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The Versatile Singer: A Guide to Vibrato & Straight Tone

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THE VERSATILE SINGER:
A GUIDE TO VIBRATO & STRAIGHT TONE

by

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Abstract

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Straight tone is a valuable tool that can be used by singers of any style to both improve technical ideals, such as resonance and focus, and provide a starting point for transforming the voice to meet the stylistic demands of any genre. By employing a resonant, minimally vibrated, balanced sound as the core of the voice, the versatile singer can stylistically unbalance the voice by layering colors and effects in ways appropriate for many types of singing. In order to fully understand the inner workings of vibrato and how it can be healthily minimized, my discussion of vibrato and straight tone is broken down into four parts: (1) acoustics; (2) physiology; (3) pedagogy; and (4) style. Perception is a key ingredient to understanding the full extent of the marriage between vibrato and straight tone. Straight tone is not completely without vibrato and the role of perception plays a large role in this acoustic deception. Equally as important is considering the physiological ways that vibrato can be produced—be it through natural or manufactured means. The mechanics behind vibrato are directly connected to the various types and degrees of vibrato, straight tone being one of them. Straight tone can take its place among the vocabulary of natural vibratos once these mechanical differences are taken into account. Vocal exercises designed to uncover a singer's innate, core sound can be used to define straight tone for each individual singer and begin the road to versatility in singing.

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PREFACE

I came to the subject of straight tone through choral music. Having moved to New York City in 2010, I stumbled across the professional choral scene, a profession I did not even know existed. The clear and uncomplicated quality of my soprano voice made me a good candidate for this type of work and I was soon singing with some of the city's finest choirs, many of which require their sopranos to sing with a relatively straight tone. It was tiring at first. An endurance test like Holy Week in the Catholic Church, which can require up to 20 hours of singing in four days, left my voice hoarse and exhausted. I knew that if I wanted to continue as a soloist, I had to figure out a way to simultaneously give my conductors what they wanted and keep my voice in working order. What I discovered over approximately three years as a professional choral singer is that I *could* achieve a straight sound without compromising my technique *and* I could improve my solo singing by honing that straight tone skill.

In March 2015, I had a defining moment in my attitude towards this dissertation topic, which admittedly wavered from time to time. I was hired to sing the soprano solo in a chamber choir version of Brahms's Requiem, while also singing in the choir for the other six movements. The soprano solo is in the fifth movement, so this job required me to sing a difficult choral soprano part for almost forty minutes immediately preceding my solo. To make matters trickier, this particular conductor envisioned Brahms's romantic work with a straight tone choral sound, especially the high soprano parts. By aiming for an incredibly well-placed, easeful, resonant sound during the choral parts, I was able to strongly contribute to the ensemble sound for the first four movements of the performance. This served as an excellent warm-up for my solo movement—my voice was ready. By allowing my air to flow at a faster rate and adding space

within my oral mechanism, I was able to transform the straight tone sound I had refined during the choral movements into the lush and vibrant sound needed for the soprano solo. I achieved a well-received solo performance after having sung music in a challenging tessitura with straight tone for forty minutes.

These choral experiences led to a curiosity about the acoustics and mechanics behind straight tone and what this could mean for versatility in singing. Few of my voice teachers had ever actively encouraged straight tone singing, but a few exercises came out of my undergraduate education that happened to be performed without vibrato, and it was precisely these vocalises that I would return to time and again, especially when switching from one style to another. They provided a strong groundwork for my voice that I could then mold into any given style. In this dissertation, I aim to break down the components of straight tone in order to better understand how the refinement of straight tone may help other singers achieve suppleness in their technique and style.

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INTRODUCTION

In this dissertation I seek to answer four questions. First, what is acoustical the relationship between vibrato and straight tone? Second, how is vibrato produced in the voice? Third, how can straight tone be incorporated into voice pedagogy? And fourth, where can we go from this basic, straight tone sound? These questions deal with four aspects of vibrato—acoustics, physiology, pedagogy, and style—that are reflected in the following four chapters. These categories are key to understanding the true character of straight tone and how it can be useful for pre-professional and professional singers.

While writing this dissertation, I struggled to decide what to call this sound. I came across several terms that could possibly fit—"core sound," "simple tone," "fundamental sound"—but I finally decided to call it "straight tone" because that is the term with which most people are familiar and that is the idea with which many people take issue. It is also the term most often found in acoustical and pedagogical literature. For the purposes of this dissertation, straight tone is neither static nor flat, as some may claim. It is moderate in volume, balanced in color, resonant in sound, and has a faint shimmer of vibrato. Acoustician Sten Ternström asserts, "The voice organ is never able to produce perfectly straight tones" (1990, 12). Thus, when I speak of straight tone, I am referring to a *perceived* straight tone. In his blog, *The Way of the Singer*, Dr. Jean-Ronald LaFond carefully differentiates between perceived vibrato and straight tone:

> Straight tone is part of a continuum relative to the normal vibrant nature of the voice… When a tone is sustained, with continuous, consistent breath pressure, the folds go into the regular pattern… However, if the breath pressure is inconsistent, or there is a great imbalance between subglottal pressure and transglottal flow, then the regularity of the pattern might be compromised and the vibrato not perceived. This we judge to be a *relatively* straighter tone [emphasis his]. The vibrato pattern is still perfectly observable in spectrum analysis, but irregularity causes the ear to perceive it as non-vibrant. (October 18, 2011)

Since perceived straight tone is not without oscillation, it is important to understand the acoustical and physiological properties behind the perceptual phenomenon of vibrato before discussing vibrato minimization.

Many sources happily tolerate straight tone, but only as a "color choice" for specific words or phrases. Sharon Mabry (2002) gives the example of "the word mournful," which "can be made to sound as such by deleting the vibrato, giving the voice a more plaintive, sympathetic quality" (43). This is certainly an acceptable use of straight tone but it is peripheral to my argument. I believe that each singer should be able to access a straight tone that is quiet, resonant, and minimally vibrated. This sound will rarely serve as a final product (except in some cases, like Gregorian chant and folk music) but rather is a vital step to aligning the voice and warming up coordination of phonation musculature. In most art, theater, and pop music, other extremes of volume, vibrancy, and tone color are used to enhance this fundamental, straight tone sound. Resonance should remain consistent in most styles of singing, as the resonant voice is a voice produced without strain on the vocal mechanism and that easeful quality is the key to a long singing career, regardless of style or genre.

Straight tone is a hot topic in the singing community. These two little words can illicit disgust among brilliant performers and voice teachers. What do some of the world's most renowned pedagogues have to say about straight tone? Richard Miller compares "nonvibratoed pitches" to "incessant mooing" (1996, 188) and William Vennard describes tones without vibrato

as “dull” and “deplorable” (1967, 205). It is true that certain straight tone deserves such criticism but not all straight tone is created equal. The straight tone that I will be discussing is the more alluring cousin of the unpleasant sound condemned by Miller and Vennard.

The idea that the basis of a singer’s sound may be without much or any audible vibrato is an unpopular one. Most classical voice teachers encourage the *bel canto* standard of vibrato, even for young college students, which fosters continuous vibrato throughout a sung phrase. In her blog, *The Liberated Voice*, Claudia Friedlander writes:

> Classical singing requires optimal development of range, balanced resonance and registration, and consistent vibrancy, but most other styles of singing exploit particular parts of the range, emphasize some qualities of resonance over others, show a preference for heavy or light registration, and value vibrato as a color choice rather than as a consistent default. In other words, while classical singing requires a comprehensive and balanced approach to technique…most other styles un-balance the voice in a variety of ways to achieve a desirable style or effect. (January 4, 2015)

I would take this statement one step further and say that the “consistent vibrancy” required of classical singing is also a way of “un-balancing” the voice “to achieve a desirable style.” The truly balanced voice, the fundamental straight tone, is the basis from which other styles can be derived.

In Chapter One: Acoustics of Vibrato & Straight Tone, I will provide an introduction to the acoustical elements that constitute vibrato, which include: vibrato extent, vibrato rate, and vibrato type (pitch, intensity, and timbre). I will present the physio-psychological illusion of sonance and how it plays into defining straight tone. A basic overview of the vocal-acoustical concepts of overtones and formants leads into a short history of vibrato study, led by Carl Seashore, whose views on vibrato as an extension of emotional speech paved the way for the modern concepts of vibrato.

Chapter Two: Physiology of Vibrato & Straight Tone begins with a mechanical overview of the vocal instrument: the larynx and vocal cords. The biomechanics of vibrato, or the way in which airflow combines with the movement of the larynx, flows into a discussion of subglottic pressure and its relationship to airflow. I use spectrographs of my own singing to illustrate the acoustical elements present in three types of phonation: breathy, pressed, and flow (the ideal). An examination of the physiological differences between natural and manufactured vibrato leads me to four problematic vibratos—tremelo, wobble, diaphragmatic vibrato, and pathological nonvibrato—and their symptoms, causes, and solutions. This practical guide can be used by voice teachers in the diagnosis and correction of faulty vibratos.

Chapter Three: Pedagogy of Straight Tone aims to solve the age-old mystery: "How do you sing straight tone *healthily*?" But I begin with a discussion of choral singing, the arena where most debates about straight tone begin. After examining the practical issues of singing in choirs, such as intonation, dynamics, blend, and stylistic vibrato trends, I delve into the problem of student-singers in university choral programs. The communication between college voice teachers and choral conductors is notoriously poor and this lack of proper contact results in many bad habits among emerging artists. I finish the first half of this chapter with a practical "Choral Singer's Mini Survival Guide," where I include tips from myself and my fellow professional choral singers on how to make it through hours upon hours of choral rehearsals without causing vocal damage. The second half of Chapter Three is devoted to defining healthy straight tone production in terms of airflow and subglottic pressure. I devised exercises in low airflow and low subglottic pressure that encourage flow phonation, the stepping stone to healthy straight tone. I include exercises that use sirens, sighs, and staccato to help voice pedagogues, choral conductors, and singers achieve straight tone singing that is free of tension.

In Chapter Four: Applications & Stylistic Modifications of Straight Tone, I examine the ways in which the core, straight tone sound discovered in Chapter Three can be used to benefit solo singing and how it can be altered and layered upon to fit a variety of vocal styles. After a chronological outline of vibrato trends from the Baroque era through the 21st century, I delve into the applications of straight tone for the solo singer and how it can help develop resonance, quiet singing, and intonation. In the final section of this chapter, I discuss un-balancing the balanced voice and dissect the recording of pop singer Adele's 2015 hit, "Hello," in order to exemplify how vocal effects can be layered on top of the basic straight tone sound to achieve emotional depth and character. I discuss how the main effects found in Adele's song—edge, vocal fry, darkening, register shifts, high belt, and vibrato—can be achieved physiologically from the core, straight tone sound.

Versatility in singing is hard to come by, but straight tone can be used to discover a singer's innate, core sound, which can be transformed into a multitude of styles. But understanding the true nature of straight tone is crucial to producing a healthy, easeful sound and the acoustics of vibrato is the perfect starting point for this journey.

CHAPTER ONE:

ACOUSTICS OF VIBRATO & STRAIGHT TONE

1.1 Acoustics of Vibrato

1.1.1 Quantifying Vibrato

Vibrato is quantified in two ways: "rate" (also called rhythm or frequency) and "extent" (also called amplitude). Rate is defined as the speed of the vibrato and quantified in a number of oscillations per second. Extent is the amount of pitch variation above and below the target pitch and is quantified in cents (100 cents = a semitone in equal temperament). For example, a typical *bel canto* vibrato may have a rate of 6 cycles per second and an extent of 100 cents on either side of the target pitch, for a total extent of 200 cents. Rate and extent vary greatly among styles of singing. In general terms, opera singers have a slower rate and greater extent than choral singers, yet these factors can vary immensely in the genre of opera alone. A Wagnerian opera singer will often have a slower rate and greater extent than an opera singer who specializes in the music of Mozart. These stylistic differences have to do with historical preference, performing space acoustics, and typical physiology of these kinds of singers. A lot can be gleaned from a singer's vibrato. A vibrato that is too slow and/or too wide is a sign of imbalance in the singer's technique. When extent and rate lose their buoyancy, sonance is not achieved.

1.1.2 Sonance

Sonance is a physiological and psychological phenomenon wherein the oscillating pitches of vibrato fuse into one vibrant tone. When a vibrato's rate extends beyond 7 cycles per second, the pitches above and below the fundamental pitch seem to disappear (Neumann 1991, 15–16).

Vibrato that does not achieve sonance, a common symptom of imbalanced technique, is known in the singing community as a "wobble." Isherwood defines *bel canto* vibrato as having a rate of 5–7.5 cycles per second (2009, 274). This range includes vibrato rates that achieve sonance and those that do not, a fair reflection of the vibratos typical in today's classical singing world where even professionals do not always achieve this acoustical ideal.

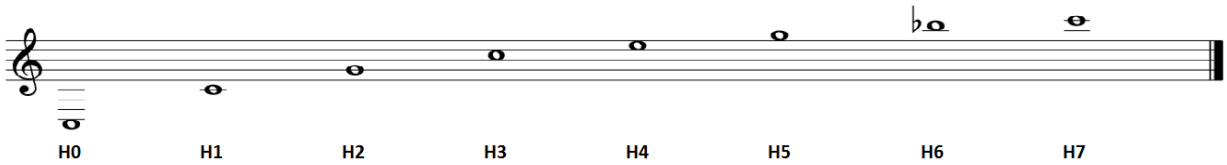
The concept of sonance has another repercussion. The sound that has been called straight tone all these years—particularly the sound appropriate for early music—actually has vibrato, but it is fast enough and narrow enough to achieve sonance.

The acoustical illusion (or "delusion") of sonance is at the core of the vibrato phenomenon. The failure to recognize it as such has deceived most observers through the centuries (and up to the present) into misunderstanding the nature of pitch vibrato, and has notably misled them into grossly underestimating the near-universal presence as well as the size of the natural, innate vocal vibrato (Neumann, 16). In other words, even a so-called straight tone will have a certain degree of vibrato in it, but it will not necessarily be recognized as such because of the auditory phenomenon of sonance.

1.1.3 Overtones

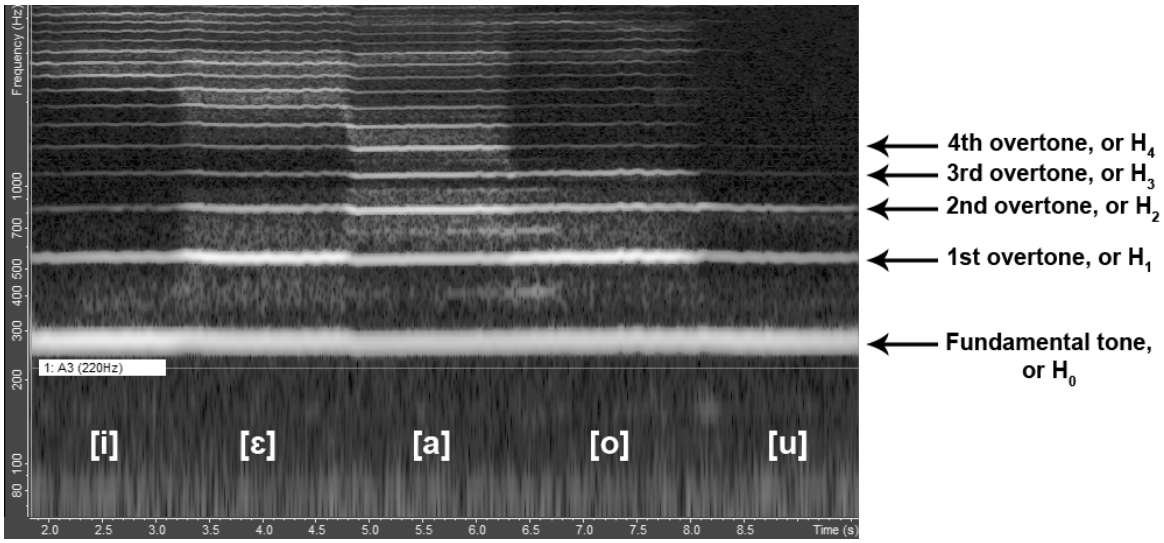
Vibrato, or lack thereof, affects the overtones of a sound, which in turn affects the color and timbre. Musical sounds are made up of a fundamental tone, as well as a series of overtones (also called harmonics or formants). The overtone series is shown in Figure 1.1. The fundamental tone is labeled as H0, with the overtones labeled H1–7. Now shown in this figure are the overtones higher than H7.

Figure 1.1: Overtone Series



The strength and distribution of these overtones affects a tone's timbre and vowel sound. Each vowel has a distinct arrangement of overtones, as shown in Figure 1.2.

Figure 1.2: Spectrograph of Five Basic Vowels



This spectrograph shows the vowels [i] [ɛ] [a] [o] and [u] sung with straight tone, and the strength of these vowels' overtones.[1] The fundamental tone is equally strong for each vowel. The vowel [i] has a strong fundamental tone, H0, as well as strong upper overtones H7 and up. This explains why an [i] vowel sounds so bright and can more easily cut through a texture. The

[1] This and subsequent spectrographs were made in October 2015 using my own voice (unless otherwise cited).

opposite is true of the [u] vowel, which has strong low overtones and almost no high overtones. The vowel [a] has a fairly even strength and distribution of overtones throughout.

1.1.4 Formants

A formant is defined as a resonance of the vocal tract. When there is a boost of energy in either the fundamental frequency or one of the overtones that means there has been a match with a formant frequency (Rosenberg 2014, 90). The bands of intensity in Figure 1.2 are formants that define the five basic vowels.

1.1.5 Singer's Formant

The singer's formant is a cluster of overtones between 2800 and 3400 Hz. When these overtones are strong, the voice can more easily cut through the texture of an orchestra. In the voice studio, this achievement is often perceived as a "ring" in the voice, while in the concert hall, it allows opera singers to be heard over large orchestras without amplification. The singer's formant is most present in male voices, however it is possible for highly trained sopranos and mezzo-sopranos to access it as well. Some studies have also found the singer's formant to be present in pop voices and elite female belters (Rosenberg, 96).

1.1.6 Room Acoustics

Room acoustics play an important role in the process of perceiving the voice and learning how to sing. On his website, David L. Jones, a pedagogical successor of the great *bel canto* teacher Manuel Garcia, relays the story of Kirsten Flagstad's first Metropolitan Opera audition. She sang in a small room and her large voice, which almost certainly achieved the singer's

formant, sounded ugly. However, once she was given a stage audition, the cleaning staff allegedly came into the Old Metropolitan Opera Stage area to hear the warmth and beauty that was her Wagnerian soprano voice. The high overtones that made up the special timbre of Flagstad's instrument were not able to reach their fullest potential until they had the open space of the theater.[2]

There are many types of performance spaces, each with its own unique vocal requirements. Singers during the Baroque era performed in intimate chamber music settings with quiet instruments, such as the lute or harpsichord, and were therefore able to sing with a gentle air stream, a technique that produced little pitch vibrato (Elliott 2006, 17). On the other hand, larger performance spaces, such as cathedrals, produced so much reverberation that straight tone singing was required for accuracy's sake (Dicke 1999, 1–2, as cited in Olson 2008, 562). Today's halls come in a variety of acoustical conditions and modern singers must adjust their timbre and vibrato in order to complement the venue. One might, for example, perform a Handel aria in Carnegie Hall's acoustically sound auditorium with brilliant, continuous vibrato while singing the same piece in the echo laden Cathedral of St. John the Divine with straight tone.

