechanism. Stockhausen was a practitioner of both diaphragmatic breathing for the half-breath and intercostal breathing for the full-breath.

One can assume that they chose the optimal breathing method for themselves through their experiences in years of singing and teaching. For Garcia and Klein, the action of pulling in the abdomen should have provided the proper respiratory condition they pursued. On the other hand, it would have been more effective for Marchesi to breathe as deeply as possible without manipulating the abdominal muscles. Wearing a corset, which makes the nature of breathing intercostal, was an hinderance to her without any benefit. For Stockhausen, who sang many *lieder* in concert settings using both methods to take a half or full breath, might have found it beneficial to create various colors of the voice. These varying approaches may imply that there is no one breathing method which satisfies all singers.

## Teachings of the Lamperti School

### Francesco Lamperti (1813-1892)

According to Craig Timberlake, Francesco Lamperti<sup>68</sup> is credited as the first author who used the term *appoggio* and *appoggiata*.<sup>69</sup> Lamperti defines *appoggio* as “The support afforded to the voice by the muscles of the chest, especially the diaphragm, acting upon the air contained in the lungs.”<sup>70</sup> This support can be obtained first by the correct position of the body, mouth, and vocal organ. *Appoggio* is not limited to the process of respiration, but it also includes body alignment, which acts upon the production of sound. To achieve *appoggio*, Lamperti writes that: 1) the lower part of the throat must be opened as in the sensation of the vowel [a], 2) the body should be held erect, with an expanded chest and relaxed shoulders, similar to the posture of a soldier, 3) the mouth should be in smiling position with the lips drawn to show the upper teeth, 4) the tongue should remain extended, which provides the largest space in the mouth in order to open the throat easily. Singing *appoggiata* means, “all notes... are produced by a column of air over which the singer has perfect command, by holding back the breath, and not permitting more air than is absolutely necessary for the formation of the note to escape from the lungs.”<sup>71</sup> The whole point to sing *appoggiata* was to learn the true character and the capabilities of the one’s voice. He believed that only the tone, produced with such support, could be clear, sympathetic, and full of expression which could convey the emotions of the soul.

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<sup>68</sup> Francesco Lamperti and Giovanni Battista Lamperti, the father and the younger son, were considered as the last great masters of the old Italian method of singing before scientific teaching of voice began. In the introduction of *Vocal Wisdom*, William Earl Brown, the pupil of the younger Lamperti and the transcriber of the book, claims that the teaching of the two Lampertis is the only remaining stream of teaching from the Golden Age of Song. He further explains that the father Lamperti learned the rules of Bel Canto singing from singers and composers such as Rubini, Presto, Bellini, Donizetti, Rossini, and Malibran, a sister and a student of the younger Garcia. Both Francesco and Giovanni Battista Lamperti relate their teaching to the famous Italian castrati Pacchierotti, Crescentini, Velluti, and Marchesi (Luigi). See Giovanni Battista Lamperti, *Vocal Wisdom: Maxims of Giovanni Battista Lamperti*, 2nd ed. (New York: Taplinger, 1975), Introduction.

<sup>69</sup> Craig Timberlake, “Pedagogical Perspectives, Past and Present, Apropos of Appoggio II.” *The NATS Journal* 51, no. 3 (January/February 1995): 35.

<sup>70</sup> Francesco Lamperti, 14.

<sup>71</sup> *Ibid.*, 22.

Lamperti classified breathing methods into three types, just as Garcia did. He disapproves clavicular breathing since it causes tension in the muscles of the throat and larynx by the inflexibility of the upper thorax. Unlike Garcia, Lamperti claims that lateral breathing hinders the natural descent of the diaphragm.<sup>72</sup> Abdominal breathing is the only breathing method which permits the diaphragm to flatten, leaving a large space in the thorax for the lungs to inflate. He says:

In abdominal respiration the only muscle made use of is the diaphragm; it enlarges and deepens the base of the thorax, pressing down upon the liver, stomach and intestines, which, yielding to the pressure, leave a larger space for the dilation of the lungs, the larynx also remaining perfectly natural and unconstrained; for which reason good singers invariably make use of this type of breathing.<sup>73</sup>

Based on this quote and his other comments, Lamperti appears to be skeptical in the effectiveness of the ribs in terms of their contribution to breathing mechanism. However, some modern voice pedagogues assert that the complete descent of the diaphragm also requires the expansion of the ribcage, assisted by the intercostal muscles.<sup>74</sup> Lamperti understood that one method of breathing could often morph into another when it was sustained for a long period. Lamperti states, “a continued abdominal respiration will become also lateral... A prolonged lateral respiration may become either abdominal or clavicular, and a prolonged clavicular respiration will become lateral.”<sup>75</sup> However, it is clear that he preferred using only abdominal breathing upon inhalation.

*Lutte vocale*, or vocal struggle, is one of the most essential concepts relating to *appoggio*. It describes a balanced state of the forces between the inspiratory muscles and the expiratory muscles, in which singers can produce the tone with proper support, *appoggio*.<sup>76</sup> Lamperti

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<sup>72</sup> We should note that Lamperti’s understanding of intercostal (lateral) breathing focuses on the side expansion of the ribs and does not include the abdominal expansion.

<sup>73</sup> Ibid.

<sup>74</sup> This, perhaps, is the reason why many modern voice teachers and singers often prefer the combination of intercostal and abdominal breathing.

<sup>75</sup> Ibid., 24.

<sup>76</sup> For Lamperti’s quotation on *lutte vocale*, see 11 of this document.



emphasized the role of the diaphragm to attain this state of balance. It is important to maintain the force of the diaphragm, resisting the force of the abdominal contraction.

### **Giovanni Battista Lamperti (1839-1910)**

There is little difference between the father and the son in terms of their opinions on breath mechanism and methods. However, for body position, the younger Lamperti avoids using the expression, ‘like the posture of a soldier.’<sup>77</sup> Instead, he encourages singers to carry an easy stance. The muscles of the neck and the throat must be free. The shoulders should be slightly thrown back without tightening the joints in order to let the chest be free without rising.<sup>78</sup>

His definition of *appoggio* is, “the steady air-pressure on the vocal cords during tone-production.”<sup>79</sup> In other words, the proper breath support is equivalent to the correct level of breath pressure. To attain it, he advocates diaphragmatic breathing, which capitalizes on the role of the diaphragm. Therefore, he advises singers to develop the upper abdominal muscles to be free of movement, trained with a deep inspiration for a lengthened period. In this manner of practice, he believed that singers could attain higher air pressure, necessary for singing higher pitches.<sup>80</sup>

His perceptions on breathing methods are rather puzzling in *Vocal Wisdom*. It is unclear whether his understanding had changed over his years of teaching.<sup>81</sup> The following quote remains difficult to understand:

It is a mistake to breathe in just one part of the body. Abdominal breathing alone brings high focused voice. But it remains throaty, small. Diaphragmatic breath alone secures good diction. But resonance of head and chest will be lacking. Intercostal breathing alone enlarges the low resonance. But diction will be faulty. Clavicular breathing alone brings low resonance only. It destroys diction.<sup>82</sup>

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<sup>77</sup> The term has a negative connotation of tightening the abdomen in attempts to raise the chest excessively and many modern voice pedagogues avoid the term.

<sup>78</sup> Giovanni Battista Lamperti, *The Technics of Bel Canto*, trans. Theodore Baker (New York: G. Schirmer, 1905), 7.

<sup>79</sup> *Ibid.*, 9.

<sup>80</sup> *Ibid.*

<sup>81</sup> The original notes of *Vocal Wisdom* were written by William Earl Brown between 1891-1893. The first edition of *The Technics of Bel Canto* was published in 1905.

<sup>82</sup> The quote has been copied the same as the original, which has some grammatical errors. See Lamperti, *Vocal Wisdom*, 43.

Regardless of the obscurity of the above quote, Lamperti addresses the importance of breath compression. He proposes that fully compressed air throughout the entire lungs is the indication of the most ideal inhalation. The whole torso must expand and contract as one unit to achieve proper air compression during the process of inhalation and exhalation. Upon inhalation, the pelvic region and breast bone may experience the strain of energy. The pressure of compressed breath may compel a singer to feel broad in the shoulders and lifted in the chest as the pressure goes up to the breast bone.<sup>83</sup> He further informs that this pressed pneumatic energy should initiate the vibration in the cords, not the breath itself.<sup>84</sup> This allows singers to avoid either breathy or guttural initiation of the tone. Considering all of these ideas, it seems that Lamperti advocates the combination of every possible breathing method which provides the maximum lung expansion in *Vocal Wisdom*.

### **Evaluations**

Overall, the Lamperti school advocates diaphragmatic-abdominal breathing. They focused on abdominal expansion, especially the upper abdomen, since it was considered to assist the complete downward contraction of the diaphragm. This contrasts with Miller's instructions on the *appoggio* technique. Both Lampertis believed in deliberate and local abdominal expansion without much focus on the elevation of the sternum and ribs.<sup>85</sup> This was due to the influence of the research by Dr. Mandl of Paris, who held that the distention of the lower abdominal wall and the forced descent of the diaphragm contribute to the increased lung capacity.<sup>86</sup> However, this assumption has been challenged by many scientists. Regardless of the dispute, a low breath is a well-received idea of proper inhalation among singers. The breathing methods of both Lampertis

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<sup>83</sup> Ibid., 108.

<sup>84</sup> Ibid., 115.

<sup>85</sup> The only exception may be G. B. Lamperti in *Vocal Wisdom*.

<sup>86</sup> Timberlake, 37.

feature many similarities to the breathing methods of the German school of singing.<sup>87</sup>

## Conclusions

During the early period of classical singing, there was almost no importance given to breath mechanism. One can assume that singers of that period used a natural way of breathing, similar to breathing for speaking. It was not necessary for them to be aware of how they breathed. It was the evolution of vocal composition which demanded greater vocal capacity. About three-hundred years ago, Mancini first aimed to improve chest endurance. Mengozzi made his opinion clear to distinguish between breathing for singing and breathing for speaking. He adopted strategic movements of the torso for an optimal respiration. Later teachers such as Garcia and Lamperti used their scientific knowledge to maximize the potentials of breathing methods.

We have learned that *appoggio* does not relate to any particular method of breathing. According to Lamperti, the author who coined the term, it defines the most ideal support which singers aim to achieve by various efforts and strategies. His son equated this support with steady breath pressure. Therefore, anyone can execute *appoggio* without knowing the term at all, if they sing with a steady breath pressure. The question remains which breathing method provides such a steady pressure most efficiently.

I still question whether Lamperti chose the particular term to imply physical actions of leaning. It is possible to assume that he pointed out the leaning sensation of the diaphragm against the abdominal muscles. He did not yet focus on the muscular antagonism between the internal intercostals and the external intercostals. Thus, he did not use the term to imply the leaning sensation upon the chest wall. It was the son Lamperti, who explained the strain of energy which singers may experience in the breast bone and the pelvic region. Regardless of the intention of Lamperti senior, the connotation of *appoggio* is likely to encourage some singers to make

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<sup>87</sup> I am curious what Miller thought of Lamperti's breathing methods. It is evident that Miller studied Lamperti since he quoted Lamperti multiple times. However, his opinions on the optimal breathing method are quite different from Lamperti's.

reckless and forceful attempts to push out the wall of the thorax from the inside. Therefore, teachers must guide their students in using *appoggio*.

Some early teachers acknowledged the role of breath pressure. The younger Lamperti advocated the breath compression which was thought to be attained by the expansion and contraction of the upper body. I believe that this new perception of breath mechanics was facilitated by the evolution of science. Perceiving a breathing method as a means to manipulate breath pressure contrasts with perceiving it as a simple way of taking a breath and letting it out. It depends on different individuals to decide which way of perceiving is more effective to singing. A divergence of breathing methods may correspond to different ways of regulating breath pressure. This may be a reason why there are so many variances in breathing methods, because every singer requires different breath pressure. Further studies, which involve examination of the sources of prominent voice teachers and scientists of the 20<sup>th</sup> and 21<sup>st</sup> centuries, would be beneficial in providing new useful information relating to breath mechanism.

## CHAPTER 3: MODERN VOICE PEDAGOGY AND SCIENCE

### Posture and Alignment for Optimal Singing

#### Is good posture helpful for breathing?

Most books on vocal pedagogy have a chapter on posture before a chapter on breathing because they have a significant relationship with each other.<sup>88</sup> James C. McKinney outlines the benefits of good posture.<sup>89</sup> First, good posture allows the skeletal structure and the muscles of the body to do their appropriate works. If the skeleton, whose job is to support and give shape to the body, is not aligned, the muscles must take over its job. This is a wasteful use of the muscles. When the skeleton is aligned, the muscles can create movement freely and assist positioning of the body at their will. This statement is supported by Julia Davids and Stephen LaTour. With good posture, singers can avoid using too much energy to keep the balance of the body with unnecessary muscular tension.<sup>90</sup>

Second, good posture allows the vocal organs to function at their best. The breathing organs, the lungs and the diaphragm, can function most efficiently when the chest is raised, and the abdominal wall is not tensed.<sup>91</sup> The vibrators and resonators of the vocal mechanism also work most effectively when unnecessary tensions are eliminated from the surrounding muscles of the neck. Barbara M. Doscher defines posture as “the common denominator” of respiration and phonation, as it facilitates the process of the air turning into the tone.<sup>92</sup>

Third, good posture provides psychological benefits to singers. It gives a sense of assurance to singers, even in a stressful situation. Doscher says, “An open, preparatory, receptive

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<sup>88</sup> One of the exceptions is Doscher’s *The Functional Unity of the Singing Voice*, as she places posture after respiration, the anatomy of the larynx, and phonation. Her reason is that posture affects not only respiration but also laryngeal positioning and phonation, and therefore, it makes more sense to place posture after everything is covered.

<sup>89</sup> McKinney, 33-34.

<sup>90</sup> Julia Davids and Stephen LaTour, *Vocal Technique: A Guide for Conductors, Teachers, and Singers* (Long Grove, IL: Waveland, 2012), 13.

<sup>91</sup> This is, of course, his opinion and will be studied further in the chapter for respiration.

<sup>92</sup> Barbara Doscher, *The Functional Unity of the Singing Voice*, 2<sup>nd</sup> ed. (Metuchen, NJ: The Scarecrow Press, 1994), 69.

posture is of great benefit to a singer's inner spirit, just as nervousness and fear produce a tense, destructive body set."<sup>93</sup> Last, a good posture of a singer makes a positive first impression to the audience. The physical impression is one of the crucial factors that determine how the audience reacts to the overall performance.

This study will look into the position of the body areas that are relevant to breathing methods. Those include: the chest, abdomen, back, shoulders, and pelvis.

### **Chest**

A consensus of opinions on the position of the chest among voice teachers and pedagogues is that the chest should be lifted at a comfortable level. The elevation of the sternum is the key component. The capacity of the lungs is increased when the sternum is elevated, and the ribs are free to extend properly. Otherwise, it is greatly reduced if the chest is collapsed.<sup>94</sup> The high position of the chest also allows the lateral expansion of the lower ribs, which allows the most efficient and instantaneous intake of breath.<sup>95</sup>

In positioning the chest, William Vennard suggests that singers imagine that they are a marionette, hanging from strings. One of the strings is attached to the top of the head, and the other is attached to the top of the sternum.<sup>96</sup> W. Stephen Smith also uses a similar tactic.<sup>97</sup> Many teachers prohibit the excessive lifting of the chest, accompanied by the severe contraction of the abdominal muscles, which is similar in such a way to a military stance. Lois Alba says, "posture is often said to be the cure-all for support, but this doesn't mean a military stance, that is, rigid

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<sup>93</sup> Ibid.

<sup>94</sup> McKinney, 33.

<sup>95</sup> D. Ralph Appleman, *The Science of Vocal Pedagogy: Theory and Application* (Bloomington, IN: Indiana University Press, 1967), 14.

<sup>96</sup> William Vennard, *Singing: The Mechanism and the Technic*, 2<sup>nd</sup> ed. (Ann Arbor, MI: Edwards Brothers, 1950), 18.

<sup>97</sup> Smith suggests singers imagine only one string is attached to the top of the head, which will raise the chest naturally. This difference compared to Vennard's may cause a somewhat different experience, depending on singers. See W. Stephen Smith and Michael Chipman, *The Naked Voice: A Wholistic Approach to Singing* (New York: Oxford University Press, 2007), 37.

chest, held high.”<sup>98</sup> They notice that the abdominal wall tends to be stiffened to a certain degree as the chest rises; however, too much rigidity in the abdomen, caused by sucking in the gut in the military manner, inhibits the free movement and disables deep breathing.<sup>99</sup>

Once the chest is placed at a high position, it is encouraged not to move during the entire activity of respiration.<sup>100</sup> A poor posture of the chest inevitably promotes clavicular breathing since the chest must rise and fall with each respiration. The maintained position of the chest serves as a necessary leverage during respiration, which facilitates the activities of the various muscles groups.

### **Abdomen**

The position of the abdomen before inhalation seems to generate little dispute amongst voice teachers. Since there is no skeletal structure determining the shape of the abdominal wall, its shape and position are more dependent to the position of the chest and the pelvis. As a consequence of the high position of the chest, a certain amount of tonicity of the abdominal muscles is generated naturally. It allows the lower abdomen to come in comfortably while the upper abdomen is free of movement.<sup>101</sup> Vennard claims, “a sagging abdominal wall is poor posture, but while it need not relax at the bottom, the top of the abdomen must make way for the motion of the diaphragm.”<sup>102</sup>

### **Back**

The spinal lift or stretch seems to play one of the most predominant roles for positioning of the back. The spinal stretch is a valuable asset to singers since it releases habitually compressed muscles and helps singers to feel “lightly balanced” and “weightless.”<sup>103</sup> Stretching

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<sup>98</sup> Lois Alba, *Vocal Rescue: Rediscover the Beauty, Power, and Freedom in Your Singing* (Norwich, NY: William Andrew Publishing, 2005), 4.

<sup>99</sup> Vennard, 17.

<sup>100</sup> Richard Alderson, *Complete Handbook of Vocal Training* (West Nyack, NY: Parker Publishing Company, 1979), 41.

<sup>101</sup> McKinney, 49.

<sup>102</sup> Vennard, 20.

<sup>103</sup> Doscher, 71.

of the spinal column can be facilitated by images such as hanging from strings or standing as tall as possible.<sup>104</sup> Some teachers, not all, suggest that singers should straighten the lower spinal area actively by tilting the pelvis down and forward.<sup>105</sup> Others advocate a natural positioning of the lumbar region.

Teachers who advocate back breathing promote the sensation of widening the upper back. The actual activity of widening the upper back involves the movement of the shoulder-blades, using the *trapezius* muscles. This tactic remains controversial amongst teachers.<sup>106</sup>

### Shoulders

Most teachers advise students to avoid slumping, a posture in which the shoulders are pulled forward too much. Teachers of this group advocate a natural positioning of the shoulders, which follows the correct position of the chest:

With the chest and rib cage expanded and the arms hanging freely, the shoulders find a comfortable, natural position. This is usually back of their normal, slumped posture...<sup>107</sup>

The high chest implies that the shoulders go back, but they should relax and be comfortable... There should be no straining like a soldier on parade.<sup>108</sup>

On the contrary, teachers such as Lucie Manén promote a voluntary movement of the shoulders since it will give the greatest space within the dimensions of the rib cage. Manén claims that the angle, which the clavicle and the scapula form with each other at the tip of the shoulders, affects the dimension of the thorax from front to back. If the tip is rotated outward, putting the shoulders backward, the dimension is increased the most.<sup>109</sup>

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<sup>104</sup> McKinney says, "Imagine that you are standing as tall as you can; you will notice a lifting or stretching sensation extending upward along the spinal column." See McKinney, 38. Smith also uses a similar imagination as he says, "imagine you are suspended in the air by a hook connected to the middle of the top of your head... the spine feels stretched but relaxed." See Smith, 37.

<sup>105</sup> McKinney, 38.

<sup>106</sup> Parting the shoulder-blades apart forces the shoulders to move forward, which is discouraged by teachers who advocate the elevation of the sternum.

<sup>107</sup> Alderson, 47.

<sup>108</sup> Vennard, 17.

<sup>109</sup> Lucie Manén, *The Art of Singing: A Manual* (London: Faber Music, 1976), 16.



## Pelvis

One of the prevailing statements on the position of the pelvis is that it should adjust to the vertical alignment of the spine, avoiding too much curvature in the lumbar region. Some teachers encourage singers to straighten the lower spine by deliberately tilting the pelvis or tucking in the tailbone.<sup>110</sup> Manén proposes a theory that the body functions at its best when the flexible sections of the spine are straightened. Those sections include the cervical spine (the neck) and the lumbar spine (the lower back). It is the most balanced position.<sup>111</sup>

Most teachers oppose such deliberate manipulation of the spine. Vennard suggests that singers should let the pelvis hang in position.<sup>112</sup> Doscher claims that the deliberate tucking in creates tension in the gluteal muscles, which can transport to the other parts of the torso and even to the knees. Once the spinal stretch is achieved by the position of the neck and the chest, the pressure on vertebral discs is relieved, and the position of the pelvis becomes natural and poised.<sup>113</sup>

## Conclusions

Many teachers and singers acknowledge the positive influence of good posture for the breathing mechanism. However, singers often feel that their old posture is more effective and natural than a 'better' posture which they try to implement because their muscles are accustomed to the old manner. After all, people are often forced into the slouched position because of the sedentary lifestyle.<sup>114</sup> Therefore, I prefer positioning the body with more indirect means, avoiding side effects which hamper the total balance. The most effective strategy for me is the spinal stretch and the elevated chest. These two activities facilitate other parts of the body to fall naturally.

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<sup>110</sup> McKinney, 37.

<sup>111</sup> Manén, 14.

<sup>112</sup> Vennard, 17.

<sup>113</sup> Doscher, 71.

<sup>114</sup> Ibid., 76.

The open chest, which demands in nature a raised sternum and slightly pushed back shoulders, takes part in increasing the dimension of the rib cage. It leads to the increased total lung capacity.<sup>115</sup> In addition to that, it is more beneficial than the slouched position in every aspect for singing as long as it does not convey new muscular tension.

## **The Art of Inhalation**

### **Why do we need good breathing for singing?**

Why is good breathing necessary for singing in the view of modern voice teachers and pedagogues? Almost all seem to agree with its positive effect on singing. The fact that breath is the sole, indispensable source for phonation assures its inseparable relationship with singing. Richard Alderson said, “Without respiration, none of the other elements of singing would function.”<sup>116</sup> The question is, do we need to manipulate the way we breathe for better singing? The importance of breathing methods is often neglected when a singer produces a fine tone without thinking about the breath. Vennard says:

Finally, it must be admitted that quite a few singers are successful in spite of theoretically poor habits of breathing. After all, everyone does breathe; and some can inhale enough for the required phrase and exhale with enough steadiness to avoid tremolo, even though they do it inefficiently.<sup>117</sup>

Some singers naturally have a greater vital capacity<sup>118</sup> and a better ability to control the breath than others. For them, poor breathing methods may still satisfy their need, as James Stark states:

I have seen some professional singers with heaving chests, some with protruding bellies, some with raised shoulders, and some with bouncing epigastriums, all of whom sang beautifully, regardless of their breathing methods. I have also seen awkward posture that have not adversely affected good singing.<sup>119</sup>

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<sup>115</sup> For total lung capacity, see 55 of this document.

<sup>116</sup> Alderson, 28.

<sup>117</sup> Vennard, 17.

<sup>118</sup> For vital capacity, see 55 of this document.

<sup>119</sup> James Stark, *Bel Canto: A History of Vocal Pedagogy* (Toronto: University of Toronto Press, 1999), 92.

As naturalists say, breathing itself is not a new activity for beginning singers. Even babies breathe naturally by instinct. Since everyone knows how to breathe, a proper inhalation is often neglected. Therefore, teachers such as Stark maintain that the method of exhalation/phonation is a more crucial element of singing than the inspiratory method.<sup>120</sup> Nevertheless, an inhalation and exhalation form a complete cycle of respiration, which affect each other and cannot be separated.

Many teachers and singers believe that singing makes greater demands on breathing than speaking does, as Stark states, “breathing for singing makes much greater demands on the respiratory system than vegetative breathing or speech.”<sup>121</sup> D. Ralph Appleman explains the reason, which is, “Muscle group actions are more varied and complex in singing than in speech because the duration of the sound and changes in frequency and intensity place additional demands upon the antagonist muscles of respiration.”<sup>122</sup> Some teachers associate the demands with acquiring the correct breath pressure. Johan Sundberg states:

In acoustical view, an overpressure of air in the lungs, referred to as a “subglottic pressure”, is the only thing required from the breathing mechanism for the vocal cords to phonate. Subglottic pressure is important for amplitude and frequency of phonation. This is one way of explaining the importance of respiration to phonation.<sup>123</sup>

There are other teachers who think of the demands as acquiring the correct airflow. Smith states:

To have the kind of power necessary for singing, the voice must speak clearly, which creates an intense muscular vibration. To balance and buoy that intensity, the breath must flow freely and consistently, which requires intense engagement with the breathing process.<sup>124</sup>

An optimal breathing technique is essential to provide singers both proper breath pressure and airflow. Inspiration is a preparatory stage to set out the optimal condition, which allows

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<sup>120</sup> Ibid.

<sup>121</sup> Ibid., 111.

<sup>122</sup> Appleman, 10.

<sup>123</sup> Johan Sundberg, *The Science of the Singing Voice* (Dekalb, IL: Northern Illinois University Press, 1987), 25.

<sup>124</sup> Smith, 34-35.

singers to attain the proper amount of breath and the flexible muscular readiness for the following expiration. Without good inspiration, good exhalation is impossible. Singers can also optimize the position of the larynx and sustain a longer phrase with a good inhalation.<sup>125</sup>

### **Is deep breathing a good breathing method?**

‘Breathe deeply’ is an expression which many singers use to describe a good inspiratory method. There are also many instructions regarding deep breathing in vocal pedagogy books. Often, this expression conveys two different meanings. One is the idea of breath going lower into the lungs; the other is the sensation felt in the lower trunk.