1.1.7 Types of Vibrato

Vibrato can be divided into three separate types: pitch, intensity, and timbre. Combinations of one, two, or (ideally) all three of those types of vibrato affect tone quality and color. "Pitch vibrato" is the oscillation of pitch around a designated pitch. It is what automatically comes to mind when we think of the term vibrato. The other two aspects of

[2] "Vocal Acoustics in the Theater," accessed June 23, 2015, http://www.voiceteacher.com/vocal_acoustics.html.

vibrato, intensity and timbre, are less obvious to the uninitiated but crucial to the production of a rich and beautiful tone. "Intensity vibrato" is oscillation of loudness and "timbre vibrato" is oscillation of overtones, which is often synchronous with pitch vibrato.

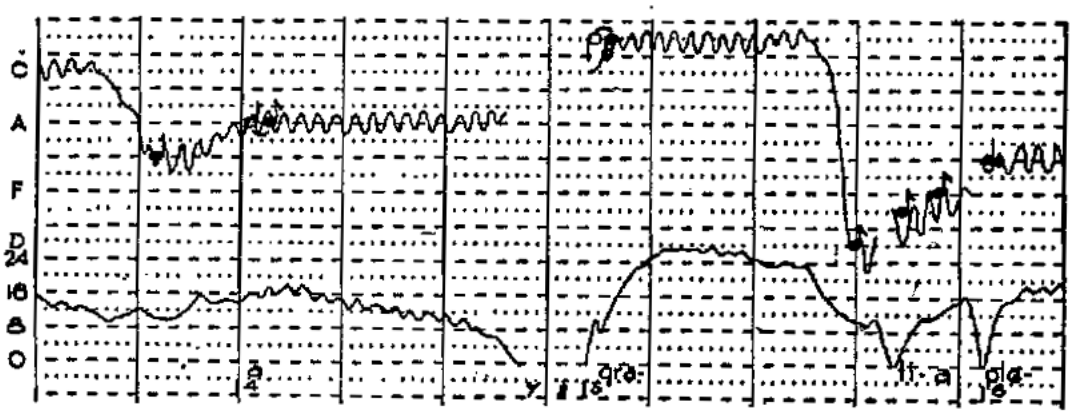
1.2 History of Vibrato Study

American psychologist Carl Seashore (1866–1949) was one of the first to study vibrato scientifically and is considered by many to be the "father of vibrato." He spent fifty years at the University of Iowa where the psychology of music was one of his main research areas. He wrote two books on vibrato, *The Vibrato* (1932) and *Psychology of the Vibrato in Voice and Instrument* (1936). His finding are summarized in "A Musical Ornament: The Vibrato," which appeared in *Psychology of Music* (1938).[3]

Seashore and his contemporaries Milton Metfessel, Max Schoen, and his nephew Harold Seashore, among others, created musical performance scores by measuring pitch and volume in musical recordings. Figure 1.3 shows one such graph delineating the simultaneous pitch and intensity vibratos of mm. 13–16 of a recording of the Bach-Gounod "Ave Maria" sung by Herald Stark.

[3] All citations to Seashore in this chapter will be from the 1938 source unless otherwise noted.

Figure 1.3: Example of Musical Performance Graph from Carl Seashore (1938, 36)



Carl Seashore[4] describes the graph:

> Frequency (pitch) is represented by a graph for each note on a semitone staff; intensity, by the lower parallel graph in a decibel scale; and duration by dots in tenths of a second. Measures are numbered at the bottom of the staff for a ready reference. (1938, 35)

In this way, Seashore made graphic representations of simultaneous pitch vibrato and intensity vibrato. Today, voice scientists and acousticians use spectrographs, visual representations of sound frequencies (fundamental tones plus overtones), to study vibrato and other characteristics of sound.

1.2.1 Defining Good Vibrato

Seashore defined good vibrato (that is, a vibrato that contributed to "pleasing flexibility, tenderness, and richness" of a tone) as a combination of pitch, intensity, and timbre vibratos (33). He found that tone quality suffered when only one or two types of vibrato were present. Other characteristics of good vibrato include freedom of irregularity in extent (37) and an average rate that is fast enough to achieve sonance but not so fast as to produce "chattering" (51). A truly artistic performance, however, should include a flexible range of rates and extents (52).

[4] Henceforth all references to 'Seashore' are to Carl Seashore.

1.2.2 Pitch Vibrato

Seashore found that oscillation of pitch occurs in almost every tone, regardless of length, loudness, or strength (35). As in his definition of artistic singing, he found that one singer's extent could range from 0.1 to 1.5 in one piece of music (44). Figure 1.4 shows a table of data that Seashore and his colleagues extracted from recordings of 29 professional and amateur singers.

Figure 1.4: The Average Extent and Rate of Pitch Vibrato for 29 Singers (C. Seashore 1938, 43)

	Average rate per second	*Average extent of a step*
All artists	6.6	0.48
de Gogorza	7.8	0.46
Schumann-Heink	7.6	0.38
Galli-Curci	7.3	0.44
Macbeth	7.2	0.31
Caruso	7.1	0.47
Rethberg	7.0	0.49
Martinelli	6.9	0.44
Ponselle	6.9	0.48
Chaliapin	6.8	0.54
Jeritza	6.8	0.53
Lashanska	6.8	0.43
de Luca	6.8	0.58
Tetrazzini	6.8	0.37
Talley	6.7	0.54
Braslau	6.6	0.36
Marsh	6.6	0.52
Tibbett	6.6	0.55
Crooks	6.5	0.47
Gigli	6.5	0.57
Rimini	6.5	0.98
Stark	6.5	0.48
Onegin	6.4	0.41
Dadmun	6.3	0.46
Seashore	6.3	0.44
Baker	6.2	0.45
Hackett	5.9	0.47
Homer	5.9	0.51
Kraft	5.9	0.59
Thompson	5.9	0.53

1.2.3 Intensity Vibrato

Intensity vibrato can most easily be identified on the organ, where it is controlled by a mechanical stop (45). Seashore found that vocal intensity vibrato occurs about one-third of the time (37) and tends to synchronize with pitch vibrato (39). Even more so than pitch vibrato, intensity vibrato is underestimated in perception and very much modified by room resonance (44).

1.2.4 Timbre Vibrato

Seashore did not include timbre vibratos on his musical performance scores but stated that this oscillation in overtones is usually synchronous with pitch vibrato (39). Depending on each individual singer's unique vocal cavity resonance, as well as room resonance, each overtone may actually have its own intensity vibrato, as well, adding to the richness and beauty of tone (45).

1.2.5 Emotional Speech

Seashore believed that good vibrato should be fostered by emotive means through "the power to feel music genuinely" (47). For him, vibrato was ever-present in nature and genuine emotion:

> Primitive peoples… exhibit the vibrato in acceptable form when singing with genuine feeling. The vibrato may appear early in childhood, as soon as the child begins to sing naturally and with genuine feeling . . . The canary bird which is taught to sing songs can sing with a good vibrato. It is the main appeal in the cooing of the dove. The vibrato is present in the hearty laughter of the adult and in the vigorous crying of the infant. (42–44)

An excellent example of emotional speaking with clear vibrato is Martin Luther King, Jr.'s "I have a dream" speech. A surprising finding in Seashore's studies is that, while vibrato indicates

emotional singing, it does not differentiate emotions; joyful, angry, and sorrowful vibratos all sound the same (47).

1.2.6 Instrumental Vibrato

In addition to vocal vibrato, Seashore and his contemporaries studied instrumental vibrato. It is generally agreed upon that instrumental vibrato came about as an imitation of the naturally occurring vibrato of the human voice. Studying instrumental vibrato can provide insight into vocal vibrato because certain aspects, such as extent and intensity vibrato, are often more easily perceived in instrumental playing.

In Seashore's summary of violin vibrato, there are several similarities to vocal vibrato, such as continuous pitch vibrato that presents as a sine curve (39) and synchronous pitch and intensity vibrato (42). There are, however, several notable differences. First, the average pitch vibrato rate is 7 with a range from 5–10; this is a faster average rate than vocal pitch vibrato with a wider range than the 5.9–7.8 range found in Seashore's study of 29 singers (see Figure 1.4) (45). Additionally, the average extent for violin pitch vibrato is only 50 cents, half of the average found in vocal vibrato (39). Second, intensity vibrato is present about half the time in violin playing versus one-third of the time in singing (41). Third is the phenomenon of sympathetic vibrato, a type of exaggerated intensity vibrato. Sympathetic vibrato is most easily heard when an open string is played (when there is naturally no pitch vibrato) and can be enhanced by fingering the same pitch on a different string (41) and eliminated by dampening the string that is sympathetically vibrating (42). Like timbre vibrato in the voice, the strength of sympathetic vibrations in string instruments depends on the resonance characteristics of the individual instrument (42).

1.2.7 Perception of Vibrato

Seashore concluded that much of the confusion over vibrato is a result of two things: the general public's inability to understand what vibrato actually is and their actual inability to hear it. Vibrato is heard as a fraction of what it really is; for example, a 100 cent vibrato is usually only heard as 40 cents—"It is this illusion which makes the vibrato tolerable," says Seashore (45). Proper perception of vibrato is dependent upon recognizing the presence of vibrato, as well as being able to differentiate between the different types of vibrato (46).

1.2.8 Straight Tone

Seashore believed that some of the most beautiful vibrato is imperceptible and can be, instead, thought of as tone quality. "Among reasons for the existence of confusion upon [the issue of how frequently vibrato occurs]," Seashore writes, "is the assumption that the vibrato is eliminated when only the grosser and uglier forms have been omitted" (42). This is, in a nutshell, the key piece of information when considering straight tone on an acoustical and physiological level. Put another way, straight tone is not truly straight. It has all the ingredients of a vibrant sound: resonance, focus, and balance. These qualities that contribute to so-called "beautiful" sound remain unchanged; the vibrato is merely minimized.

1.3 Conclusion

Sonance, the physio-psychological phenomenon where oscillating pitches fuse into one tone, is key to both vibrato and straight tone. To achieve sonance, vibrato rate must be fast enough and extent must be small enough to avoid perceiving two separate pitches. According to Carl Seashore, one of the first to study vibrato scientifically, all three types of vibrato (pitch

vibrato, intensity vibrato, and timbre vibrato) are heard simultaneously in the most pleasing of sounds. Perception of vibrato is key to understanding straight tone, which is redefined in this dissertation as a minimally perceived vibrato that remains resonant, focused, and balanced in color.

CHAPTER TWO:

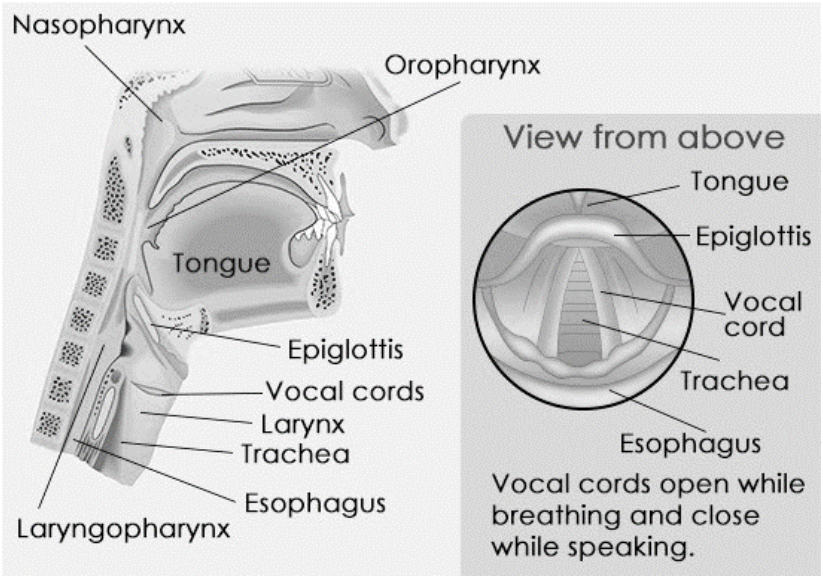
PHYSIOLOGY OF VIBRATO & STRAIGHT TONE

2.1 Physiology of Vibrato

2.1.1 The Larynx

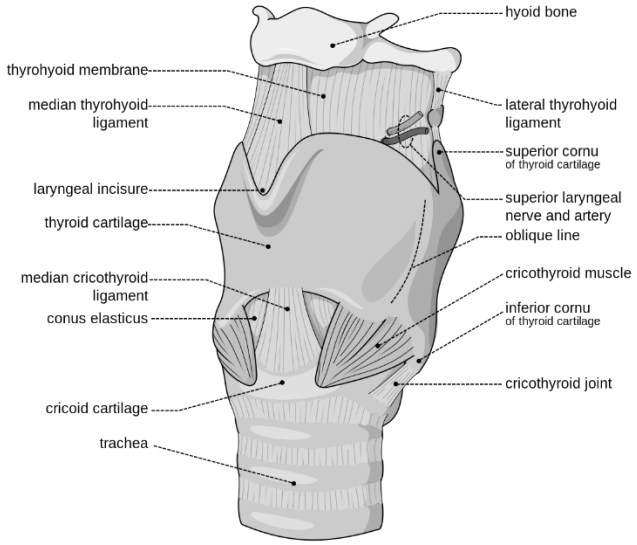
The larynx, colloquially known as the voice box, is a collection of cartilage and muscle located in the neck. It is involved in several processes: breathing, sound production, and protecting the trachea (windpipe) from food aspiration (breathing in food). Inside the larynx are the vocal folds (also known as vocal cords). By regulating the tension of the vocal cords, the larynx helps control pitch and loudness. Figures 2.1 and 2.2 show the basic anatomy of the larynx from three different perspectives.

Figure 2.1: Larynx and Vocal Cords[1]



[1] http://www.buzzle.com/images/diagrams/human-body/vocal-cords/larynx-and-vocal-cords.jpg, accessed May 14, 2016.

Figure 2.2: Anterolateral View of the Larynx[2]



2.1.2 The Biomechanics of Vibrato

The larynx creates vibrato through a combination of bioelectric energy, the cricothyroid muscle, and airflow. The cricothyroid muscle is part of the larynx and is the specific muscle responsible for stretching the vocal folds and controlling pitch (Mason 1971, 136; Kirkpatrick 2008, 551). Kirkpatrick explains the biomechanics behind the oscillation known as vibrato:

> Because of the bioelectric energy that powers our muscles, when a muscle within the body is tensed, that tension is not continuous, but oscillating. This means that the muscle flexes and releases continuously while in use. The bioelectric energy that controls our muscles is something akin to alternating current. If ever you have been shocked by an electric outlet, you have experienced on a macro level how your muscles react to an oscillating power source; involuntarily, your muscles contract and release in sympathy with the alternation of the current. Something very similar to this happens on a micro level in your body any time muscle activity is engaged. (552)

[2] Illustration by by Olek Remesz; https://upload.wikimedia.org/wikipedia/commons/thumb/8/8a/Larynx_external_en.svg/1125px-Larynx_external_en.svg.png, accessed May 14, 2016.

He continues to clarify how this translates into the pitch fluctuations we know as vibrato:

> The cricothyroid muscle works in opposition to the vocal folds (thyroarytenoids), controlling the position of the thyroid cartilage in relation to the cricoid cartilage and, more importantly for singing, controlling pitch. In order to sustain a given pitch, the cricothyroid and thyroarytenoids must pull against one another to maintain the posture of the laryngeal cartilages and the vocal fold tension necessary to create the desired pitch. Because of the muscle antagonism involved in sustaining that position, and because of the oscillation of tension in the muscles as they flex and release in sympathy with the pulses of the bioelectric system that controls them, the tension of the vocal folds fluctuates causing a vibrato. (552)

2.1.3 Subglottic Pressure and Airflow

In singing, the movement of the larynx is propelled by airflow. The resulting vibrato is a delicate balance between airflow and subglottic pressure (Kirkpatrick 2008, 552). Subglottic pressure, or air pressure that builds up beneath the vocal folds, is what actually causes phonation to occur and is determined by the amount of airflow escaping between the vocal folds and the resistance to that flow. In *Practical Vocal Acoustics* (2013), Kenneth Bozeman describes three types of phonation, based on the following phonation equation (5):

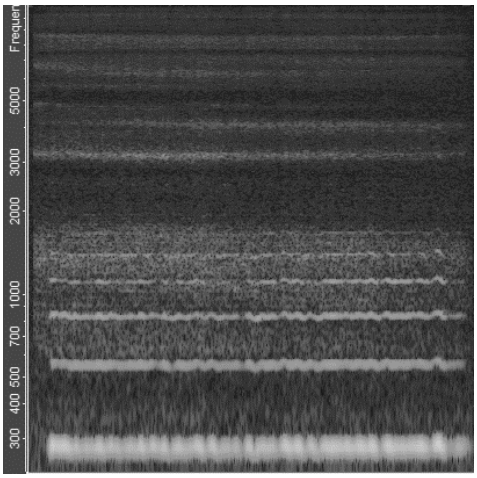
subglottic pressure / airflow = glottal resistance

Figures 2.3–2.5 show the specific acoustic roll-off pattern, or weakening of the upper overtones, for the following three types of phonation.

"Breathy phonation" has low subglottic pressure to airflow ratio, meaning there is more air than the folds know what to do with so excess air escapes. The result is a steep roll-off, which sounds airy or flute-like, with few high overtones (6). Because of the low glottal resistance, this kind of phonation often lacks the biomechanical energy to produce natural vibrato, as shown in Figure 2.3. According to a study by John Large and Shigenobu Iwata

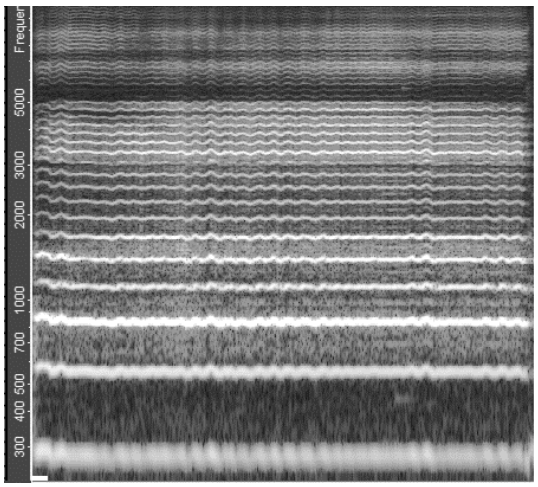
(1976), airflow is significantly lower in straight tone pitches in all three registers of the soprano voice (44). In Figure 2.3, there are few upper overtones and the vibrato is minimal.

Figure 2.3: Spectrograph of Breathy Phonation, Sung Vowel [a]



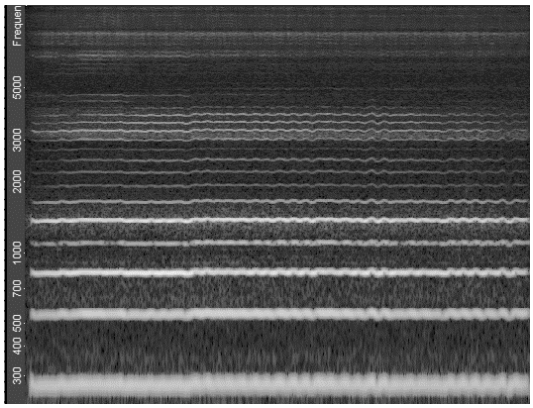
"Pressed phonation" has a high subglottic pressure to airflow ratio, meaning the amount of air coming through the folds is minimal but there is a lot of mounting pressure underneath. The result is a gradual acoustical roll-off with fairly strong high overtones, which often can sound brassy (5). Because of the high glottal resistance, this kind of phonation can produce problematic vibratos, such as a tremolo or wobble (discussed in the next section).

Figure 2.4: Spectrograph of Pressed Phonation, Sung Vowel [a]



The ideal type of phonation is "flow phonation," which has balanced subglottic pressure and airflow (6). The result is a moderate acoustic roll-off with beautiful high overtones and a natural vibrato that does not call attention to itself. Pedagogically speaking, this manner of singing involves precise coordination between the breath and phonation systems. In Figure 2.4, there are stronger overtones throughout, as well as prominent vibrato.

Figure 2.5: Spectrograph of Flow Phonation, Sung Vowel [a]



2.2 Natural vs. Manufactured Vibrato

A natural vibrato results from a combination of airflow and laryngeal movement. Some singers, however, micromanage vibrato directly from the throat. The resulting differences are subtle, but vibrato rate, extent, and timbre are all affected.

2.2.1 Airflow Vibrato

Airflow vibrato, called "breath pressure vibrato" by Sally Sanford (1995), is similar to the Baroque Italian norm, which used a flexible air stream (3.2).[3] Figure 2.6 shows a spectrograph of Sanford's own demonstration of airflow vibrato. The vibrato rate in this example is approximately 5.5 and the overtone roll-off resembles flow phonation.

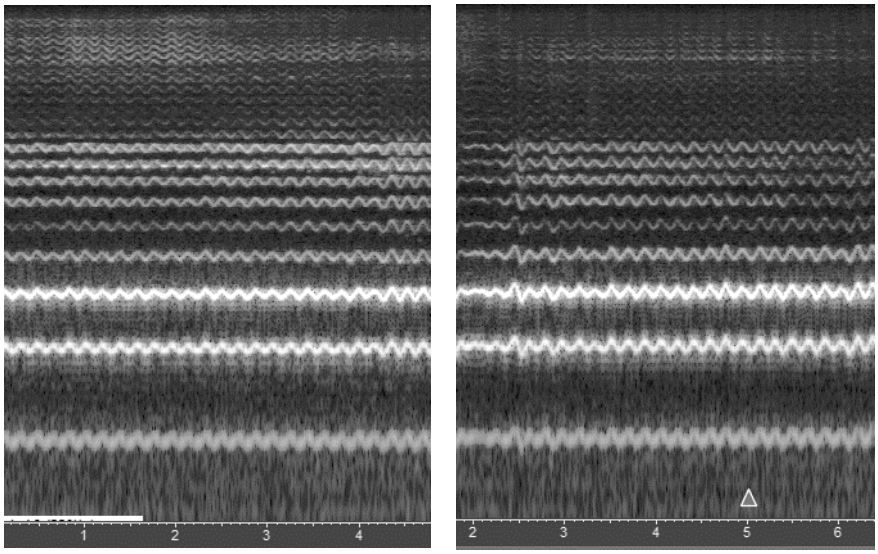
Nicholas Isherwood (2009) calls this ideal form of vibrato *bel canto* vibrato. He defines it as having a rate of 5–7.5 and an extent of 50–100 cents (273). Physiologically, he attributes it to "the free synergistic contraction and relaxation of the intrinsic muscles of the larynx due to subglottic breath pressure," (274) which confirms the biomechanics discussed earlier in this chapter. He provides a helpful tip for recognizing airflow vibrato: "If the index finger and third finger are placed on the larynx while singing with a *bel canto* vibrato, a vibration somewhat like that of an electric razor might be felt, but the larynx does not noticeably move up and down," (274) solidifying the fact that laryngeal movement does occur during airflow vibrato but on a much smaller scale than many singers might expect.

In *National Schools of Singing* (1997), Richard Miller attributes this kind of vibrato to the aesthetics and vocal technique of the Italian and English singing schools (95–97). He ascribes airflow vibrato to the concept of *chiaroscuro*, the balancing of bright and dark timbres in the

[3] Sanford's online article does not have page numbers, so citations will refer to its various sections (e.g., 1.3).

voice. Emphasizing a bright timbre can result in a faster vibrato rate, while emphasizing a dark timbre may result in a slower vibrato rate. Striking a balance between the two allows for a beautiful, natural vibrato that is neither too slow nor too fast. Directly related to the artistic concept of *chiaroscuro* is the technical idea of *appoggio*, or sterno-costal-diaphragmatic-epigastric breathing, one of the foundational concepts of the Italian *bel canto* style of singing.

Figure 2.6: Comparison of Spectrographs of Sanford's Breath and Throat Vibratos[4]



2.2.2 Laryngeal Vibrato

Laryngeal vibrato, which Sanford (1995) calls "throat-produced vibrato," is similar to the Baroque French trill technique that does not disturb the steady stream of air. In the Italian school, laryngeal vibrato is used only ornamentally (3.2). Ornamental use of laryngeal vibrato is a technique used to this day in commercial and jazz music. Figure 2.7 shows a spectrograph of Sanford's own demonstration of laryngeal vibrato. The vibrato rate in this example is

[4] Original audio from Sanford 1995, 3.2.

approximately 5 and the overtone roll-off is slightly steeper than the airflow vibrato example, with fewer high overtones. What is most striking about the difference between these two examples is the unevenness of the extent in Sanford's throat vibrato, most clearly at the onset of the sound. This is evidence that throat vibrato is harder to control than breath vibrato because it is manufactured, not natural.

Isherwood describes a type of laryngeal vibrato, which he calls molto vibrato. Produced by the extrinsic muscles of the larynx, it is often used in Romantic music to heighten emotion (274). Laryngeal vibrato is ever-present in Romantic music because slower and wider vibrato is perceptually louder and as Romantic orchestras grew, opera singers were left to develop new strategies to be heard unamplified (274). As Isherwood points out, laryngeal vibrato's close cousin is the trill: "The extrinsic support muscles of the larynx participate increasingly as the larynx vibrates perceptibly, with a vertical movement similar to a well executed [*sic*] trill" (276).

Richard Miller (1997) describes a slower vibrato rate (≈5) as characteristic of the German school of singing (95). The German technique utilizes the extrinsic laryngeal muscles to open the throat, as well as a dropped sternum, distended abdomen, and low abdominal support (95–96). "This relationship appears to affect the nerve impulses as well as the synergetic activity of the muscles which function within the hypopharyngeal system; one result is manifested in the slower frequency of the vibrato rate," he writes (96).

2.2.3 Epiglottis Vibrato

Airflow vibrato (natural) and laryngeal vibrato (manufactured) are the two most common forms of vibrato, but there are a few other forms of manufactured vibrato that should be briefly mentioned. The first is epiglottis vibrato, an alternation of breath and sound that occurs as a

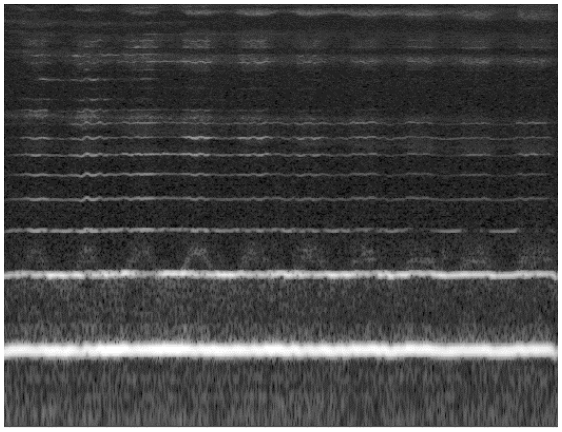
"soft fluttering of the epiglottis involving a softening of the sound by vocal placement in the nasal pharynx" (Isherwood, 276). The epiglottis is a part of the larynx and functions during swallowing to keep food out of the lungs. Isherwood calls this gentle glottal vibrato, which can most easily be described as a turtle dove effect (276). An exaggerated version of this is called a hard glottal vibrato and is similar in sound to an instrumental flutter-tongue effect or even laughter. Another version of epiglottis vibrato is "goat" or "horse" vibrato, an effect that was criticized throughout the eighteenth and nineteenth centuries by pedagogues like Giovanni Battista Mancini and Manuel Garcia (279).

Richard Miller (1997) attributes this kind of vibrato to the French school aesthetic. He deduces that the sound is a result of a "narrowed pharynx, elevated tongue, raised larynx, and the emphasis upon placing the tone in the masque," (96) a laundry list of technical "don'ts" in the Italian school of pedagogy prevalent today in the United States.

2.2.4 Lip and Tongue Vibrato

Changing overtone pitches by manipulating the lips and tongue (changing the shape of the vocal resonator) has its origins in overtone or diphonic singing. Isherwood defines this technique as a type of vibrato, but it is actually a way of isolating the overtone changes that define timbre vibrato. As discussed earlier, different vowels have different overtone layouts, so an easy way of isolating these overtones is to say something like [u-o-u-o-u-o] over and over on one pitch. The transition from [u] to [o] will cause the overtones to shift, creating a timbre vibrato. Figure 2.7 shows the oscillating overtones in a spectrograph of vocal timbre vibrato.

Figure 2.7: Spectrograph of Vocal Timbre Vibrato[5]



2.2.5 Historical Overview of Vibrato Criticism

Historically, vibrato has always been a contentious issue. Throughout the eighteenth and nineteenth centuries, voice commentators have used numerous and confusing terms for various forms of vibrato. In his study of nineteenth century newspaper reviews, Richard Bethell (2009, part 3) distinguishes between the often-praised "vibrato" (narrow), the criticized "tremolo" (wider), and the castigated "wobble" (widest). [6] He found that around the year 1905, the term "resonance" started being used, defining a newly "permissible level of wavering" and clearly distinguishing between a vibrato that achieves sonance and one that does not (the wobble).

In the German-speaking world, tremolo was called "Bebung," literally "trembling." In 1777, clearly disapproving, Robert Bremner called this type of sound "the voice of one who is paralytic." Sometimes singers induced this sort of vibrato by moving the lower jaw, a habit that is considered improper technique in modern vocal pedagogy (Jerold 2006, 162). Bebung was most effective when added to the end of a long, sustained note—a stylistic technique used in

[5] In this recording, timbre vibrato was achieved by alternating the vowels [u] and [o].
[6] Bethell's online article does not have page numbers, so citations will refer to its various sections (e.g., part 1).

modern musical theater. In 1847, Manuel Garcia described this kind of vibrato as an artificial means to enhance volume and add intensity, which, like Isherwood's molto vibrato, is helpful for amplification over a large orchestra and sometimes asked for by composers such as Donizetti and Meyerbeer (Jerold 2006, 165). Another kind of vibrato criticized in the eighteenth and nineteenth centuries was the French "balancement" and "flaté," similar to what Isherwood calls glottal vibrato (276).

2.3 Problematic Vibratos: Symptoms, Causes, & Solutions

Today, there are four general types of problematic vibrato: wobble, tremolo, diaphragmatic vibrato, and pathological nonvibrato. Wobble, tremolo, and pathological nonvibrato have rates that call attention to themselves. Diaphragmatic vibrato, while passible in some voices, is technically an inefficient means to an end.

Since vibrato occurs naturally, the solution to problematic vibratos is not to attack the vibrato itself, but rather to determine what technical issue is causing the problematic vibrato. In her blog post, "Vibrato Hell" (May 29, 2012), Dr. Claudia Friedlander blames problematic vibratos on "resistance and/or entanglement preventing the vocal folds from vibrating freely, combined with excessive breath pressure," such as pushing with the abdomen, squeezing the rib cage, or collapsing the shoulders and sternum on exhalation. According to Friedlander, sources of resistance can include over-adduction of vocal folds, tongue and jaw tension, micromanaging the larynx, poor resonance, uncoordinated articulation, and poor posture or alignment. All of these issues can prevent the free and natural vibration of the cricothyroid muscle that causes vibrato. In *National Schools of Singing* (1997), Richard Miller posits that vibrato rates are not necessarily pathological problems but rather related to "national tonal aesthetics" (93). The

extremes of these tonal aesthetics, however, are indeed caused by imbalances in vocal production. The Italian ideal can be considered subjective, but a singer with a free and balanced instrument will likely have a much longer career than a singer with constant tension, so in this way, a natural vibrato is indeed superior.

In the following section I will discuss symptoms, causes, and solutions for each of the four types of problematic vibratos.

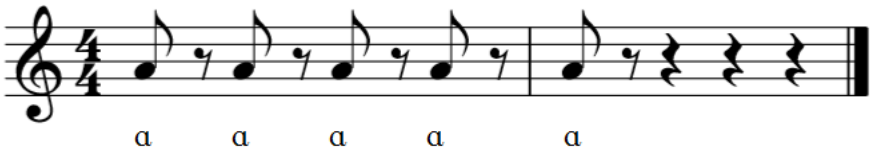
2.3.1 Wobble (also known as "Oscillation")

Symptoms: The symptoms of a "wobble" (or, as Richard Miller calls it, an oscillation) include a vibrato rate that is too slow (usually less than 5), an extent that is too wide (greater than 100 cents), timbre that is weighty or dull, and a delayed onset of vibrato.

Causes: The wobble is often heard in aging voices, likely due to the natural loss of muscle tone and larynx ossification that comes with getting older (Miller 1997, 94). Friedlander does not agree with this diagnosis, however, and considers that aging voices simply become less forgiving and are not able to compensate for their technical faults. Technical faults causing a wobble may include over-adduction of the vocal folds (high subglottic pressure) and tongue tension. As discussed earlier, too much subglottic pressure in relation to airflow causes pressed phonation, often a parent to the wobble. Miller blames the wobble on excessive rib breathing, hung jaw, and distended lower jaw (1997, 97).

Solutions: Since a delayed onset of vibrato is often a symptom of a wobble, it can be beneficial to practice short, stacatto onsets. In *The Naked Voice* (2007), W. Stephen Smith's fourth invention, "Spontaneous Combustion," which consists of five detached [ɑ]'s (see Example 2.1), is a perfect exercise for this purpose.

Example 2.1: W. Stephen Smith's Fourth Invention, Spontaneous Combustion (2007, 87)



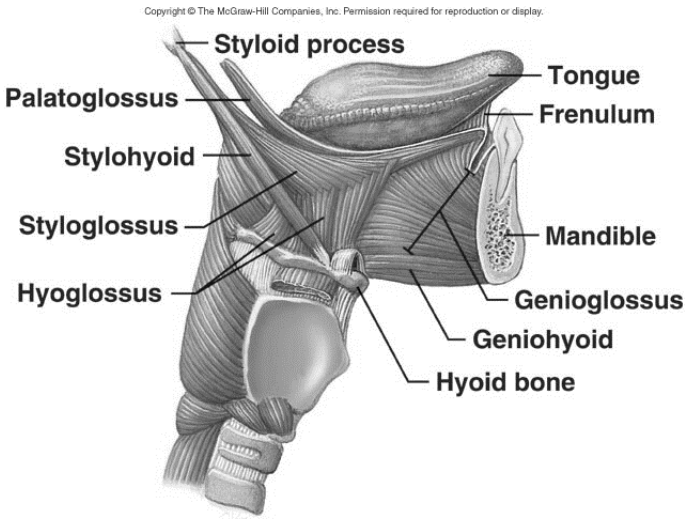
"The opposite of this exercise," he writes, "is the style found in most pop and Broadway singing where the singer starts with a straight tone, then adds the vibrato after a few seconds. Some opera singers also start to sing a note without a fully vibrant, balanced sound, then let it bloom" (86).

In his article "Teaching Methods for Correcting Problematic Vibratos" (2008), Adam Kirkpatrick suggests quick crescendos from *piano* to *mezzoforte* (555). This exercise requires the singer to lighten his or her tone production, which can help alleviate the pressed phonation likely causing the wobble.

Tongue tension, another contributor to the wobble, is usually defined by the hyoglossus retracting and depressing the base of the tongue (see Figure 2.8). The hyoglossus is a muscle of the tongue that presses down on the larynx, hindering its flexibility. (You can feel this muscle by gently pressing your thumb under your chin, just behind the jawbone.) Usually tongue tension of this sort occurs because a singer will try to imitate a dark sound by forcefully lowering the larynx. There is, however, a tension-free way to maintain a lowered and stable larynx: "The only way to stabilize the larynx without compromising its function is to create dynamic stability through movement: the balanced production of continuous phonation, continuous airflow, and continuous musical and dramatic expression" (Friedlander 2015). To retrain the tongue, Dr. Friedlander suggest three tactics: 1) massaging the hyoglossus with either your thumbs or a

handheld massager; 2) stretching the hyoglossus by contracting its antagonist muscle (the genioglossus) and sticking out your tongue; and 3) monitoring for tension in the hyoglossus during vowel production and finding resonance in the oropharynx and nasopharynx (see Figure 2.9) instead of in the supraglottal tract (which is what forcefully lowering the larynx achieves).

Figure 2.8: Tongue Anatomy[7]

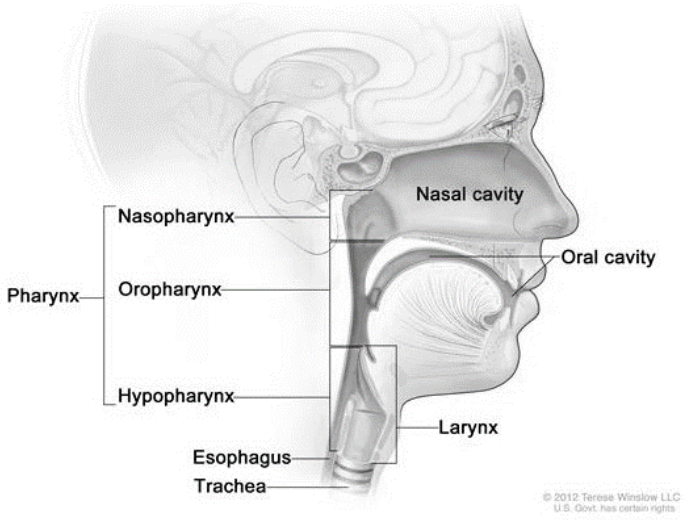


2.3.2 Tremolo (also known as “Bleat” or “Caprino”)

Symptoms: A vibrato that is too fast goes by many names, including bleat, caprino (Italian), and most commonly, “tremolo.” This should not be confused with the seventeenth and

[7] http://www.drdooleynoted.com/wp-content/uploads/2014/10/IMG_5466.jpg, accessed May 14, 2016.

Figure 2.9: Anatomy of the Pharynx[8]



eighteenth-century term tremolo, which is closer to the modern wobble. A tremolo has a narrow extent and often fails to go below the fundamental pitch, resulting in a hump-like pattern instead of a sine curve. There is often an excess of upper overtones, causing a shrill tone quality (Miller 1997, 94). Physical symptoms of a tremolo include visible jaw oscillation and jaw pulsation (Kirkpatrick, 555).

Causes: Friedlander blames tremolo on poor resonance balancing and micromanaging of the larynx. Similarly to the wobble, pressed phonation caused by too much subglottic pressure can manifest in this kind of sound: "The air passes through the glottis at a high velocity against a great deal of resistance, resulting in a high-intensity tremor of the muscles of the larynx (Kirkpatrick, 555). Pressed phonation can occur when a singer tries to sing too loudly without expanding pharyngeal space. Miller (1997) blames this problematic vibrato on a raised larynx,

[8] http://www.cancer.gov/images/cdr/live/CDR713970-571.jpg, accessed May 14, 2016.

tongue tension, and high costal-high dorsal breathing, colloquially known as "high breathing" (96–97).

Solutions: Since many of the entanglements that cause a wobble are involved in tremolo production, many of the exercises used to combat one problem may work on the other, too. Kirkpatrick recommends exercises that focus on independence of the articulators (the tongue and jaw) to encourage tension-free articulation. He also recommends sighing exercises, as sighs are "characterized by seemingly unrestricted airflow and very little subglottic pressure" (556).