McKinney claims that the breath should go deeper into the lungs than in natural breathing. He supports his assertion with a scientific truth that “the lower half of each lung is much better equipped with capillaries than the upper half.”<sup>126</sup> In this case, a deep breathing means filling out the lower half of the lungs.

During the process, singers often feel a sensation in the lower trunk, and they misunderstand that it is the breath that they inhale. However, singers with some anatomical knowledge understand that it is the visceral pressure exerted upon the abdominal wall or the pelvic floor, caused by the downward movement of the diaphragm. Doscher clarifies that we do not feel the position or the movement of the diaphragm because it does not have any proprioceptive nerve endings within itself.<sup>127</sup> The lower the diaphragm moves, the stronger the sensation becomes in the lower trunk. We feel this sensation most strongly through abdominal breathing.

The issue is that we can exert force to the lower trunk regardless of the breath. Inexperienced singers are more likely to misinterpret this sensation with the sensation of deep breathing. As Miller states, some may even embrace this tension, considering it to be helpful in their vocal mechanism. This becomes a more complicated issue when singers try to find the

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<sup>125</sup> Alderson, 30.

<sup>126</sup> McKinney, 48.

<sup>127</sup> Doscher, 18.

muscular antagonism necessary for *lutte vocale*, because it also requires a similar muscular tension.

As a result, there are voice teachers who oppose deep breathing. Manén maintains that a deep breath, which singers take in as much as they can, is not suited to singing. That breath would produce a sensation of fullness and stiffness, which interferes with the free movement of a singer's body and the control of air.<sup>128</sup> M. Sterling Mackinlay warns singers that it is unnecessary to cram the lungs with air since it causes the sensation of fatigue and suffocation.<sup>129</sup> This manner of deep breathing is counterproductive as it creates too much muscular tension.

### **Is there ONE optimal breathing technique for all?**

We have seen that there is no unanimity amongst the breathing techniques of earlier voice teachers. It is not different from modern voice teachers and pedagogues. About this issue, Smith says:

There are almost as many ideas about correct breathing for singing as there are voice teachers. Every vocal pedagogy book has a chapter about breathing, and the various approaches range from “Don't think about breathing at all”, to the most complicated and intricate understanding of the musculature involved and how to manipulate the muscles for proper breath support.<sup>130</sup>

Stark states it is an illusory goal to find a consensus on a proper breathing technique because respiration phases are difficult to measure in their entirety.<sup>131</sup> Doscher claims there is “no set formula” for proper breathing that can suit every singer's need, both from an empirical point of view and a scientific one.<sup>132</sup> This might be a frustrating news to all singing pupils. Often, it takes much patience for singers to find their optimal breathing method. If they struggle with breathing, they may need to try different tactics from not thinking about breathing at all to using different sets of the muscles. It can be a difficult process but necessary one. Vennard says, “it

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<sup>128</sup> Manén, 17.

<sup>129</sup> M. Sterling Mackinlay, *The Singing Voice and Its Training* (London: George Routledge & Sons, 1910), 29.

<sup>130</sup> Smith, 34.

<sup>131</sup> Stark, 111.

<sup>132</sup> Doscher, 25.

may be said that no matter how well a person sings, if his breathing can be improved his singing can also.”<sup>133</sup> Doscher states that a good basic understanding of the physiology of breathing can lead to a better accomplishment.<sup>134</sup>

### **Why is it difficult to name a breathing technique?**

Before getting into the descriptions of different breathing methods, it is important to notice the confusion which the names of each breathing technique create. McKinney expresses his frustration, as he says:

...there is little agreement among teachers concerning the names of different breathing methods. For example, there is no widely-accepted name for the method of breathing previously advocated in the section on breathing for singing, even though it is in common use; it has been referred to as diaphragmatic, costal, pancostal, intercostal, rib, belly, and diaphragmatic-intercostal breathing by various authors, and this is not an exhaustive list! Neither is it easy to come up with a name that is both accurate and descriptive.

Most names of breathing methods are named after the body area where the expansion happens during inspiration; however, this is not the case for every breathing method. We have already seen that Garcia’s intercostal breathing is different from that of Marchesi or Lamperti. Vennard, an advocate of abdominal breathing, uses the terms abdominal and belly interchangeably. However, belly breathing is associated with a specific German breathing technique, which involves the abdominal distention and lowering of the chest during exhalation. Although they both allow the abdominal expansion, Vennard does not advocate a voluntary lowering of the chest.

This study examines the comprehensive information on the representative breathing methods; clavicular, thoracic, abdominal, back, and natural breathing. There will be an examination of who advocates or prohibits such methods and why. We will also see a few different interpretations of the same named techniques.

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<sup>133</sup> Vennard, 17.

<sup>134</sup> Ibid., 26.

## **Clavicular Breathing**

### **What is it?**

No breathing method has more agreement on its description than clavicular breathing. The physical indication of clavicular breathing is simple. It is often called high chest breathing or upper chest breathing. Vennard also describes it as “the last resort”, a breathing manner used by the exhausted athlete.<sup>135</sup> Clavicular breathing involves a predominant expansion in the upper chest, which causes raising the shoulders and the clavicles during inspiration at a visually noticeable degree.<sup>136</sup> The lungs only expand upward because the lower ribs are immobilized, and the chest is forced to move up and down with each respiration.<sup>137</sup> This type of breathing encourages a posture close to the military stance which involves raising the upper chest and sucking in the abdomen drastically.<sup>138</sup> It has no value as a breathing method for singing.

### **Why is it universally disallowed?**

There seem to be four major reasons why almost all voice teachers prohibit clavicular breathing. First, it allows the least amount of air inhaled during inspiration. With the lower ribs immobilized, it provides the least lung volume for the breath.<sup>139</sup> A deficiency of breath supply forces singers to breathe more frequently, which is not efficient.<sup>140</sup> Secondly, singers tend to have poor control over exhalation/phonation. The air is most likely forced out in an uncontrolled manner.<sup>141</sup> Many teachers believe that a steady airflow requires a healthy muscular antagonism between the muscles of inhalation and exhalation. Since the lower ribs are immobilized, and the diaphragm is not contracted, they cannot create any resistance to the expiratory muscles.<sup>142</sup> Third, it causes excessive tensions in the throat and the neck. These tensions cause various laryngeal

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<sup>135</sup> Vennard, 18.

<sup>136</sup> Appleman, 12.

<sup>137</sup> Mackinlay, 29.

<sup>138</sup> Alderson, 37.

<sup>139</sup> Mackinlay, 30.

<sup>140</sup> Appleman, 12.

<sup>141</sup> Alderson, 36.

<sup>142</sup> Some teachers question the role of the diaphragm during exhalation. They claim that the diaphragm only contributes to the process of inhalation.

problems, such as moving the larynx out of the position, hindering pharyngeal resonance by shortening the neck,<sup>143</sup> or impeding control of pitch and intensity.<sup>144</sup> Lastly, singers are exhausted quickly since it takes a great effort to lift the entire rib cage every single time of respiration.<sup>145</sup>

#### **How can we avoid it?**

Some teachers suggest that singers should adopt a proper posture, raising their chest comfortably before taking a breath.<sup>146</sup> McKinney advises that students should avoid pulling in the abdomen to assist raising of the chest during inhalation. If they habitually pull in the abdomen too strongly, they should practice pushing out the epigastrium as a means-to-an-end until the habit disappears.<sup>147</sup> Alderson claims that there should be no feeling of movement in the clavicles, and the shoulders should be free.<sup>148</sup>

#### **Thoracic Breathing (Intercostal)**

##### **What is it?**

There are mixed opinions on the description of thoracic or intercostal breathing. The most all-inclusive idea is that all breathing is thoracic since the air is taken into the lungs, located inside the thorax.<sup>149</sup> Whereas many teachers use both terms interchangeably, Alderson differentiates thoracic breathing and intercostal breathing by the focus of activity. He believes that the goal of thoracic breathing is the expansion of the ribs and the elevation of the sternum. Therefore, his interpretation of thoracic breathing is more of a posture. On the other hand, intercostal breathing focuses on the muscular activity of the intercostal muscles in holding the ribcage expanded.<sup>150</sup>

##### **What is the rationale for this method?**

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<sup>143</sup> Ibid.

<sup>144</sup> Appleman, 12.

<sup>145</sup> Mackinlay, 30.

<sup>146</sup> Vennard, 19.

<sup>147</sup> McKinney, 57.

<sup>148</sup> Alderson, 36.

<sup>149</sup> Ibid., 34.

<sup>150</sup> Ibid., 35-36.



Many teachers acknowledge the contribution of increasing the dimensions of the thoracic cage to lung capacity.<sup>151</sup> This can be first achieved by a proper posture. Advocates of thoracic breathing state that singers should focus on expanding the thoracic region even further with the assist of the intercostal muscles.

They also claim the expanded thorax will allow the epigastrium to have better control over the diaphragm to create proper breath pressure and flow. The muscular antagonism between the internal intercostal muscles and the external intercostal muscles also contributes to a controlled exhalation.<sup>152</sup> It is regarded as a breathing method that can avoid all unnecessary muscle tensions.<sup>153</sup>

### **What is the strategy?**

The elevation of the sternum and the expansion of the ribs sideways or all directions are encouraged by the advocates of thoracic breathing. Alderson suggests that singers should elevate the sternum by moving it as far as possible from the spine. Because the sternum is set at an angle, its forward and upward movement should be felt mostly from the bottom where the ribs and the solar plexus meet. Singers are encouraged to maintain the positions of the elevated sternum and ribs during both phases of respiration.<sup>154</sup>

The largest conflict in thoracic breathing is the position of the abdomen. Some teachers advocate that singers should pull in their abdomen when they inhale, which facilitates the lateral expansion of the ribs. The others advocate the upper abdominal expansion, similar to abdominal breathing.

### **Should the abdomen be flattened?**

Similar to the English school, one group of voice teachers advocates that the abdomen should flatten while the chest is lifted during inhalation. This assertion is supported by what the

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<sup>151</sup> Appleman, 12.

<sup>152</sup> Alderson, 34-35.

<sup>153</sup> Mackinlay, 31-32.

<sup>154</sup> Alderson, 34-35.

legendary tenor Enrico Caruso said, “To take a full breath properly, the chest must be raised at the same moment the abdomen sinks in.”<sup>155</sup> Lilli Lehman, a famous German soprano and a teacher, used a similar technique, described in her “*How to Sing*.”<sup>156</sup> She says:

I had learned this: to draw in the abdomen and the diaphragm, raise the chest and hold the breath in it by the aid of the ribs; in letting out the breath gradually to relax the abdomen... I have naturally attained great dexterity in it; and my abdominal and chest muscles and my diaphragm have been strengthened to a remarkable degree.<sup>157</sup>

Lehmann explains that she overcame the shortness of breath which she inherited as a young girl with this method. However, her dissatisfaction with this method led her to abandon all “superfluous drawing in of the abdomen and diaphragm.”<sup>158</sup> Her optimal method was to draw in the abdomen and the diaphragm “just a little, only to relax it immediately.”<sup>159</sup> Manén agrees with Lehmann by saying, “Among innumerable attempts to explain the secret of respiration in singing, Lilli Lehmann, in my opinion, is the only authority who describes it correctly.”<sup>160</sup>

### **Should the abdomen protrude?**

Among the advocates of thoracic breathing, a major group of teachers allow the free movement of the epigastrium while maintaining the high chest position. Some insist on calling their technique thoracic while the others call theirs abdominal. Regardless of the difference of the names, their optimal techniques seem to be identical, considering their instructions. Teachers such as Doscher call it a combination of thoracic and abdominal breathing.

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<sup>155</sup> Caruso and Tetrazzini, 53.

<sup>156</sup> Lilli Lehmann, *How to Sing*. New rev. and supplemented ed. (New York: Dover Publications, 1993).

<sup>157</sup> Lehmann, 8.

<sup>158</sup> *Ibid.*, 11.

<sup>159</sup> *Ibid.*

<sup>160</sup> In spite of her agreement with Lehmann, Manén’s verbal instruction on breathing methods is not aligned with Lehmann. Manén agrees with the lifted chest and the flattened abdomen, but she does not seem to mean pulling in the abdomen. Her illustration shows this. My best understanding is that she advocates the position of the high chest in a way that the abdominal muscles must flatten to support their raised position. However, the abdomen will still protrude slightly by the downward movement of the diaphragm and will become firm. See Manén, 19.

Mackinlay, who qualifies thoracic breathing as the most effective breathing method, asserts that not only the lower ribs should be allowed to expand, but the abdomen should also be relaxed so that the lungs can expand downward to a certain degree.<sup>161</sup> Mackinlay defines abdominal breathing as a technique which does not allow the expansion of the lower ribs so that the lungs are allowed to expand entirely downward. In contrast, Sundberg claims that the expansion of the lowest ribs is another sign of diaphragmatic breathing.<sup>162</sup> Regardless, many teachers believe that the complete descent of the diaphragm causes abdominal expansion. Thus, it is natural for them to prefer the ‘belly-out’ position to the ‘belly-in’ position during inhalation.<sup>163</sup>

### **Who advocates or prohibits this?**

A majority of voice teachers accept the postural benefit of thoracic breathing. This is due to the many advantages that an increase in the thoracic volume contributes to singing. Teachers such as Alderson, Doscher, Lehmann, and Manén showed their preference for thoracic breathing.

Smith expresses his skepticism towards thoracic breathing. He maintains that with proper alignment and posture, the chest is already expanded as much as necessary and more attempt on expanding the chest is inefficient and unnatural.<sup>164</sup> Appleman and Vennard state that thoracic breathing is not effective during the phase of exhalation. They claim that thoracic breathing is incapable of performing controlled exhalation without the assist of the abdominal muscles. Appleman states that thoracic breathing inevitably depends upon the intercostal muscles for exhalation, which cannot function successfully as the muscles of exhalation.<sup>165</sup> Vennard further adds that the *transverse thoracis* muscles, the only muscles in the thorax which can pull the ribs down, are not strong enough to control the complete process of exhalation. Therefore, he suggests that thoracic breathing should be coordinated with abdominal breathing.<sup>166</sup>

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<sup>161</sup> Mackinlay, 32.

<sup>162</sup> Sundberg, 28.

<sup>163</sup> Stark, 112.

<sup>164</sup> Smith, 37.

<sup>165</sup> Appleman, 12.

<sup>166</sup> Vennard, 19.

## **Abdominal Breathing (Diaphragmatic)**

### **What is it?**

A wholistic opinion given to diaphragmatic breathing by Alderson is that all breathing is diaphragmatic since there will be no movement of air in and out from the lungs without the activity of the diaphragm.<sup>167</sup> However, advocates of diaphragmatic breathing focus more on the activity of the diaphragm which flexes or tightens during inhalation. The terms diaphragmatic and abdominal are often interchangeable because the movement of the diaphragm often causes abdominal expansion, and the diaphragm itself can be only felt by the surrounding abdominal muscles.<sup>168</sup> All advocates of abdominal breathing embrace the expansion on either upper or lower abdominal wall as a sign of diaphragmatic contraction, as Sundberg says, “if the abdominal wall expands during inspiration, the inspiration involves an activation of the diaphragm muscle.”<sup>169</sup>

### **What is the rationale for this method?**

Smith claims abdominal breathing is the most natural way to breathe since it is how babies breathe with their belly pooching out.<sup>170</sup> While advocates of abdominal breathing believe that it allows the maximum inhalation, they also emphasize its effectiveness on breath control during exhalation. Since the muscles of the diaphragm and the abdomen are designed to be antagonists with each other, together they create the steadiest control upon the escaping air with the help of intercostal muscles. Alderson clarifies that “The complex heavy muscles of the epigastrium are connected to the diaphragm in such a way to exert great influence on it, especially in allowing it to relax slowly and steadily.”<sup>171</sup> Appleman uses the term “sphincter”<sup>172</sup> to

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<sup>167</sup> Some may argue that respiration can be facilitated without any movement of the diaphragm. One can still breathe even if the abdomen is held in tightly, and the air is taken in only by the expansion of the extreme upper chest, as in clavicular breathing.

<sup>168</sup> Alderson, 37-38.

<sup>169</sup> Sundberg, 28.

<sup>170</sup> Smith, 37.

<sup>171</sup> Alderson, 38.

<sup>172</sup> Appleman, 12-13.

imply this abdominal muscular activity, which is necessary for uninterrupted flow of breath pressure into the vocal folds since the diaphragm is ‘passive’ during exhalation.

### **What is the strategy?**

#### **Upper abdominal expansion**

Teachers such as Alderson, McKinney, and Vennard propose that the point of expansion should be in the epigastric region, at the latitude of the solar plexus.<sup>173</sup> The point of expansion can be felt as high as where the lower ribs are located in a similar manner to thoracic breathing.

During exhalation, Alderson maintains that the epigastrium must remain out firmly without conscious pulling in. A slight outward pressure during exhalation is helpful to avoid the abdomen moving back in too fast. While the epigastrium holds steady, the lower abdomen should move in gradually to create good breath control.<sup>174</sup>

#### **Lower abdominal expansion**

Smith uses lower abdominal expansion to assist a deep breathing.<sup>175</sup> Physiologically, singers find more difficult to perform the lower abdominal expansion with the raised chest. As Miller pointed out, lower abdominal expansion causes some singers to lower the chest unconsciously. Smith opposes lowering the chest.

### **Who advocates or prohibits this?**

We can assume that most teachers are advocates of abdominal breathing and believe that the contraction of the diaphragm is an important activity in singing. They often think of abdominal expansion more important than chest expansion.<sup>176</sup>

Thoracic breathing which uses the belly-in position during inhalation is in opposition to abdominal breathing. The advocates of the particular thoracic breathing may argue that pushing down the diaphragm and protruding the stomach were due to Mandl’s teaching. Several voice

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<sup>173</sup> See Alderson, 37-38; McKinney, 50; and Vennard, 19.

<sup>174</sup> Alderson, 37-38.

<sup>175</sup> Smith, 35-37.

<sup>176</sup> See Smith, 35-37.

teachers such as Garcia, Klein, and Lunn were against this ‘deep’ method of breathing.<sup>177</sup>

Mackinlay, although he was an advocate of thoracic breathing with the belly-out position, saw the danger of deliberate and forcible displacement of the abdominal contents since it could take a great amount of physical effort and potentially cause indigestion or other internal disorders.<sup>178</sup>

## **Back Breathing**

### **What is it?**

Back breathing focuses on the expansion of the back and encourages involving the muscles of the back during respiration.

### **What is the rationale for this method?**

The core muscle of back breathing is the *lattisimus dorsi*, a very powerful set of muscles covering most of the back area. According to Appleman, it serves as both a rib-raiser and the muscle of exhalation. It contains muscle fibers that can elevate the ribs while its contraction during exhalation compresses the lower thorax, helping the controlled exhalation.<sup>179</sup> Alderson states that the back muscles contribute to the act of respiration just as they do when lifting heavy objects. In respiration, the back muscles can take some strain off the epigastrium, allowing it to be more flexible and independent. The lower back muscles, especially, can resist the pull of the abdomen during exhalation.<sup>180</sup>

### **What is the strategy?**

There are two separate approaches to perform proper back breathing. Alderson describes more wholistic approach to back breathing, balancing the use of back muscles with the chest and the abdominal muscles. He admits that it is difficult for singers to train the back muscles since they are designed primarily to hold the skeleton upright. He suggests that singers should practice

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<sup>177</sup> See Brian White, *Singing Techniques and Vocal Pedagogy* (New York: Garland Publishing, 1989), 32.

<sup>178</sup> Mackinlay, 31.

<sup>179</sup> Appleman, 40.

<sup>180</sup> Alderson, 38-39.

expanding the back muscles during inhalation while avoiding pulling the shoulders forward for the sake of the back expansion since it will lower the sternum and the ribcage.<sup>181</sup>

Brian White suggests taking a more direct approach to expand the back. Singers may lean forward and place their hands in the back as they take a deep breath to feel the lower back expansion. It also helps to imagine that the breath goes down to the lungs and then to the back. Lastly, singers may pull the shoulder-blades apart to encourage the use of the back muscles.<sup>182</sup>

### **Who advocates or prohibits this?**

Alderson believes that all aspects of breathing should be combined in the most efficient way. He uses an analogy of walking, in which the knees, ankles and other parts of the lower body cooperate.<sup>183</sup> Similarly, Appleman also acknowledges the role of *lattissimus dorsi*. These teachers do not consider back breathing as the only plausible breathing method, but they look for a way to coordinate it with their own methods. Teachers such as White are the true advocates of back breathing, as they try to expand the back actively.

On the other hand, there is a more extreme method of ‘dorsal’ breathing, taught by Sine Butenschøn and Hans M. Borchgrevinck.<sup>184</sup> They claimed that every phonated pitch has a “place of origin” in the vertebrae. As the note goes higher, it is generated in the lower level of the place of origin. Even the advocates of back breathing, such as White, disagree with this method.<sup>185</sup>

Doscher does not acknowledge any importance of the *lattissimus dorsi* along with other auxiliary muscles during respiration. She claims that the function of most of the auxiliary muscles is postural and their effect on breathing is minimal.<sup>186</sup> McKinney indicates his concerns against back breathing since too much concentration on the expansion of the back may eliminate the frontal expansion. While the displacement of the viscera during inhalation may cause an

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<sup>181</sup> Ibid.

<sup>182</sup> White, 24.

<sup>183</sup> Alderson, 39.

<sup>184</sup> Sine Butenschøn and Hans M. Borchgrevinck, *Voice and Song* (Cambridge: Cambridge University Press, 1982), 12.

<sup>185</sup> White, 26.

<sup>186</sup> Doscher, 17.

expansion in all direction below the ribs, the greatest expansion should be in front of the body. This is because the attachment of the diaphragm to the skeleton is higher in front, and the upper abdomen is more inclined to expand with less effort than the side and the back. He also complains that it is not only poor posture to pull the shoulders forward, but it also can transmit tension from the shoulders to the vocal mechanism.<sup>187</sup>

## **Natural Breathing**

### **What is it?**

Natural breathing has already been introduced by Miller as one of the breathing techniques of the French school of singing.<sup>188</sup> Some elements of natural breathing seem to be adopted by teachers such as Alba, who maintains that breathing should not impose any extra effort on breathing muscles.<sup>189</sup> The sensation of this method should be identical to the sensation of breathing for speech, which does not use extra voluntary muscular effort for higher subglottic pressure.

### **What is the rationale for this method?**

Alba believes that all activities, such as setting muscles, pushing out, and holding out the ribs with a conscious effort, produce unnecessary tension. Once proper posture is established, the breath must be taken in the most natural way without being rigid in any part of the body.<sup>190</sup>

### **What is the strategy?**

Several goals which Alba desires to achieve with natural breathing are quite inclusive and similar to the goals of other types of breathing. She aims for natural expansion in the back and the waist as the lungs fill. Natural expansion will occur in the rib cage as well as the downward contraction of the diaphragm without deliberate pushing down. Singers should protrude their

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<sup>187</sup> McKinney, 50.

<sup>188</sup> See 10 of this document.

<sup>189</sup> Alba, 6.

<sup>190</sup> Ibid.



abdominal wall slightly and be free to move around without rigidity. All of these activities must be performed without active muscular effort.<sup>191</sup>

### **Who advocates or prohibits this?**

Miller expresses concerns with natural breathing because it has a tendency to become clavicular breathing. Vennard does not find it useful to use the term ‘natural’ in teaching voice because no one truly knows what is ‘natural.’ He states, “it means an expression one applies to what is habitual.”<sup>192</sup> According to Vennard, there are many functions of the body that are instinctive, which we perceive as natural, but they are not helpful for singing. Learning how to sing is to overcome those natural tendencies. Art becomes the greatest when it ‘looks natural’ but it is the hardest state to achieve.<sup>193</sup> Perhaps, Alba’s final thought on breathing implies the same difficulty:

The more you rely on the simplest means for breathing and the gentle release of all the tension you feel in your body, the more singing will finally become an involuntary act, subject only to your desire to express yourself through the music.<sup>194</sup>

### **Nose Breathing vs Mouth Breathing**

#### **What are the advantages and disadvantages of each?**

Beginning singers often struggle to decide whether to breathe through the nose or mouth. This concern seems to fade away as they gain more experience, but it would be worthwhile to examine the different merits of nose breathing and mouth breathing in singing.

It is the scientific truth that the nose is designed to filter the foreign matter from air and to make the air warm and moist.<sup>195</sup> Therefore, in theory, the breath must be taken entirely through the nose for the sake of one’s health.<sup>196</sup> On the other hand, the breath taken by the mouth tends to

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<sup>191</sup> Ibid., 11.

<sup>192</sup> Vennard, 24.

<sup>193</sup> Ibid.

<sup>194</sup> Alba, 11.

<sup>195</sup> Alderson, 32.

<sup>196</sup> Mackinlay, 36-37.

dry the soft palate and the pharynx.<sup>197</sup> Every singer knows by experience that a dry throat is deadly for singing.

However, the nose is designed to slow the air down in order to perform many functions.<sup>198</sup> As a result, singers often experience taking not enough air through the nose during the short rests given by the music, while mouth breathing ensures that a much greater amount of air can be inhaled in a short time. Another advantage of mouth breathing advocated by some teachers is that it adjusts resonators correctly by reflex actions.<sup>199</sup>

### **What is the optimal strategy?**

It seems that the most popular strategy among voice teachers is to breathe through the nose during long rests and to breathe through the mouth during short rests. Another opinion is to breathe through the nose and the mouth simultaneously since it takes the most amount of air for a short time.<sup>200</sup> It is perhaps unwise to persist in one way of breathing since they both have clear advantages and disadvantages. The most beneficial method will be combining the two, exploiting the benefit and reducing the risk of each nose and mouth breathing.

### **Noiseless Breath**

#### **What are the benefits of quiet breath?**

In the history of vocal pedagogy, the noiseless intake of breath has been one of the most important elements of healthy inspiration. Voice teachers and pedagogues today also suggest that singers should learn how to breathe silently, as McKinney claims, “A well-performed inhalation should be noiseless.”<sup>201</sup> Alderson points that there are three major benefits that singers can experience by the noiseless breath: 1) it is more efficient as more air can be drawn than noisy intake, 2) it is less likely to dry the throat, and 3) the body is more settled with the quiet breath.<sup>202</sup>

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<sup>197</sup> Alderson, 32.