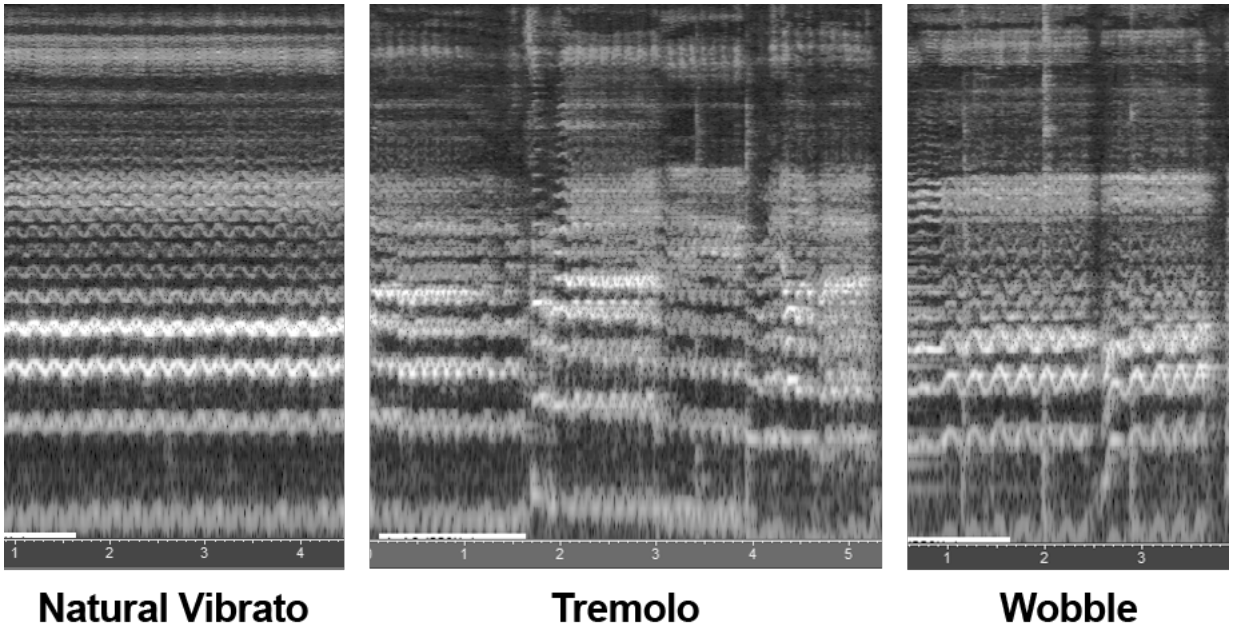
W. Stephen Smith's second invention, "Free-Flowing Air," is the perfect tool to access light subglottic pressure, "minimally engaging the vocal folds" (67). "For overadducted folds to vibrate," Smith writes, "singers must force air through with immense breath pressure. Free-Flowing Air takes the vocalis muscles [the vocal folds] out of the process, so we actually feel the breath flowing through the glottis without the sensation of resistance" (67). Beginning in the falsetto register, the singer should begin with a vocalized downward sigh. "We never consciously engage the voice, but rather let the voice go free as the air flows out. Any vocal response just happens on its own" (70). Falsetto is a familiar register to most men, but women may have a harder time accessing it. Smith suggests using terms such as "choirboy" and "Julia Child voice" to help women access this sound (70).[9]

In an online video[10], tenor Franco Tenelli skillfully demonstrates two types of problematic vibratos: tremolo and the wobble. Figure 2.10 (see p. 34), a spectrograph of these recordings, reveals several characteristics of these sounds. Tenelli's natural vibrato has a rate of approximately 5, a shape that resembles a sine curve, a gradual roll-off, and plenty of high overtones. This acoustical formula achieves a beautiful sound that is balanced in color. His

[9] See p. 63 for further discussion of Smith's "Free-Flowing Air" exercise.
[10] https://youtu.be/h17jTctswFY, accessed May 14, 2016.

tremolo has an approximate rate of 9 with a weak fundamental, strong middle overtones, and weak high overtones. Since the fundamental is weak, it is more difficult to pinpoint the pitch in this goat-like sound. This is also due to the shape of the curve, which more closely resembles humps above the fundamental than a sine curve that goes above and below the fundamental. His wobble has a delayed onset of vibrato, a rate of approximately 3.5, a strong fundamental, weak middle overtones, and fairly strong high overtones. The wobble clearly does not achieve sonance and sounds like two alternating pitches.

Figure 2.10: Spectrographs of Natural Vibrato, Tremolo, and Wobble,
as Demonstrated by Tenor Franco Tenelli



2.3.3 Diaphragmatic Vibrato (also known as "Faux Vibrato")

Symptoms: One type of manufactured vibrato, termed "diaphragmatic vibrato" by Isherwood (281) and "faux vibrato" by Kirkpatrick (555) is often mistaken for a wobble by voice teachers because of the similarities in the two sounds. Friedlander brings up her personal

experience with this kind of vibrato in her blog post, "Build Vibrato 8 Ways!" (2012). She confesses that she produced vibrato this way for years (probably due to the fact that she was a clarinetist before becoming a singer and this is how clarinetists produce vibrato). She emphasizes that this kind of vibrato is only simulating the "natural, organic vibrato characteristic of free singing," and that this strategy is extremely effortful. "If a singer has yet to cultivate the vocal freedom, coordination, and overall energy required to elicit vibrato," she writes, "they may be tempted to superimpose a manufactured vibrancy onto their tone." Friedlander was able to get away with this technique for a long time, "but no matter how successful the results," she concludes, "this approach to singing technique will always be massively more effortful and far less beautiful than an approach honoring the way your vocal anatomy is designed to respond to expressive impulses."[11] Like the wobble, diaphragmatic vibrato often has a slow rate and wide extent that draws attention to itself and fails to achieve sonance.

Causes: Voice teachers should be careful when actively asking students to add vibrato to their tone because a diaphragmatic vibrato is often the result. Physically, this kind of vibrato is manually added by pulsating the upper abdominal muscles, similar to the action one would make when shivering with cold. Miller blames this defect on weak breath support and failing to master the appoggio technique (cited by Isherwood, 281).

Solutions: Kirkpatrick recommends starting anew and instructing the student to sing with a straight tone and then develop a natural vibrato from there (see below).

[11] "Build Vibrato 8 Ways!" published May 31, 2012, http://www.claudiafriedlander.com/the-liberated-voice/2012/05/build-vibrato-8-ways.html.

2.3.4 Pathological Nonvibrato

Symptoms: At this point, it is important to differentiate between a deliberate straight tone skillfully used for stylistic or expressive purposes and an unintentional "pathological nonvibrato." This sound is often found in pre-pubescent children whose vocal musculature has not yet matured and is a generally accepted sound for this demographic. In teenagers and adults who demonstrate a pathological nonvibrato, the sound usually lacks an even vibrato and may sound dull and colorless.

Causes: There are a variety of entanglements that can cause a lack of vibrato. Excess tension in the abdominal muscles (Isherwood, 271), often incorrectly thought of as breath support, can carry stress into the neck and throat and increase subglottic pressure. On the other end of the spectrum, breathy phonation often lacks vibrato (Kirkpatrick, 554) because there is not enough subglottic pressure to initiate the bioelectric impulses that drive natural vibrato. Finally, in "Vibrato Hell," Friedlander names under-energized singing, a cousin of breathy phonation, as a possible culprit.

Solutions: Richard Miller suggests speaking or singing with heightened emotion to encourage vibrato (cited in Isherwood, 281). Related to this, breathy phonation can often be overcome with instructions such as "whine" or "cry," which can be helpful in achieving glottal closure (Kirkpatrick, 554). Kirkpatrick recommends the classic *messa di voce* exercise as a possible cure for nonvibrato. On an [i] vowel (acclaimed for helping breathy phonation because of its naturally bright quality), have a student sing a very long crescendo followed by a decrescendo, starting at pianissimo and peaking at fortissimo. Somewhere along the way, balance between subglottic pressure and airflow will be achieved and a natural vibrato may occur. A tip for finding closure at the fortissimo volume is to lift something heavy, since a

natural function of the larynx is to help with strenuous activity. Vibrato also sometimes naturally occurs at the end of a long, sustained tone because as the singer runs out of breath, the glottis unconsciously becomes more efficient in order to save air (554).

In his column, "Maintaing [*sic*] Consistency of Timbre When Intensity is Changing" (1997) in *Journal of Singing*, Richard Miller calls the *messa di voce* "the ultimate exercise for ensuring skill in combining breath management and sung phonation," but warns that it is not for beginners (33). Instead Miller suggests onset exercises to promote vibrancy:

> In the skillfully executed onset, the musicianly ear and the phonatory mechanism jointly undergo a split-second prephonatory-tuning process that permits exact pitch targeting and precise consonantal or vowel definition. Onset exercises bring not only exactitude of intonation, but also well-balanced timbre, of which vibrancy is an essential ingredient. This happens because when the flow of air is commensurate with the demands of the targeted fundamental, there is no graduated brief testing period for arriving at the degree of breath energy that ensures pitch centering, but rather an immediate meeting of airflow and vocal fold approximation. The vibrato, which is a relaxant principle, helps ensure this. (33)

When a singer is ready to conquer the *messa di voce*, Miller suggests starting on a pitch in the lower-middle range and breaking it up into three parts: a crescendo, a silent breath, and then a decrescendo (34). In the end, he agrees that a solidly executed *messa di voce* will have a steady, continuous vibrato and flow phonation (34). Smith's onset exercises from the wobble section of this chapter may be helpful in promoting the muscular coordination that results in natural vibrato, as well.

2.4 Conclusion

Vibrato is created physiologically through a combination of bioelectric energy, the cricothyroid muscle (part of the larynx), and airflow. Equal balance of subglottic pressure and airflow creates the most efficient glottal resistance, known as flow phonation, which is balanced

in overtones and has a natural vibrato resulting from the coordination between the breath and phonation systems. Manipulating airflow or laryngeal movement to manufacture vibrato negatively affects vibrato rate, extent, and timbre. By understanding the symptoms and causes of four problematic vibratos (wobble, tremolo, diaphragmatic vibrato, and pathological nonvibrato), a natural, more beautiful vibrato can be achieved. Balancing phonation and airflow, releasing tongue tension, and singing with heightened energy are all important contributing factors to a pleasant, natural vibrato.

CHAPTER THREE:

PEDAGOGY OF STRAIGHT TONE

3.1 Straight Tone in Choral Singing

When I moved to New York City in 2010, I followed the path taken by many emerging professional singers and took a job singing in a church choir on Sunday mornings. The church where I ended up, St. Catherine of Siena, was a Catholic church that valued the English Renaissance sound of boy sopranos. My fellow sopranos and I were encouraged to sing with as little vibrato as possible. At first, the conductor would pick on me for singing with vibrato because it upset the delicate, placid sound he was looking for. I had to be mindful of my vibrato and get into a different mode, both mentally and physically, but it did not come naturally.

Once my choral career took off, I could sing upwards of thirty hours of rehearsals, concerts, and services in one week, most, if not all, requiring straight tone. It did not happen immediately, but after some time I learned how to disengage my vibrato without putting stress and strain on my vocal mechanism. This skill has helped me in my choral endeavors but, more surprisingly, it has helped my solo singing too. My choral singing has become multipurpose. Amid all the straight tone singing I do as a professional choral singer, I practice technical concepts, such as resonance production, vowel placement, and breath support, that I then apply to my vibrant singing outside of the choir. This strategy has ended up serving a dual purpose; I use my straight tone singing to improve my vibrant singing and I hone the technical skills necessary to make healthy straight tone singing second nature.

3.1.1 Choral Singing: A Practical Money-Maker

This research can benefit every singer and choral conductor, as choral singing is common among amateurs, college voice majors, and professionals. The National Association of Schools of Music requires that undergraduates in music performance spend 25–35% of their time in ensemble participation, pedagogy courses, and recitals, resulting in many degree programs having a four-semester ensemble requirement.[1] Often choral singing does not end after college. In a major musical metropolis like New York City, many emerging and established professional singers earn income performing with choral groups and many more have weekly choral church and temple jobs. Because of the widespread nature of choral singing among voice students and professionals, it is important to take a deeper look into the technique and acoustics of straight tone singing and its benefits for the solo singer.

Choral singing is often analogous with straight tone singing. However, what many people imagine when thinking of a choral sound is actually a particular style of choral singing from the United Kingdom. This "Cathedral Style" has been described as having a "passionless 'statuesqueness,' a steadiness of tone akin to the note of the organ, which is only fit for accompaniment" (Bethell[2], part 2). This style is standard in today's best northern European choirs but not quite as pervasive in the United States (Gable 1992, 97). New York City features many different styles of vibrato in its professional choirs, from the booming, operatic sound of the New York Choral Artists, the resident choir of the New York Philharmonic, to the balanced straight tone of Musica Sacra, New York's oldest professional choir.

[1] National Association of Schools of Music. *Handbook 2012-13.* Last modified August 5, 2013. http://nasm.arts-accredit.org/site/docs/Handbook/NASM_HANDBOOK_2012-13.pdf.
[2] Since Bethell's paper is only available as a website, I will cite sections within the paper (e.g. "part 3") instead of page numbers. The full paper is available at: http://www.york.ac.uk/music/conferences/nema/bethell/.

3.1.2 Reasons for Straight Tone in Choral Singing

There are several factors for the trend of straight tone in choral singing. One is the crystal microphone used in the early days of radio. Its rudimentary design meant that it could be damaged by a sound with too much volume and power, so weaker, straight-toned voices sounded best on recordings. Another was the discovery by choral conductors of Carl Seashore's finding that vibrato is technically an oscillation of pitch. Since an entire choir could not synchronize its vibrato, the myth among choral conductors was born that a choir could not sing in tune if voices vibrated (Vennard, 206). There was a time when straight tone singing was used only for special effects and early music, but some believe the trend is now spreading and "as likely to be employed throughout in Brahms's *Nänie* as in Josquin's *Missa l'homme armé*" (McCoy 2011, 298). Today, however, some conductors are moving away from a completely straight sound. Olaf Christiansen, for example, the famed director of the St. Olaf Choir, once known for their straight sound, now prefers a "stabilized vibrato" in which "the pitch deviation is limited to a reasonable extent" (Vennard, 206). Christiansen's stabilized vibrato closely mirrors what I call straight tone in this dissertation. This move toward a more flexible concept of vibrato is indicative of the twentieth century's acoustical discoveries that vibrato and straight tone are not cut-and-dried concepts and should be viewed as a spectrum.

3.1.3 Vibrato Trends in Renaissance and Baroque Choral Music

Writers during the Renaissance and Baroque periods did not comment on the use of vibrato in vocal ensembles, so it is difficult to know what the performance practice was at the time (Gable 1992, 96). An ideal voice for Renaissance singing has been described as "resonant," but "light in the upper range," such as the great Lieder singer Dietrich Fischer-Dieskau.

Sopranos need to have the flexibility to softly float notes at the top of the staff while maintaining clarity at pitches below the staff (Blachly 1994, 14). Singers with such voices often have little natural vibrato to begin with or have learned to disengage their vibratos with ease, like Fischer-Dieskau, whose recording of Schumann's *Liederkreis*, is almost 50% straight tone (Large 1976, 45).

Good Renaissance ensemble singing should adhere to the "proportion, balance and 'naturalness' that are so clearly idealized in the other arts of the time," yet remain full of intensity (when appropriate), dynamics, shape, and contrast (Blachly 1994, 15). Heider gives a reasonable, two-sided view on vibrato in the vocal ensemble:

> In small ensembles, where each singer is expected to display some individuality as well as some subordination to the artistic whole, vibrato is out of place only if (1) it interferes with intonation, (2) [it] contradicts the affect of the text, or (3) [it] never goes away. (Heider 1997, 51)

This well-rounded outlook on vibrato is one from which singers of all genres can learn.

3.1.4 Vibrato & Intonation in Choral Singing

Much of the literature that takes issue with vibrato in Renaissance and Baroque ensemble singing deals with intonation. Michael Morrow, director of the London-based early music ensemble Musica Reservata, believes vocal vibrato interferes with intonation (Bethell, part 1). Bethell cites Franchinus Gaffurius's *Practica Musicae* (1496), which states that singers, "should avoid tones having a wide and ringing vibrato, since these tones do not maintain a true pitch" (part 2). Bethell states that "absolute clarity in contrapuntal music is mandatory," and that "vocal vibrato is incompatible…with tonal clarity" (part 2). Not only can excessive pitch vibrato disturb complex counterpoint, but vibrato of more than a quartertone may also muddle ornaments and melismas, making them recede into the musical texture instead of standing out. Baroque

composer Giuseppe Tartini disallowed the use of vibrato when singing a half-step because of the careful tuning required for such a small interval (Tartini 1782, 35, cited in Sanford 1979, 72). Straight tone lends itself well to the precision and dexterity of intonation that early choral music requires.

3.1.5 Dynamics in Choral Singing

Many early vocal ensembles sing without vibrato during *piano* or *mezzo forte* sections but add vibrato during *forte* sections. Interestingly, competing vibratos can acoustically negate this increase in volume and a greater effect may be possible by leaving vibrato out of forte sections (Gable 1992, 97). As a choral performer, I can say that allowing the voice to vibrate at loud volumes is easier than singing straight tone at a high intensity since the speed of airflow is directly related to pitch vibrato and volume. Singing a loud straight tone is dangerously close to "straightening" a modern sound (the opposite of healthy straight tone technique).[3] My suggestion would be to find other ways to intensify the straight sound during forte sections, such as adding more resonance and focus. Acoustically, this may produce a more present sound since the brain attributes greater subjective loudness to tones with many overtones (Skinner & Antinoro, 1970, cited in Goodwin 1980, 126) and singing in "choral mode," as Goodwin calls it, has been found to produce stronger partials around the first formant than singing in "solo mode" (Goodwin 1980, 125).

[3] I will return to this topic later in this chapter.

3.1.6 Choral Blend

Much of a choir's unique sound is due to an acoustical phenomenon known as the "chorus effect," which is to a choir's timbre what sonance is to an individual's timbre. It results from individual singers' differences in pitch, vibrato, and vowel shape within a choir and this "sum" of "acoustical energy of individual voices" leads to a rich and complex choral sound (Fagnan 2005, 110–111).

Similar to the choral effect is the concept of choral blend. Goodwin defines choral blend as "an ensemble sound in which individual voices are not separately discernible to a listener" (1980, 119). One pedagogical method for achieving blend is vowel modification. In his study, Goodwin recorded thirty sopranos, first singing in "solo mode" and then singing in "choral mode." He concluded that the blended tones had "fewer and weaker partials on frequencies above the first formant.… However, partials in the region of the first formant were often stronger among sounds produced in blending than in solo singing" (124–125). In other words, the blended voices were quieter individually but as a result of spectral changes resulted in no reduction of volume overall and, at times, even had a slight increase in volume.

On the subject of vibrato within choral blend, Goodwin found that singers who had strong upper partials while trying to blend in "choral mode" tended to slightly reduce the width of their pitch vibrato (126). Because of the individuality of various voices, he concludes that "vibrato modifications may be advantageous for one singer but not for another" (127) when trying to blend within an ensemble. It seems there is no one-size-fits-all solution. This explains the wide degree of opinions on the subject of vibrato in choral music. Some claim that choral blend is achieved less through the elimination of vibrato and more through likeness of voice quality:

> Since each voice has its own characteristic overtone pattern, which determines its quality, the problem of securing good intonation and blend will be reduced if voices can be quite similar in quality, thereby eliminating pitch conflicts in the overtones produced by the various voices. The ideal, in so far as pitch and blend are concerned, is to have voices in a section of nearly identical quality. (Liemohn 1958, 50)

Fagnan found this to be true in his study on incorporating *bel canto* vocal techniques into choral singing. He found, "a very consistent trend in the improvement of ensemble acoustic energy, timbre and intonation" (2005, 1) by engaging choirs in the core elements of *bel canto* singing, which, in effect, increased the vibrancy in his participants' voices. The results of this study are significant, especially when dealing with student choirs, as voice teachers should more easily be able to bridge the gap between choral and solo technique.

3.1.7 Student-Singers in University Choral Programs

The practical problem with straight tone singing in choral music is that many choirs are made up of students or amateurs. Unhealthy straight tone singing can be detrimental to the growing voice. Unfortunately, many voice teachers do not teach their students (or know) how to sing straight tone in a healthy way. Scott McCoy, director of the Presser Music Center Voice laboratory at Westminster College of the Arts, describes this "feat" of singing without vibrato as requiring "balanced, easy breath support, laryngeal freedom, muscular release in the articulators (especially the tongue and jaw), and the willingness to make a different sound quality" (McCoy 2011, 299). Learning a healthy technique for straight tone singing is vital for the choral singer, especially if they are in the early stages of their education.[4]

Margaret Olson, author of *The Solo Singer in the Choral Setting: A Handbook for Achieving Vocal Health*, lists several pedagogical reasons that student singers may want to avoid

[4] I will return to this topic later in this chapter.

choral singing: "[U]ndue stress on the vocal mechanism, insufficient air flow/breath support, incorrect muscle memory, spreading of the tone, pitch inaccuracy, lack of an overtone series, lack of 'ring' in the voice, and loss of individual tone quality" (2008, 563). Professional singer Daniel Hoiness agrees: "Vibrato management is ridiculous and pernicious, when one is dealing with young, unbuilt voices. The urge to control something before it is ready for control is one of my sore points" (cited in Wrolstad 1979, 151). Hugh Ferguson Floyd, Director of Choral Activities at Furman University, emphasizes the danger of straight tone for young singers: "In voice studios with freshmen and sophomore students, the teacher is trying to get a consistent vibrato rate and I want to do everything I can to assist them in the studio… I use straight tone as seldom as possible" (Olson 2008, 562). This idea of flexible vibrato, which is so crucial to the well-roundedness of a singer, is exactly the skill that a young singer may be too inexperienced to achieve without proper supervision.

There are certain choral rehearsal conventions that can be dangerous for the young solo singer if not guided correctly:

> [T]o tune the ensemble, the conductor may practice chord building in which the basses sing the tonic, the tenors sing the third, and so on. To participate in this exercise, singers have to modify their vibrato rates and adjust their tuning to blend with the rest of the section. Repeated modification during this exercise can slow down the flow of air, fatigue the vocal folds, and disconnect abdominal interaction from the vocal instrument. (Olson 2010, 39)

Every characteristic that Olson lists here can just as easily be an asset to the budding singer as it can be a detriment. The ability to modify one's vibrato rate encourages a flexible air stream. Adjustment of tuning allows development of a young singer's ear. Slowing down airflow in and of itself is not bad vocal technique. It will result in a quieter sound, but this is probably for the best, as singing too loudly in a chorus can cause vocal fatigue. Fatigue can result from a number of bad habits, such as poor posture, and is not exclusive to choral singing. The same problem

can occur in an operatic aria or an art song that lies in the *passaggio*, for example, if it is not approached with enough resonant space and focus. Olson's mention of abdominal disconnection also has little to do with choral singing specifically. Perhaps she is implying that as the young singer searches for the correct intonation and blended tone, he or she may forget basic vocal technique. It is imperative for voice teachers and choral conductors to use language that is pedagogically sound. A casual remark such as "drop the jaw," (an instruction that every singer has certainly heard many times in his or her career!), often aimed at increasing resonance, can be misconstrued by the young singer who may hyperextend the jaw instead of letting it release freely, resulting in tension and fatigue (MacDonald 1999, 158).

The importance of building a solid vocal technique in the first few years of college should not be underestimated, and developing a free and resonant vibrato is a part of that process. Young singers are often placed in colleges' larger choirs while the chamber ensembles are reserved for more experienced singers. This bodes well for young singers finding their resonant sounds since the more members of a choir, the easier it is for a singer to sing with a more individualistic tone without fear of "sticking out" of the texture. For the rare budding Wagnerian soprano or tenor who finds it particularly difficult to blend within an ensemble, a discussion can be had between the voice teacher and choral conductor to find a resolution. Often large, high voices may solace in singing lower parts in choral pieces.

Olson summarizes her staunch view against student-singers engaging in straight tone singing:

> A singer…has many scientific and pedagogical reasons to avoid straight tone: undue stress on the vocal mechanism; insufficient air flow and breath support; undoing of muscle memory; spreading of the tone; pitch inaccuracy; loss of overtones; loss of 'ring' in the voice; and loss of individual tonal quality. (Olson 2010, 75)

Many of these characteristics, however, have little to no connection with vibrato or straight tone. Slow airflow and breath support are two separate issues, with only lack of the latter being detrimental. Worry of spreading of the tone and loss of overtones is simply inaccurate, as a truly beautiful straight tone needs both of these qualities just as much as a vibrant tone does. "Ring" is a quality that some singers try to overcome with false vibrato, so practicing straight tone singing can actually help with this issue. And finally, vibrato is not the only characteristic that individualizes a voice. An individual timbre, while partially shaped by pitch vibrato, can be cultivated to a greater extent through straight tone that allows a singer to hone his or her intensity vibrato, which can add the sparkle and shimmer that so many voice teachers look for. In the end, choirs cannot carry all the blame: "[T]he responsibilities of singer, voice teacher and choir or opera conductor are inextricably intertwined in the vocal education of university-age singers" (MacDonald 1999, 158). Johan Sundberg astutely suggests, "If…the student…has a hard time learning two slightly differing types of voice use at the same time, it seems wiser to concentrate on one thing at a time" (1987, 143). These two separate techniques, however, are not so different that they cannot be integrated into one pedagogy.

3.2 A Choral Singer's Mini Survival Guide

Before I delve into how to sing straight tone healthfully, I would like to address some practical challenges that face choral singers today. I would be remiss to write an entire dissertation on straight tone without tackling some common problems that choral singers face. While many of these problems can often be mollified by the motto, "Don't forget your technique," it is helpful to be mindful of when exactly technique is forgotten and why.

3.2.1 Sight-Singing

Most professional choral singers do a great deal of sight-singing. Rarely is a professional chorister given his or her music ahead of time and, in fact, impeccable sight-singing is one of the main skills required of singers in the profession. Because the mind is so focused on singing correct pitches, rhythms, and words, technical considerations like breath management can be easily forgotten. Posture is one of the easiest things to fix in this situation. If sitting (choristers usually sit during rehearsals), it is helpful to place both feet flat on the ground, neither leaning forward nor leaning back into your chair. It may also be beneficial to hold your music up high enough that you do not have to look down at your music, causing a bend in your neck and, literally, in your instrument.

3.2.2 "Folder Shoulder"

The concept of folder shoulder is one with which most choral singers are familiar. Without mindfulness, holding your folder of music for hours upon hours can result in a great deal of tension in the shoulder, neck, and back. This, in turn, can diminish a singer's ability to expand the ribcage upon inhalation, thus causing the entire breathing mechanism to become less efficient. In my personal experience, I have found that my shoulders tend to droop forward when I stop paying attention to them. This causes the shoulder blades to stick out, misaligns the spine and head, and brings tension into the neck area.

On her website FixTheNeck.com, Rochelle Cocco suggests the following procedure to realign the shoulder blades, which I often do during rehearsals to combat folder shoulder:

> Pull down the shoulder blades by slightly lifting tops of shoulders, then rotate them back and down in a smooth motion that continues by pulling down the shoulder blades. The effort should be felt in the mid to lower back, where muscles from below — the lower trapezius and perhaps lower fibers of serratus anterior contract and pull down on the shoulder blades. (The shoulder blades don't actually move much, and they shouldn't, but their tops tilt up vertically allowing the shoulder blade to lie flat against the posterior ribcage/upper to mid-back; margins of the blades closest to the spine should be parallel with each other…Very importantly, the movement takes place in back and not directly on top of the shoulders. Done correctly there is minimal depression at tops of shoulders.[5]

The muscles between the shoulder blades and in the mid-back must be strengthened to prevent this kind of drooping of the shoulders. A bent-over two dumbbell row (see Figure 3.1) is an excellent exercise for this purpose:

1. With a dumbbell in each hand (palms facing your torso), bend your knees slightly and bring your torso forward by bending at the waist; as you bend make sure to keep your back straight until it is almost parallel to the floor. Tip: Make sure that you keep the head up. The weights should hang directly in front of you as your arms hang perpendicular to the floor and your torso. This is your starting position.
2. While keeping the torso stationary, lift the dumbbells to your side (as you breathe out), keeping the elbows close to the body (do not exert any force with the forearm other than holding the weights). On the top contracted position, squeeze the back muscles and hold for a second.
3. Slowly lower the weight again to the starting position as you inhale.
4. Repeat for the recommended amount of repetitions.[6]

Figure 3.1: Bent-Over Two Dumbbell Row

[5] http://fixtheneck.com/shoulder_blades.html, accessed May 14, 2016.
[6] http://www.bodybuilding.com/exercises/detail/view/name/bent-over-two-dumbbell-row, accessed May 14, 2016.

3.2.3 Vocal Fatigue

The best advice for dealing with long rehearsals that I came across in my interviews with professional choral singers can be summarized in one word: pacing. Singers admitted to taking parts down the octave and even mouthing the words to keep their voice from tiring before the actual concert. I find no fault in these tactics. Indeed, actively listening instead of singing can be more beneficial, musically, than muscling through.

While this kind of fatigue can mostly be prevented through the tactics on straight tone singing discussed later in this chapter, sometimes the sheer number of hours singers are required to sing in a given week (say, Holy Week or the week of Christmas) can cause even the healthiest of voices to give out. In addition, the voice is an instrument stimulated by the entire body, so if the body is sick or physically tired, singing technique can suffer.

3.2.4 Loud Straight Tone Singing

As a choral performer, I can say that allowing the voice to vibrate at loud volumes is easier than singing straight tone at a high intensity since the speed of airflow is directly related to pitch vibrato and volume. Singing a loud straight tone is dangerously close to "straightening" a modern sound (the opposite of healthy straight tone technique, as discussed later in this chapter). My suggestion would be to find other ways to intensify the straight sound during *forte* sections, such as adding more resonance and focus. This may produce a higher intensity sound since the brain perceives sounds with greater overtones as lounder (Skinner & Antinoro 1970, cited in Goodwin 1980, 126) and choral singing has been found to yield stronger overtones around the first formant than solo singing (Goodwin 1980, 125). Singing quietly can enhance the ability of

the choral singer to hear the choir as a whole without being distracted by his or her own sound, which, in the end, results in more musicality and less wear and tear on the vocal mechanism.

3.3 Redefining Straight Tone

Straight tone is round and clear in quality. It has minimal vibrato, yet shimmers with energy and pulsation. For far too long, voice teachers have imagined straight tone as an ugly, flat sound without color or resonance. Professional choral soprano Katherine Wessinger, recalled asking her college voice teacher about the healthy way to sing straight tone: "She said never to do it, basically. I thought, 'Well okay, I guess I'll figure it out on my own'" (interview with author, February 27, 2015). This is, unfortunately, many singers' experience. They seek guidance but are turned away because of old-fashioned prejudices when straight tone singing is actually the core of all other types of singing and, once mastered, is both beautiful and expressive. This major misconception hinges on the concept of sonance, which I introduced in Chapter One. Straight tone is not actually straight at all. All three types of vibrato (pitch, intensity, and timbre) are present yet almost imperceptible because of their small extent and quick rate.

While the idea of singing with minimal vibrato is unpopular, Ingo Titze, an expert in the field of voice science, has suggested that the ability to control vibrato can be a useful skill: "It may actually be a good exercise to learn how to disengage your vibrato…the extent (how much it goes up and down) is in the singer's control" (Titze, personal interview with Margaret Olson; cited in Olson 2010, 76). Because choral singing is lucrative in large cities such as New York, it benefits any young professional singer to learn how to sing healthfully with straight tone. In addition to its practical benefits, straight tone can be used stylistically as a color in the palette of

the human voice, adding flavor to early music, art song, opera, musical theater, and contemporary commercial music (CCM), such as pop, rock, folk, and country. Straight tone functions as the core sound of the versatile singer who can skillfully manipulate it to fit any style.

3.4 Healthy vs. Unhealthy Straight Tone Production

Titze dispels the common misconception that vibratoless singing automatically signifies poor technique: "Vibrato is an indication of good muscle balance and a vibrato-free voice might mean that the person has good balance but they disengaged it somehow" (Titze, personal interview with Margaret Olson; cited in Olson 2010, 76). In her blog entry, "Vibrato Hell" (May 29, 2012), Claudia Friedlander defines vibrato as representative of a free voice. In other words, when all technical aspects of singing are in check, a voice will be vibrant. When straight tone singing is required, the naturally occurring vibrato can be inhibited, but it must be done with skill. In *Exploring Twentieth-Century Vocal Music* (2002), Sharon Mabry writes:

> Indeed, if the use of straight tones summarily destroyed voices, thousands of singers would have lost their voices by now, since the use of nonvibrato is prevalent in some musical styles and cultures. When listening to a well-known, vocally-trained group such as The King's Singers, who have had a long, illustrious career, it is obvious that straight-tone singing is a staple in their repertoire of vocal colors and has not impaired their singing voices. They are able to switch at will between a normal vibrato and a straight tone according to the style of music or the interpretation of a particular text. (44)

It is certainly possible to sing straight tone with healthy technique that allows for facility and flexibility in the voice. But how exactly is it done? Unfortunately, harmful recommendations tend to circulate within educational and professional choirs alike. Gary K. McRoberts gives one such example of bad advice in his article, "The Unheralded Choral Art – JAZZ":

> The ideal sound in choral jazz is that of the straight tone. To achieve this quality the singer will find it necessary to push considerably more air through the voice. The excessive amount of air diminishes the chance of the vibrato interrupting the line. (1977, 33)

This method of producing straight tone results in an airy, pushed sound that lacks breath support. Lack of support can cause a myriad of problems, such as breathlessness and tension in the tongue and jaw. Another method of producing straight tone is to sing with normal, operatic technique and then use the throat and tongue muscles to inhibit the natural movement of the larynx. Once again, this strategy will produce fatigue and strain, not to mention an unpleasant sound. These are the types of straight tone production that voice teachers fear and warn their students about, and rightly so. But there is a better way.

3.4.1 Low Subglottic Pressure

Sally Sanford, an internationally recognized specialist in Renaissance and Baroque singing, pinpoints low subglottic pressure (which she calls "air pressure") as the key to healthfully minimizing vibrato. Instead of "straightening out" modern operatic technique, Sanford advocates for "a completely different vocal aesthetic, a different technique, and a different way of conceiving of vocal sound altogether" (1997, 13). "If you try to suppress vibrato without changing the air pressure," she warns,

> you will have to use some kind of constriction in the vocal tract. Such constriction can lead to unnecessary tension and fatigue. This can understandably alarm voice teachers when their students start 'straightening' their sounds for singing early music. (1995, 3.1)

> Using the standard operatic technique taught in conservatories as the basis for straight tone singing is the first mistake most singers make, both student and professional. They straighten out their sound and experience excruciating fatigue. Lianne Coble, a soprano with the Metropolitan Opera Chorus, summarized this concept thus:Straight tone choral singing requires a singer to adapt a more pressurized air flow, rather than the free-flowing, balanced sensation one gets from singing in the *bel canto* style. One controls how one's breath is flowing, but there still has to be a sense of forward motion, rather than the feeling of "holding" the voice back. (Email interview with author, March 16, 2015)

This common mistake, "holding back" the voice, is what causes the tension and fatigue commonly associated with straight tone singing.

When using straight tone pedagogically, subglottic pressure is the concrete goal. Straight tone happens to be a side effect, but a useful side effect that helps whittle down the voice to its most fundamental core. By finding this simple, *mezzo piano*, minimally vibrated sound, other aspects of the instrument, such as resonance, come into clearer view. Once this core sound is mastered, other aspects of vocal technique, such as movement of the larynx and soft palate, can be isolated and understood.

Singing with lower subglottic pressure can be a difficult concept to grasp. In Chapter One, I introduced three types of phonation that result in different ratios of subglottic pressure to airflow: breathy, pressed, and flow. Just as straight tone singing is often incorrectly produced through breathy phonation (take McRoberts' statement above), operatic singing is often incorrectly produced through pressed phonation. Both can, however, be achieved with flow phonation (balanced subglottic pressure and airflow).

3.4.2 Flow Phonation

Flow phonation can be achieved in numerous ways, depending on how much subglottic pressure you initially use. For a straight tone sound, low subglottic pressure must be paired with low airflow, to keep the balance of flow phonation. For an operatic sound, high subglottic pressure must be paired with high airflow. The ingredients of each version of flow phonation are varied and the resulting sounds will be different. In general, flow phonation made up of low subglottic pressure and low airflow will have the least vibrato (straight tone) and flow phonation made up of high subglottic pressure and high airflow will have the greatest vibrato (vibrant,

operatic singing). To return to Sanford's remarks, low subglottic pressure must be combined with low airflow when trying to achieve straight tone. The alternatives, phonation skewed toward subglottic pressure or airflow, result in pressed and breathy phonation, respectively. Flow phonation that is achieved with low airflow is "more streamlined," as put by Jamet Pittman, a soprano with the professional choir at the Cathedral of St. John the Divine (interview with author, March 4, 2015). It may even feel breathy, even though it is not. "If the breath is being used efficiently through the instrument," Wessinger told me, "you have a nice, free, breathy *feeling* that's not breathy" (interview with author, February 27, 2015; emphasis mine).

3.4.3 Finding the "Hoot"

Flow phonation is not possible without both resonance and an open throat, sometimes called "hoot." Many of the professional choral singers I interviewed included this hoot in their straight tone singing technique. "There's a lot of space [in the throat]," Pittman said, "There's space in the back but it's compartmentalized toward the front of the mouth. It feels very forward even though there's space back there" (interview with the author, March 4, 2015). The best straight tone is by nature *chiaroscuro*, bright and dark simultaneously, as Pittman described. Practicing choral straight tone can help the naturally bright-voiced singer find the *oscuro* (dark) side to his or her voice, as it did for me. Wessinger warns of over-darkening to achieve straight tone, "trying to create a tone that blends more easily with the voices around me… If I pull it too far back, I start to feel tension in the back of the tongue. The muscles at the sides of my neck get tight" (interview with the author, February 27, 2015).

Creating space through tension is a common mistake that can be traced back to one of the fundamental skills a young singer learns: lifting the soft palate. Many teachers describe the

feeling of lifting the soft palate as a yawning sensation. While this is technically correct—the soft palate does rise during a yawn—a full yawn involves the use of more than just the soft palate. It brings tension into the tongue, the jaw, and the throat. Isolating the soft palate is a sensation that is more closely related to the feeling of being underwater. When a person is underwater, the soft palate automatically plugs the nose to keep water from getting in. This sensation, which is similar to the feeling of a stuffy nose while sick, is the soft palate lifting and creating space in the back of the throat. Lifting the soft palate is usually associated only with higher register singing, but it plays a vital role in producing healthy straight tone throughout the voice's entire range.