<sup>198</sup> McKinney, 47.

<sup>199</sup> Vennard, 19.

<sup>200</sup> McKinney, 47.

<sup>201</sup> Ibid., 50.

<sup>202</sup> Alderson, 43.

### **How do we breathe quietly?**

It is agreed amongst most teachers that the throat must be properly open in order to take in the breath silently. Bozeman says:

A vocal tract poised for resonance can be prepared prior to singing by means of a noiseless inhalation, which also requires a relatively open throat and tube convergence.<sup>203</sup>

McKinney claims that the poorly open throat causes a gasping or wheezing sound because the incoming air is partially blocked on its path.<sup>204</sup> As a remedy, Bozeman advises that singers should feel a sensation of coolness in front of the mouth, rather than the throat. The wind chill effect is the strongest where the path for the air is the narrowest. To provide a proper wind chill effect in front of the mouth and in the throat, the singer can shape the mouth and the throat accordingly. It means that the more open the throat is, the less cool the effect is in the throat.<sup>205</sup> This will ensure that the throat is less dry, and more amount of air can be drawn for a short time. Every voluntary and involuntary musculature for respiration is less likely to be disturbed if the throat is open during inhalation.

Many teachers also consider a slow inhalation to be helpful for the art of noiseless breath. The slow pace of incoming air is less likely to hammer the vocal folds and to cause gasping.<sup>206</sup> It ensures the body will be less startled.

### **Slow Inhalation vs Fast Inhalation**

A majority of teachers seems to concur that slow inhalation is beneficial for breath exercise. Slow inhalation is more inclined to promote taking a deep, gentle, and full breath than a fast inhalation. On the other hand, fast breath tends to cause noise during inhalation as Mackinlay says, “the cords are sucked together by the rush of air and make an irregular series of vibrations,

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<sup>203</sup> Kenneth W. Bozeman, *Practical Vocal Acoustics: Pedagogic Applications for Teachers and Singers* (Hillsdale, NY: Pendragon, 2013), 62.

<sup>204</sup> McKinney, 50.

<sup>205</sup> Bozeman, 62.

<sup>206</sup> See Mackinlay, 33.

an unmusical sound, noise.”<sup>207</sup> Another ill effect of fast breath is that it may associate with negative psychological conditions such as fright or anxiety for certain singers in their early training.<sup>208</sup> It makes singing an unpleasant activity.

Fast inhalation is not the best option that singers have, but it is a necessity when the music calls for it. Manén explains that quick inspiration and protracted expiration is the proper cycle for singing, whereas the same length of inspiration and expiration is for an unconscious, normal breathing. If the breath must be taken fast, it must be done in the most efficient manner. Manén’s solution is a “surprise breath,”<sup>209</sup> which she believes to be the most effective breathing manner for singing. Vennard also supports the concept of surprise breath, which he believes to be quick and deep, and will produce the best adjustment of the throat by reflex actions. However, it is crucial that a pupil must possess enough imagination to create the “genuine surprise” to use this “natural aid” for proper inhalation.<sup>210</sup> Overall, fast inhalation is evidently more suitable for trained singers.

### **Conclusions**

The study proves that the variability of different breathing practices is prevalent. However, there are certain opinions with which I agree more than others because of my personal experience. Most of all, I agree with the concept of deep breathing, which involves the sensation of expansion both in the low ribs and the abdomen. Some may call it a combination of thoracic and abdominal breathing. In the view of thoracic breathing, I am an advocate of “belly out” position, because I do not push in my abdomen during inhalation.<sup>211</sup> Although I concentrate on

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<sup>207</sup> Ibid.

<sup>208</sup> Alderson, 43.

<sup>209</sup> Manén attempts to analyze the processes of a surprise breath. “He draws a quick, snatched breath: his larynx closes, he holds his breath... his chest is lifted, [and] the abdomen is flattened... his larynx opens, he exclaims ‘ah!’; the larynx closes... the chest remains lifted.” See Manén, 18.

<sup>210</sup> Vennard, 28.

<sup>211</sup> I see the benefit of belly-in position in a different aspect to other teachers studied in this document. Since the protruded abdomen must always come back in to its natural state, it always leads to a high subglottic pressure. On the other hand, if the abdomen is pulled in during inhalation and returns to its natural state during exhalation, a relatively lower subglottic pressure may be generated because the abdominal wall doesn’t exert any force upon the diaphragm. In theory, if too much subglottic pressure is

expanding in all directions, the frontal expansion is most apparent among them. Although physical manifestations of side and back expansion happen, they are more difficult to achieve with good posture. However, I believe that they are as important as the frontal expansion for optimal lung expansion, as long as they facilitate the proper contraction of the diaphragm. It would be wise to avoid some breathing methods which encourage bad posture, such as a sagging abdominal wall or rounded shoulders. Body expansion must not be accompanied by any muscular tension around the neck and the upper chest.

Selecting between nose and mouth breathing, and between slow and fast inhalation has been clarified through the course of this study. Most modern voice teachers understand their different effects. Young singers or their teachers may find the information collected in this document useful. More advanced singers with firmly held ideas about their own technique may find this discussion superfluous to their singing.

There is no dispute regarding the value of noiseless breath. In my opinion, it has no drawback, which is remarkably rare to find in any singing method. It is such a relief that at least there is one instance where all teachers of singing can agree.

## **The Art of Exhalation**

### **Breath Support**

#### **What is breath support?**

Alderson states that the term “support” is commonly used as teaching vocabulary but is often not understood. He states that it is a psychological term which describes “a wide range of feeling,”<sup>212</sup> which can confuse singers easily. For example, Alba says, “think of the breath issuing from the lungs supporting the tone; the feeling is of leaning on the breath. This is *appoggio*.”<sup>213</sup> This advice is rather abstract and does not provide any theory how that sensation can be achieved.

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the problem, the singer may adopt the belly-in position to negate the force of abdominal contraction. This requires further research. For more information on the subglottic pressure, see 62-64 of this document.

<sup>212</sup> Alderson, 29.

<sup>213</sup> Alba, 4.

On the other hand, the term “support” also implies a physical aspect, as in supporting an object with physical effort. Doscher refers to the distinguished laryngologist Dr. Friedrich S. Brodnitz, who says, “The term ‘support’ suggests that the voice is a kind of physical object which has to be lifted from below by a supporting force.”<sup>214</sup> While Brodnitz was skeptical towards the role of physical force in singing, many teachers and singers seem to use muscular effort for breath support. It is both the action and the sensation for them, as they describe:

Support is the act of constantly sustaining the vocalized sound with the breath pressure... it is the sensation of establishing an abdominal muscular effort coordinated with the vocalized sound.<sup>215</sup>  
Breath support is a dynamic relationship between the breathing-in muscles and the breathing-out muscles... a balanced tension is set up between the muscles of inhalation and the muscles of exhalation.<sup>216</sup>

As a consequence, some teachers oppose using the term breath support because they do not believe in the voluntary physical action during exhalation. Smith states that such voluntary activities bring rigidity in the abdominal muscles which may hamper the free flow of air.<sup>217</sup> Doscher refers to the voluntary physical effort as the ill effect of hyper-functional voice disorders. She proposes the term “breath energy” as a good alternative for “support.” She suggests other images to avoid rigidity, such as “feeling a cushion of air around the waist”, “feeling the buoyancy of treading water, or “balancing lightly on a trampoline.”<sup>218</sup>

### **What is the purpose of support?**

The purpose of breath support is to supply “adequate breath pressure to the vocal folds for sustaining of any desired pitch or dynamic level.”<sup>219</sup> Appleman claims that the motor activity or driving forces for the production of unwavering sound during phonation can be obtained by

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<sup>214</sup> Friedrich S. Brodnitz, “Semantics of the Voice,” *Journal of Speech and Hearing Disorders* 32:4 (1967): 325-330.

<sup>215</sup> Appleman, 11.

<sup>216</sup> McKinney, 53.

<sup>217</sup> His students refer to the ‘support’ as “the s-word” due to the strong objection by their teacher. See Smith, 38-40.

<sup>218</sup> Doscher, 24.

<sup>219</sup> McKinney, 53.

employing the strong muscles of the body. The thoracic muscles of inspiration must oppose the abdominal muscles of expiration. This creates the point of suspension in which the thoracic pressure and the abdominal pressure are equal. It ensures the complete control of vocal intensities and changes of interval for singers.<sup>220</sup> This antagonism between the muscles of inspiration and the muscles of expiration is a physiological necessity since they are natural antagonists to each other.<sup>221</sup>

### **What is the main argument regarding breath support in singing?**

Stark describes one of the main arguments regarding breath support in the following statement: “The main bone of contention regarding breath support in singing is the relative role played by passive recoil forces as opposed to active muscular forces during phonation.”<sup>222</sup> I see his argument as a question as to how much active muscular efforts should be involved during phonation. According to his observations, there is a group of researchers who state that the elastic recoil force of the lungs, caused by the relaxation of the inspiratory muscles, is followed immediately by the smooth transition to the contraction of the abdomen and perhaps the internal intercostal muscles. This implies that the transition from the passive force to the active force is an unconscious activity; and therefore, the entire process of exhalation is done under the state of unconsciousness.

The opposite group of researchers claims that it is nearly impossible for singers to manipulate such a smooth transition from the passive to the active force, which satisfies the complex demand of accurate subglottic pressure and airflow rates. As a consequence, singers usually use both passive and active forces from the start; therefore, the whole process is voluntary. In this circumstance, singers deliberately control the muscular antagonism from the moment in which the phonation starts.

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<sup>220</sup> Appleman, 11.

<sup>221</sup> Doscher, 15-16.

<sup>222</sup> Stark, 112.

Modern voice teachers and pedagogues vary in their opinions on this matter. One group of teachers believes that the passive recoil force of the lungs provides adequate breath pressure and airflow rates. The other group maintains that the phonation for singing demands the muscular tensions created by the resistance of the inspiratory muscles against the expiratory muscles. Their intersection is the volume of the lungs since it affects both the force of the passive recoil of the lungs and the active recoil of the expiratory muscles.<sup>223</sup> Therefore, it is beneficial for singers to understand different conditions of the lung volume before investigating varied methods of breath support.

### **Lung Volume in Singing**

#### **What is Vital Capacity?**

Vital capacity (VC) is the amount of air directly corresponding to the amount of air singers can use for singing. It is the amount of air which one can expel from the lungs after a maximum inhalation. The amount of air contained in the lungs after a maximum inhalation is called total lung capacity (TLC). A certain amount of air always remains in the lungs after a maximum exhalation. That volume is called residual volume (RV). Therefore, VC is the amount subtracted from one's TLC by RV.<sup>224</sup>

$$VC = TLC - RV$$

Despite the fact that different individuals show varied numbers, the average volume of VC for a healthy adult male is approximately 5 liters.<sup>225</sup> An adult female has a relatively smaller volume than an adult male. Many scholars maintain that TLC is more or less a fixed number, whereas singers can lower their RV by squeezing the lungs effectively. This means that one's VC

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<sup>223</sup> Ibid.

<sup>224</sup> Sundberg provides a more precise formula, formulated by Baldwin, measuring one's vital capacity. See Sundberg, 32.

<sup>225</sup> Appleman says the average volume of VC for an adult male is approximately 225 cubic inches, roughly 3.7 in liters, which is smaller than that of Sundberg's research. But he states that some men have much higher volume of 350 to 400 cubic inches, roughly 5.7 to 6.6 in liters. See Appleman, 26-27.



can be extended by taking a breath as close to TLC as possible and reducing RV in the lungs.<sup>226</sup>

### **What is Functional Residual Capacity?**

Functional residual capacity (FRC) is the amount of air left in the lungs after a person exhales passively, which is approximately 2.4 liters. This quantity of air will remain in the lungs even after death. It is a particular lung volume at which the passive elastic recoil forces of the lungs and the expiratory forces are in equilibrium. As soon as the volume of air drops below or reaches above FRC, passive forces attempt to bring the volume back to it. The passive forces of the lungs become stronger as the more volume of air drops below or reaches above FRC.<sup>227</sup>

### **How does lung volume affect singing?**

Earlier research showed that there was no correlation between VC and tonal quality or intensity in speech.<sup>228</sup> This was partly due to the relatively small volume of air used for phonation in speech, which was only about 13% of the VC. This condition significantly changes during the act of singing, which demands more volume of air due to the adequate breath pressure and air reservoir necessary for sustaining the desired pitch and intensity in a long phrase. Appleman projected that close to 54% of the VC may be used for the act of singing, which was reasonably true. However, more recent research revealed that a subject, a trained opera singer, used the range of 55% to 10% of the VC during a normal speech and the range of close to 100% to even 5% of the VC during singing.<sup>229</sup> This result proves that the act of singing demands a much larger amount of air, and some trained singers are certainly capable of using most of the VC.

Research, conducted by John W. Large, testing 40 singers for their vital capacity, shows that their VC was 16% larger in average than their predicted VC based on Baldwin's formula.<sup>230</sup> Another study shows that professional singers have a considerably lower RV ratio than non-

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<sup>226</sup> Stark, 111.

<sup>227</sup> Sundberg, 27.

<sup>228</sup> Appleman, 26-27.

<sup>229</sup> Sundberg, 34-35.

<sup>230</sup> John W. Large, "Observations on the Vital Capacity of Singers," *The Journal of the Acoustical Society of America* 52, 147 (1972): 147.

trained singers.<sup>231</sup> Taking both results together, the increase in the VC is largely accomplished by the reduction of the RV, not the increase in the TLC. Sundberg concludes, “It seems that one simply learns how to squeeze one’s lungs more efficiently.”<sup>232</sup>

The passive forces of the lungs seeking the equilibrium at FRC seem to play a significant role in breath support. We can assume that teachers who prohibit deliberate muscular effort to support the voice rely on these passive forces of the lungs after inhalation. The more quantity of air the lungs take, the greater the passive forces are, as well as the breath pressure inside the thorax. The forces and the pressure gradually decrease as the air leaves the lungs, and become zero at the FRC, where the active forces of the expiratory muscles must take over to expel the air until reaching the RV. The passive forces of the lungs may generate less subglottic pressure compared to the situation in which they are combined with the active forces of the expiratory muscles.

### **Is passive recoil force enough for breath support?**

Teachers who prohibit the extra muscular effort of the expiratory muscles during phonation do not employ any voluntary movement of the abdominal muscles or thoracic wall. In one of the most radical methods, Smith says to simply “release all of the muscles of inhalation.”<sup>233</sup> As a result, he states singers may experience rushing out of the air in a sudden motion, which is the most ideal manner of the free-flowing air. The position of the abdomen will return to its ‘pre-inhalation’ state, and there is no need for deliberate contraction. Therefore, there is no ‘breath support’ but only the correct regulation of the air by the vocal folds, depending on the desired pitches and dynamics.<sup>234</sup> Alba seems to concur with Smith, as she says that the air

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<sup>231</sup> Wilbur J. Gould, “Effect of Voice Training on Lung Volumes in Singers and the Possible Relationship to the Damping Factor of Pressman,” *The Journal of the Acoustical Society of America* 58, (1975): S94-95.

<sup>232</sup> Sundberg, 35.

<sup>233</sup> His mantra on exhalation is “Release all of your air, all the time.” See Smith, 40.

<sup>234</sup> I see a potential error in Smith’s understanding of his own method, which he believes it is a reaction against other methods which create too much breath pressure and too little airflow. His method of releasing the air in a sudden motion actually may generate relatively higher subglottic pressure than the methods which use the state of *lutte vocale*, especially at the beginning of exhalation. This is because the

flows most efficiently when there is no resistance, much like the water flows through the stream where the least resistance exists with the help of gravity. She claims that no “death-defying” attempts are required to support the voice.<sup>235</sup>

Amongst the teachers who advocate the equilibrium of inspiratory and expiratory muscles, Doscher promotes a rather passive use of the abdominal muscles. She maintains that the expiration must remain easy and steady to achieve the optimal balance between the pressure and the flow.<sup>236</sup> An excessive involvement of the abdomen may cause unduly release of air, which upsets the balance. Instead of concentrating on the abdominal muscles, she proposes to focus on maintaining the position of the thorax which evokes natural responses from the abdominal muscles without undue strength.

### **Is a voluntary abdominal force necessary?**

There are a few voluntary abdominal forces which singers may use during the phase of exhalation. First, the practitioners of thoracic breathing who inhale in a belly-in position can either release the abdomen to return to its natural state or keep it contracted until the end of exhalation. Singers such as Caruso or Lehmann used the first method, whereas the latter is the method of elevated chest and contracted abdomen technique of the English school.

The practitioners of abdominal breathing may use one of the three methods of voluntary abdominal movements; 1) pulling in the abdomen, 2) pushing out the abdomen just enough to maintain the expansion, and 3) pushing out the abdomen further.

Appleman states that singers should learn the great compression of the abdominal and

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recoil force of the abdominal wall after the abdominal expansion is so strong without any opposing force that it exerts a great force upon the diaphragm, pushing the air upward. This means that the increased airflow will also increase the subglottic pressure because a certain degree of glottal resistance is required to produce a balanced tone. Perhaps, this is exactly what he may want after all, even though he rejects the idea of breath pressure. This is purely my theory.

<sup>235</sup> Alba, 3.

<sup>236</sup> Doscher, 20-21.

back muscles for controlled exhalation during early training.<sup>237</sup> The abdominal muscles, along with the *transverse thoracis* and *latissimus dorsi*, must be greater in their force than the muscles of inspiration.<sup>238</sup> As a consequence, active compression of the expiratory muscles increases the subglottic pressure and the rate of airflow, potentially increasing the glottal resistance of the vocal folds.

Like Doscher, a large number of teachers advocate the muscular antagonism between the muscles of inhalation and exhalation for a steady supply of breath pressure. McKinney says, “The best way to gain control of the exhalation process is to try to maintain the expansion around the middle of the body – in the upper abdomen, the lower ribs, and the back – while the diaphragm slowly begins to release its tension.”<sup>239</sup> To do so, singers should stay in the posture of inhalation by using the diaphragm and the external intercostals as a counter-balancing force against the abdominal muscles. A precise muscular antagonism must be achieved between them since “no muscle works alone; it is opposed, and steadied, in its action by one or more muscles.”<sup>240</sup> Since it is impossible for singers to control the muscles of the diaphragm directly, some singers maintain the image of inhalation during exhalation to keep the lowered position of the diaphragm. Other singers push out the abdomen ever so slightly. They embrace a feeling of fullness around the ribs, the abdomen, or the lower back, first caused by the expansion and followed by the succeeding muscular antagonism. This pushing out force must surrender to passive expiratory force in this the tug-of-war at the end of an exhalation.

The most excessive effort is to push out the epigastrium even further during an exhalation. Although the method is criticized for causing pressed phonation and exhausting the body, it is

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<sup>237</sup> He states that once singers have learned the great pressure of the abdominal and back muscles, they should learn how to release such dominating pressure and maintain the balance between the thoracic and abdominal forces. See Appleman, 11.

<sup>238</sup> It is interesting to note that he acknowledges the role of *latissimus dorsi* as both inspiratory and expiratory muscles. He claims that it contains the muscle fibers which can elevate the ribs, therefore, contributing to inspiration. When it contracts, it compresses the lower thorax and contributes to the controlled exhalation. Ibid.

<sup>239</sup> McKinney, 51.

<sup>240</sup> Vennard, 20.

still widely accepted as a method of German belly breathing. This method has the same purpose: to maintain the balance of the inspiratory and expiratory muscles. However, Regnier Winsel explains that this ‘outward’ tension must increase in proportion to the rising of pitch. The higher the note is, the more singers should increase the outward tension.<sup>241</sup>

### **The Art of Holding Back the Air**

We have been discussing maintaining the muscular balance, and this leads us back to the discussion of ‘holding back the air.’ Since earlier voice teachers such as Lamperti introduced the sensation of holding back the air, this concept has been adopted by various breathing techniques. Perhaps, the most extreme technique among them is *stauprinzip* or breath damming.<sup>242</sup> Breath retention is also the result of *lutte vocale*, the muscular equilibrium between the muscles of inhalation and exhalation. This allows the minimum amount of air to be expelled because the upward movement of the diaphragm is hindered. The sensation is similar to holding back the air. In consequence, many modern voice teachers who advocate the muscular equilibrium also agree with the sensation of holding back the air. Stark says:

This pressure is felt as ‘pent-up’ breath energy, and is sometimes described as held-back breath, compressed breath, or breath damming. This constant interplay between breath pressure, glottal resistance, and vocal tract adjustments gives the singer the tools to vary the intensity and voice quality, and to sing with a seamless legato and without apparent register transitions.<sup>243</sup>

On the other hand, there is a group of teachers who object strongly to the concept of holding the breath. They advocate the free flow of air and oppose any excessive tension of the body. Smith states, “When singers tighten the abdominal muscles, thus holding back the air, I commonly ask, ‘What are you saving the air for?’ We must nourish the voice by releasing the breath, not holding it back.”<sup>244</sup> Doscher also objects against the concept, saying, “Holding back

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<sup>241</sup> Regnier Winsel, *The Anatomy of Voice: An Illustrated Manual of Vocal Training* (New York: Exposition Press, 1966), 30.

<sup>242</sup> See 7 of this document.

<sup>243</sup> Stark, 120.

<sup>244</sup> Smith, 41.

air is rather like trying to drive a car with the emergency brake on.”<sup>245</sup> Vennard takes a neutral stance, as he explains that the act of holding the air is only beneficial when it is done by the diaphragm and the intercostal muscles. The worst scenario is to hold the air by the glottis, which will inhibit the free-flowing tone. Singers must learn how to produce the free-flowing tone before trying to control the breath.<sup>246</sup>

### **How does breath support change for high notes?**

To decide on the proper breath support strategy for singing high notes, one must understand what high notes demand of respiration. Many voice teachers acknowledge the interplay between breath pressure and flow affects the singing voice. It is most likely that their understanding of this mechanism may have a strong influence on their support strategy for different registers.

Some teachers claim that high notes require more air and encourage singers to increase either breath pressure or airflow, as Mackinlay says: “Hence we shall find, that as we sing upwards in a register we have to exert greater pressure and sustain more, and as we sing downwards in a register we exert less pressure and have increasing relaxation.”<sup>247</sup> As a consequence, it is logical for them to employ more muscular forces during exhalation, as Sundberg states:

An increase in the subglottic pressure, produced in order to sing a high or loud note, for instance, will exert an increase in the pressure on the abdominal wall... then the muscular contraction of the abdominal wall must increase in synchrony with the subglottic pressure.<sup>248</sup>

Other teachers believe that there is no change in the amount of air which singers need to sing different pitch levels. When the pitch level is an octave higher, its phonation frequency is double the frequency of the note an octave lower. Since this means that the glottis will open twice as frequently, we can assume that twice the air will escape. However, Sundberg found that the

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<sup>245</sup> Doscher, 21.

<sup>246</sup> Vennard, 27.

<sup>247</sup> Mackinlay, 42.

<sup>248</sup> Sundberg, 30.

actual amount of breath used is similar because the duration in which the glottis opens during each cycle of vibration is twice shorter in a higher octave.<sup>249</sup> He also observed that the amount of air is increased only when the loudness of the voice is increased. Therefore, it would be logical for singers not to change their breathing methods to manipulate the breath mechanism.

### **Breath Pressure vs Airflow**

#### **What is breath pressure?**

The breath pressure inside the thorax after inhalation becomes an *overpressure*, which means that the pressure is higher than the atmospheric pressure. This overpressure of air within the lungs exerts a force on the surface of the compressed thorax as the glottis is closed. The pressure scales in proportion to the degree of contracting force of the thoracic wall and the resistance against airflow caused by the glottis. The pressure rises the most if the glottis is closed firmly. If the glottis is partly open, its resistance against airflow drops, and the pressure decreases. Such phenomenon can be observed in any kind of enclosure; for example, a rubber balloon. Once the air is sucked into the balloon and its aperture closed, the overpressure within the balloon will exert a force on the surface. If the pressure is too strong, the balloon may explode. The air may rush out through the aperture once it is open, as long as the pressure inside the balloon is stronger than the outside one.

The breath pressure we use in singing is always an overpressure. Due to its correlation with the glottis, it is referred to as *subglottic overpressure*, or simply *subglottic pressure*. It is the primary resource required from the breathing mechanism for phonation, affected in its degree by the movements of different sets of muscles.<sup>250</sup> The increase in subglottic pressure leads to an increase in loudness of a tone at all times, and in phonatory frequency, thus raising the pitch, to some degree.<sup>251</sup>

#### **How much subglottic pressure is required for singing?**

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<sup>249</sup> Ibid., 41.

<sup>250</sup> Ibid., 26.

<sup>251</sup> Ibid., 39-40.

Sundberg says the range of subglottic pressure generated for normal speaking is between 6 and 15 cm H<sub>2</sub>O.<sup>252</sup> In loud singing, higher subglottic pressure is generated in the neighborhood of 20 or 30 cm H<sub>2</sub>O. Higher and louder tones may even generate the subglottic pressure up to 70 cm H<sub>2</sub>O, which is exceptional. Typically, a subglottic pressure above 60 cm H<sub>2</sub>O is rarely observed.<sup>253</sup> A general understanding is that the highest subglottic pressures are mostly observed in tenor voices, singing above the *passaggio*.<sup>254</sup> The pressure can rise up to 150 cm H<sub>2</sub>O or even higher under different conditions, such as when a person is lifting a heavy object. The firmly closed glottis prevents the air from escaping, while the expiratory muscles forcefully contract, and together they cause a forceful exhalation.<sup>255</sup>

According to Proctor, the pressure generated by the passive recoil of the lungs after a maximum inhalation may amount to 20 cm H<sub>2</sub>O.<sup>256</sup> One may speculate that the pressure created by passive lung forces after a maximum inhalation may satisfy required subglottic pressures for most singing, but is not adequate for producing a higher and louder sound. However, there are other laryngeal conditions which affect the subglottic pressure, and one of them is a glottal resistance.<sup>257</sup> The complex variance which constitutes the subglottic pressure makes it difficult for singers to draw a simple conclusion on their breathing and laryngeal strategies.

### **What is airflow?**

Airflow in singing is the amount of air which flows through the glottis, which is measured in milliliters of air per second (ml/s). The flow in and out of the lungs is triggered by the difference in pressure. When an *underpressure* is established inside the lungs, meaning that

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<sup>252</sup> Air pressure values are measured in centimeters of water (cm H<sub>2</sub>O).