In the following section, I will elaborate on these topics with vocal exercises designed to break down the multiple facets that together form healthy straight tone singing. Most of them should be performed in the lower middle of a singer's range (e.g., C4 to G4 for a soprano), however, the sensation of singing should be approached as if from the top of the range (with the lifted soft palate). Bringing the hoot into the middle and lower registers is important for achieving the low airflow and low subglottic pressure flow phonation that is straight tone singing.

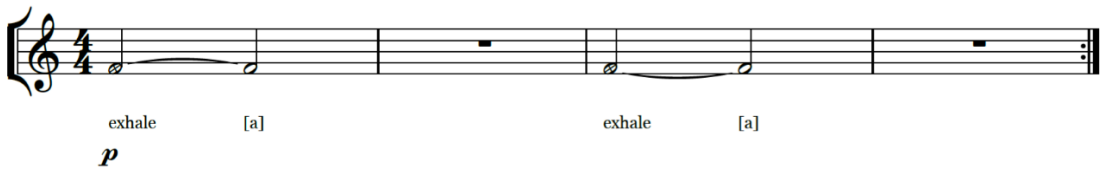
3.5 Straight Tone Exercises

As discussed earlier, the two main elements of flow phonation are airflow and subglottic pressure. These two aspects of phonation must be balanced to produce flow phonation, which is desirable as a base for almost every type of singing. Speed of airflow directly contributes to vibrato, therefore low airflow is required to minimize vibrato. To keep everything in balance, both subglottic pressure and airflow must be low to sing with straight tone.

3.5.1 Low Airflow

My favorite strategy for achieving low airflow is the image of "fogging up a window." Raise your palm to your mouth and exhale as if you are going to fog up a window. Make the exhalation silent; if you can hear yourself exhaling, the airflow is too fast. In Example 3.1, I devised an exercise to practice this gentle approach:

Example 3.1: Low Air Flow Exercise



The exhalation on the first two beats of each bar should be silent and then gently grow into a *piano* [a] in a comfortable part of the range. The inhalation during the measures of rest are slow and gentle to match the exhalation. It is important to note that straight tone should not be the goal for this exercise, but if flow phonation is achieved with a truly low rate of airflow, vibrato will be minimal.

The exercise in Example 3.1 doubles as an onset exercise and is a steppingstone to the "silent onset." Onset is the beginning of a sung sound. There are three types of onset: (1) aspirated, (2) glottal, and (3) silent. An "aspirated onset" is achieved when airflow begins before phonation; in other words, the sound begins with an [h]. A "glottal onset" is achieved when phonation begins before airflow; this sound is often used in the English and German languages to emphasize words that begin with vowels. The silent onset is achieved when airflow and breath begin simultaneously. While each onset has its place, the silent onset is generally considered the ideal for healthy, classical singing. These three onsets coincide with the three types of

phonation: aspirated onset to breathy phonation, glottal onset to pressed phonation, and silent onset to flow phonation, further strengthening the case for the pedagogical use of straight tone.

3.5.2 Low Subglottic Pressure

Subglottic pressure, or the amount of air that builds up beneath the vocal cords, is more difficult to isolate than airflow. The breath management concept of *appoggio*, from the Italian school of singing, helps to ensure balance between airflow and subglottic pressure and, if performed with low airflow as described above, achieves the low subglottic pressure that is essential to performing straight tone healthfully. Essentially, *appoggio* (from *appoggiarsi a*, "to lean upon") keeps the torso's position of inhalation (i.e., lowered diaphragm, raised chest, expanded side and back ribs) for as long as possible during singing (or exhalation) (Miller 1996, 23–24). Miller suggests the following breath management exercise for the practice of *appoggio*:

> Raise the arms above the head. Return the arms to the sides while retaining the moderately high posture of the sternum and rib cage. If the chest, at this point, cannot be raised somewhat higher with an upward thrust of the sternum, the basic thoracic position is too high; if the chest sinks during either inspiration or expiration, the initial thoracic posture was not sufficiently high. Breathe in and out, easily and silently, making certain that the sternum does not fall and that the rib cage does not collapse. (Miller 1996, 29–30)

Miller describes another exercise that many teachers believe were used by the great castrato Farinelli to achieve his amazing breath control:

> Inhale while mentally counting from 1 to 5 at a moderate tempo, maintaining absolute silence… Complete but unforced expansion of the ribs and of the muscles of the umbilical-epigastric area and of the lumbar area should be realized.
>
> Suspend the breath without any sensation of holding it (glottis remains open, an action sometimes termed "The Van Den Berg Maneuver" in the field of phoniatrics), without any muscular tension in either the vocal tract or the torso. The position of the rib cage and the abdominal wall is retained while silently counting from 1 to 5 at the original tempo.
>
> Exhale silently, maintain as far as possible the same posture of sternum and rib cage, counting 1 to 5… Immediately following completion of the three-part breath cycle of 1 through 5, move without pause to a cycle of 1 through 6, passing through the three successive phases of the exercise; in this fashion, increase the numbers until 9, 10, or perhaps 12 counts have been achieved. (Miller 1996, 31)

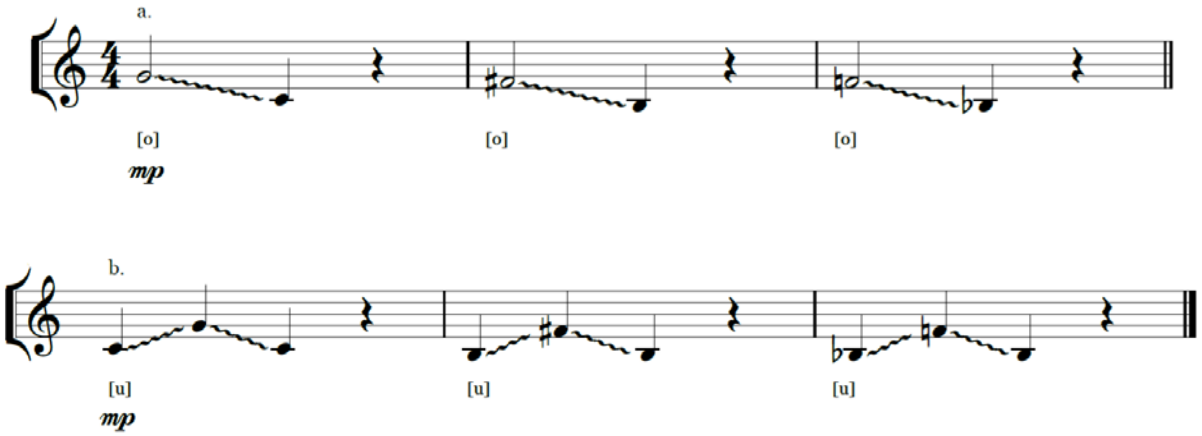
The sensation of suspension, while the glottis remains open but air goes neither in nor out, is similar to the feeling of straight tone in the low and middle register. In the quietest, straightest of singing, the airflow and subglottic pressure are both so low that it almost feels as if nothing is happening at all.

Because the vocal instrument is not visible, *appoggio* and breath management can be difficult to grasp for the young singer. Imagery is a valuable tool to any teacher of singing and I have found the image of a balloon most valuable for the concept of *appoggio* and, in the end, singing straight tone: Imagine your torso is a balloon. When you inhale (or blow up the balloon) everything (including your side and back ribs) expands. Now imagine that your balloon has a tiny hole in it. The air seeps out slowly but the balloon remains intact. The sides of the balloon remain expanded. This is what *appoggio* should feel like. Now imagine the opposite: the balloon has untied. The air barrels out of the balloon and it flops to the ground. This indicates a lack of breath support. *Appoggio* is the constant feeling of expansion in the ribs (the sides of the balloon) while air escapes at a steady and controlled pace.

3.5.3 Sliding

Slides are an excellent way to access an easy vibratoless sound, naturally. A slide is, by definition, free of vibrato since it does not stay on any one pitch long enough for it to oscillate. This is opposed to a *portamento*, which is a slide with manufactured vibrato. Examples 3.2a and 3.2b illustrate two gliding exercises. Example 3.2a helps encourage bringing the hoot down into the lower register. Example 3.2b should be performed after 3.2a is mastered, as the starting lower note should be sung with the hoot found in the previous exercise. One of the most difficult parts of performing these exercises is keeping the slide even throughout the duration of the note. Many young singers will sustain the first pitch and then quickly slide to the next pitch. This is a good starting point, but the goal is to sing the slide as continuously as possible.

Example 3.2: Slide Exercises

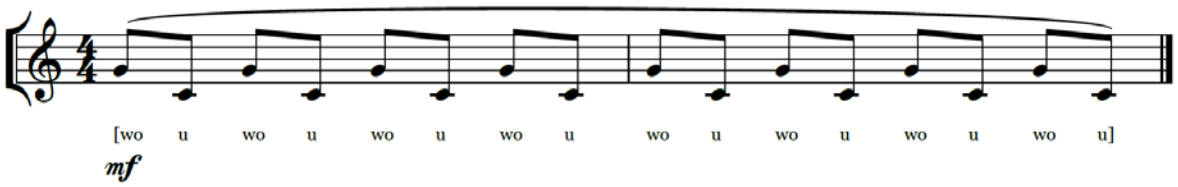


3.5.4 Sirens

Accessing a glide can be difficult for some students, but there are several images and analogies that can help, such as that of a siren (see Example 3.3). Some singers may feel

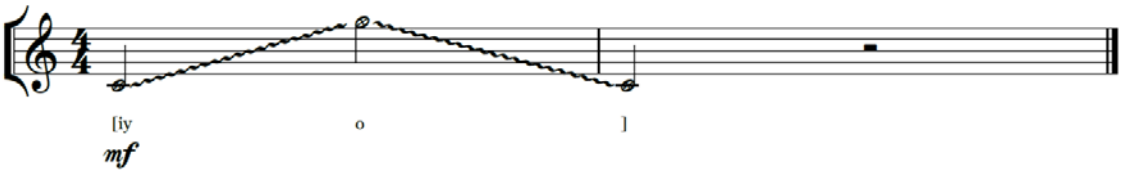
childish trying to imitate the sound of a fire truck or ambulance, but it is a sound that is universally familiar.

Example 3.3: Siren Exercise #1



In my own experience as a voice teacher, I have found the sounds [w] and [j] to be helpful in accessing the slide. Their hybrid consonant-vowel quality makes it difficult to force a vibrato into the sound. Sirens connote energy, which makes students less likely to micromanage the sound. Example 3.4 shows a siren exercise using [j] that can be performed on undetermined pitches from the bottom to the top of a singer's range. The actual slide up should be performed on the [j], which is similar to its cousin, the vowel [i].

Example 3.4: Siren Exercise #2



3.5.5 Sighing

Like the siren, a sigh can be used to achieve a slide. In *The Naked Voice*, W. Stephen Smith breaks down his singing philosophy into six inventions (or vocal exercises). The first two,

"Simply Speaking Simply" and "Free-Flowing Air," isolate two colors of the voice: *chiaro* (bright) and *oscuro* (dark). Although not specifically stated in his book, these exercises generally produce very little vibrato in the voice. The second exercise, "Free-Flowing Air," isolates the falsetto register of the voice, which can be useful when learning how to sing with straight tone. Smith's exercise aims to achieve flow phonation by lessening both the subglottic pressure (what he calls adduction of the vocal folds) and airflow (what he calls breath pressure):

> The body of the vocal fold is the vocalis muscle. This muscle is covered by alternating layers of skin-type tissue and fluid. Commonly singers overadduct (squeeze the folds together). For overadducted folds to vibrate, singers must force air though with immense breath pressure [resulting in pressed phonation]. Free-Flowing Air takes the vocalis muscle out of the process so we actually feel the breath flowing though the glottis without the sensation of resistance. The vocal folds are only slightly adducted [low phonation], so when the air flows through, only the tissue on the outside of the fold vibrates—not the vocalis muscles. (2007, 67–8)

Phase One of Smith's Free-Flowing Air exercise is a vocalized downward sigh. He writes:

> Most men know what falsetto feels like…. It is more difficult to introduce this concept to women because they seldom think they have a falsetto and are therefore not as likely to truly let the air carry their voice. With women, I use terms like "fluty," "choirboy voice," "dumb blonde voice," or "Julia Child voice," to help them achieve the feeling of falsetto. Women should try for a hooty, straight-toned, breathy feeling in the sigh without a feeling of stiffness in the throat. (70)

Although it may be tempting to go towards breathy phonation in this exercise, it is not the sound Smith aims to achieve:

> If we actually direct the airflow into the back space and let the voice *feel* breathy, we don't get a breath sound. Instead, it comes out pure and clear—like a flute…. [A] flute is all overtones and resonance with almost no fundamental tone…. Even though we make some sound as the air passes through the vocal folds, we *feel* no engagement of the folds and no fundamental tone at all—only overtones." (70; emphasis mine)

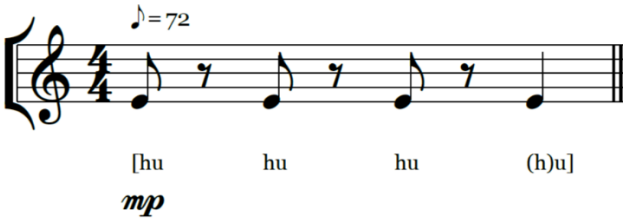
The adjectives Smith uses to achieve this falsetto sound are similar to those given to me by the professional choral singers I interviewed. Pittman described the "formalness" of straight tone: "Automatically I sit a little taller and I feel more confined. I feel a little more British and

repressed" (interview with author, March 4, 2015). The feeling of confinement should not transfer itself into the vocal mechanism itself, but it is a useful mental image.

3.5.6 Staccato

Like the slide, a *staccato* note does not have enough duration for there to be an oscillation of pitch. A well-performed *staccato* is actually just a silent onset since there is no time for the sound to build into anything more. Therefore, onset exercises are excellent building blocks for learning how to sing with straight tone. Example 3.5 illustrates a vocal exercise that builds up the silent onset from the breathy onset:

Example 3.5: Silent Onset Exercise



I have notated the final [h] in parentheses because the singer should feel the air of the [h] through his or her lips (it should feel similar to the warmth of fogging up the window) but it should be inaudible. In this way, the singer practices synchronizing airflow and phonation, resulting in quiet flow phonation with minimized vibrato.

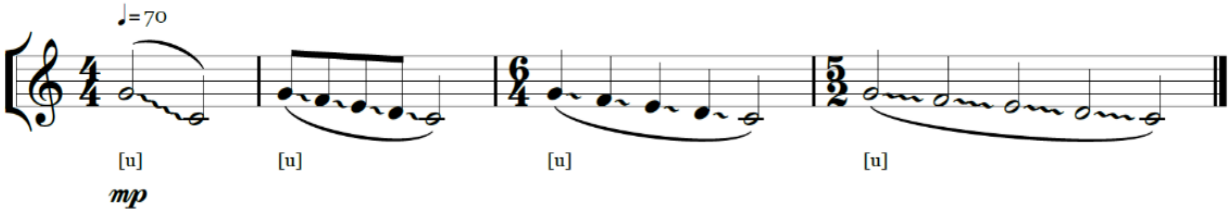
3.5.7 Sustaining Straight Tone

Once a singer has mastered these exercises, he or she can extend them into actual straight tone singing. The most difficult aspect of singing straight tones is sustaining them. Take the

example of the final, belted note in a musical theater song: the pervasive style is to sustain the pitch with straight tone until the very end when vibrato is let back into the voice. The decreased airflow that results in a straight sound actually releases as the body runs out of air, resulting in vibrato. For this reason, sustained straight tones should be the final step in learning straight tone and should only be attempted once low subglottic pressure and low airflow have been mastered.

Once a clear slide has been established, it can be methodically slowed down to a five-note descending scale (see Example 3.6).

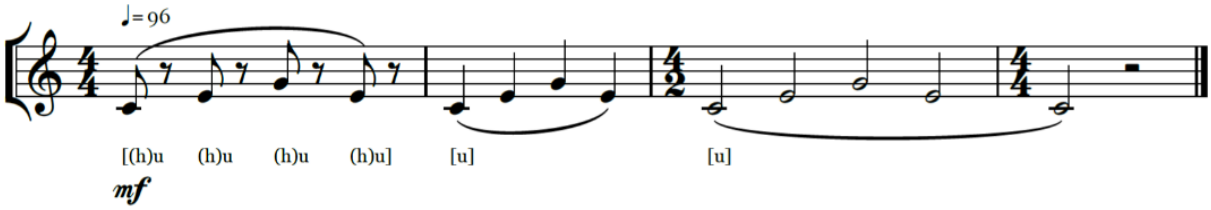
Example 3.6: Using the Slide for a Straight Tone Descending Scale



Each sustained note in this exercise is connected by a slide, but the sustained pitches systematically increase and the airflow remains low.

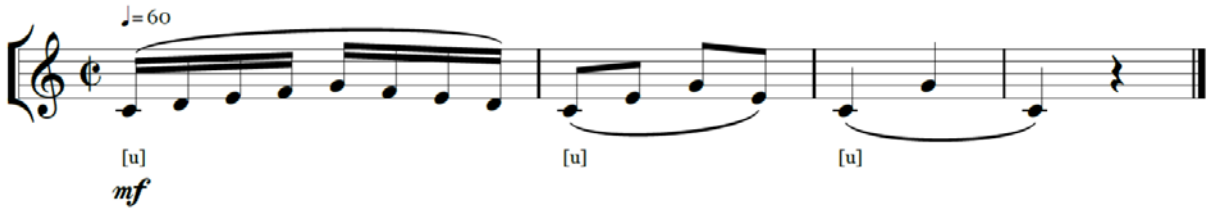
Staccato notes can also be systematically extended into sustained pitches. Example 3.7 develops a staccato arpeggio into a sustained one:

Example 3.7: Using the Staccato Arpeggio for a Straight Tone Arpeggio



The key to these exercises is to keep the airflow and subglottic pressure constant from beginning to end. Example 3.8 shows an exercise that puts everything together:

Example 3.8: Straight Tone Exercise



Like the slide, quick, melismatic passages are also usually straight tone, simply because there is not enough time for the pitch to oscillate. By beginning this exercise with a fast scale, the straight tone mechanism can be kick-started for the more sustained phrases that follow.

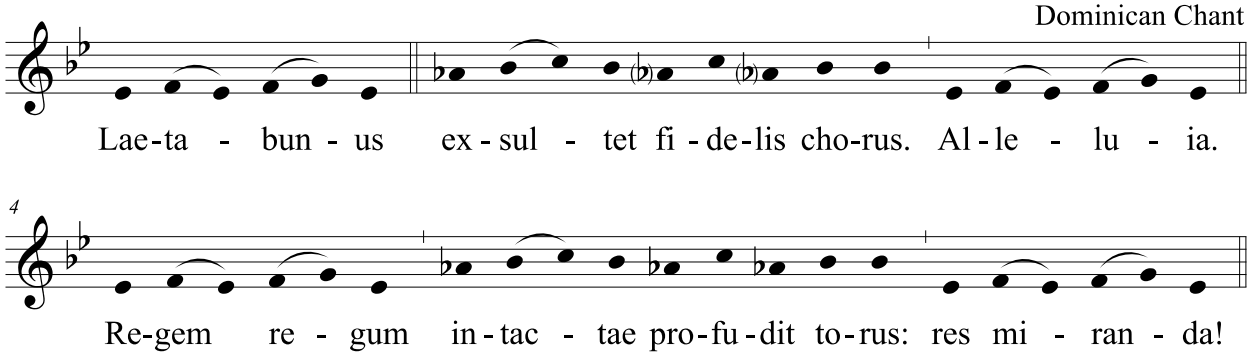
3.5.8 Gregorian Chant as a Tool for Learning Straight Tone

One of the skills I learned as a liturgical musician was the art of chanting. Successful chant singing is particularly challenging for choral ensembles but especially helpful in developing proper straight tone singing in the individual singer. Gregorian chant, a common practice in Catholic services, can be performed by soloists or by a choir. When a chant is performed by a choir, it can be sung in unison or in organum. I find chanting to be soothing on the voice and an excellent warm-up for four reasons: (1) chants are usually written in the middle register; (2) they are sung smoothly and at a moderate tempo; (3) they are written in Latin, which consists of pure vowels without diphthongs; and (4) singing in unison or at perfect intervals is a great exercise in listening and intonation.