<sup>253</sup> Sundberg, 36.

<sup>254</sup> Stark shows the data from his own experiment that the subglottic pressure starts to rise dynamically at *E4*, reaching nearly 60 cm H<sub>2</sub>O when singing *Bb4* with fortissimo.

<sup>255</sup> This is perhaps the basic principle of the *Stöhlaut*, the groaning utterance technique. See 7 of this document.

<sup>256</sup> Sundberg, 27.

<sup>257</sup> The glottal resistance involves laryngeal studies, which will not be studied in great detail in this document. Simply speaking, the more the glottal adduction there is, the more the glottal resistance is applied to the passing air, increasing the subglottic pressure. To learn more about this, see Sundberg, 38-39.



the outside pressure is higher than the pressure inside the lungs, the air rushes in. Likewise, the air rushes out from the lungs if the pressure is higher inside the lungs than the outside. Therefore, the airflow depends on the subglottic pressure more than anything.<sup>258</sup>

Various studies identify a range between 100 ml/s and 600 ml/s is used, at different volumes, in normal speaking.<sup>259</sup> In singing, firm phonation, which is associated with relatively high resistance caused by adduction of the vocal folds, uses a steadier flow of air amounting to around 100 ml/s. On the other hand, the airflow is more fluctuated and exceeds 200 ml/s during loose phonation.<sup>260</sup> In theory, a healthy male adult, whose vital capacity is around 5 L (5000 ml), can sustain a single note for 50 seconds using firm phonation, as long as he can endure the desire for a new breath caused by the accumulation of the carbon dioxide in the lungs.

Many singers assume that the airflow rate increases when singing high notes. This common misjudgment is based on their experience and the scientific observation that a change of interval by an octave doubles the frequency of phonation; the vocal folds vibrate twice as frequently. It is assumed, therefore, that twice more air will be consumed. However, the air consumption is almost the same since the glottis opens for a time half as long and therefore lets only half of the air escape during each cycle of abduction and adduction of the vocal folds. The higher tones are generally accompanied by the increase in dynamics, which is the actual motivation of the airflow increase.<sup>261</sup>

### **The Art of Letting the Air Flow**

Voice teachers use expressions such as “let the air flow” or “use the free-flowing air” to solve a pressed or tight phonation. These expressions can mislead their students without clarifications. The airflow is a natural outcome of the breath pressure. The air always flows

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<sup>258</sup> Sundberg, 37.

<sup>259</sup> Ibid., 38.

<sup>260</sup> Stark, 237-238.

<sup>261</sup> Sundberg found that some singers reduced the airflow rate when singing high notes because they created more glottal resistance, caused by the use of certain laryngeal muscles to raise the pitch. See Sundberg, 39-47.

during any type of phonation, firm or loose, unless the vocal folds are completely closed. There will be no sound phonated without the airflow. When the voice teachers ask their students to let the air flow, what they mean is the proper regulation of airflow; the correct quantity and steadiness. Proper expiratory techniques will furnish this regulation.

In the meantime, the free-flowing air is also related to the laryngeal function. The vocal folds are the main regulator of airflow, which decide the amount of air passing through the glottis by using different degrees of the adduction activity. This is called glottal resistance. It is of utmost importance that singers learn to use the proper degree of glottal resistance without squeezing the throat. Without a healthy activity of glottal adduction, the voice becomes either too breathy or too tight.

Many advocates of free-flowing air encourage singers not to force out the air, caused by the excessive contraction of the abdomen. Too much breath compression may cause too much airflow, which may hamper the balanced functioning of the glottis. Instead, they claim that singers should let the vocal folds regulate the correct amount of air without manipulating the abdominal muscles.<sup>262</sup>

### **Is the battle between *more* pressure and *more* flow inevitable?**

Subglottic pressure and airflow cannot exist without each other. Nonetheless, there are different proponents who insist one is more important than the other. Why do we have such a quarrel on this subject? One of the most common perceptions on their relationship is described by Smith in the following statement:

It is a simple law of physics that the greater the air pressure, the less the airflow, and the greater the airflow, the less the air pressure.<sup>263</sup>

Following this statement, Smith maintains that greater airflow is what brings the freedom in the vocal production, not breath pressure. It is this antagonistic relationship

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<sup>262</sup> Smith, 41-42.

<sup>263</sup> Smith, 40.

between them, resembling each end of a seesaw, which promotes one over the other. Contrariwise, Alderson claims the higher breath pressure is more beneficial to the voice than the greater airflow. He introduces an analogy of electricity to describe their relationship. In producing 3300 watts for an air conditioner, the power companies have determined 220 volts at 15 amperes is better than 110 volts at 30 amperes. Likewise, singers should “increase breath pressure and reduce breath flow to achieve a better, stronger tone.”<sup>264</sup>

The tug-of-war between breath pressure and flow takes place in the larynx which is affected by the degree of glottal resistance. Assuming that the exerted expiratory force is the same, the more subglottic pressure is generated if the glottal resistance is increased, and less air flows. The opposite reactions occur if the glottal resistance is reduced. Finding a steady, healthy balance between subglottic pressure and airflow is essential for singers, and it can be assisted by proper breathing methods.

### **Conclusions**

Different dynamics involved during the phase of exhalation cause more complications in determining the optimal strategy for breath support. Whereas some teachers object to using the term support, I personally do not mind it. The singing mechanism requires a higher breath pressure than the breath pressure we establish during speaking. Once the higher breath pressure is generated, it must be sustained for a longer period. To satisfy these needs, breathing methods for singing require certain movements of muscular sets, which invoke a physical sensation not experienced in breathing for speaking. Since most untrained singers are unable to perform these muscular movements, the term support is inevitably used. However, it may be wiser to use an alternative term such as breath energy if less trained singers involve too much rigidity during the process of phonation. Even amongst more trained singers, hyper-functional voice disorders are quite common.

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<sup>264</sup> Alderson, 29.

From my personal experience, I find it difficult to use the method in which I simply release all tensions of the inspiratory muscles after a deep inhalation. In such case, the expiratory forces are too strong and the air rushes up towards the glottis harshly. As a result, the glottis alone needs to resist all the incoming air, and it always fails by either letting too much air escape, or accumulating too much air under the glottis, causing fatigue. I see this method having more potential for a soprano voice, which uses less glottal resistance by nature than the tenor voice. Thus, a higher ratio of airflow is natural and necessary for the soprano voice.

I propose that one can achieve muscular equilibrium by balancing the forces between the inspiratory muscles and the expiratory muscles. It is the most successful way to elongate the duration for which the lungs are expanded and provide the greatest passive recoil forces. Simultaneously, it prevents too much increase in subglottic pressure, caused by the powerful abdominal muscles of exhalation. It involves a certain muscular effort from the muscles of inhalation to counteract the muscles of exhalation. The sensation of this muscular effort may translate to the sensation of “leaning”, the *appoggio*. This sensation is close to the sensation of maintaining the “breath column” or the “breath cushion”, as others have expressed. The goal, as many teachers observed, is that the muscles of inspiration must surrender to the muscles of expiration gradually, but not in a sudden motion. The steadiness of this muscular control sustains the consistent subglottic pressure and also stabilizes the airflow.

Different teachers call this expiratory method by various terms and expressions, such as *lutte vocale*, *singing on the gesture of inhalation*, *suspension*, *holding back the breath*, and most importantly, *singing appoggiata* or *singing with appoggio*. Each expression can mislead singers if the principle is not clarified; therefore, a complete understanding and proper use of the vocabulary are paramount for teachers. Combined with the proper use of the laryngeal muscles, good expiratory methods can lead to the most successful phonation.

## CHAPTER 4: RESEARCH ON ACTIVE PERFORMERS

### About the Research

The purpose of the document is to examine how much the *appoggio* technique and the various other breathing techniques described in the literature correlate with breathing methods used by current opera singers in the United States. The earlier chapters provide the information on breathing techniques as described in the literature. This chapter gathers data on practical breathing methods.

The research involved conducting a one-on-one interview with twenty-six young professional opera singers who were active members of the apprentice program at Santa Fe opera. During an interview I asked each singer twenty questions relating to *appoggio* and their breathing methods. Their age ranged from 25 to 37. The group included 6 sopranos, 6 mezzo-sopranos, 7 tenors, 4 baritones, 2 bass-baritones, and one bass. I tried to make a good balance of the *Fach*<sup>265</sup> among each voice type by including both relatively lighter and heavier voices.<sup>266</sup> It was an important condition since observing a tendency in breathing methods was a goal, not only among different voice types, but also singers with different repertoires within the same voice type.

Each singer's qualification as a valid subject was important. Every singer in the group had made considerable achievements and successes as young opera singers in the United States. Many of them were the winners at the grand finals and the regional stages of the Metropolitan Opera National Council Auditions, and other renowned competitions within the United States. Almost all of them were active members of one of the most prestigious resident artist programs in the United States. In addition, a few had already made their appearances on the main stage of major and minor opera houses.

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<sup>265</sup> A German classification of singers based on the various characters of the voice such as range, weight, and color.

<sup>266</sup> It would have been ideal if there were equal numbers of heavier female voices and lighter female voices.

The factor that their age is rather young for an opera singer serves the purpose of this document because it provides data on how breathing techniques are taught in the United States in the current generation. All of them gave vivid and diverse opinions, which were exciting to hear. It was interesting to find that even the most knowledgeable among them had specific questions on *appoggio*. Every young student of classical singing may have similar questions, and I hope that the information gathered here will help answer some of those. Their complete responses are included in the appendix with some minor corrections and adjustments to facilitate understanding.<sup>267</sup>

The twenty questions cover a wide range of topics corresponding to the subjects discussed in earlier chapters. However, for the scope of the document, this chapter will focus on analyzing practical breathing strategies for inspiration and expiration used by the subjects.

## **The Inspiratory Methods**

### **Which Inspiratory Methods Do They Use?**

All subjects were asked a few questions about the way they inhale. One of these questions included the points of expansion which the singers experience during inhalation. The singers also described various sensations and degrees of muscular effort taking place during inhalation. The following charts display the summary of their answers. The order of singers within the same voice type indicates the weight of the voice, from lighter voices to heavier voices.<sup>268</sup> Each point of expansion is marked by either “V”, indicating a voluntary action, or “I”, indicating an involuntary action. The expansion as a voluntary action implies that singers aim to expand the certain points of the body, or pull in, with intention. Likewise, expansion as an

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<sup>267</sup> One thing to note is that there were a few singers who had never heard the term *appoggio* before the interview. Also, a very few singers said that they had heard about *appoggio*, which they did not consider to be their breathing technique or the aspect of support they apply to their singing. In such cases, I asked them what they believed or thought as the most ideal breathing technique or the aspect of supported singing. It would be easier for readers to substitute the term *appoggio* with “the ideal breathing technique” or “the ideal support” in the respective questions.

<sup>268</sup> The order of the singers was decided by the roles which they played and were in preparation. The decision is arbitrary and approximate.

involuntary action implies that the expansion is a reflex or second nature to singers, accomplished without being conscious of the action.<sup>269</sup> Different movements of the body other than expanding are indicated with texts. If singers pointed out the different levels of expansion, they are also indicated.

### Sopranos

The most significant and prevailing idea of inhalation among the sopranos found in this research was the expansion in the lower torso. Many of them state the most expansion occurs or is felt in the lower abdominal region: the pelvic floor, lower gut, or groin area. This is surprising since the distention of the lower trunk is more of a characteristic of German breathing techniques. Miller’s description of *appoggio*, encompassing sterno-costal-diaphragmatic-epigastric breathing, does not include ‘hypogastric.’

**Table 2 Points of Expansion for Sopranos during Inhalation.**

	<i>Chest</i>	<i>Ribs</i>	<i>Upper Abdomen</i>	<i>Lower Abdomen</i>	<i>Middle Back</i>	<i>Lower Back</i>	<i>Side Walls</i>
Soprano 1	I		I	I (most)		I	
Soprano 2			I	I (most)	I	I	
Soprano 3	I	I		I	I	I	I
Soprano 4		I	I	I	I		I
Soprano 5		I	I	I			
Soprano 6		I	I	V (tuck in)			

While the lower abdominal expansion during inhalation is experienced by all six sopranos, the upper abdominal expansion is the second most popular. Singers of this group experience the expansion in almost every part of the body besides the upper chest. Soprano 6 is the only singer who uses tucking-in movement during inhalation. She reports that she tucks in the place right below the navel while the lower abdominal area such as the pelvic floor expands. All

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<sup>269</sup> The classification is subjective since it is made based on the author’s interpretation of the answers. Some of the answers were provided in a way that is difficult to classify as a voluntary or an involuntary action. Some singers said that they were mentally intentional, but physically unintentional with their body expansion. There were also singers who said the expansion was intentional in early training, but had become more second nature to them recently. For clarification, readers are encouraged to read the actual answers in the appendices.

six sopranos are advocates of abdominal breathing, capitalizing on the lower abdominal expansion, combined with elements of intercostal and back breathing.

### **Mezzo-sopranos**

Similar to the group of sopranos, the group of mezzo-sopranos reports that the lower abdominal expansion is the most popular during inhalation. An interesting observation is that they tend to focus on the lower expansions in the abdomen and the back more than the sopranos do. Fewer numbers of mezzo-sopranos experience the expansion in their ribs, and none of them mentions the chest expansion and the middle back expansion. A few of them describes that the pelvic floor is the only place of focus, which may correspond to making deeper and darker colors of mezzo-soprano voices. I speculate that they may capitalize on the strong descent of the diaphragm, which pulls down the trachea and lowers the larynx.<sup>270</sup> To summarize, the group of mezzo-sopranos advocate the lower abdominal breathing in combination with the upper abdominal, lower ribs, and lower back expansion.

**Table 3 Points of Expansion for Mezzo-Sopranos during Inhalation.**

	<i>Chest</i>	<i>Ribs</i>	<i>Upper Abdomen</i>	<i>Lower Abdomen</i>	<i>Middle Back</i>	<i>Lower Back</i>	<i>Side Walls</i>
Mezzo-soprano 1			I	I (most)		I (less)	
Mezzo-soprano 2		I		V			
Mezzo-soprano 3		I		I			I
Mezzo-soprano 4		V	V	V			
Mezzo-soprano 5			V	V		V	
Mezzo-soprano 6			I	I (most)		I	

### **Tenors**

It is significant to note that there is less focus on lower abdominal expansion among the male singers. The upper abdominal expansion is the most popular among the tenors. There are

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<sup>270</sup> There should be more laryngeal study to confirm this speculation.



more singers among this group than other groups who experience the middle back expansion.

Although the lower abdominal expansion is still popular, the tenors seem to experience the most expansion a bit higher in the torso.

**Table 4 Points of Expansion for Tenors during Inhalation.**

	<i>Chest</i>	<i>Ribs</i>	<i>Upper Abdomen</i>	<i>Lower Abdomen</i>	<i>Middle Back</i>	<i>Lower Back</i>	<i>Side Walls</i>
Tenor 1			V		V		I
Tenor 2			I	I	I	I	I (less)
Tenor 3	V	V	V		V		I (less)
Tenor 4			V	V	V		V
Tenor 5			I (less)	I		I	
Tenor 6		V	V	V (less)			
Tenor 7	I			V		V	

Tenors 1 and 3 report they do not experience any expansion in the lower torso. Tenor 4 reports that he experiences the expansion through the entire abdomen but does not focus on the lower expansion. Tenor 2 reports that there is more flexible reaction from the lower abdomen as it expands or pulls in depending on the demands of the music. Tenor 6 reports that the major expansion happens around the rib cage, and the lower abdominal expansion is minor. Tenors 5 and 7 are the only tenors who are active in expanding the pelvic floor/the groin area. They are two tenors who sing Wagnerian roles. They are advocates of lower abdominal breathing while the other tenors use a combined method of abdominal and intercostal breathing.

### **Baritones, Bass-Baritones, and Bass**

There is less uniformity among the breathing methods of the lower male voices. While the abdominal expansion is most common, there are a greater number of singers using the chest expansion. One of the baritones and a bass report that their lower abdomen is drawn in during inhalation. Some of them tuck in their tailbones intentionally before taking a breath to facilitate the expansion in the lower back. Their breathing methods contrast with those of the lighter tenors but correspond to those of the heavier tenors.

**Table 5 Points of Expansion for Baritones, Bass-Baritones, and Basses during Inhalation.**

	<i>Chest</i>	<i>Ribs</i>	<i>Upper Abdomen</i>	<i>Lower Abdomen</i>	<i>Middle Back</i>	<i>Lower Back</i>	<i>Side Walls</i>
Baritone 1		I	I	I (most)	I		
Baritone 2	I	I (most)	I	I (draw in)			
Baritone 3	I		I	I		I	I
Baritone 4	I		I (less)	V		V	
Bass- Baritone 1	I					I	
Bass- Baritone 2				V		V	
Bass 1		V	V	V (draw in)	V		

**Voluntary or Involuntary?**

Every soprano reports that the expansion during inhalation is either an unconscious action or an action which does not involve any muscular effort. The only exception is the slight tucking-in action which Soprano 6 makes. Soprano 3 describes that any intentional pushing-out the body parts is the signal of incorrect breathing. Sopranos 1 and 2 claim that the natural expansion occurs during inhalation, which is mentally intentional but physically unintentional. Soprano 5 questions the effectiveness of the back breathing because the physical manifestation of back expansion is difficult to achieve by breathing. It may have to involve voluntary muscular effort to expand the back, which tightens the abdomen as a result.

While the most mezzo-sopranos tend to expand naturally like the sopranos, mezzo-sopranos 4 and 5 report their expansion is as a voluntary action. Mezzo-soprano 4 reports that she used to expand physically without taking a breath for the purpose of creating space for the air to rush in. She does not practice this exercise any longer since the expansion has become second nature to her. Mezzo-soprano 5 reports that she has to think about the body expansion to make it happen, and it is physically intentional. She is careful not to overdo it without the incoming breath.

The group of tenors seems to embrace that the voluntary muscular effort is a necessity for the body expansion during the process of inhalation while the natural and involuntary expansion

is the ideal goal. Tenors 1, 3, 6, and 7 report that they push or let out the body parts on purpose to make the expansion happen when they practice. Tenor 2 reports that he pushes down and out his abdomen at an unconscious level. Tenor 4 reports that the expansion is intentional, but he focuses on the sensation of breath filling in rather than the muscular effort. Tenor 5 reports that he tries to avoid expanding without the air since it will tense his body too much.

All four baritones report that they do not force out the parts of their body like many tenors do. They believe in the natural expansion caused by the intake of the breath, but the expansion is mentally intentional for some of them. Likewise, the two bass-baritones are conscious of their expansion, but they do not push out. In contrast, Bass 1 reports that the expansion is intentional both physically and mentally.

### **Evaluation**

A great diversity is observed among the breathing methods of the singers in this research. Nonetheless, there is a certain uniformity in their methods. First, the belly-out position is much more widely adopted than the belly-in position. Almost all singers perceive the abdominal expansion as the natural result of the descent of the diaphragm. We can assume that the intercostal breathing with the belly-in position is rarely taught in the United States.

Another uniformity is the lower abdominal expansion in female voices. They seem to experience more resisting sensation in the lower abdomen than in the upper abdomen. This contrasts with the suggestions of many voice teachers, such as Miller or Lamperti, who address the importance of upper abdominal expansion. The upper abdomen accommodates the expansion more easily than the lower abdomen; therefore, it creates more space in the body with less muscular tension. However, we may assume that the female singers do not suffer with such tensions because none of them pushes out their abdominal wall, except a couple of the mezzo-sopranos. It may be more beneficial for them to take a little less than the maximum amount of air if it causes too much stiffness. Many of them explain that they prefer to take just as much air as

they need for the next phrase. They may feel more pressure in the pelvic floor because of the visceral dislocation and the idea of deep breathing.

On the other hand, some tenors put active muscular effort in increasing the dimension of the torso by pushing out the areas of the body. The upper abdomen is the focal point because it protrudes the most among different parts of the body. The increase of the air containment allows a greater inhalation, which corresponds to increasing the forces of both passive recoil of the lungs and the contraction of the expiratory muscles. This may be necessary for tenors when they sing the notes above the *passaggio*, which generates higher subglottic pressure. On the other hand, many of them believe that the expansion must become natural and not forced.

The breath pressure is the major source of amplification of the voice. Assuming that the conditions of the vibrators and the resonators are the same, it is natural for a singer with larger lungs to sing more loudly than a singer with smaller lungs. The baritones, bass-baritones, and bass seem to be more intentional in expanding their body than female singers since the level of volume and the brute force of the sound are one of the qualities that lower male voices pursue. While higher subglottic pressure is the necessity for tenor's high notes, lower male voices may use higher subglottic pressure to increase their vocal power. However, too much subglottic pressure, which impairs proper functioning of the glottis, must be avoided in any circumstance.

## **The Expiratory Methods**

### **Which Expiratory Methods Do They Use?**

To understand the expiratory methods of the subjects, they were asked what physical activities they use during the phase of exhalation/phonation. They were also questioned if they change their method when they sing high notes. Lastly, I asked them which of the two contrasting expressions they agree with, *holding back the air* or *letting the air flow*. Their preference may relate to their perception on effective air consumption.

### **Sopranos**

Among the six sopranos, two of them report that they do not perform any muscular activity at an intentional level. One of them reports that the lower abdomen tucks in with no intention. Since the contraction is a natural movement of the abdominal muscles during exhalation, we can conclude that the three sopranos do not use any voluntary muscular activity. The other two sopranos report that they maintain the expansion without using too much effort. The sensation is closer to resistance, not pushing out the wall of the thorax. The last soprano, who sings the most dramatic roles, reports that she pulls in the point of her abdomen right below the navel and expands the sides at the end of the phrase. She is the only soprano in the group who uses the muscular effort during phonation.

**Table 6 Expiratory Strategies of Sopranos.**

	<i>Range</i>	<i>Activities</i>
Soprano 1	middle	There is no voluntary activity.
	high	Nothing changes in terms of breathing. Just needs more mental energy.
Soprano 2	middle	Maintains the expansion without any tension.
	high	Nothing changes in terms of breathing. Just needs a cushion of air underneath.
Soprano 3	middle	The low abdomen tucks in unintentionally.
	high	Nothing changes in terms of breathing.
Soprano 4	middle	Maintains the expansion as in a sense of resistance, not pushing out.
	high	Tries to feel low in the pelvic floor to let the minimal amount of air released. Nothing really changes in terms of breathing.
Soprano 5	middle	Does not think about breathing at all if the phrase starts correctly.
	high	There is no difference in singing high notes.
Soprano 6	middle	There is more pulling in of the abdomen right below the navel and she expands the side a little more at the end of the phrase.
	high	Takes less effort to sing high notes. Takes a slightly shallower breath and stops pulling in the abdomen.

Five sopranos report that nothing changes in relation to breathing when they sing high notes. Soprano 6 changes her strategy to take a shallower breath and stop pulling in her abdomen. One of them reports that high notes call for more mental energy. Another reports that she tries to feel low in the pelvic floor to let the minimal amount of air released. Nevertheless, there is no considerable amount of muscular effort observed in their report.

### **Mezzo-sopranos**

Reports by mezzo-sopranos are more varied than those of the sopranos. All of them seem to agree that there is a certain energy kept in the body to avoid collapsing. Mezzo-sopranos 3 and 5 report that they maintain their expansion; one pushes out the lower abdomen slightly, and the other does not. Mezzo-soprano 5 pulls in the groin area to harness the support. Mezzo-soprano 1 tries to maintain the expansion only for challenging phrases. The others allow their body to follow the natural function.

**Table 7 Expiratory Strategies of Mezzo-Sopranos.**

	<i>Range</i>	<i>Activities</i>
Mezzo-soprano 1	middle	Relaxes for less challenging phrase. Maintains the expansion for more challenging phrase.
	high	Tries to keep the breath as low as possible.
Mezzo-soprano 2	middle	Adds more engagement in the body.
	high	The chest feels elevated as in lifting up an object and the low abdomen tucks in.
Mezzo-soprano 3	middle	Maintaining expansion by pushing out the lower abdomen but not too much.
	high	Nothing changes in breathing activity.
Mezzo-soprano 4	middle	Naturally going back to pre-inspiratory state but without collapsing or losing all energy.
	high	There is no change of strategy since the amount of air released in high notes and low notes is the same.
Mezzo-soprano 5	middle	Maintains the expansion in high abdominal area without pushing out further. Pushes in from the groin area for support.
	high	There is no difference in sensation when singing high notes.
Mezzo-soprano 6	middle	Different movements of the abdomen depending on the notes being sung. The abdomen comes in for high notes such as <i>E5</i> or <i>F5</i> .
	high	Pushing out the lower abdomen for the highest notes such as <i>G5</i> or <i>Ab5</i> .

When singing high notes, Mezzo-sopranos 3, 4, and 5 do not experience or make any change in their expiratory strategy. Mezzo-soprano 1 does not describe a specific activity but tries to feel the breath as low as possible. Mezzo-soprano 2 and 6 make voluntary muscular efforts; one tucks in the lower abdomen, whereas the other pushes it out.

### **Tenors**

All seven tenors report that they maintain their expansion during phonation, using different strategies. Some use the image of inhalation, an efficient and indirect method of encouraging the muscles of inhalation to resist the muscles of exhalation. More direct method,

such as pushing out the body wall, is also adopted by the others. The postural strategies are also used to keep the chest upright and outward. Tenor 3 reports that he pulls in his lower abdomen while maintaining the chest expansion.

**Table 8 Expiratory Strategies of Tenors.**

	<i>Range</i>	<i>Activities</i>
Tenor 1	middle	Maintains expansion by keeping the sensation of inhalation.
	high	There is more sensation of pushing out the low rib cage area, the chest, and the high abdomen. The muscles around those areas get firmer.
Tenor 2	middle	Maintains expansion.
	high	For more energy, high abdomen protrudes and low abdomen tucks under.
Tenor 3	middle	Leans on the chest to the point of pushing out the chest. The lower abdomen is pulled in.
	high	The chest is pushed out more and the lower abdomen is pulled in more.
Tenor 4	middle	Maintains expansion by keeping the upright posture and the image of inhalation.
	high	There is more abdominal contraction which is unintentional. The tension between inspiratory and expiratory muscles increases.
Tenor 5	middle	Keeps the chest up and high to avoid collapsing. Sustains the abdominal muscles not to pull in too quickly by slightly pushing them out.
	high	Reinforces the above activities.
Tenor 6	middle	Maintains expansion by staying out rather than pushing out to let the minimum air be used.
	high	The intercostals are down and out and the abdomen goes up and in.
Tenor 7	middle	Maintains expansion.
	high	The expansion becomes more intense. The sternum expands out.

According to their reports, there is a much greater sense of effort from the tenors when singing high notes. When producing high notes, it is evident that all of them perform muscular activities at will or experience some significant changes of sensation in their body. This must relate to what Stark calls the “pressure event,”<sup>271</sup> which occurs as the *passaggio* gets closer. The muscular activities used vary from each singer. Tenors 1, 5, and 7 report that the sensation or the physical effort of pushing out the abdomen becomes greater. Tenor 4 experiences that the tension between inspiratory and expiratory muscles grows as a result of resisting against the greater abdominal contraction. Tenors 2, 3, and 6 increase the force of lower abdominal contraction, while they keep their chest expanded.

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<sup>271</sup> Stark shows in his phonetogram that the subglottic pressure begins to rise dynamically from *E4* and above in tenor voice. See Stark, 239-240.

### **Baritones, Bass-baritones, and Basses.**

All four baritones maintain the expansion by pushing out the upper abdominal region. Three of them push out the lower abdominal wall, and one of them lets it come in gradually. This is a similar result to the tenors. Both bass-baritones report that they do not maintain the expansion. One of them lets the body shrink as the air leaves, and the other pulls in the lower abdomen to support the spine. Bass 1 maintains the expansion in the chest and upper abdomen, while the lower abdomen tucks in like a seesaw action.

**Table 9 Expiratory Strategies of Baritones, Bass-Baritones, and Basses.**

	<i>Range</i>	<i>Activities</i>
Baritone 1	middle	Maintains the expansion by pushing out the lower abdominal area.
	high	Stops pushing out the lower abdomen. It feels like drawing it in.
Baritone 2	middle	Maintains the expansion in the upper abdomen by pushing it out to hold the diaphragm in the low position. The lower abdomen is pulled in gradually.
	high	Nothing changes except that the high note calls for more body energy, causing the lower abdomen to come in a little.
Baritone 3	middle	Maintains expansion especially in the lower abdomen.
	high	There is slightly more effort to push out the lower abdomen to maintain the expansion.
Baritone 4	middle	Maintains the expansion by pushing out the lower abdomen in order to resist the abdominal contraction. This helps the consistent flow of air.
	high	Adds a little more pushing out pressure to the lower abdomen to keep the expansion.
Bass- Baritone 1	middle	Allows the body to shrink naturally as the air leaves the body.
	high	Nothing changes in terms of breathing.
Bass- Baritone 2	middle	Pulls in the lower abdomen naturally to support the spine.
	high	It is ideal not to change the way to support.
Bass 1	middle	Maintains the expansion in the chest with the help of the intercostals. The upper abdomen comes out as the lower abdomen tucks in like a seesaw action.
	high	There is more outward thrust in the upper abdominal area.

When singing high notes, Baritones 1 and 2 let the lower abdomen come in, while Baritones 3 and 4 increase their efforts to push it out to keep the expansion. Both bass-baritones do not involve any change of the strategy for singing high notes. Bass 1 pushes out the upper abdomen and lets the lower abdomen continue to tuck in.



### **Holding Back the Air vs Letting the Air Flow**

Many voice teachers and pedagogues emphasize the art of holding back the air in spite of the negative connotation of the term. The word ‘holding’ is unfavorable in singing and perhaps in any arts which involve body movement because it evokes the image of rigidity, the enemy of all. On the other hand, the art of letting the air flow evokes the image of freedom and movement; therefore, it is more widely accepted by singers.

The interrelationship of breath pressure and airflow has been examined already in an earlier chapter.<sup>272</sup> In the same manner, the art of holding back the air and letting the air flow interplay with each other, aiming for the same goal. Their goal is to achieve a steady air supply to the vocal folds, allowing them to regulate the proper ratio between the subglottic pressure and airflow. However, the art of holding back the air involves the muscular activity to slow down the ascent of the diaphragm by balancing the forces between the muscles of inhalation and exhalation. The art of letting the air flow relates to bringing ease to the singer’s body. Most successful singers know how to find the balance in between these two strategies. They choose one term over the other, or both, depending on their personal experience and need.

**Table 10 Singers’ Preference between Holding back the Air and Letting the Air Flow.**

	<i>Hold back the air</i>	<i>Let the air flow</i>
Soprano 1		○
Soprano 2	○	○
Soprano 3		○
Soprano 4	○	○
Soprano 5	○	○
Soprano 6		○
Mezzo-soprano 1		○
Mezzo-soprano 2		○
Mezzo-soprano 3		○
Mezzo-soprano 4		○
Mezzo-soprano 5	○	○
Mezzo-soprano 6	○	○
Tenor 1	○	
Tenor 2		○
Tenor 3		○

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<sup>272</sup> See 65-66 of this document.

Tenor 4	○	
Tenor 5	○	
Tenor 6		○
Tenor 7		○
Baritone 1		○
Baritone 2		○
Baritone 3		○
Baritone 4		○
Bass-baritone 1		○
Bass-baritone 2		○
Bass 1	○	○

As shown in the chart, almost all singers agree with the idea of letting the air flow. This result proves that the free-flowing air is a concept more widely accepted than breath retention in modern voice pedagogy. Sopranos 2, 4, 5, and Bass 1 report that they acknowledge the benefits of holding back the breath under certain situations. Many singers who stay away from holding back the air relate the concept to unrequired tension.

Tenors 1, 4, and 5 were the only subjects who preferred the art of holding back the air to letting the air flow. They argue that they use their *appoggio* technique to hold back the air in their torso to regulate proper breath pressure. In their experience, they felt that the art of letting the air flow caused too much flow of air, which failed them in sustaining consistent subglottic pressure. They are the only singers who associated the art of letting the air flow with over-blowing the air, which is an adverse condition, not only for tenors, but for any voice.<sup>273</sup>

### Evaluation

The research finds that the male singers, in general, make or experience more voluntary muscular efforts during exhalation than the female singers do. Most female singers, mainly the sopranos, do not give much attention to breathing once they start singing. They also do not experience much change in their body when they sing high notes. We can assume that the quality

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<sup>273</sup> In their answers to question 11, almost all singers report that they prefer a smaller amount of air released during phonation. This may suggest that over-blowing the air should be avoided by any voice type. My theory on why only a group of tenors associates too much airflow with letting the air flow is only a speculation. A possibility is that tenor voices naturally look for less airflow than any other voices because of their required glottal resistance. They are usually stingier in air consumption because they strive to increase the duration of the adduction of the vocal cords in each cycle of vibration to produce more powerful singer's formants. More laryngeal studies and research are required to support this theory.

of their high notes does not benefit from extra breath pressure created by the voluntary expiratory forces. Only a couple of mezzo-sopranos used voluntary abdominal movements.

On the other hand, most male singers are more strategic with their expiratory methods during phonation. Most male singers try to maintain their expansion during phonation with conscious efforts. I speculate that one reason is that the recoil force of the expanded abdominal wall is greater for the male singers because they make the greater expansion. To balance that expiratory force, they must scale their inspiratory force. The other reason is that they need to reduce the airflow for higher subglottic pressure, which facilitates higher glottal pressure. These two reasons are connected.

Many more male singers than female singers become more conscious of their breathing methods as they sing high notes because they think that the stakes become higher. One group maintains the expansion by pushing out or staying out, whereas the other group pulls in their upper or lower abdomen. Simply speaking, the first strategy holds the air, and the other strategy propels the air. I believe the first strategy is ideal because it lets the vocal folds do their job without upsetting them. However, if the singer's high notes require the increase in both subglottic pressure and airflow, more air supply is necessary. They will trigger the stronger abdominal contraction regardless of the singer's intention.

### **Conclusions**

Among all the work which this dissertation entailed, it was most exciting to observe the breathing methods of the singers. I believe that the research was successful in discovering certain inclinations for breathing methods of different voice types. Experienced teachers and singers know a great deal about the various characteristics of different voice types through their experiential and scientific knowledge. Many of the findings correspond to this knowledge. However, I was particularly surprised, as a tenor, that some of the interviewed singers of the other voice types do not experience any change in terms of physical sensation as they sing high notes. Thus, they report that they do not change their expiratory methods to satisfy the need. Some of

the sopranos report that they focus much more on the resonators for singing high notes than on the breath. Their approach to singing high notes varies from tenors who use more active engagement with their body. Many of the tenors report that it is the physical sensation of singing high notes which naturally demands such muscular activity. Tenors' obsession on breathing methods may surprise singers of the other voice types, who might consider the tenor voice to be unnatural.

Besides the differences between the voice types, individual differences among singers in the same *Fach* also existed. This is another confirmation that every voice demands something different from its respiratory system. Therefore, there is no one technique of *appoggio* which fits everyone. However, singers can find their own optimal breathing method as long as they understand the principles of the breath mechanism and the needs of their vocal instrument.

Finally, this study reveals that there is a hunger for knowledge about *appoggio* among even the most successful and promising young singers of today, including those who have had extensive training and have read widely. It is my hope that the information gathered here will help answer some of those questions.

## Appendix A: Survey Questions

### Basic information

Voice type:

Roles performed:

Roles in preparation:

### About *appoggio*

1. Who taught you *appoggio*? Or have you learned about *appoggio* through the literature?
2. How would you define *appoggio*?
3. How would you describe the characteristics of *appoggio* compared to other breathing techniques that you know?
4. How would you describe the purpose of *appoggio* and its influence on your singing?

### Posture and Alignment

5. How do you arrive at good posture?

### Breathing Strategies

6. During the phase of inhalation, where do you feel the expansion in your body if there is any? Is it voluntary or involuntary?
7. During the phase of inhalation, do you push out or in any part of your body? Is it voluntary or involuntary? Do you take a different strategy?
8. Do you have any particular opinions about breathing through the nose, mouth, or both?
9. During the phase of exhalation, do you push out or in any part of your body? Or do you try to maintain the expansion or relax your body?
10. During the phase of exhalation, do you try to hold back the air or let the air flow freely?
11. During the phase of exhalation, do you let a large amount of air escape or a small amount of air escape?
12. Does your breathing strategy change when you approach high notes?

### Other Topics

13. How does your *appoggio* technique affect your breath management? How do you avoid stacking breath? Do you try to use up all the inhaled air by the end of a phrase?
14. Have you ever switched to a different voice type? If yes, did your breathing methods change?
15. If you are a female singer, do you feel any change in your breathing method when you switch between registers?
16. Are you conscious of your breathing technique while performing?
17. Do you have any different strategy you would like to try to improve your breathing technique?
18. Do you exercise regularly? Do you think it helps or hinders your breathing technique?
19. Where would you start if you teach a student about the *appoggio* technique?
20. Do you have any questions about *appoggio* other than things you already know?

## Appendix B: Responses

### Soprano 1.

Roles performed: Adele (*Die Fledermaus*), Cendrillon, Frasquita (*Carmen*), Gretel, Pamina (*Die Zauberflöte*), Queen of the Night (*Die Zauberflöte*)

Roles in preparation: Adina (*L'elisir d'amore*)

2. I took an undergraduate vocal pedagogy class, and we talked about it briefly. It hasn't been used in that term in my lesson, but the concept was the same.
3. The way I feel *appoggio* is about having some good tensions in my breathing. It's the way to utilize the diaphragm to stay low and not taking the shallow or high chest breath.
4. *Appoggio* is more like a full body experience. That being said, as a coloratura, most of my focus is on singing in higher register. Breath regulation is more important than the breath capacity. When I sing very high notes, I don't need a ton of air but just some focused air. For me, it's about regulating the proper amount of breath. *Appoggio* helps it. It's a leaned breath, not pushed, but relaxed and easy, opposed to something rigid. I think that breath is not as big issue as for me compared to more dramatic singers.
5. The purpose is to create a flexible breath which doesn't trap me in one position. That flexible breath allows me to sing high or low registers, coloratura, or more sustained passages. It makes me less stiff when I sing.
6. I try to relax as much as I can. As a female singer, heels can be problematic. I try to relax my legs so that it doesn't stiffen my hip and torso. I hold a lot of tension in my hip and I try to relax. Because I danced very competitively for 13 years, my upper body tends to get stiff easily. My lower abdomen expands when I breathe, and it deflates when I sing, but not consciously. There is also just a small expansion in my high abdomen and the chest and they deflate when I sing.
7. I feel mostly in my lower tummy, around the pelvic floor, and little bit in my lower back as well. There is a small amount of expansion in my chest. It feels as if the breath is incoming from low, curving through the back and out through the back of my head. This is how I envision. It is very mentally intentional. If it's unintentional, I tend to push. I need to focus on spinning the breath and relaxing. If I get too tense, I have to make sure that my whole body is released.
8. I don't push out or draw in any part of my body. It just happens. I let my body expand naturally.
9. I don't have any particular opinions. It's something that I don't over-think. I just breathe through both. It doesn't matter to me where I get my air through. As long as my body stays open, the tone happens to be open and free. Probably it relates to my *appoggio*, but I can't quite describe it. I believe breathing through both is the quickest way to breathe in.
10. I don't think about doing anything voluntarily. I don't push in or out any part of my body during exhalation.
11. I let the air flow freely. I feel that the idea of holding back the air causes tension in my body. The more natural it is, the more flow there is, and the freer the sound will be.
12. I agree with the natural amount of air out. I want my body to do what's natural for me. When I speak, I don't think about the breath. Even though I need more air to sing, my body knows how much air I need without my brain knowing. I don't think about breathing nearly as much when I sing high notes. Most of my focus is on creating the space in my pharynx. Breathing is actually the last thing to think about. Low notes require more air for me. I try to focus the air because the danger is the tone getting breathy.
13. It keeps me from holding back or pushing out the air. I really don't think actively about singing a long phrase. When I think about it, it becomes the problem. If I focus on singing through, it just happens.

14. Yes, I had a very dark color and sang as a mezzo. And I switched to a more lyric soprano and then I have become a coloratura soprano. I don't necessarily feel there was any big change in my *appoggio*.
15. Yes. I feel that there is a change in the space. If my body is aligned correctly, I feel I use more air in the chest register since it is more energized.
16. I am not. Before an audition, if I get nervous, I power pose to open up my chest, which increases testosterone. As a dancer, I have a natural open chest. I've never been a sloucher.
17. No.
18. I used to exercise regularly. It's still in my body. If I did some intense abdomen work to keep my core tight, it hindered my abdomen to be too rigid to sing. Once I differentiated those feelings, I could now relax my abdomen.
19. Just don't get in on your head. You can't hold on to them in any one answer. You can't be rigid in your body.
20. I am curious how other people describe *appoggio*. Also, I will be interested to see how it affects different voice types or what alterations people make depending on their repertoire.

## **Soprano 2**

Roles performed: Adina, Donna Anna (*Don Giovanni*), Lucia, Queen of the Night, Sophie (*Werther*)

Roles in preparation: Zerbinetta (*Ariadne auf Naxos*), Woglinde (*Das Rheingold*)

1. My first teacher taught me *appoggio*, who was also a yoga teacher. I studied a little bit through Richard Miller's books as well as through Lamperti exercises.
2. When I think of *appoggio*, I feel an actual pressure in my chest and it feels that I'm accurately balancing the pressure between inhalation and exhalation. I feel very specific equilibrium which involves the muscles in my chest, directing in and out. I feel the antagonism of those muscles around the middle and top of the sternum.
3. My current teacher talks about the abdominal tucking in, but if I do that, I feel I am over supporting. *Appoggio* is a steadier and more balancing act. *Appoggio* lends more naturally to the emotional vulnerability because I am more aware of my chest being open.
4. It's almost a test if I am supporting correctly with *appoggio*, neither over nor under supporting. Both the legato and the consistency throughout the range become better.
5. I was a dance major, and I worked on the Alexander technique and Feldenkrais method. The biggest thing for me to stretch my hip flexors and iliopsoas to find a more natural curve in the spine after sitting for so long. Strengthening these muscles help me to feel easier to breathe. I do twist stretching in my torso to be more aware of my body. Body awareness is a big part of my singing.
6. I try to feel the expansion in my lower back and around in the middle, all around 360 degrees. There is also an expansion around the abdomen, but more in the low abdomen. I used to expand on the side and keep it expanded but I had to stop it because of the tension it created. The process is mentally intentional and physically unintentional. It's more of a release rather than engagement.
7. I try to let the lower part of my body expand naturally. I would almost let my chest depressed, just a little bit, so that I could prevent shallow breathing with the high chest. Instead of physically moving out my side and back, I just let them expand or stay the same as naturally as possible.
8. I like breathing through the mouth because I can release my tongue and other tightened parts of my neck. If I breathe through the nose, I feel everything inside my mouth gets tightened. Breathing through both may just happen naturally but I focus to breathe through the mouth.
9. I try to maintain expansion but not to the point of tension. If I try to tuck in my abdomen, I over-blow the air, and too much air pressure rises. I won't try to keep the expansion all the way to the end of the phrase because it causes a sudden collapse and tightness. I will

- gradually let the body relax like the piece of paper is falling down in a gentle, natural, and swaying motion. I'm not going to press my body to keep it expanded.
10. I switch between the two. In ascending phrase, if I hold back, my body gets tight. I make sure to flow the air evenly. Especially in soft singing, it gets easier to drink in the air, holding it back. On the other hand, in a long phrase, you cannot sustain the whole phrase if you flow the air out too much.
  11. It depends on which phrase you sing. I get tired to sing while letting only a small amount of air after taking in big breath. You need to spend air equal to zero at the end of the phrase. If you take a big breath, you should use large amount of air. In a short phrase, you'll take a little bit of air and use that much. It's important to take the amount of air you need.
  12. Intellectually, I know that I need less air on the high notes, so that I only feel the thinned air around high C. But when I sing above high E, I feel I need something like a cushion of air underneath me. To help that, I need to lengthen my mouth and the back of my neck. But I try not to feel or think too much about breath in general.
  13. When I feel the *appoggio*, I can make longer phrase and need less breath, because I have more control of the air. I almost always use all the air in one phrase.
  14. No.
  15. Yes. I need to be very careful with avoiding too much upward pressure in the *passaggio* and notes right above the staff. I have to think of thinning the shape around those notes like an hourglass. In other words, I turn my voice like a male singer does. I try to keep everything consistent, especially trying not to lift my shoulders and chest.
  16. In any critical moment, I become very aware, but I try not to focus on it. It's about keeping my top half of my body relaxed and down.
  17. To me, it's not something you can improve. It is like a test if I'm supporting properly. Especially when you are younger, it is difficult to find the right amount of support. It's most important to find the balance.
  18. I don't. But I know it helps. Dancing helps me a lot because it's a mixture of stretching, cardio, and balanced muscles strengthening. Weights only go for one particular muscle while dancing helps multiple muscles.
  19. It is not forced. Nothing is forced about the way it should be. It should be done with ease.
  20. Can it be measured? Is it something that you can measure in the lab? Can one person have more leaning sensation in a certain area than the others? Does *appoggio* correspond to different voice types? I guess I'm curious whether it is a sensation or an actual physical action. Or something psychosomatic?

### **Soprano 3**

Roles performed: Beth (*Little Women*), Despina (*Così fan tutte*), Frasquita, Marie (*La Fille du Régiment*)

Roles in preparation: Nannetta (*Falstaff*), Sophie (*Die Rosenkavalier*), Susanna (*Le nozze di Figaro*)

1. All three of my teachers taught me about *appoggio*. No literature.
2. It is the correct breath that creates correct resistance with your diaphragm so that you get the steady flow of air. When my *appoggio* is correct, I can fill the air flowing in the right column and I know it is resonating out to the audience like the sound wave. Resistance is created by the muscles in my torso, leaning against each other. I'm not pushing out the muscles but there is a healthy tension resisting to give in.
3. *Appoggio* is the only main breathing technique I worked on. It feels deeper than regular breathing and almost more bouncing. It goes to the low point, and the air is bouncing off of my diaphragm.



4. It makes my voice blossom and not held on my throat. I know the longevity of my voice is expanded and not hurting myself on my throat. It makes my vibrato much more even and my high notes solid. It made my middle voice solid and my top and bottom became even.
5. The chest should be upright. The shoulders are back but not too far, just hanging on the side, naturally aligned. I can't pop my head back at all. Keeping the chin down helps. I think about my thighs, knees, and quads to be engaged but not locked.
6. I feel the expansion into my groin area and into my bottom part of my rib cage in my back. My chest and side also expand. If I have an inner tube around my body, I breathe into that. Everything expands but more into the lower part of my body. Since I worked on this for long, it's like a second nature right now.
7. The expansion happens naturally on inhalation. If I intentionally push out, I know it's a signal that I'm doing it wrong.
8. I do a combination of nose and mouth breathing. But I depend on mouth breathing more, which is more natural to me. I do [i] breathing, which is to breathe on [i] vowel, especially before singing high notes. I never breathe only through the nose because I don't get enough air fast.
9. I think about the lower part of my body being engaged, almost like tucking in. But it's not anything more than that. It's not a voluntary pushing in. Tucking in just happens when the air is driven out from the body.
10. I let the air flow. Holding means not spinning and not getting all the overtone I can get. It's not the complete sound I can make.
11. When I'm warming up to get into the slender part of my voice, I think about the small amount of air out. When I'm singing, whatever happens, happens. The physics I know is that I need less air on the high notes and more air on the low notes. But I don't actually apply this to my singing.
12. For high notes, I am not really thinking about the breathing at the point. There are extra bounces on my diaphragm and even lower part of my body.
13. It completely relates to my breath management. I agree with the idea of using up all the air in a single phrase. When I'm left with air, I breathe out.
14. No.
15. When I'm going down into my chest, it feels a little bit different. But I can't really explain it.
16. I am unconscious about it at this point and it's more like an autopilot. I do panting or using unvoiced consonants to engage my low part of my body when I practice.
17. I plan on practicing on leaning on the piano with my abdomen while singing.
18. I think cardio, running, and swimming really helped me with my lung capacity. But if I do too much abs, I get soar and it bothers. I can't do too many shoulder exercises as well.
19. Do not manufacture breathing too much. It should feel like jumping on a trampoline. It's flexible and movable, but there's healthy tension and energy. One should master the low expansion.
20. I am curious to know if I have to do something different in terms of breathing strategy on my extreme top notes, such as E flat or E natural.

#### **Soprano 4**

Roles performed: Adina, Lucia, Pamina

Roles in preparation: Euridice (*L'Orfeo*), Gilda (*Rigoletto*), Susanna

1. My graduate teacher used the term in lessons. I read Barbara Doscher.
2. I think of it as a release and a resistance to collapsing. Down and out. You release your oblique muscles to open and let the diaphragm muscle descend. You want to maintain the expansion of the structure which should never collapse.
3. In some breathing techniques, I know people think of tucking in the abdominal muscles and articulating a lot of breath. But I believe *appoggio* is a more consistent way of using the

- breath. I don't really agree with tucking in the abdomen. It's more about maintaining expansion yet still reflexive. You never really let the air tank completely collapse.
4. The purpose of *appoggio* is to maintain the optimal tone and vocal freedom. If I'm really hooked on to it, I have a lot more vocal freedom in dynamics and expression. If I'm using my breath to maintain the spin and the focus of the sound, I don't have to tense any muscles on my throat and my abdomen. You want good amount of tension, but the body should not be rigid. If I think about openness and anchor in my breath, it allows my throat to be open.
  5. I think of a natural posture from top to bottom. First, my head should be natural. My chest is open but not too heroic though. My spine is neutral, and not too swayed. My leg position is very critical for me. I take a pretty broad stance with one foot slightly forward. This allows me to have the pelvic neutrality which I need. Ideally, these positions should remain the same when I breathe and sing.
  6. There is postural openness in my chest, and a sensation of activity in my back and low rib cage. The expansion happens in my abdomen from high and all the way down to the pelvic floor. I maintain stability in my thighs and hips. For me, I don't think much of the lower back. I allow my side, oblique muscles, to expand and never let my side collapse. There is a different type of breath I use. My initial breath sets up my *appoggio*. Later breaths are just like taking sips of breath afterwards.
  7. I am not pushing out my muscles but just releasing them out.
  8. I think either can be useful. Mouth breathing is my go to, silent and open breath. But if I have been gasping a lot by taking too many quick breaths, then I will take a nose breathing to slow down so that my glottis is more completely open during inhalation. In other words, I do nose breathing when I feel my mouth breathing became inconsistent. I never do both. I was only taught mouth breathing.
  9. I try to maintain the expansion. I would describe it as more resistance. When I think about pushing out, that's a wrong kind of tension. I don't really relax my upper body since I am fully engaged. Only sometimes, I would relax my tailbone to let the pelvic stay neutral, not too upright.
  10. I was taught more in the manner of holding back the air. I was really calculating the breath to not completely depleted. Now I have more muscular built, I don't necessarily think of that because I just want to create beautiful legato. If I think about holding back the air, it loses the fine balance sometimes. The good balance is required. To me, the idea of letting my air flow is staying aware of the connection of resisting collapse. It does not mean using a lot of air necessarily, but rather letting your body to use the right amount of air to get through the given phrase. You don't have to over-manage it.
  11. I choose the medium amount of air escaping. I think that it has to feel as if the large amount of air is going out, but you can't actually do that. Scientifically, I am using the small amount of air when I sing like a laser beam. So, it's kind of both at the same time. I would describe it as a small canoe flowing through a huge canal.
  12. The amount of air that I need for the extreme high notes is very minimal, so I try not to overuse my air. I try to feel lower in my pelvic floor, the higher I go. It requires a little bit of maintaining thinned air to be connected throughout. I try not to mess with my *appoggio*.
  13. I try to use 90% of my air but never fully 100%. Not completely deflated. It elongates my breath cycle.
  14. No.
  15. Yes, for sure. For me, I have to focus on those areas because I have a tendency to back off when the register change happens. What I try to do is to think of the air very focused through the *passaggio* area. Because if I don't, the registration event will not be navigated well. I will come off my breath. I have to stay very supple in my *appoggio* through *primo* and *seconda passaggio*. My middle C (C5) is the area for me to come off the voice and I have to stay

- really focused. It is more mental rather than trying to help the tone with over-involvement. The focus is to maintain the resistance and not to use too much air.
16. It depends on the piece and how new it is. As I'm getting more experienced, it becomes more habitual. But there are times when I have to be conscious about it, especially when there is too much tension. Then I think about releasing it by taking a new initial breath.
  17. I revisit my *appoggio* as if it's a new technique pretty regularly. I always question myself if my *appoggio* is still working correctly.
  18. Yes, I do. I will do deep breathing if my breath gets shallow after running. Lifting has been helpful to increase stability in my lower body. I also like yoga for my singing.
  19. The main thing I focus is to release the lower abdominal muscles and to maintain the expansion. This is the most helpful thing for me.
  20. If one's body changes dramatically, like losing weight, how does *appoggio* translate and feel differently?