When I began chanting, I wanted to fill the enormous church with a sound that was both pure and round (*chiaroscuro*) and chanting was the perfect vehicle for discovering those qualities

in my voice. The combination of moderate range, pure vowels, stepwise motion, and unison singing makes the chant an ideal tool for developing a free, vibratoless sound. The opening of the Dominican chant "Laetabundus" (see Example 3.9) is a good example of these key characteristics.

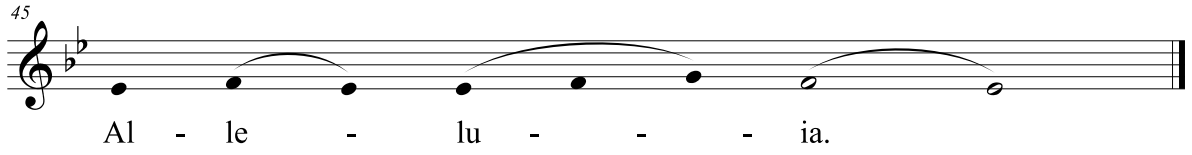
Example 3.9: Dominican Chant, "Laetabundus" (mm. 1–6)



The range of this excerpt is a major sixth, from E♭4 to C5, and the tessitura is mid-range, around G4. All five basic Italianate vowels—[i], [e], [a], [o], and [u]—are present in these first two lines of text, allowing the singer to practice maintaining resonance while shifting from one vowel to another without the extra challenges of diphthongs or vowel modification due to range. This technique, known as vowel tracking, refers to keeping the integrity of the pure vowel while minimizing inefficient muscular efforts. As the tessitura of this chant is at speech level, it provides a good range for practicing this fundamental vocal technique (Miller 2000, 132). In *Structure of Singing*, Richard Miller devotes a full chapter to resonance balancing through non-nasal consonants. Of the consonant [l], he writes: "When properly harnessed, [l] helps acquire the quick tongue action essential to free articulation…The consonant [l] can serve as a mode for all other alveolar consonants when the singer has mastered it" (1986, 92). The word "alleluia,"

arguably one of the most sung words in the Christian liturgy, is the perfect tool for practicing the key concepts of resonance balancing, vowel tracking, and free tongue articulation. This single word contains four of the five basic vowels connected by a string of [l] consonants (see Example 3.10).

Example 3.10: Dominican Chant, "Laetabundus" (m. 45)

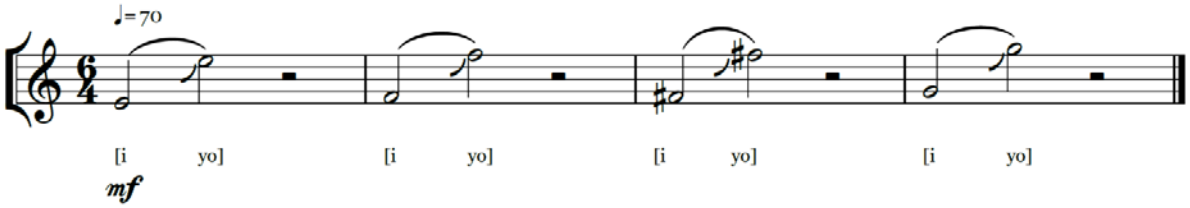


3.5.9 Straight Tone for Sopranos: Extending into the Upper Register

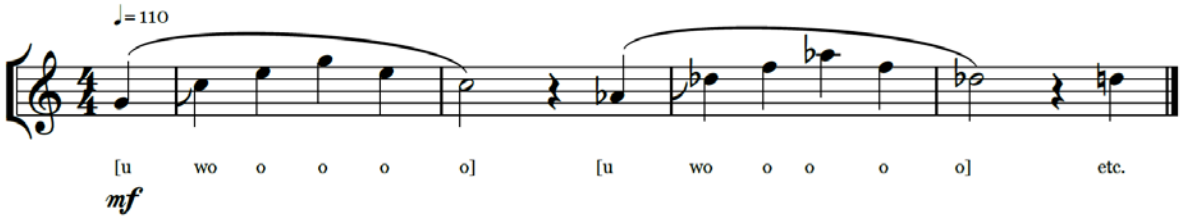
The exercises up to this point have all been moderate in range. Sopranos, however, often have the unenviable position of singing high notes with straight tone. As tenor James Archie Worley, a professional choral singer of 25 years, put it, "Of course, you know, it is worse for the sopranos… [the conductors] hear the sopranos more… they don't really say "straighten it out" to the men as much as to the women" (interview with author, February 25, 2015). With this in mind, I have developed a couple of exercises to practice high straight tone singing for women. This kind of singing should feel light and effortless. In my own experience, achieving resonance and vowel matching becomes most vital when singing straight tone above the staff. It is truly a testament to a singer's technique to be able to sing high notes with straight tone without strain, but if everything is lined up, it should feel easy. Example 3.11a uses the closed [o] vowel to create space with the soft palate without involving the jaw. It also uses an upward slide on [y] to keep clarity in the voice. Unlike previous exercises, this slide should be quick and immediately preceding the high note, otherwise too much weight could be carried into the higher register.

Example 3.11: Practicing Straight Tone in Upper Range

a.



b.



Example 3.11b uses the [w] slide to maintain proper glottal closure on the ascent and the closed [o] vowel to create space in the soft palate without the use of the jaw.

3.6 Conclusion

Straight tone, a minimally vibrated sound produced with flow phonation at a low dynamic level, is, for better or for worse, a practical aspect of singing today. Choral singing is a pragmatic money-maker for young professionals and the ability to sing healthfully with straight tone, as is required in many choirs, is essential for modern singers. Most singers are discouraged to sing with straight tone by their voice teachers, who fear it damages the voice. While it is true that singing with traditionally vibrant tone and using the tongue and neck muscles to "straighten" it out can be harmful to the voice, there is a way to minimize vibrato in the voice that is not only harmless but also beneficial.

Low airflow is the key to keeping the larynx from oscillating, and therefore to minimizing vibrato. But to keep the balance of flow phonation, low airflow must be paired with low subglottic pressure. Vocal exercises that focus on slides, sirens, and *staccato* passages can be beneficial to the singer who wants to learn how to sing with straight tone successfully. Due to their moderate range, pure vowels, and even rhythm, Gregorian chants are also an excellent vehicle for practicing this straight tone technique. Once a singer has mastered this technique in his or her middle range, the skill can be extended to the upper register, where *appoggio* and low airflow are even more vital.

CHAPTER FOUR:

APPLICATIONS & STYLISTIC MODIFICATIONS OF STRAIGHT TONE

4.1 Straight Tone as a Stylistic Choice

> In a letter to Dr. John W. Large, famed baritone Dietrich Fischer-Dieskau wrote:
>
> …if one surveys the whole range of European music, there are innumerable styles and uses for [straight] tone productions. From sacred Gregorian chants to witch voices in Verdi, from Castrati arias to word interpretations by Hugo Wolf, one can find possibilities for use. (Cited in Large 1976, 45)

Indeed, straight tone and vibrato can be appropriate to any genre of music, but to what degree each is used can be the difference between a stylistically authentic performance and an imitation.

4.1.1 Vibrato Performance Practice in Baroque Repertoire

There is a wealth of opinion on the appropriateness of vibrato in classical solo singing, particularly when dealing with Baroque music. Attitudes on vibrato in Baroque music range from firm anti-vibratoists, like Richard Bethell (2009), to proponents of continuous vibrato, like Frederick Neumann (1991).[1] Among the moderates are Julianne Baird (1997), who views vibrato as an ornamental or expressive device, and Anne Harrington Heider, who believes that "an unvarying straight tone is as inappropriate as an unvarying vibrato" (1997, 50).

One reason for differences between modern and Baroque vibrato is the moderate character of vocal range and dynamics in Baroque music. Physiologically, singing loudly produces more vibrato than singing quietly; similarly, singing high notes loudly is easier than

[1] The term "vibratoist" was used by Frederick Kent Gable in his 1992 article "Some Observations Concerning Baroque and Modern Vibrato" to refer to singers who regularly use vibrato. "Continuous vibrato" is a style of singing that came into fashion near the end of the nineteenth century, where a fairly wide pitch vibrato is used on almost every note.

singing high notes softly. Vibrato may have naturally arisen from the natural fluctuation that happens at the height of a *messa di voce* but this type of vibrato was not meant to be continuous (Gable 1992, 93).[2] Some Baroque writers warned singers of singing too loudly, particularly on high notes, possibly to avoid the resultant vibrato. Gable states:

> Among modern singers, the training for the continual loud singing needed in large opera houses and for being heard over a 20th-century orchestra makes this muscular movement so habitual that it is transferred to singing at all dynamic levels and becomes difficult to remove or control. This is what today is usually called the "natural" vibrato, when in reality it is forced, learned vibrato resulting from loud vocal production. (1992, 93)

The size and perceptibility of learned vibrato from loud singing is unfortunate for the modern day singer looking to expand his or her horizons into early music. Some voice teachers consider *piano* singing an advanced technique, as it requires a well-placed sound and relaxed throat and neck musculature. However, introducing the idea of quiet, straight tone singing at moderate pitch levels—as opposed to quiet, high singing, which is truly an advanced technique—early on in a singer's education can be of benefit to one seeking to develop an array of vocal colors. Alexander Blachly sums it up well:

> Professional singers in the Renaissance sang quite differently from modern professional singers; or, to put it the other way around, standard vocal training today often leaves the aspiring professional singer unsuited for Renaissance music. The majority of voice teachers still tend to encourage modern operatic technique as a universal goal for their students, and the high-pressure, high-vibrato style such students use is antithetical to the delineation of counterpoint…and to precise tuning independent of instruments (1994, 13).

Modern vocal technique differs from Baroque vocal technique for reasons that include performance space, musical requirements, and physiological demands on the voice. Today's well-rounded singer would do well to seek out a flexible vocal sound that can be molded to the musical requirements of multiple time periods, including the Baroque era.

[2] A "messa di voce" is a slow crescendo–decrescendo over a sustained note.

4.1.2 Pitch Vibrato and Intensity Vibrato in Baroque Repertoire

There are opposing views on the type of vibrato (e.g., pitch vibrato or intensity vibrato) and amount of vibrato (e.g., continuous or ornamental) appropriate to Baroque repertoire. Frederick Kent Gable (1992) and Martha Elliott (2006) agree that a shimmering fluctuation in intensity (loudness) is an acceptable form of continuous vibrato, but are against much, if any, pitch fluctuation. Even though pitch vibrato and intensity vibrato are physically produced in two different ways, the average listener may have trouble differentiating between the two. When pitch vibrato becomes too wide, sonance is not achieved and a wobble occurs. Pitch and/or intensity vibrato may be continuous in Baroque music but should remain unnoticeable (Neumann 1991).

In his study of nineteenth-century newspaper reviews, Bethell (2009, part 3) distinguishes between the often-praised "vibrato" (narrow), the criticized "tremolo" (wider), and the castigated "wobble" (widest).[3] He found that around the year 1905, the term "resonance" started being used, defining a newly "permissible level of wavering" and clearly distinguishing between a vibrato that achieves sonance and one that does not (the "wobble"). In 1906, a writer for *Daily Mail* called the problematic "tremolo" a "proof of diaphragm instability, or other fault of vocal production," while the "vibrato" was "the true ringing resonance of the well-trained voice" (Bethell 2009, part 3). A distinction should be made not only between pitch vibrato and intensity vibrato but also between the various levels of pitch vibrato, from a vibrato that realizes sonance to one that fails to achieve it.

These different combinations of vibrato attributes form a fascinating matrix of possibilities for the modern singer of Baroque music. The true artist should be open to exploring

[3] "Tremolo" in this connotation should not to be confused with the Italian term *tremolo*, which did not always carry a bad connotation.

numerous combinations of pitch vibrato, intensity vibrato, continuous vibrato, and ornamental vibrato, to find a balance of what best suits the music, the text, and the historically informed practice.

4.1.3 Vibrato Performance Practice in Classical and Romantic Repertoire

Many ideas on vibrato that we consider appropriate for Baroque singing can be applied to the Classical style as well. In 1778, Mozart himself wrote in a letter:

> The human voice trembles naturally—but in its own way—and only to such a degree that the effect is beautiful. Such is the nature of the voice…. But the moment the proper limit is overstepped, it is no longer beautiful—because it is contrary to nature. (Cited in Anderson 1938, 552)

The limit that Mozart refers to is likely the threshold between pitch vibrato that achieves sonance and a wobble. While vibrato during the Classical period may have been present and widely accepted, it is "a much different phenomenon from today's wider, more continuous vibrato" (Elliott 2006, 107), as exemplified in early recordings of *bel canto* singers like Dame Nellie Melba and Adelina Patti, who used great care and restraint in their vibrato choices (Donington 1982). Of Patti, an 1883 reviewer wrote:

> We have been so often disgusted by the abuse of the vibrato that we sometimes forget how effectively it may be used as an occasional ornament. Madame Patti illustrates this by frequent, but never tedious employment, and she has never permitted it so to affect the perfect control of her voice as to deprive her of the power of sustaining sounds with a steadiness and purity such as we too seldom listen to. (Reviewer, *Manchester Guardian*, Mr. Harrison's Concert, Free-Trade-Hall, Manchester 1883, as cited in Bethell 2009, part 3)

Bethell is convinced that continuous vocal vibrato, as we know it today, was a rarity all the way up to the early Romantic period. He makes the unpopular conclusion that music by Schubert, Beethoven, Rossini, Bellini, Mendelssohn, and even Donizetti should be sung without vibrato. He berates the modern performance practice of Rossini's *bel canto* operas, one that is full of

continuous pitch vibrato, sometimes taking up a major third from top to bottom, a practice that Rossini himself condemned.

4.1.4 Opera Singers in the Context of Ensemble Singing

While the rich tone that occurs when members of a larger chorus execute individual vibrato may be appropriate for nineteenth and twentieth repertoire,

> opera singers should change their vocal production when singing a duet or larger ensemble piece; solo parts can admit more vibrato, but it should be minimized in ensembles, to allow the audience to hear the notes themselves. (Gable 1992, 96)

Gable continues, "one would…like to hear the solo quartet passages in Beethoven's Ninth Symphony sung so that the notes could be heard without having to struggle through the vibratos" (97). Like the reduction of vibrato in Classical- and Romantic-era vocal music, this may be an unpopular opinion, but it comes from the intrinsic complexity of ensemble singing.

Verdi's *Requiem* is a prime example of a Romantic masterwork that simultaneously requires full-bodied brilliance and balanced blend from its quartet of soloists, who perform in a variety of duets, trios, and quartets, often *a cappella*. The unaccompanied nature of these passages makes it that much more vital that the soloists achieve impeccable intonation and create a unified ensemble. Reviewers, however, are quick to dismiss ensemble problems among the four soloists as an inevitability of the work:

> The unaccompanied ensembles went further afield, but in this piece they almost always do. (Bernard Holland, *New York Times*, March 13, 2006)

> In the unaccompanied quartet singing, they wandered in the intonation desert on occasion, but that usually is the case in this piece. (Gregory Sullivan Isaacs, *Theater Jones*, February 21, 2014)

> Most people who have heard the Requiem quite a few times have stories about the intonation problems in these ensemble passages. (Robert Hugill, *Opera Today*, July 26, 2011)

There are those reviewers, however, that call out the often world-renown soloists for their intonation, blend, and ensemble issues, some even being denounced for excessive vibrato, quite an achievement in a work seen as the height of Romanticism:

> Some imprecision in the coordination among the soloists, the Tanglewood Festival chorus and orchestra in the "Agnus Dei" made that oasis of peace less persuasive. (Zachary Woolfe, *New York Times*, July 28, 2013)

> But the intensity of the Requiem's drama is almost beside the point, since the tremulous singing of soprano Daniela Nedialkova and mezzo-soprano Ivanka Ninova make pitch a central issue; even though tenor Roumen Doikov and bass Emil Ponorski are much steadier, the quartet is unpleasant in its unfocused quality. (Blair Sanderson, *AllMusic.com*)

> Borodina seems to have difficulty in control, her excessive vibrato and ugly vowel sounds (for instance the harsh "a" in sanctus) make for a sadly disappointing performance. (Alex Barton, *MusicTeachers.co.uk*)

> Mezzo-soprano Cynthia Hanna displayed an impressive range and affecting chest voice, though her vibrato sometimes obscured her intonation. (Adam Parker, *The Post and Courier*, April 13, 2013)

There are singers, however, who are able to modify their vocal technique between the vibrant sound required of Verdi's solo writing with the more temperate and collaborative sound needed for the ensembles:

> As a quartet, they blended, but in an operatic manner. This didn't sound like a quartet used to singing oratorio. Here the blend was achieved by dynamics, but each voice kept their "character" when singing together. (Gregory Sullivan Isaacs, *Theater Jones*, February 21, 2014)

> The celebrated mezzo-soprano Dolora Zajick has a firm yet luscious voice and easily took control of her important part. Her ability to blend in the quartet and project her important vocal contribution showed the mark of a seasoned veteran in this work. (Alan Becker, *South Florida Classical Review*, January 17, 2011)

> In all, the quartet of soloists was notable for their tonal beauty, fine blend, and ability to fully grasp the intense drama of Verdi's writing. (Alan Becker, *South Florida Classical Review*, January 17, 2011)

> The soloists are more than just 4 individuals, Verdi asks them to sing in ensemble rather a lot and to do so unaccompanied. Poplavskaya, Pentcheva, Calleja and Furlanetto patently listened to each other and though their voices were very different, created a real ensemble. Most people who have heard the Requiem quite a few times have stories about the intonation problems in these ensemble passages. But not here. And in the Agnus Dei Poplavskaya and Pentcheva sang in octaves in a way which, whilst not quite of one voice, came pretty close. (Robert Hugill, *Opera Today*, July 26, 2011)

The true, well-rounded artists of the classical singing world *are* able to achieve the precarious balance of soloistic and ensemble singing, which truly makes a convincing performance of this piece a *tour de force*.

4.1.5 Straight Tone in Art Song

In 1976, John W. Large performed a study analyzing Dietrich Fischer-Dieskau's recording of Schumann's *Liederkreis*, Op. 24, and determined that the baritone used straight tone approximately 40% of the time. He even found that the fourth song, "Lieb' Liebchen, leg's Händchen," is 70% straight tone, this range resulting from the varied character of each song. Fischer-Dieskau was considered to be one of the best singers of German Lieder in the second half of the twentieth century, and Classic CD (United Kingdom) ranked him as the second greatest singer of the century.[4] "It can be stated in principle that one almost always can find involuntary and uncontrolled straight tones used by most singers. Technical ability or carelessness naturally are not the criteria," the singer wrote to Large in 1970. Instead, textual interpretation, along with style, should be the governing factors. Of "textual exegesis," he warns, "only such singers who possess an absolute, reliable sense for the right placement, and still more certainty in the fine art of transition to the vibrato, should use straight tones" (Large 1976, 45).