### **Soprano 5**

Roles performed: Gilda, Micaëla (*Carmen*), Pamina

Roles in preparation: Susanna, Tatyana (*Eugene Onegin*), Don Elvira (*Don Giovanni*)

1. One of my teachers taught me. No literature.
2. It is a balanced air pressure, and the raised sternum is the key.
3. The sensation of *appoggio* involves pressure down and out as opposed to up and in. *Appoggio* is the only breathing technique I've encountered.
4. *Appoggio* enables the most efficient adduction of the vocal folds. It allows the relaxed lowered larynx without any manipulation of the tongue and jaw. It also provides dynamic freedom in the voice.
5. I raise my sternum and put my shoulders back like in a superman or pigeon posture. The chin has to be lowered. I have an abstract concept of connection between the back of the head and the shoulder blades, which straightens the breath column.
6. The raised position of the sternum is intentional. I feel the expansion in the rib cage. Back expansion is more of an abstract concept rather than a real action. It's rarely helpful unless everything else is aligned, because it tightens my abdominal muscles. I need to let my abdomen loose for *appoggio*.
7. I don't actively push out my body while I'm breathing. It's more of a balance. But it's even more important not to pull in any part of the body. The intentional part is the posture which includes the raised sternum and shoulders back. This helps the vacuum sensation of inhalation. Only then, the expansion can happen naturally.
8. I prefer mouth breathing. Breathing through the nose requires the lowering of the soft pallet. It's an extra action that you don't need. If you breathe through the mouth, the soft palate may lift naturally.
9. Personally, I don't have to think about breathing until the next phrase if I start the phrase with the right amount of balanced adduction of the vocal folds. In other words, In the middle of singing, I don't think about breathing anymore. I know something is wrong if my *appoggio* collapses. If one thing is off, the other things are off like dominos. Only then, I would check my *appoggio* again.
10. Air needs to flow. Holding back the air is an extremely advanced concept, and it's only applicable to certain techniques, especially for the extreme upper registers for female singers. I also think of holding back the air as the essential way to keep the larynx down and steady. For example, if you are singing a staccato-coloratura passage, you cannot take a breath in each note. This is the only time I only hold back the air. Otherwise, you will develop the flutter and wobble if you try to hold back the air.

11. It depends on the singer and the repertoire. I will not use too much air for roles like Pamina because the flexibility needs a thinner sound. When I sing Tatiana, I use more air in terms of sensation, regardless of the actual scientific truth.
12. There is no difference in the sensation when I sing higher notes.
13. When you get to the end of phrase and you still have the air left, it may be a sign that you didn't use *appoggio* correctly. If you're struggling with the breath management, there is a sign of something wrong. If I feel the breath stacking, there's an issue. Breath can be a symptom of other issues. I will not only direct the problems of breath management to my *appoggio*.
14. I actively sing some mezzo-soprano repertoire, but I sing the same way.
15. There is no difference. If I feel any change in my breathing, I know there is another problem that I need to address.
16. I am absolutely conscious about my posture, which includes the raised sternum and the back position of the shoulders.
17. No.
18. I think general exercise helps but I avoid sit-ups and other exercises which create tight core.
19. The posture is the most important step for experiencing the correct *appoggio*. The only way to practice *appoggio* is to experience the effectiveness of it in one's body.
20. How does one maintain *appoggio* when one is active on stage?

### **Soprano 6**

Roles performed: Alice Ford (*Falstaff*), Amelia (*Un ballo in maschera*), Countess Almaviva (*Le nozze di Figaro*), Desdemona (*Otello*), Mimi (*La bohème*)

Roles in preparation: Lady Macbeth (*Macbeth*), Salome, Turandot

1. I have never heard of the term *appoggio*.
2. Breathing is my weakest technique. I have never gone so deeply about it. Most often said is to feel the expansion in my back but I never feel it in my back. I try to feel deeply in my lower torso by breathing through a straw or in straw position. It is a breathing technique that uses the whole of your upper body expansion as well as the pelvic floor which allows you to support the sound and control the air flow at your will.
3. My habit is shallow breathing and gasping. But it is supposed to be a quiet, deep, and full breath. My teachers often talked about floating the rib cage. When it floats, it expands the most. The sternum must be present.
4. Because my tendency is to take a quick, shallow breath, I end up getting stacking. My voice gets tight. If I breathe correctly, I can take a fuller breath, which helps me to sing through the whole phrase, change dynamics at ease, and keep the voice freer and fuller.
5. The shoulders are back, and the chest is open. I use the high heels since they force my shoulders back, and everything is straighter up and down. It may have to do with a balance and gravity. I try to think of the back of my head going up because my natural habit is to jut my chin out.
6. I feel it in my lower gut, the pelvic floor, and also in my ribs and high abdomen. But I don't feel much in my back. Side expansion is more like second nature to me, just a result of the deep breath.
7. I pull in the place right under the belly button just a little bit. Just a little tuck. Other areas expand. It's natural. The tuck is almost second nature to me at this point but it's something manufactured. It is the center of my support.
8. I do mouth breathing. I have a small nasal passage and I don't get as much air when I breathe through my nose.
9. The tuck continues to pull in from the same place below the navel. Then I try to expand a little more in my side at the end of the phrase to maintain the quality of my sound.

10. I agree with letting the air flow freely. It does feel satisfying to hold back the air because you feel you're in control. But it is counterintuitive. Holding back means you are tight and constricted. But when you allow the air to move, you can do more with it.
11. Letting a small amount of air escape is more beneficial. Small amount of air feels easier to control. You can end up having your cords fight against large amount of air if it is passing too quickly.
12. I use much less breath on my high notes. In fact, I don't breathe as deeply as other times. I don't do tucking in anymore in my high notes. I actually breathe higher in my torso. In fact, I always had an easy time on high notes, this has been always natural. I feel less labored in my body.
13. I agree with the idea of using up all the air in each phrase. It's not something that happens always. I definitely stack if I have too much air left. I try to get rid of it if I have time. When that doesn't happen, my sound gets tight.
14. Yes, but it was a long time ago. I don't remember how my breathing techniques changed.
15. The only difference I'm aware of is for anything above the staff. I take a bit shallower breath, and I feel a lot less air pressure.
16. I would say 75% time unconscious. Sometimes I would like to breathe through a straw to feel how deeply the air goes.
17. I want to try out a medical breathing monitor with a ball hovering in the plastic bag, just to see how much breath capacity I have.
18. I do not. Cardio exercise may help like riding a bicycle.
19. Breathing more deeply in your body. Not letting your shoulders rise and fall. Feeling the expansion in your chest and belly and even back.
20. Is *appoggio* a technique relating only to breathing or all inclusive? If you have to give somebody one exercise to experience the feeling of *appoggio*, what would you tell them to do?

### **Mezzo-soprano 1**

Roles performed: Giulio Cesare, Rosina (*Il barbiere di Siviglia*), Sister Helen (*Dead Man Walking*), Zerlina (*Don Giovanni*)

Roles in preparation: Ariodante, Charlotte (*Werther*), Cherubino (*Le nozze di Figaro*)

1. None of my former teachers used the specific term. I only heard about the term after my graduate school. But I believe the idea of *appoggio* was always taught.
2. It's a breathing technique that keeps you supported and healthy. You won't use the muscles around your vocal apparatus and won't get fatigued easily.
3. I breathe as if I'm breathing while sleeping, which helps me to access my diaphragm easily. It is related to the idea of natural breathing, which is about not trying to force the air into the lungs. I'm trying to get bigger breath more quickly in the most natural way.
4. Breathing is the foundation of singing. It's related to freeing the articulator and making sure the sound is supported. Over time, my breathing technique has made my singing voice fuller, healthier, and more focused.
5. I try to stay as upright as possible with the open chest. I don't put my shoulders back. Instead, I rotate my biceps out. I try to keep my back lengthened. I put my palm on the back of my neck so that I don't shorten it. I try not to get on my toes.
6. I usually feel expansion around my diaphragm and my entire abdominal area, both high and low. But there is more expansion in the lower abdomen. Sometimes there is a sensation in my lower back, and not much in my chest. I think it's the breath making all these happen. When I breathe, I try to expand my entire torso vertically, feeling tall, ending up with chest elevation a bit. I don't focus on the sternum or rib cage.
7. I let my body expand naturally on inhalation. I don't intentionally push out or in.

8. I think either is beneficial. Breathing through the mouth lets a bit more breath in than the nose. But you can avoid gasping when you breathe through the nose.
9. I try to relax my body unless it's a particularly challenging phrase, which then I try to maintain the expansion. There is an engagement happening in my abdomen, and I'm not trying so hard to maintain the expansion. My focus is in the resonator, not much in my torso at the time of singing.
10. I agree with letting the air flow. But the air is focused, not breathy. Holding back the air means trying to save the air to me. But I should let it flow because the breath is connected to the sound I make.
11. It depends on the character and the range of the phrase. I need more air on higher range and less air on the bottom. I need to use more air in the coloratura, and less air in the sustained passage. I need the less amount of more focused air for singing staccato.
12. I try to keep the breath low as much as possible. I am still trying to figure it out. I need to avoid taking a shallow breath.
13. The goal is to take the enough amount of air for the upcoming phrase to avoid stacking. Then I do not need to use all the air in one phrase. I don't try to expel the air out left in the lungs.
14. I was a soprano, but I was too young to figure out anything back then.
15. During a register change, I focus on my resonator, not much my breathing. My *appoggio* remains the same.
16. In a practice room, I am very conscious. When I perform, I hope I'm not thinking about it. I will do panting once in a while.
17. I practice breathing while bending over from the seated position. It is relaxing and helps me to feel more expansion.
18. I try to. I do some interval training with running. I do some Pilates. Those help. I try to avoid too much workouts on my abdominal muscles before singing because I cannot release them afterwards.
19. I like to start with the exercise of bending over and touching your thigh with your stomach. It's very relaxing and one can easily feel the expansion in the body. It is a helpful way to avoid high chest breathing.
20. I am wondering if the back breathing is beneficial or not because it is difficult for me to feel it. I also try to breathe quietly, which I believe is beneficial, and I want to know why.

### **Mezzo-soprano 2**

Roles performed: Cherubino, Dorabella (*Così fan tutte*), Hansel, Ruggero (*Alcina*), Zerlina  
 Roles in preparation: Carmen, Charlotte, The Composer (*Ariadne auf Naxos*), Octavian (*Die Rosenkavalier*)

1. From my teacher. The opening chapters of Garcia's book - A complete treatise.
2. *Appoggio* is the slow controlled release of air through the support, which starts from the initial attack. The sensation of *appoggio* comes from the pelvic floor. The support for the phrase comes from the chest like a sobbing sensation.
3. Some techniques believe in pushing down, but I don't think of that. For me, it's more like a zipping-up sensation.
4. The purpose is to take any pressure off of the throat so that the voice is free and singing *legato* becomes better. It makes my sound more focused and present.
5. When I'm nervous, I will lower myself to the ground by bending my knees slightly. Since I have a natural open chest and shoulders, I try not to think about my posture too much because I may carry tension in my upper body as an athlete does.
6. I feel the expansion in my lower abdomen, close to the pelvic floor. I don't think of other places primarily. I know my ribs expand but it's the consequence. The chest is always present. I don't try to force the expansion because it just happens naturally. I just let my

- lower abdomen release and the breath goes low. I don't bother with my back because they don't really move at all.
7. I just let it expand naturally.
  8. I'm not opposed to nose breathing, but I'm definitely more of a mouth breather. I've heard once about breathing through both. Nose breathing is to make sure your placement is high. If you have to take a quick breath, nose breathing will create too much sound and it won't give you enough breath. Some people do breathe loudly through the mouth and this will end up gasping and ending up too high in your chest.
  9. My lower abdomen engages a little bit but whatever happens, happens. If I think about singing *legato*, my body will do what is necessary. If I'm micro-managing, I get into trouble. However, it is important to keep my chest support my sound and not to relax my body completely.
  10. I believe in letting the air flow. Holding back the air may create the sobbing sensation, which is good, but I don't actually hold the air. After the initial attack, the air will flow. Otherwise you will create tension.
  11. I think the small amount of air. You don't want your sound to be breathy by letting too much air out at once. I know some people do that for pianissimo singing.
  12. I really think of my pelvic floor kicking in or tucking in. The chest will feel elevated a little, like when lifting up objects.
  13. *Appoggio* regulates my breath management. When I do not use up all my air, I start to stack and then I become out of breath. If I completely use up my air for that phrase, I can easily release and start a new breath again. If I am stacked a lot, I expel the air by blowing it out like an emergency plan.
  14. I started as a soprano, but I was too young to know what I was doing.
  15. In *passaggio*, more *appoggio* is engaged. For example, if the line starts on F4 and goes up to high F (F5), I will try to support more from Bb4.
  16. I am conscious of it. I do breathing exercises. The routine is, I exhale and then I bend over, I inhale, I get up and then I exhale. This is just to feel consciously what your body is doing.
  17. The idea of lifting the chest and tucking in the abdomen is a new technique, and it helps me.
  18. Yes, I do. Running helps a lot. I have asthma and running clears my chest. I don't do much abs workout except when I'm doing yoga, which is more of a core exercise. But tight abdominal muscles will not hinder as long as you can still release them. You should not suck them in.
  19. I would teach them an idea of pulling taffy as they are singing legato line, and your body will adjust to it. I will ask them to move their hands slow and consistent because the hands can betray the brain power.
  20. What are the other people's thoughts on *appoggio*? If there is one optimal method on how to do it, I would love to know. Everyone has a different idea in this business.

### **Mezzo-soprano 3**

Roles performed: Cherubino, Dorabella (*Così fan tutte*), Joe (*Little Women*), Meg Page (*Falstaff*), Suzuki (*Madama Butterfly*)

Roles in preparation: Charlotte, Hermia (*A Midsummer Night's Dream*)

1. I do not consider my breathing technique is *appoggio*. I assume that *appoggio* has to do with support. I have only heard about it from other singers and I have not read any literature about it.
2. It must be a normal breathing technique with good posture with optimal efficiency.
3. Breathing is the most natural thing that humans do. When you put technique to it, it becomes tense. It should be natural and not forcing.
4. Breathing is the foundation of singing. If there is a problem in breathing, you will not be able to sing with the full potential of your voice. You do not have to take too much breath for

- resonance, singing legato, and doing everything musically. With good breathing, you have a better control on your voice in terms of dynamics, articulation, and more.
5. I do not really do anything with my chest, shoulders, and neck. Some postural exercises I do are to sing with one leg up, to bend, or to push the heavy object. Sometimes I start to slouch if I am physically tired, which I try to avoid.
  6. I feel the most expansion in the lower rib cage in front and side, but not much in the back. I try not to let my chest rise to avoid high chest breathing. There is a little expansion in the lower abdomen.
  7. I only let my body expand. The expansion happens naturally. I try to breathe low to avoid my shoulders and chest rising.
  8. I use both when I'm naturally breathing. Otherwise, I don't have any preference.
  9. I believe maintaining the expansion through the phrase is important. I try to keep my chest open because I am a natural sloucher. It helps me to maintain my expansion better. Sometimes, I feel as if I am pushing out the lower belly around the pelvic floor to keep the expansion. But once I start to feel tensed, I let my body do what it needs to do, which is to come back in.
  10. I let the air flow. Any sensation relates to holding feels like tension to me.
  11. It depends on what you're singing. To sing a long-sustained phrase, you need to use a small amount of air. For shorter and louder phrase, you need to use more amount of air.
  12. If I breathe too high, the high note does not come out well. Other than that, there is not a huge change in my breathing. The change is very mental.
  13. I usually use up all my air in one phrase to avoid stacking.
  14. I started as a soprano. As soon as I got rid of the tension in my breathing, my voice dropped and became more like a mezzo-soprano.
  15. My problem is to let too much air escape and my voice gets breathy. So, I have to focus my sound between the mid and low registers.
  16. I am unconscious of breathing when I perform. Sometimes I make sure to breathe properly when I warm up. I put my hands on the side and try to feel the expansion.
  17. Breathing through a straw was an interesting exercise because it made me more aware of my breath.
  18. Yes. It helps my breathing and posture. Running, dancing, and lightweight lifting are all helpful.
  19. My teaching may vary depending on the way the students hold themselves in posture. Otherwise, I will ask them to let their body do what it needs to do naturally. Every human knows how to breathe.
  20. What are other people's thoughts on *appoggio*? What is the Italian breathing technique exactly?

#### **Mezzo-soprano 4**

Roles performed: Cherubino, Dorabella, Hansel, Zerlina

Roles in preparation: Carmen, Charlotte, Nicklausse (*Les contes d'Hoffmann*), Octavian

1. None of my teachers used the term *appoggio* but I consider my breathing technique uses good support. I read some literature at my graduate vocal pedagogy class talking about *appoggio*.
2. When I breathe, I breathe through my mouth and I feel my soft pallet raises. The breath expands to the lower ribs and to the back and my lower abdominal muscles are used to support. There is a visual and sensational expansion and contraction of the supporting muscles.
3. I know people talk about the belly breathing. Your lungs are not your stomach, and your stomach is not your lungs. There is much more expansion in your lower ribs, below the heart line, than in the abdomen. For me, it's about the bottom two ribs. I understand some people



talk about breathing as low as their groin area to feel the grounding support. But that is not what is really happening scientifically. Also, the diaphragm is an involuntary muscle and you cannot feel it. Breathing must be quiet. Gasping is never good. It should be easy as well, not as difficult as the belly breathing.

4. It will energize my sound and my phrasing. Sometimes I lose the energy if I think about relaxing and not supporting. It is my *appoggio* that brings the exciting energy to my voice.
5. I used to think a lot about my posture. I find it difficult to assign one posture to every person because no one has a perfect body and the symmetrical frame. I would never recommend singing with slouch position. I think about my feet being firm on the ground. I engage my hip flexors, thighs, and glutes to protect my low back. I think about my groundings are in those low area. I try to keep my upper body as free as possible. I naturally carry a lot of tension in my shoulders because of my scoliosis. I try to keep my shoulders back because that allows more expansion in my chest.
6. I feel the expansion mostly in the ring underneath my lower ribs, which is a little higher than my natural waist. My lower abdomen also expands a lot. The expansion is second nature to me because I have been doing it for a long time. I used to expand those areas intentionally, even without taking a breath, to create space for the air to come in.
7. I do not draw in any part of my body. I only expand.
8. I breathe through my mouth, mostly. If you are breathing through your nose, you have to work as twice as hard to lift your soft pallet and to open your throat. I will only breathe through my nose to take humidified air when I feel my voice is being dried. I don't think I can breathe through both simultaneously.
9. I release my body, but it is still engaged, not completely relaxed. I do not maintain the wideness of my torso. It will naturally go back to the original state as I use my breath. I should be able to see the contraction which means I am using the air properly. But it is different from losing tension completely. If there is only collapsing, it means nothing.
10. I agree with letting the air flow. Some coaches have told me to hold back the air in the sense of reserving the air. It is possible that they thought I was letting too much air escape. But it's still difficult for me to understand what they really meant. I believe there should be freedom in your voice and in your body. If you're reserving the air and holding onto the air, it's too easy to force another part of your body to do the work.
11. It depends on where you are in your voice or what kind of repertoire I sing. It is both for me.
12. I found that singing in lower registers and higher registers requires the same degree of support. So, there is no change of strategy.
13. *Appoggio* elongates my breath cycle. I try to take as much as I need for that phrase so that I don't tank up my lungs.
14. No.
15. Singing lower requires more air. When I'm switching from the head voice to the chest voice, I try to engage more, leaving my throat open. I imagine that I would need greater expansion to sing lower register. But I use more mental preparation, not physical.
16. Unconscious. I practice them a lot so that I do not think about it when I am actually singing. I just focus on taking the quiet breath and engaging the lower torso.
17. I do not know any other strategy, but I am open to try.
18. No. But when I exercise, I do some physical therapy exercises. They help to strengthen the muscles for *appoggio* in addition to support my lower back. None of the exercises I do hinders *appoggio*.
19. Visual and physiological engagement and energy in the torso will be the most important thing. I would like to see the expansion in their body. It may look different depending on individuals.
20. I wonder how other people think of *appoggio*. Is *appoggio* still considered the optimal way of singing?

## Mezzo-soprano 5

Roles performed: Giulio Cesare, Nancy (*Albert Herring*), Nicklausse, Zerlina

Roles in preparation: Cherubino, Rosina, Sesto (*Giulio Cesare*)

1. My undergraduate teacher talked about *appoggio*. I also read some literature talking about it, such as *The Naked Voice* by Stephen Smith or *Great Singers on Great Singing* by Jerome Hines.
2. It is the breathing technique which is successful to allow singers to experience physically what using the air feels like. It is a grounding sensation to the pelvic floor, allowing you to efficiently use air by feeling the lean into the low pelvic position.
3. It is the actual mechanical way to achieve the consistent resonance as opposed to normal breathing, in which you are not aware of breathing. It allows you to address things immediately to fish around what could be wrong. It is a more practical and efficient way. I was once told that I was using the German technique, for which everything was very literal. I used to breathe in and push the abdomen in a much tighter manner. It was a very structured way of breathing. Using *appoggio*, I do not try to use the muscles as literally as before. Now it is more about allowing the expansion and letting the air flow rather than manifesting them physically.
4. It starts from taking a low breath, like breathing from the floor. It helps the resonance to be more consistent by not using any unnecessary muscles or tensions around the throat. *Appoggio* uses a good tension.
5. I think of a good posture. I think about my head being lighter, my neck not leaning forward but being tall and straight. The back should not be swayed. The good posture will make me lean forward a little bit.
6. Every part of my belly below the low rib cage expands. The front expands more than the back. I don't think about my side much. I let my high abdomen expand throughout. It is very physically intentional since I have to think about it to make it happen. I keep my chest upright and open.
7. I expand everything out. It is intentional, but I am trying not to overdo it. It is not unnatural injection of air.
8. I should always breath through both. Breathing only through the nose can be helpful when I feel I am singing too heavy. I feel nose breathing will help the overtones and prevent heavy singing. Mouth breathing has a danger of creating tongue tension which makes the sound too muffled.
9. I try to maintain the expansion in my high abdominal area. I don't push out anymore. I push in from my groin area to feel the support coming from the lowest part of my body, which is like a generator. My chest is upright. I try to relax my knees.
10. I had two different teachers who were an advocate of each idea. They were both very helpful. Letting the air out may help with going in around upper *passaggio* with ease. Holding back the air idea can help you with the consistency in lower registers. If I don't think about holding back the air, my voice cracks.
11. It is the small stream of air which I need, but it is moving fast. If I let too much air out, my voice becomes heavy, and the vibrato slows down. It can make my voice breathy in the bottom.
12. I think of less air to use on high notes. My body stays the same, trying to be expanded. I don't notice a difference.
13. *Appoggio* accesses the power generator for wherever the air is going. It allows the air to move wherever it wants. For high notes, it wants to go up and back of my skull. For low notes, it wants to go straight out of my eye balls. I don't try to use up all the air. I just try to make it as evenly as possible. Whatever I have left, I silently exhale.
14. No.

15. I used to feel differently between different registers. Back in my early training, my teacher taught me to use less air on the low notes, more air on the high notes, and I blasted the top. I couldn't use my air efficiently. I now realize that I need the lean throughout the whole range. I feel I need more expansion in lower notes instead.
16. I am conscious. I always check in my posture, stretching, and a sensation of breathing through a straw.
17. I am actually playing with the idea of making my *appoggio* smoother in motion.
18. Yes, I work out three times a week. What helps is the squat. What hinders is lifting weights too much. I feel my muscles, which are supposed to be loose, get too tired and tight.
19. *Appoggio* is the generator. It allows the voice to resonate, inspired by the air, not just project. I somewhat agree with the concept of two inches down and back from the navel, or lower. That is the point where you should feel the expansion.
20. A lot of people get really confused about *appoggio*. I'm wondering what other people think about it. My teacher used to say the point of expansion is two inches down and back from the navel. But since I worked on my voice more, I feel the point of expansion is even lower for me. I don't specifically place it anywhere, but I try to take as lowest breath as I can.

### **Mezzo-soprano 6**

Roles performed: Mrs. Nolan (*The Medium*), Narciso (*Agrippina*), Paquette (*Candide*), Tituba (*The Crucible*)

Roles in preparation: Carmen, Cornelia (*Giulio Cesare*), Dalila (*Samson and Delilah*)

1. My undergraduate teacher used to teach *appoggio*. She recommended reading some pedagogy books.
2. It is a very complicated subject for me. My idea about *appoggio* changes every month. It has to do with narrowing and speeding up the breath. It also has to do with how you take the breath. It allows you to go through the smooth shift in vocal line.
3. Because of my asthma, I need to slow everything down. My heartbeats accelerate with shallow breathing. I have to breathe through the straw very slowly. *Appoggio* promotes a slow and deep breathing, which takes away the tension from anxiety for me.
4. It narrows and brightens my singing voice since my voice is naturally dark. It's the *chiaro* part that *appoggio* brings to my voice. It makes my voice steadier throughout the range and my voice projects better.
5. First, I put my shoulders back and my chest out. This is what I've always been taught. I was an ice skater and that upright, shoulder back position was very important. I also played violin and the posture for that is also similar. My legs should be apart a little bit.
6. There is expansion right under the ribs. I can feel it right on the sternum and all around the back. And then, everything follows. I feel the expansion on the sides, the mid to lower back, but not much in the upper back. I feel the most expansion in the lower abdomen and it goes all the way up to the sternum. It just happens as I breathe. For a big high note for which I need more air, I get more intentional, but I don't really think about it. I believe that one should not think about breathing much once you practiced it. It only tenses you up. The deep breathing sensation only happens with the expansion.
7. I just let my body expand naturally when I breathe in.
8. I typically breathe through the mouth more than through the nose. Nose breathing is not deep enough. I usually need a solid deep breath. I will start to panic if I don't get enough breath in my lungs.
9. It depends. When I sing high notes around E5 or F5, my stomach naturally comes back in. For even higher notes, such as G5 and Ab5, I will push out my lower abdomen. When I push in, the air feels more refined and I let smaller amount. When I push out my lower abdomen, it feels more openness in my body and the tone.

10. I agree with letting the air flow. If you hold back the air, you stop the air. It makes your phrasing stop and tightens your body.
11. I use smaller amount of air in the middle range. I use much more air in the high notes but not to the degree which takes the voice out of line.
12. Answered in question 9.
13. Breath capacity is important. I try to get as much as air possible even if I don't need it. I like the idea of tanking up the air in my body. I don't really think about using up all the air. I wouldn't expel the leftover air. I don't go to zero. I just start from where I am no matter how much air is left.
14. No.
15. Yes, mostly on upper registers, not much in lower registers. My lower registers are over developed. When I go higher, it feels like there is a small door I have to go through. I have to be in the right position. It's very hard to shift for me.
16. I don't think about it in the performance. My singing is not as good when I think too much.
17. I am not looking for a trick or quick solution, but I am looking for the maturity of my voice and technique. I wouldn't try to change my *appoggio* by myself because I don't want to cause any harm by doing it incorrectly.
18. I typically run about a mile. I also do other exercises such as squats, pushups, and more. They definitely help the lung capacity.
19. It is difficult to teach *appoggio* to someone because I haven't even mastered it. At this point, it is the core support in my head.
20. I want to know what other heavy female voices do in terms of *appoggio*. I wonder how *appoggio* can help me with my register shift to the upper *passaggio*. Is *appoggio* something that requires more time to develop?

### **Tenor 1**

Roles performed: Count Almaviva (*Il barbiere di Siviglia*), Ferrando (*Così fan tutte*), Nadir (*The Pearl Fishers*)

Roles in preparation: Ernesto (*Don Pasquale*)

1. My first teacher taught me *appoggio*. I used to read a lot of Miller's books, Garcia's *Hints on Singing*, *Vocal Wisdom* by Lamperti.
2. It is a technique to slow down the collapse of my rib cage. With *appoggio*, I can maintain the subglottal pressure without using the muscles in my throat.
3. I haven't tried other techniques, but I heard about German belly breathing. I believe *appoggio* is more organic, and it doesn't force your body to do something unnatural. It feels very deep and firm in my lower back and high abdominal muscles. My chest feels open and firm.
4. Breathing with *appoggio* gives you the most freedom. It allows you the flexibility on your throat because it takes away any extra muscular activity or tension. This is very important to sing coloratura passage without squeezing your throat.
5. If I'm slouching, *appoggio* won't be efficient. Whichever position I am, I try to align my chest and spine so that they don't collapse. Rolling back my shoulders opens my chest. Noble posture resonates with me, like a soldier. I don't really think about the lower part of my body, legs, knees, and hips. It's the upper part of my body that is important for my *appoggio*. I imagine hanging from the string attached to the top of my skull.
6. I feel it in my high abdominal region, not so low, and a lot in my mid back, right below my rib cage. The chest feels open, set along with my posture, and is kept nicely and steadily. I feel things drop and go out in the side. I first thought about it intentionally when I was training. I've been breathing in that way and now it's very natural. It's more involuntary now.
7. I think about expanding out only so that it doesn't collapse in my chest, keeping the sensation of inhalation throughout.

8. I haven't really thought about it. I breathe through both. Some teachers taught me to breathe through the shape of the vowel that I will be singing, but I don't really think about it. I take a very long breath, almost a length of a bar. It's slow, quiet, and calm.
9. I keep the sensation of inhalation while exhalation is happening. When I go for the high notes, I feel even more of pushing out my low ribcage, around the high abdomen. It feels very firm there. I don't think about drawing in any part of my body. I only relax my throat, but not my torso. That is why I feel sore in my torso after a performance.
10. I think I do agree with holding back the air even though it possesses the dangerous connotation if one holds the air in the throat. But if you hold the air in your lower muscles with *appoggio*, it gives you more control in creating the sound you want to make. Everything depends on the healthy control and there cannot be tension. The tenors are supposed to sing with much glottal pressure and it's about how to control them in a healthy manner.
11. It is much more important for the airflow to be focused and concentrated. The airflow should be slender. Using too much air causes lack of consistent vibrato and breathiness, and it messes up with the intonation.
12. There is more pushing out sensation in my chest and high abdomen. The muscles around those areas will firm up even more. I don't really feel anything in my lower abdomen even though I think about going low.
13. No, I don't think I use up all the air. I think my tone quality suffers at the end if I reach the end of breath cycle. I don't really think about stacking up. If I still have a lot of air left, I won't take another breath, I will just simply continue. I don't like to be in the last bit of breath which makes my tone and vibrato suffer. To sing long phrase, I keep my support firm so that I know exactly how long I can sing. I don't let everything out too quickly.
14. No.
15. N/A.
16. Right now, unconscious. But as I was learning, I had to think about *appoggio* consciously over and over. I do practice the sensation being low to make sure that my body is very settled into the ground.
17. No, now my thinking has become the way I breathe. They are very much connected to the tone I create. When I think about the color I want to create, it informs my body how I should inhale.
18. Yes, I do, but I never really relate my exercise to my singing. Cardio helps the acclimation so that I don't sing with a high heart rate. I don't really feel upper body exercises help with my *appoggio*.
19. I've always had teachers to tell me it's supposed to be very natural. But it was more about training myself and it can feel unnatural during the training. I only feel it's natural after long training. I will ask them not to be discouraged even if it feels overworked or unnatural. I think the inhalation plays the big part. The breath has to be low, quiet, and enables open throat. Another big part is the posture, and especially, the chest should be upright.
20. I'm interested to know how different *appoggio* is compared to other breathing techniques.

## **Tenor 2**

Roles performed: Alfredo (*La Traviata*), Don Ottavio (*Don Giovanni*), Nemorino (*L'elisir d'amore*), Tom Rakewell (*The Rake's Progress*)

Roles in preparation: Stage Manager (*Our Town*)

1. One of my previous teachers used the term *appoggio*. Other teachers taught the same concepts but not used the term specifically. I became more familiar with the term through Richard Miller's literature, *Training Tenor Voices*, but not in depth.
2. It is about regulating the proper airflow in a natural manner. If the mechanism is not working naturally, everything becomes strange. Even when we talk, we support, and I believe singing

- works in the same way. *Appoggio* involves the natural breath in and some engagement of the whole abdominal area.
3. The relaxation and the awareness are two main things. Clavicular breathing is tensing and engaging in an inefficient way. *Appoggio* is the whole-body experience. The abdominal muscles should be relaxed. Quiet breath is also important.
  4. Without *appoggio*, I will not be able to project my voice efficiently and sustain my voice in the long phrase. If the appropriate parts of my body don't do the work, other parts of my body will suffer, causing many problems in the throat. I believe producing inefficient sound such as wobbles is the result of the bad breathing techniques. *Appoggio* helps to produce clear vocal tones.
  5. The spine should be aligned. The position of the head is important, not too forward nor backward. The position of hips is also important; the pelvis needs to be tucked in a little bit for the alignment of the spine. Chest has to be somewhere in the middle, not too front and not too crouched. I believe the length of the area from the sternum to the groin area should be elongated than the normal position but not too expanded as to create tension in the lower back. Once I breathe, I am committed to keep my position throughout.
  6. There is an expansion in the upper and lower abdomen and around to the lower back. There is a small side expansion. I don't think the chest should be engaged at all. My normal position always keeps my stomach in. But when I breathe, I become aware of letting the expansion happen.
  7. The abdomen does what it needs to do depending on the needs of the singer and the repertoire they sing. I feel both expansion and tucking in. Sometimes I push my abdomen down and out without thinking about it, or it is pulled in sometimes. I believe in the natural functions of the body.
  8. I almost never breathe through my nose. But I don't really have an opinion about it. I think breathing through the mouth is more efficient because it's quicker. There is a sense of height when you breathe through the nose, but it really doesn't work for me. There is more sense of open through in mouth breathing, which is more helpful to *appoggio*. Nose breathing feels tight and narrow.
  9. It is difficult to relax while singing. I try to maintain the position that I created during inhalation. When I try to give more vocal energy, my high abdomen comes out while my lower abdomen tucks under.
  10. I let the air flow. I think singing is the regulation of the air through engagement, *appoggio*. If you're holding back the air, you're creating the tension, which is in opposition to *appoggio*. The air will flow no matter if you want it or not. If you hold back the air, you will not phonate.
  11. I think there is efficient and inefficient singing. Efficient singing regulates the correct amount of air. Too much air creates breathy tone and too little air creates pinched sound. When you are singing lower notes, the adduction of the folds is bigger, and more air goes through for each vibration. It's the opposite for singing higher notes.
  12. I believe we use the same amount of breath throughout the range. But there is more engagement and awareness when we go into the top notes. Breath doesn't change but our awareness and engagement do.
  13. Ideally, you should take the necessary amount of breath for the upcoming phrase. If it's a long phrase, you need a substantial breath. On the contrary, the short phrase does not require a full breath but requires a full relaxation. You should avoid tanking up the lungs because you may end up stacking.
  14. No.
  15. N/A.
  16. I become conscious of *appoggio* when the stakes are high. Otherwise, I would like to let my body do what it should do as it is trained.

17. I am not aware of other methods. I'm not looking for other options, but I'm open to checking them
18. I exercise regularly, and it helps. I was a swimmer before. We are vocal athletes and our body should be healthy. The full body exercises help. You should avoid exercises creating tension around the neck like dumbbell shrugs. Most other exercises are helpful if they are done correctly.
19. It has to be natural, but not as natural as when we speak. That's habitual. Students should figure out the point of expansion and adopt correct posture. I will ask them to do some breath exercises without using the voice.
20. First, I am curious about other people's ideas about *appoggio* and how the term has gone for so long undefined. At least to me. I also want to know how much knowing *appoggio* intellectually translates to the singing. Sometimes, I find singers well prepared intellectually don't sing well.

### Tenor 3

Roles performed: Ferrando, Laurie (*Little Women*), Tonio (*La Fille du Régiment*)

Roles in preparation: Edgardo (*Lucia di Lammermoor*), Fenton (*Falstaff*), Nemorino, Rodolfo (*La bohème*)

1. All of my teachers. One of the teachers explained *appoggio* in a way which I don't necessarily think of it right now. It involved pushing out sensation in a sense of resisting collapse. It worked against me to push too much. I've read Richard Miller's *Training Tenor Voices* and Jerome Hines' *The Four Voices of Man*. It was interesting to me that every famous singer he interviewed had different opinions about *appoggio*.
2. It is a breathing technique that allows me to efficiently use the air in the lungs through the ability to control the speed and the amount of air. It feels as if I am going to fall over with my chest pushing forward whereas the abdomen is being pulled in and engaged. Those two muscles feel counteractive and counterbalanced.
3. All of my teachers taught *appoggio*, so I don't quite know other breathing techniques that exist. But the idea of breath-supported sound is the only way to sing classically.
4. The sound which doesn't use *appoggio* technique is breathy because there is too much air escaping in the tone. The tone is unclear. It's not loud and resonant enough because the air is not being released efficiently. Instead of the air being turned into a musical tone, it is just released as air. With *appoggio* technique, all the air coming out of the lungs are turned into tone because *appoggio* creates the correct sub-glottal pressure. The air comes out in even fashion and because of that, all the air is able to pass over the vocal cords to participate in producing tone.
5. I often think of my hips being very low as if they are pushing down to the ground. The shoulders become broad and low and my scapulae are touching each other. These activities are quite intentional and exaggerated motions.
6. I feel most expansion in the entire rib cage, all around from front to back. When you bend over and suck in the air, there is a back expansion. There is also an expansion in middle and high chest. A small expansion in the side area, too. I mentally think I am taking a breath and the expansion happens naturally. I would say the expansion is half intentional, since I still nudge out the compartment, the rib cage, by guiding them. When I was learning, I had to make it happen all the time. Now I don't do it as much, but I still do big chest out sometimes.
7. I think of the lower part of my torso both not to be in or out. I have my chest, all around the rib cage, front and back, to expand out. Broadening of the chest, and chest out front.
8. Breathing through the nose helps singers to find more head voice dominant sound. Breathing through the mouth can do many different things. If I want to create more head voice for dramatic and emotional reason, I will breathe through the nose. Producing head voice feels safe, and it sounds safe. When I try to sing with more chest dominant sound, it feels more

- dangerous to push. Therefore, I prefer nose breathing in general, but it's all about making a different choice. If I need to sing more dramatic, I will breathe through the mouth. I feel they make differences in my *appoggio*. It is mostly mouth breathing which can upset my *appoggio*.
9. I almost lean on my chest almost to the point it feels like pushing out. But I pull in the lower abdomen when I sing. The point of pulling is from the lowest abdominal area, and the pulling sensation goes up to the high abdomen.
  10. I let the air flow. It is about getting the air out of your own way. You should let the air out as little as possible so that the air can just move where it wants to move. Holding back the air means almost synonymous to hold the air in the throat. Letting the air flow is same as freeing the throat.
  11. I never think of letting the large amount of air escape. Even if it may be true scientifically that larger amount of air is coming out, I wouldn't want to have too much air in my sound. When I try to make loud chest voice, I think of the tiny stream. The large sound comes from the resonance, not the amount of air.
  12. I try to feel the muscular support even more, which involves the chest out and the lower abdomen in. The chest feels as if it is almost about to fall over.
  13. I believe the *appoggio* definitely elongates the breath cycle. It's because of the efficiency, not the capacity. I don't really care about using up all air. I admit there is some truth to the fact that using up all the air in a phrase before taking a new breath prevents stacking. It prevents high chest breathing.
  14. No.
  15. N/A.
  16. When I have a difficult passage to sing, I think about my *appoggio*. When the stakes are not high, my body is more relaxed, and I let my body do what it's supposed to do. I try to feel more of the counterbalance between the muscles of inhalation and exhalation, the healthy tension. This helps me to find the core of my sound.
  17. I would like to try wearing a training belt a little bit tightly around the low ribcage. I believe it will help me to identify the antagonizing sensation.
  18. Yes. I think any muscular building helps around the chest and arms. Rowing machines help a lot. I am not so sure about cardio.
  19. The most important thing is the muscular antagonism. The sensation of deep anchor. I would start with leaning against the wall with the hands. Using the Pilates ring to put in between the legs can help students to find the balance in the lower muscles. Making a short burst of sound or a hearty laugh may help to identify the supported sound. These exercises have to be carefully watched, not to be done by the throat.
  20. How much information is out there to understand *appoggio* anatomically and scientifically? Is it going to help me? Why do I feel the amount of work I have to do for *appoggio* different every time I sing? Also, why is it difficult to be consistent in my *appoggio* even though I can perfectly conceptualize how to do it?

#### **Tenor 4**

Roles performed: Albert Herring, Fenton, Ferrando, Lysander (*A Midsummer Night's Dream*)

Roles in preparation: Don Ottavio, Nemorino, Peter Quint (*The Turn of the Screw*), Tamino (*Die Zauberflöte*)

1. My first teacher introduced *appoggio* to me. I also studied the literature by Miller and McCoy.
2. It is a balanced state of tensions between the muscles of inhalation and exhalation. Exhalation can be paced over the extended period. The tension can be adjusted to influence subglottal pressure depending on tessitura or musical context.



3. *Appoggio* is a more entire body phenomenon compared to a specific part of body or area. I believe that it is taught more widely than other techniques.
4. The purpose is to create a beautiful tone which is flexible to the demands of whatever music you're singing. If I engage *appoggio* correctly, my tone and vibrato become even, and that I can access the full range of my voice consistently.
5. I think of the slightly elevated sternum and lengthened back of the neck which are connected. I also try to feel the connection of the weight in the feet and to the top of my head. I perceive my spine lengthening upwards, at the same time my weight sinking into the feet.
6. I feel the expansion in my pelvic floor and in the abdomen all the way around. Some lateral expansion also occurs in my rib cage. I feel the front and back expansion a little bit but more lateral expansion. It is very much intentional. I don't think of it as a muscular action but rather as the sense of breath filling. I get into technical trouble if I think too much of muscular expansion. The expansion is reflexive. But I am thinking of breathing as an intentional action. The expansion happens first in the pelvic floor, and then the lowest belly part, and it rises.
7. I don't pull in any part. I only expand out. One way I can tell the inhalation is deep is making sure it's absolutely silent.
8. I find breathing through both is most helpful for me to establish space in the back of my throat to allow the process of inhalation unforced. When I breathe through both, it's easier to feel the expansion in the abdomen and the pelvic floor. I feel the nose breathing tends to result in the high chest breathing while the mouth breathing only encourages the belly breathing.
9. I try to maintain the expansion. The first thing is to maintain the upright posture. The second is to maintain the image of inhalation. I try to keep thinking about the general feeling of inhalation.
10. As an image, I like singing on the gesture of inhalation. It is close to the idea of holding back the air. I am skeptical to approaches that involve a lot of airflow. This relates to my experience. My habit is to blow the air, creating the tension in various parts of my body. For me, thinking of continual inhalation and resisting my habitual temptation are more effective. The initiation of pitch is less clear when I blow the air out. Coloratura passages become difficult to sing clearly.
11. I let a small amount of air out. But for the high note, it does feel like there is an increase in the speed of air when singing higher notes. I find the imagery is useful. The speed of my vibrato helps me to feel my larynx is low. I do it through imagery. I feel my general energy increases. I try to resist the contraction of muscles of exhalation by continuing the gesture of inhalation.
12. There is more energy when I go up to higher notes. The tension between the muscles of inhalation and exhalation increases. I feel more energy in my lower ribs and abdominal muscles. There is more contraction, which is like a general body energy.
13. I manage my breath through *appoggio*, which is a physical process. It lengthens my breath cycle much longer.
14. I changed from baritone to tenor. Frankly, I didn't really know what I was doing back then. But I believe it just got better.
15. N/A.
16. I am always conscious. It's an active phenomenon and very mental for me. I need to try to focus how I begin the tone, energizing my singing all the way to the release and then allowing the release to be the beginning of the next breath.
17. I'd like to experiment with taking a smaller breath while maintaining a deep inhalation.
18. Yes. I think it helps as long as I exercise without holding my breath. Cardio exercises are helpful. Some lightweight lifting exercises are helpful for postural stability. Heavyweight lifting can be problematic, if it leads to rigidity.

19. I would say the relationship between the posture and breath will be where I begin. The upright posture is the most fundamental aspect to correct breathing.
20. I would like to learn more about the relationship between *appoggio* and glottal closure, as in a question, how they influence one another. I suspect that when I engage *appoggio* correctly, my glottal closure becomes more precise and balanced. I think it should neither be breathy nor too tense, but it needs to be precise enough, so that vibrato begins immediately, and the pitch is also clear. Also, I'd love to learn more about the role of a diaphragm in maintaining *appoggio* during singing. I know the diaphragm is in a contracted position after inhalation. Is the action of the diaphragm totally passive or does it work by itself? For example, if I maintain the image of inhalation, how much of the diaphragm muscles may work to stay low?

## Tenors 5

Roles performed: Cassio (*Otello*), Don Ottavio, Ferrando, Roméo, Malcom (*Macbeth*)

Roles in preparation: Edgardo, Peter Grimes, Siegfried

1. I had only one teacher who talked about *appoggio*. But I never tried to achieve *appoggio* intently. I've read Miller, *Training Tenor Voices* and Scott McCoy.
2. Sitting on or leaning against the breath with the sense of suspension of the rib cage. This is what's supposed to happen when you're doing *appoggio* correctly. But to me, it feels almost the holy grail of fantasy to grasp what the *appoggio* is, because it's not tangible or directly achievable thing.
3. It is difficult for me to talk about the characteristics of *appoggio* because I waffled between many different ideas on breathing techniques. All my teachers taught different things. Ideally, my breath should be slow and quiet.
4. The purpose is to support the tone so that the vibrato and resonances are even. It allows singers to sing *legato* because there is connection and support between notes. It adds stability throughout the whole range and it takes weight off of the glottis. It optimizes subglottal pressure so that the air doesn't over-blow through the cords.
5. The upright chest is most important for me. I try to feel wide chest to make sure I don't squeeze my rib cage, which ends up less space for the lungs. Only sometimes, I try to let my shoulder blades touch each other. However, when I feel my singing is not going well, I don't want to keep this upright posture which feels unnatural to me. Sometimes I just want to let all the tensions go in my upper torso and focus on something else. It has two different sides.
6. Ideally, the expansion is in my lower back. There is a down and outward motion of release in the pelvic floor/groin area as the guts move out. Sometimes I only go for expansion in the high chest and high abdomen and sustain that. Occasionally I take a good breath, but I also have a difficult time as I tense out and over pressurize. I don't think about side expansion much. I believe the expansion must be unintentional since I disengage my muscles to create space for the air to come in. I don't want to expand my body without the air.
7. It's a natural expansion.
8. I don't really pay attention to them. I just try to breathe through both whenever possible.
9. I try to keep my chest up and high and not collapse. I have a minor sense of pelvic floor moving upward. I try to resist my abdominal muscles coming in too quickly. It feels as if I am pushing it out slightly so that it doesn't come in too quickly. Lower abdomen requires more attention and the upright chest has become more habitual.
10. I agree with holding back the air. It means to me that it's a coordination of vocal cords adducting sufficiently. The muscles should not allow pushing more air than what you can handle. Over-blowing the air is the most taxing thing. Too much air passing through the cords swells them immediately. Blowing all the air is much easier to do but sustaining it is much harder and more important. We can't just let the air flow too fast. Especially male singers need more pressure than female singers.

11. Definitely a small amount for me. I just equate a large amount of air escaping with overblowing, which is poor cord adduction. *Appoggio* helps my optimal adduction, which gives me much more stamina and stability on my vocal cords and my singing. It also creates a more constant core in my sound.
12. I don't have any specific change in my strategy, but I try not to collapse my chest. I would also reinforce what I'm already doing.
13. I agree with using all air, but I struggle with that. Ideally, you want to use up the air not to stack. Once a while, I should expel the air out.
14. I was a baritone only for six months when I was much younger. I was too young to have any concepts about breath support. But my teacher taught me to do an active tuck in my lower abdomen. But I lightened my mechanism when I switched to tenor. I had to release my habit of tucking in.
15. N/A.
16. I should be conscious ideally because it has never been second nature to me. If I don't think about it, it barely yields the result I want.
17. I want to focus more on active aspects of *appoggio*. I am aware of releasing part of it. I'm trying to figure out how to be more active with *appoggio*.
18. Yes. Cardio is great. I do some chest exercises and it gives me a better understanding of muscle groups, but I make sure I don't lift too heavy. The danger is the tight core. I don't personally know any single person with six packs who sounds free except a couple.
19. I would say posture. It's most important to find the elevated chest that's comfortable. You don't want to tense up by engaging muscles for the elevated chest before singing. You need to discover how to engage only necessary muscles which don't hinder your singing. Especially, the abdominal and back muscles shouldn't be tensed. Your tailbone may have to be turned down in order to prevent your spine getting too shortened. The spine should be elongated.
20. Is that a tangible thing? How does one know that one has achieved the perfect *appoggio*? How can you ever be sure? What is the defining characteristics of tone that is supported by *appoggio*?

## Tenors 6

Roles performed: Don Jose (*Carmen*), Peter Grimes, Pinkerton (*Madama Butterfly*), Tamino

Roles in preparation: Alfredo, Turiddu (*Cavalleria rusticana*), Rodolfo

1. My undergraduate teacher used the term. I also read about it from other literature later.
2. It is the idea of taking in the necessary amount of air to sing a phrase with the pressure necessary to create the singer's formants. It is also the idea of creating the breath pressure while also being able to create the vacuum sensation with lung expansions.
3. It's directly under the xiphoid process<sup>274</sup> where I feel the support. It involves high chest and low sensation in the lower abdomen. The chest rumbles while *appoggio* is happening in the diaphragm area. It needs to be empty between the xiphoid process and the pelvic area. The place should stay open with no gut being tight.
4. The purpose is to sing flexible within your entire range but also to help you understand the confines of your voice. It depicts how you should sing, as in a question, Rossini or Verdi. As soon as you can sing with *appoggio*, you can sing anything within your confines.
5. There are several things I do; high sternum, heels on the ground, shoulders back and down, and always making sure I am expanding 360 degrees.
6. I feel the expansion in my lower rib cage all round. I feel my lower abdomen expands but not without any tension. They are intentional expansions. If my rib expansion doesn't happen, I

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<sup>274</sup> A small cartilaginous process at the lower part of the sternum.

- won't be able to sing my high notes. I think of the empty space in the torso first which creates the space for the air to get sucked in.
7. I push out the area where the expansion happens. I push in the bottom of my pelvic area but very slightly.
  8. I think both are effective, but I always breathe through my mouth. Nose breathing doesn't work for me.
  9. I stay out to maintain the expansion. This means that I only let the minimum amount of air after my diaphragm goes down. Then, my vocal cords adduct in a natural way. It doesn't feel like pushing out my body, only staying out. For men, I believe keeping the maximum capacity of chest is very important.
  10. I let the air flow. Holding back the air means you have to push the air out some way, which I don't agree with. Everything benefits from letting the air flow.
  11. I agree with letting a small amount of air, unless I run out of the air too fast. But it has to have enough energy.
  12. It shouldn't change too much, but you should study the high phrase many times so that you know how much air it takes. I always sing the best when I feel like laying back on the chair. If my ribs are not open, I can't sing my high notes. When they are down and out, it will make my abdomen goes up and in. The most important thing to me is to stay open in my intercostals. My chest is the main source of an amplifier.
  13. I agree with taking the necessary amount of air for the phrase. So, I don't believe in tanking up, but it happens. I try not to. I also agree with the idea of using up all the air in a single phrase and start new. But most of the time, I just breathe back in, without expelling. It is ideal to expel the air to create the vacuum sensation.
  14. No.
  15. N/A.
  16. I am conscious. I imagine that I smell the rose to find the back space in my pharynx and then everything should be physically aligned.
  17. I love wearing an aerobic belt which helps me a lot to keep the expansion out.
  18. Yes. I feel anything that engages my core helps. But a heavy lifting such as bench press can be harmful.
  19. The important thing is that the breath inhaled, and the resistance of airflow create the proper pressure which results in the vacuum of the vocal folds.
  20. I wonder whether people are conscious of every breath they take or only dramatic breath before high notes. Also, I am curious how high the chest should be. And what tension is a good tension?

### **Tenor 7**

Roles performed: Hoffmann (*Les contes d'Hoffmann*), Rinuccio (*Gianni Schicchi*), Rodolfo

Roles in preparation: Cavaradossi (*Tosca*), Siegmund (*Die Walküre*)

1. I never heard of *appoggio* before.
2. It is a sensation close to the support that comes from the area between the belly button and the groin area. If you take a breath naturally, you can feel the resistance in the diaphragm area and your throat can stay relaxed.
3. I consider that my breathing technique is slightly more energized than some other techniques which only use natural, easy, and relaxed breathing. For me, there is energy I'm trying to create and feel.
4. The purpose is to create support that can be sustained and take away resistance from my vocal cords and throat. I don't have to use the muscles in my throat anymore. When I support my voice correctly, the majority of the colors of my voice comes from that support. Then I can avoid over darkening my sound. I also get less fatigued with my support.

5. I try to find the sense of openness from my sternum. If someone is scared, it's easy to close down the chest and the shoulders, which closes off the voice. Mentally, I try to be fearless. As a tenor, this psychological aspect is very important, and the posture plays a huge role. Good open posture. I will roll back my shoulders a bit to broaden the chest, but not to the point it's too held.
6. I feel the expansion in the lower half of my abdomen to the groin and my lower back. It's almost like connecting vertical dots in my low back. I also feel it around my belt line. I don't necessarily feel the resistance or expansion in my chest, but it goes out indeed. When I'm supporting well, I also feel activity where my sternum is. When I take a breath, I don't really feel the side much. My teacher taught me to build four side walls, but for me it's more about the front and back. But the side definitely plays a part. The expansion is intentional at least when I practice. I'm trying to get to the place where it's natural. I want to feel those points of activity around the belt line, which are the signal to me that I'm breathing correctly.
7. I try to expand my body naturally. If I try to make something happen by force, it means I'm tensing a part of my body. The goal is to create that expansion which is reacting to my breath rather than forcing it out.
8. I am not a fan of breathing through the nose. I feel I get caught in the top of my chest. I breathe into the vowel shape that starts the next phrase, and this is much more helpful. I haven't really thought about breathing through both.
9. I try to maintain the expansion. If the line is ascending, I feel the expansion continues downward. If it's not, I just try to maintain wherever it is. The expansion remains throughout the phrase.
10. I agree with letting the air flow. Holding back the air means tension. Letting the air flow means relaxation.
11. A smaller amount of air may be better. Often times, we let out too much air which is excessive.
12. The higher I go, the more intense the expansion is. I need to feel more grounded. Often times, if there is an ascending line, the expansion goes lower. My lungs try to expand, and diaphragm continues to push down. There is a slight resistance in my sternum to maintain my chest resonance. The sternum expands out. I would need more air to sing higher notes, so hence, more engagement.
13. I try not to take too much air in the beginning. I believe Caruso once said that you only take a sip of air. This idea helped me a lot. I don't necessarily try to let all the air out by the end of the phrase. But I release my muscles at the end. I haven't found any problems making through the long phrase. If you use the air efficiently, you don't need a lot of it.
14. No.
15. N/A.
16. I suppose the goal is to have it eventually unconscious. Though right now, I still have to devote some brain power to my technique. It also depends on the difficulty of the passage. I often breathe out through a straw to the water. This helps me you can see when the air stops. It helps me to find more consistency in my breathing. I sing through the straw and it reveals very quickly if your air is consistent.
17. I am curious to find out how alexander technique may help my technique. I would also like to know what other breathing techniques there are.
18. Yes, I do. Cardio generally helps. When I'm running, I have to be careful not to breathe too heavy or shallow. This will make my voice tired. If I do shoulder exercise too much, it tends to tighten my neck. I do lots of heavy lifting, but I try to do more repetition with less weight.
19. I would start with taking unnecessary tensions away. Throat and chest should be easy when taking a breath. If you tell your student to support, they will tense up. After they build a healthy habit, I will try to talk about more energized expansion.

20. I am curious to know, apart from what I described, is there any radically different breathing technique out there? The more I know about other techniques, it will only make me better because I can use them if they are good or avoid them if they are not.

### **Baritone 1**

Roles performed: Count Almaviva (*Le nozze di Figaro*), Figaro (*Il barbiere di Siviglia*), Marcello (*La bohème*)

Roles in preparation: Valentin (*Faust*)

1. I learned it from my teacher, but I haven't read any literature about it.
2. It is a release and tension at the same time. It involves releasing the lower part of the torso to increase the air capacity. At the same time, it's about keeping expanded and not collapsed in the lower torso.
3. I feel there is a very deep breathing, deep within the body.
4. I do *appoggio* so that I have maximum air capacity. At the same time, remembering the tension is not collapsing the core but keeping it expanded as possible. It helps my sound to connect to my body. It creates the fully bodied tone with overtones.
5. I keep my chest up and tailbone down. I roll my shoulders back and imagine pinching a pencil in the middle of my back between the shoulder blades. The purpose of this activity is to keep my rib cage expanded during singing.
6. I feel the expansion in my gut, from the lower ribcage to the pelvic floor. I feel it also in the middle back. I don't think about the side expansion, but it does happen. I mentally think about it intentionally, but the physical activity happens unintentionally. Lower abdominal expansion is the biggest among them while chest and upper abdominal expansion are somewhat in the middle.
7. When I'm breathing in, I don't push out or draw in intentionally. I let my body expand naturally on inhalation.
8. When I inhale, it is usually through my nose and tiny open mouth, so both. For a dramatic choice, I breathe through my mouth in a specific vowel. I'm not really tied down to one breathing.
9. I try to maintain the expansion by pushing out the gut, pelvic floor area.
10. I let the air flow. If I think about holding back, it makes me collapse in my body. If I think about letting the air flow, it makes my body more flexible and buoyant, like a balloon, with air coming in and out.
11. I use a smaller amount of air for loud singing and more air for soft singing.
12. When I approach high notes, I relax the lower abdomen, meaning that I'm not forcing it out anymore. It feels like I'm drawing in the lower abdomen a little bit.
13. I can sing any long phrase if I take a good breath with proper expansion. I never really think about using the entire amount of air in one phrase.
14. I was a tenor earlier and switched to baritone. When singing as a tenor, I only used to breathe into my chest, nothing lower. Now I think about much lower breath.
15. N/A.
16. I usually do my *appoggio* unconsciously, but I think about it time to time. When I retake the breath, I make sure to chest out and put the shoulder blades close together. And then, I take a deep breath into the floor.
17. I would like to learn to keep my low ribcage and pelvic floor expanded without forcing. I would also like to learn how to always take the same consistent breath.
18. Yes, I do. It helps because the heavy breathing and panting that I do after tough exercises reminds me to breathe deeply while both exercising and singing.
19. I would ask a student to breathe down to the floor, imagining the air is coming down to the lower area of the body.

20. I wonder how to maintain the correct tension and expansion in the lower torso without forcing. Some people talk about expanding as if they are pushing against the wall. Is it helpful or not?

## **Baritone 2**

Roles performed: Count Almaviva (*Le nozze di Figaro*), Lescaut (*Manon*), Marcello, Olivier (*Capriccio*)

Roles in preparation: Figaro (*Il barbiere di Siviglia*)

1. I don't consider my technique to be the same as the *appoggio* technique since I didn't learn it from anyone or any literature.
2. It's about supporting my breath for singing with my diaphragm. It includes taking a deep breath, relaxing my throat, and finding the center of energy in my body.
3. It feels much deeper and rounder and has more physical sensation involved around my belly and the back. It allows me to use my breath more economically.
4. The correct breathing technique helps me to have a better control over my voice. It allows me to sing a longer phrase with healthy voice and to produce a classical voice.
5. While I am standing, I stretch my arms all the way above my head and grab my hands together. Then I slowly put my arms down while maintaining the open chest.
6. I believe I am pushing down my diaphragm low. I mainly expand my chest to the side to increase the size of my rib cage, like a bird flapping, but not so much in the front and back. I don't push up my chest too much because it locks my back. Simply, I try to expand to the side, but the front and back expansions follow. The front expansion happens all the way down to the lower belly. I believe the whole process is involuntary and natural as I only think about breathing deeply.
7. When I breathe in, I let my body expand especially around the low ribcage and upper abdomen area. The lower abdomen is drawn in a little bit to support my breathing. Chest should be always relaxed and open as much as possible to give space to the lungs.
8. I always try to breathe as if I smell the rose, but with the nose and mouth both. I believe it's the fastest way to take a large amount of breath in a short period. I will only breathe through the nose in the beginning of the song.
9. Because my diaphragm is naturally moving back up while singing, my job is to hold my diaphragm in the low position by holding my upper abdomen area. So, I push it out. The Lower abdomen is going in without any force. The chest feels open and stretched out to the side. The front of the chest is comfortable, and the back is free.
10. I let the air flow. Singing is as same as speaking. You shouldn't do all the extra things when you're singing. After learning the basic principles, you have to let your body do natural things. I believe the air should flow naturally. Holding back the air feels to me as if I create tension under my vocal cords.
11. I try to let less air out. Your vocal cords get less stressed when less air comes out. You can also sustain better by using the air economically.
12. I don't do anything different specifically when I sing high notes. Since high notes demand a little more tension and energy, my lower abdomen may come in naturally. But that doesn't mean that I try to change anything.
13. My breathing technique allows me to control my air more economically. But I never hold the air inside my body. I try not to have any air left in the lungs at the end of the phrase so that I can start a new phrase with a fresh breath.
14. No.
15. N/A.
16. I do it consciously. I keep my chest open, check my posture, and take a good deep breath. When I sing, I try to feel the support from the groin area.
17. Not at this moment.

18. Yes. Swimming and running feel very helpful. The weight lifting helps me to feel stronger on the side of my chest.
19. It is all about being able to control the strong muscles of the diaphragm.
20. What is *appoggio*? Can any person learn the *appoggio* technique? Is it for everyone? Can anyone become a successful opera singer without the *appoggio* technique?

### **Baritone 3**

Roles performed: Guglielmo (*Così fan tutte*), Lindorf (*Les contes d'Hoffmann*), Papageno (*Die Zauberflöte*)

Roles in preparation: Belcore (*L'elisir d'amore*), Figaro (*Il barbiere di Siviglia*), Don Giovanni

1. I would consider *appoggio* to be one of my breathing techniques and I would agree with the technical aspects of it. My first teacher used the term. I have briefly read some literature, mostly Miller and Doscher.
2. It is a breathing technique using a breath supported from the lower abdomen for sustained singing.
3. It feels much lower as if you're almost connected to the pelvic floor with the focus on your abdomen and back.
4. The purpose of *appoggio* is to provide optimum efficiency for breathing and support to phonate. *Appoggio* itself has a self-contained apparatus which helps the voice to operate at maximum efficiency. But it doesn't directly affect my voice. *Legato* is also a byproduct of supported breathing.
5. My idea on proper posture is to keep the chest up, head straight and tilted down a bit, shoulders relaxed down. The shoulders should not come up.
6. The expansion happens forward and backward in a downward and outward motion. It happens right below sternum and all the way below to the pelvic floor. There is not much expansion in your chest but minimal. There is the expansion in my side and lower back, but not much in the upper or mid back. I need to start off mentally, and it should become the muscle memory. I can expand even without taking a breath. But you're expanding because you're taking a breath.
7. It should be a natural expansion. I don't really push out or draw in.
8. When I breathe through my nose, I think about higher space. However, I don't necessarily think they relate to my *appoggio*.
9. I try to maintain the expansion, especially lower abdominal expansion. I don't push in any part of my body. There is a relaxation to be loose in some other parts of the body, but to support the voice, one cannot lose the healthy tension.
10. Holding back the air means tension. Letting the air flow helps the apparatus to work at its maximum efficiency.
11. I prefer to use a smaller amount of air because it is more efficient. Using too much air is as if you're wasting the air.
12. For high notes, I think low, the opposite direction, and I try not to force the sound out. I try to maintain the expansion even more. Maybe I add a little more effort to push out the lower abdomen when I go higher.
13. *Appoggio* gives me an ability to control how much air I let out. I agree with the idea to take a fresh air and use all the air in a phrase. If I have any air left, I expel it unvoiced and start a new air, depending on how much time I have.
14. No.
15. N/A.
16. I am conscious at first, but it becomes unconscious. To establish it, you have to be conscious. Once you start singing, you let it happen.
17. I just want to continue supporting with *appoggio*. I may try to relax different areas of my body. But It's not something I will explore heavily.



18. Yes. Cardio helps the most, especially running. Heavy lifting doesn't quite help.
19. I will teach a student the low supported breath which allows for maximum breath support and efficiency of sound without carrying any excessive tension along the vocal tract. For that, I will start with correct breathing and posture. Breathing should be low with the focus of air. The posture should be upright with proper alignment of the vocal tract from the pelvic floor to the top of your head.
20. How other people do *appoggio*?

#### **Baritone 4**

Roles performed: Figaro (*Il barbiere di Siviglia*), Guglielmo, Schaunard (*La bohème*), Silvio (*Pagliacci*), Papageno

Roles in preparation: Billy Budd, Count di Luna (*Il Trovatore*)

1. My voice teachers from the past taught me *appoggio* but without using the term specifically.
2. It is a breathing technique that maximizes the intake and controlled release of breath. It allows keeping active pressure while the air is released through phonation.
3. Compared to other techniques, there is a sensation of dropping the physical weight as your body expands. It's more supported from lower expansion.
4. The purpose is to make sure you can maintain the long phrases of *Bel Canto* style compositions and provide an active support for your vocal technique. It doesn't necessarily contribute to my voice itself. But if you support your voice with your airflow, you are less likely to attempt to use your larynx to force air.
5. I think tall. I try to align my spinal column. I have a naturally broad chest as I regularly work out. My legs are securely grounded and well balanced.
6. There is the most expansion in the lower part of my stomach, almost at the pelvic floor, and my lower back. My upper expansions are secondary nature from the sternum and higher in the chest. The lower rib area and the upper abdomen are the areas that I feel the least expansion. The expansion is intentional. As I breathe, I release the muscles to expand.
7. I let my expansion happen naturally. I don't force out my body. I also don't push in any part of my body.
8. I don't feel one is superior to the other. I breathe mostly through my mouth. For the beginning of the new phrase, I breathe more through my nose. But as I go on, I naturally breathe through both.
9. I push out the lower abdomen slightly to maintain the expansion. It allows me to keep active pressure by resisting the contraction so that the air flows consistently.
10. I would say I let the air flow. To me, letting the air flow means avoiding too much subglottal pressure. I feel holding back the air interrupts the natural function.
11. I prefer to use the small amount. It means more efficient use of breath. Large amount of air escaping means wasted use of breath.
12. When I approach higher notes, I would increase the pressure slightly in lower abdomen area to let more expansion happen. I feel the expansions in my chest and back, but I don't try to control them consciously when I sing.
13. The whole process of breathing is controlled to maintain active pressure. I don't necessarily think about using up all the air. If I feel that my body needs oxygen desperately, I will expel carbon dioxide, and take a fresh breath. However, this doesn't happen very often. Expelling the air is an unusual occurrence to me. Usually I will just continue the breath cycle normally.
14. No.
15. N/A.
16. I am mostly unconscious. When I sing, I don't really think about breathing anymore. When I was younger, I focused on not raising my shoulders. That translated into lower expansion.
17. Not really at this point.

18. Yes. I feel swimming helps the most. Grunting while lifting is destructive towards vocal health in general.
19. I would say a full chest and abdominal expansion and also into the back. For me, *appoggio* is all about the posture and expansion.
20. No.

### **Bass-Baritone 1**

Roles performed: Albert (*Werther*), Figaro (*Le nozze di Figaro*), Leporello (*Don Giovanni*)

Roles in preparation: Cesare Angelotti (*Tosca*), Mustafà (*L'italiana in Algeri*)

1. One of my teachers taught me. I also read Marchesi.
2. *Appoggio* to me is a fancy word of breath. It's the most natural breathing technique.
3. *Appoggio* is characterized by efficient intake with the strong principle of adduction of the cords. It is translated as a core in the sound to the audience.
4. It encourages traditional Italian manner of singing, such as *legato*. Because it is the most efficient starting point, it allows me the most flexibility to traverse.
5. I spend a lot of my time in my lesson on my back. The leaning sensation happens in the back. I practice standing against the wall on my back to feel that. My teacher will put his hands on my back to feel the stretch. If I lay on the ground and spread my arms out, my chest is automatically open while the back is pushing against the ground.
6. The expansion happens in the lower back and the chest. The tailbone is already lowered a bit so that the most stretch becomes available in my back. My chest expands up and forward. I have a natural broad chest and I don't try to think in a muscular way. I don't think my belly has to expand, but it has to hang loose. I never hold my belly. The expansion was intentional for a long time when I was studying. The whole point of practice is to make conscious habit unconscious. It became more unconscious recently. But mentally, I still think about it in my warming up. If everything works in warm up, I don't have to think about it in the performance.
7. I never intentionally push out. I don't draw in any part of my body. I let my body expand naturally.
8. My teacher was a big fan of mouth breathing, but Francisco Araiza made all his students breathe through the nose which made me think. But I prefer mouth breathing in general.
9. I know people say that you have to keep the expansion. I think it's unnatural. Our body is like an accordion. I would keep my body open as much as possible, but the body has to shrink as the air is leaving. Your chest should go in as the air is leaving. The back can stay stretched.
10. Air should always flow. Holding back the air to me means giving a false sense of core by abusing air pressure which results in the voice sounding brittle.
11. It depends. The air should always be focused. Lower notes need less air with high focus. You need more air as you go higher with the same focus.
12. Most of the change happens up in the head. I try to keep everything consistent in terms of breath throughout the range.
13. You should use what you need, no more, no less. It is about trusting the body that it knows how much air you need. If I don't use all the air in a phrase, I expel the air out to start fresh. Held air is toxic. It has too much carbon dioxide and we need to get rid of it.
14. I never switched but I sing both baritone and bass repertoire. *Appoggio* doesn't change.
15. N/A.
16. To me, *appoggio* is a goal, not a technique. So, I think about my technique to get to *appoggio*. I always, no matter what day it is, start with humming the major 3rd chromatically to make sure that I'm breathing, and everything is working correctly.
17. I've become very comfortable with what I'm doing now. But I have a hard time singing on my sitting position or while I'm kneeling. I'd like to make them better.

18. Yes. I run every other day. It helps my *appoggio*, making the condition of the lungs and the heart better.
19. I would say don't forget to breathe. Open your mouth and breathe. It's that simple to me.
20. To me, the overarching idea of *appoggio* has always been strange because every voice is different. I wonder if *appoggio* is an actual technique or just a goal. Is there any standard way to teach *appoggio*?

### **Bass-Baritone 2**

Roles performed: Colline (*La bohème*), Leporello, Méphistophélès (*Faust*), Raimondo (*Lucia di Lammermoor*)

Roles in preparation: Fasolt and Fafner (*Das Rheingold*)

1. I worked with a teacher who describes his school as Swedish Italian school. He also worked with William Vennard. I've read some pedagogical books but it's difficult to learn from them.
2. *Appoggio* is a consistent muscular application that results constant breath stream. It involves slightly leaning on the balls of the feet and bending the hips to elongate the spine. I don't believe in the pulling the diaphragm down. The point of *appoggio* is to let everything back in. Outside of that, it lets the rib cage come down as the voice goes out.
3. In my understanding of *appoggio*, it is not done with pressure, unlike the German technique using the pressure. It's using the outer stretch rather than pushing.
4. I think the purpose is to maintain the constant breath stream. It's supposed to affect your singing, by the vocal cords vibrate with the Bernoulli effect rather than squeezing them. Your voice becomes freer, more resonant, and less driven.
5. I lean slightly forward in the balls of my feet and bend my hip to elongate the spine. I will raise my arms up on my head and push up the ceiling. This causes the scapulae to swing out and lowers the sternum. This also raises the rib cage to swing out and lowers the tailbone. Sit bones direct towards the arch of the feet.
6. There is an expansion right about the lumbar area, the hanging ribs in the back. It allows the rib cage to swing out. The sternum will drop naturally. As the diaphragm comes down, the viscera swing out, and the stomach will expand out. For me to allow those to happen, I need to expand my lower back and the tire belt around my belly. I feel the inhalation requires a lot of mental intention to negate the effect of stress. The physical intention should be about release.
7. I let my body expand naturally.
8. Ideally, you will breathe through both. I think that it creates the most relaxation. If you only breathe through your nose, you're holding the mouth. If you only breathe through the mouth, your nasal pharynx is closed. By breathing through both at the same time, you completely release the pallet.
9. Once I start to sing, I generally relax but I pull in the abdominal wall to support the spine. I do not maintain the expansion. When you stand up straight, the abdomen is pulled in naturally and that's what I do. I think about the gentle vacuum sucking air out of the body.
10. I let the air flow. This relates back to the concept of gentle vacuum sucking out. Depending on whom you're teaching, the concept might work or not. The vocabulary of holding the air back will lead to the tension.
11. I think that the crucial point is letting the air out. If it feels large or small, either can be correct. The sensation is relative.
12. Ideally, the breathing remains the same. The only thing that should change is the shape of the resonator and the tongue shape. That's difficult to do because of the acoustic shift. It causes me to support differently, but it's not ideal.
13. To me, *appoggio* and breath management are the same thing. If I feel too much air left, then I try to expel that air, so that I can start fresh.

14. I moved from baritone to bass baritone. I don't think my *appoggio* changed because of the switch.
15. N/A.
16. I am conscious of my *appoggio* always.
17. No, but I have found the balance exercise to be effective, such as using the half ball thing to stand on, standing on one leg while raising the other leg, and so on.
18. No. But when I do, push-ups help my *appoggio*. I don't feel any exercises hinder *appoggio* unless they are done with bad postures.
19. You should let the air out. Don't hold the air. Completely release the air out.
20. Not at this point.

### **Bass 1**

Roles performed: Colline, Nick Shadow (*The Rake's Progress*), Raimondo

Roles in preparation: Leporello, Olin Blitch (*Susannah*), Sarastro (*Die Zauberflöte*)

1. I first learned about it through my teacher. Afterwards, I read Garcia, Vennard, and Miller.
2. I think of it in terms of resistance provided to the diaphragm by the abdominal wall. The muscular process regulates the breath.
3. I have worked on only two methods, *appoggio* and the German technique. I think of it as a buoyant and bouncy technique. It has higher location for the breath. German technique was lower and more static like a wall. Everything is locked in the area between the belly button and pelvis. I don't necessarily think of breathing quietly but it happens to be that way. I think of it as a seesaw since the lower abdomen comes in while the upper abdomen comes out.
4. The purpose of *appoggio* is that it allows more consistent breath-flow, even throughout the phrase. It ends up in being able to sing longer phrases with even tone quality. It also completely improved my ability to access my head register for the lighter mechanism.
5. In coherence with Garcia, I work on noble posture. Shoulders are fairly neutral, slightly rolled back, not extensively, and the chest is open and outward. I try not to notice other part of the body.
6. The expansion is in the rib cage, 360 degree all the way around, especially in front between the sternum and the belly button. I don't notice much expansion below the belly button. The expansion is intentional both physically and mentally.
7. I suppose there is a slight tuck in the lower abdomen at the end of inhalation. I'm not quite sure whether it's at the beginning of the exhalation or the end of inhalation. Perhaps it's a pivot where two processes are merging.
8. I have no strong opinions, but I don't like breathing through the nose.
9. The expansion is maintained in the chest area with the help from the intercostals. The lower abdomen starts to tuck in as I sing while the upper abdomen comes out like a seesaw action.
10. I believe air should flow freely in my lungs, but there is a holding sensation at the glottis level. Resistance against the air comes from the glottis. I don't feel any holding in my chest to keep the air reserved. A healthier way of holding back the air is the resistance in the diaphragm. It regulates the even flow. I believe the point is to let the air flow consistently, not letting it pop out.
11. I lean more towards using a smaller amount of air for economy of breath.
12. I notice a lot more engagement in the upper abdomen as I go high. There is a little more thrust in the abdominal area. I also use that area for coloratura as it moves like a rapid fire.
13. Breath management is one of the reasons why we do *appoggio*. Abdominal wall regulates the amount of breath escaping. I don't try to use up all the air. If I have too much air left, I blow it out. It's like expelling that air out, unvoiced, silent. You will see Caruso or other singers kicking the air out in order to not to stack.
14. I'm inching up to bass-baritone. But there will be no strategy change.
15. N/A.

16. Conscious. The first part of my warm up is always the breathing exercise, such as panting.
17. I don't know because I'm not aware of other strategies of *appoggio*. From a personal standpoint, I'm really trying to get rid of German breathing technique out of my body.
18. Not at this point. I've never felt it hindered me in any way. Any type of exercise helps. There is a lot of talks about abs workouts relating to *appoggio*. Some say that strong six packs make you have difficulty to do *appoggio* because your abdomen gets too tight. It is true that *appoggio* needs fluid expansion of the abdomen. This is still my question.
19. When I teach my students, I let them know it's a muscular process. I always remind them of the productive tension. There is a large group of teachers who believe any tension is just a bad thing. What I want them to understand is that it's a muscular process that governs the flow of the breath. I don't think it naturally happens for anyone.
20. I'm curious how singers who advocate German breathing technique explain the regulation of breath, if everything happens in the bottom of the torso.

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