[4] "Top Singers of the Century" Critics' Poll (June 1999).

Straight tone as an expressive technique can be used in any type of art song from any country. Sharon Mabry points out that,

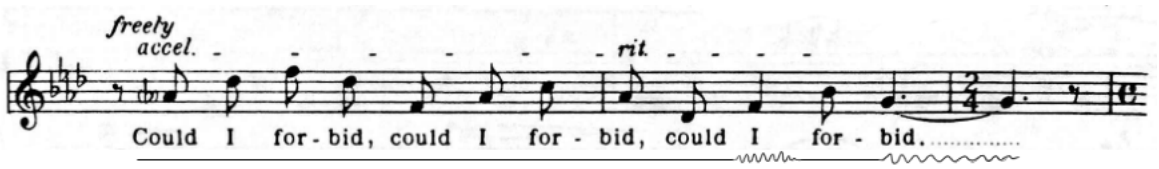
> If one listens carefully to well-respected interpreters of songs by composers such as Poulenc, Strauss, Schubert, Duparc, and Debussy, to name a few, straight tones are a common occurrence. In this case, straight tone is used for expressive purposes, to bring out subtle emotional contrasts by means of a vocal color change. The vibratoless tone is quite useful for delineating specific or subtle characteristics of individual words in a text. (43)

Fischer-Dieskau states that this type of expressive use is best suited for songs written in a declamatory style. An excellent example of this is Libby Larsen's song cycle, *My Ántonia*, based on the novel by Willa Cather. The third song, "Landscape II: Winter," is the perfect vehicle for straight tone as an expressive device as the song is marked by stark contrasts in mood and character. The song begins with a hauntingly dissonant wave of tremolo in the piano after which the singer exclaims, "Winter comes down savagely on little towns on the prairie." Larsen marks each syllable of the first four words of this death foreshadowing with a tenuto mark. I have performed this song over ten times and coached the entire song cycle with Larsen in 2012. My interpretation of these tenuto markings is a harsh, vibratoless sound that evokes the sorrow that is to come later in the narrative. The next vocal phrase, "Winter lies too long in country towns," is marked as "starkly." This, too, is an excellent opportunity to use straight tone, probably the most "stark" of vocal effects. The next two pages are upbeat and pleasant, in contrast to the foreshadowing beginning. But the second half of m. 31 brings back the opening theme, "Winter comes down savagely," this time followed by the text, "like the light of truth itself!" which Larsen has marked "half-voiced." My interpretation of this instruction is to produce a very airy, weak sound. This kind of low subglottal pressure produces both a breathy tone and little to no vibrato, so this instruction by the composer often results in a straighter tone. After the narrative discloses the tragic death of the title character's father, the opening phrase

returns, “Winter comes down savagely,” this time followed by “with a bitter song,” marked “bitterly.” This instruction evokes a fast vibrato in my voice but I like to follow it with a straightening of the final word, “song,” as an ironic juxtaposition to the meaning of the word.

It can be an eye-opening exercise to compare the use of straight tone in multiple performances of the same song. Aaron Copland’s “Why do they shut me out of Heaven?” (1949–50) is an ideal vehicle for this type of evaluation. Martha Lipton’s early 1950’s recording with Copland at the piano is a clear expression of the aesthetic ideals of the time, for she uses continuous vibrato on almost every note. Barbara Bonney’s 1998 recording, on the other hand, displays the opposite aesthetic. Her default tone production in this song is straight and she uses varying degrees of vibrato to highlight word stress and accentuate musical phrases.

Example 4.1: Straight tone and vibrato in Barbara Bonney’s recording of Copland’s “Why do they shut me out of Heaven?” (1998), mm. 24–26



In Example 4.1, straight tone and vibrato use is indicated by the line directly underneath the text. Bonney sings the penultimate phrase, “Could I forbid, could I forbid, could I forbid,” almost entirely with straight tone, except for the last “I” and the final, strong syllable of “forbid.” Both these syllables are set to longer note values, which almost certainly contributes to the added vibrato. But more importantly, stressing “I” with vibrato emphasizes the speaker’s inward contemplation, putting herself in God’s position.

Vibrato and straight tone are expressive devices and art song is one of the clearest examples of the power these vocal styles have to paint text with meaning. But neither is interesting nor powerful if it is used continuously with no reprieve.

4.1.6 Straight Tone in Twentieth and Twenty-First Century Music

"Beautiful vocal tones," Mabry writes of modern music in *Exploring Twentieth-Century Vocal Music* (2002), "are still desirable, but they are not the only goal in performance. Sincerity of sentiment and the ability to shift that sentiment when called for is more important than in the past" (45). Contemporary composers, who, as a whole, are notorious for adding an abundance of instruction to their scores, often request a variety of colors from their performers, including straight tone, sometimes marked as "hollow tone," "white tone," or "stark" (Mabry, 45).

Some assume that modern music should be performed exclusively with straight tone, but that is not the case. Straight tone is but one of many colors employed by singers of contemporary music. There are a couple reasons, however, that straight tone singing may be more applicable to and appears more often in modern music than music from earlier eras: (1) intonation, and (2) extended techniques.

The need for precise intonation can be divided into two categories: microtonal music and atonal music. Charles Ives, a pioneer of his time, was one of the first composers to plant the seed of vocal extended techniques in his music. His style, based on his childhood memories of hymn tunes and traditional songs, gave birth to the idea of microtones in Western music, mimicking the oh-so-slightly out-of-tune singing and playing of amateur musicians. Several systems have been developed to notate microtonal music, but the most common notation is the use of arrows above the noteheads. Because microtonality speaks in fractions of tones, it is crucial to perform this

technique with as little vibrato as possible. Since even the narrowest vibrato can cover a semitone from top to bottom, microtonal music must be delivered with as much precision as possible. Atonal music, including serialism and the like, can be performed with vibrato but can be rehearsed with a straight tone to ensure the proper intonation of unusual pitches that do not fit in with the standard tonality that singers are most used to.

Mastering the art of straight tone is crucial to learning the art of *Sprechstimme*, or contoured speech-song used most notably by the Second Viennese School's Arnold Schoenberg. According to Mabry, eliminating vibrato is crucial to *Sprechstimme* sounding like speech, especially in a piece with both sung tones and *Sprechstimme* tones. This flexibility in tone allows for the greatest contrast between the two styles of vocal production. Other extended techniques, including whispered tones, shouts, and glissando, also use straight tone as part of the effect.

4.1.7 Straight Tone in Contemporary Commercial Music

Contemporary commercial music (or CCM) is a relatively new term that encompasses all "non-classical" music. Included among its many genres are musical theatre, pop, jazz, rock, blues, and folk music. Vibrato is one of the leading differentiators between classical and non-classical singing and is often the main obstacle for singers trying to switch musical worlds, from classical to CCM and vice versa. Each area of CCM has its own stylistic conventions but, generally, a continuous vocal vibrato is not acceptable, as it is in operatic singing. Later in this chapter, I delve further into some CCM vocal styles and techniques.

4.1.8 Vibrato as an Ornament

Many Baroque experts have concluded that vibrato was most likely used as an ornament rather than as an absolute. Seventeenth-century texts are filled with terms that describe vibrato-related vocal ornaments. In Italy, there is reference to the *trillo* and *tremolo*; in France, the *balancement*, *flaté*, and *tremblement*; in England, it was called a *shake* or *sweet'ning*; and in Germany, the *Bebung* and *Zittern das Stimme*. The use of these terms, however, is inconsistent and has led to trouble in interpretation among modern singers and musicologists. Some used terms like *tremolo* to refer to vibrato that was unable to achieve sonance and was, therefore, unpleasant (Neumann 1991, 16). Understanding the trill can be helpful in understanding the difference between good and bad vibrato:

> When the interval of the trill is smaller than a half step, or when the two tones of which it consists are beaten with unequal speed or strength, or quiveringly, the trill sounds like the bleating of a goat. The precise place for production of a good trill is at the opening of the head of the windpipe (larynx). The movement can be felt from the outside when the fingers are placed there. If no movement or beating is felt, this is a sure indication that one is bleating out the trill only by means of the vibration of air on the palate. (Baird 1997, 36)

One of the ways the human voice produced vibrato is through the up and down movement of the larynx. This is similar to the trill, but less exaggerated.

Gable deciphers three ornaments illustrated in a late seventeenth century English text by Roger North called *Notes of Me*: 1) the "plaine note," which "begins thinly and softly, thickens, and becomes louder in the middle, perhaps including a slight 'natural' vibrato, and then terminates as it began," 2) the "waived note," which is like the "plaine note" except it continues to vibrate past the middle, and 3) the "trillo note," which is a normal trill with clear upper and lower pitches (1992, 92). Another Baroque ornament consists of the addition of vibrato to the end of a long-held note, usually at an important cadential moment in a piece, like the ending.

This is an identical convention to what is presently used in contemporary musical theatre. Gable asserts:

> Many early music singers would do well to adopt this rather commonly-heard vocal technique for final notes, provided they are singing with a relatively vibrato-free tone to begin with. The strongly-attacked, full-volume, full-vibrato, held-out-to-the-bitter-end singing (or playing) of the last note of a phrase or of a complete piece is out of place in the baroque, except as a special effect. Yet we still hear it much of the time. (1992, 95)

Like vibrato, straight tone was also used as an expressive device, oftentimes, for example, to bring out a dissonance. Regardless of what terms were used, vibrato was used meticulously in the Baroque period to convey an array of emotions. In the Baroque era, the addition or exclusion of vibrato was scrupulous, unlike the overarching vibrato of today's *bel canto* singers. Even in the Romantic era, teachers and composers such as Manuel García and Gaetano Donizetti sometimes indicated vibrato through the notation of a wavy line or simply by writing the word "vibrato" in the score (Elliott 1992, 138). This attention to detail supports the idea that vibrato was, neither in the eighteenth century nor in the nineteenth century, the overarching presupposition that it is today.

The use of vibrato as an ornament is not exclusive to Baroque music. Ornamental vibrato can be found everywhere from Gregorian chant to 21st century pop music. In Gregorian chant, for example, the *quilisma* is "an ascending three-note neum recognized by the jagged note in the middle. . . The note before the jagged note is ictic and is sung expressively."[5] Since Gregorian chant is generally sung without vibrato, the expressiveness of the jagged note is enhanced with vibrato. Ornamental vibrato is also used in pop music. Superstar Beyoncé has incorporated vibrato into her signature style, merging the more classically sung style of 1950's R&B with modern day pop. She allows her voice to vibrate at the ends of phrases, sometimes even

[5] "Gregorian Chant Notation," http://media.musicasacra.com/pdf/neumes.pdf, accessed October 1, 2015.

purposefully widening the extent of her vibrato for ornamental effect. In her 2006 hit "Irreplaceable," she starts the song by singing the phrase "to the left, to the left," after which she hums dramatically. In the middle of the hum she purposefully adds vibrato and then increases its extent to add to its expressivity. These types of precise stylistic considerations are vital to achieving authenticity in style.

4.2 Applications of Straight Tone

Straight tone can be applied to singing in two ways. First, it can help find the balanced, core sound that is necessary for healthy technique in singing. Once the core sound has been found, it can then be unbalanced in various ways to achieve the stylistic qualities required for any genre of singing, from opera to musical theatre to rock. In the following section of this chapter, I examine how straight tone can contribute to a healthy core sound and how it can be used to fix vocal faults.

4.2.1 Resonance Finding Strategies

By stripping away stylistic conventions like vibrato, a singer can focus on two of the most important aspects of classical singing technique: resonance and vowel tracking. The problem with working on these aspects of vocal technique with a large vibrato is that it can mask deficits in these areas. Once the vibrato is gone, it is easier to both hear and feel a truly resonant voice, as opposed to one that is making up for a lack of resonance with vibrato.

One of the first concepts I teach my students is the ways in which the three articulators of the mouth (the tongue, the lips, and the jaw) are used to create different vowels. In Table 4.1, I

have devised an illustration for the basic position of the articulators for eight basic vowel sounds, from brightest to darkest.

Table 4.1: Position of the Articulators for Eight Basic Vowels

	Lips	Tongue	Jaw
[i]	neutral	high	neutral
[e]	neutral	⇩	neutral
[ɛ]	neutral	⇩	⇩
[a]	neutral	neutral	open
[ɑ]	⇩	neutral	open
[ɔ]	⇩	neutral	⇩
[o]	⇩	neutral	⇩
[u]	rounded	neutral	neutral

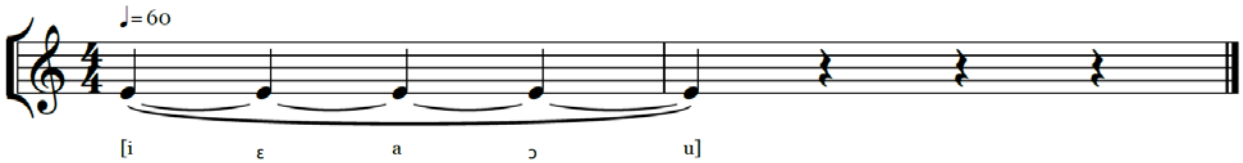
There is no vowel on this chart where every articulator is neutral. Neutral position requires using no muscular effort at all. A good analogy is to think of neutral as the way your mouth feels at the dentist when you have had a local anesthetic. The feeling is of utter numbness.

I find it most helpful to students if I let them discover this chart on their own. Focusing on five of the eight vowel sounds ([i] [ɛ] [a] [ɔ] [u]), I have them begin on [i] and ask them to describe the state of each articulator. It is useful to start on [i] because many beginners mistakenly widen their lips to create the vowel and are surprised to figure out that the lips are completely unnecessary and, in fact, cause unneeded muscular tension. I then have the student sing the next vowel in the progression, [ɛ], and ask them to describe which of the articulators needs to change and how. This series of events continues until the student arrives at [u]. The goal is to use as little muscular effort to create each vowel as possible and to discover and eliminate excess mechanisms that are used in the creation of vowels.

One of my favorite exercises that deals with these issues was introduced to me by Professor Jennifer Trost during my undergraduate studies at Penn State University. She may not have intended for the exercise to be done with straight tone, but over the years, it has morphed into one of the most fundamental aligning exercises that I use for myself and for my students.

This exercise (Example 4.2) consists of five basic vowels, [i], [ɛ], [a], [ɔ], and [u]. It should be noted that two of these vowels, [ɛ] and [ɔ], are different from their counterpart Italianate vowels, [e] and [o], which are the closed versions. I prefer the open versions in this exercise because, along with the lack of vibrato, they expose the voice in ways that pushes the singer to create resonance without the aid of a crutch.

Example 4.2: Resonance and Vowel Tracking Exercise



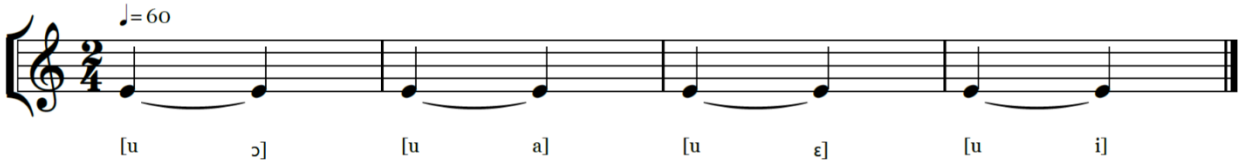
The five vowels should be sung in one breath at a moderate volume. The goal is for each vowel's resonance to line up with the one before and after it; in other words, no significant change in sensation should be felt when going from one vowel to the next. Each body is different, so where exactly the sensation is felt cannot be determined. It is a joint effort of the voice teacher's ear and the voice student's body awareness to come up with a unique perspective for each student.

The order of the vowels is from brightest to darkest, but can be reversed depending on a student's needs. For example, if a singer has a naturally bright voice, it may be more helpful to

start on the dark [u] to encourage the dark color in the following vowels. If a student has a naturally dark voice, it may be best to start on the bright end of the spectrum.

If a student is having trouble with one vowel, or if a particular vowel has especially good resonance, the exercise can be broken down further. For example, if a student has a resonant [u] vowel, then that vowel can be used to encourage proper alignment in another vowel. Example 4.3 shows one such modification of the original exercise.

Example 4.3: Extracting the Benefits of a Particular Vowel



This modification can be done all in one breath or with breaths between each pair of vowels. The variations on this exercise are endless and can be sculpted to suit any student's needs.

This exercise can be broken down even further still. I have found that many singers have a favorite vowel—a vowel that naturally achieves resonance. This vowel is different for everyone. No one vowel is more likely to hold this position than another because everyone's instrument is built differently. At various points in my career I have found different vowels to hold this coveted title. When I was an undergraduate, [i] was my vowel of choice because I found it easy to deliver a focused sound. Now [u] is the vowel I look to most often because it helps to round out the sound I developed earlier in my career.

Regardless of which vowel one chooses, the favorite vowel can be used to influence other, less-resonant vowels by isolating each articulator change from one vowel to another. For example, if a student was having difficulty achieving resonance on the [a] vowel but had

mastered the [u] vowel, I would first ask the student to describe each articulator change. He or she might say, "Well, the jaw opens, the tongue remains neutral, and the lips return to neutral position." Then have the student sing a long, sustained pitch on [u], changing each articulator one at a time to achieve the [a] vowel. The jaw would slowly drop, then the lips would slowly release.

4.2.2 Soft Singing

Before I start discussing the stylistic uses of straight tone, I would like to point out two aspects of singing that are present in any style: soft singing and intonation. The straight tone techniques I have outlined up to this point can strengthen both of these characteristics in singers of any style. *Piano* singing in the upper register of the voice is an advanced technique, as it requires a well-placed sound and relaxed throat and neck musculature. Using straight tone to find optimal resonance can help achieve healthy, soft singing.

Like straight tone, soft singing is often achieved through tightening the musculature and stopping the flow of air. While soft singing and straight tone are closely linked, it would be a mistake to say that one cannot be done without the other. As discussed in Chapter Three, straight tone is most easily achieved by slowing the flow of air. This results in a quieter sound. Since airflow speed is so closely linked with both volume and vibrato, quiet singing has less vibrato than loud singing.

4.2.3 Intonation

Michael Morrow, director of the London-based early music ensemble Musica Reservata, believes vocal vibrato interferes with intonation (Bethell 2009, part 1). Bethell cites Franchinus

Gaffurius's Renaissance treatise *Practica Musicae* (1496), which states that singers "should avoid tones having a wide and ringing vibrato, since these tones do not maintain a true pitch" (2009, part 2). He states that, "absolute clarity in contrapuntal music is mandatory," and that "vocal vibrato is incompatible…with tonal clarity" (2009, part 2). Not only can excessive pitch vibrato disturb complex counterpoint, but vibrato of more than a quartertone may also muddle ornaments and melismas, making them recede into the musical texture instead of standing out. Baroque composer Giuseppe Tartini disallowed the use of vibrato when singing a half-step because the careful tuning required for such a small interval would be destroyed (Tartini 1782, 35, cited in Sanford 1979, 72).

Straight tone lends itself well to the precision and dexterity of intonation. Alexander Blachly sums it up thus:

> Professional singers in the Renaissance sang quite differently from modern professional singers; or, to put it the other way around, standard vocal training today often leaves the aspiring professional singer unsuited for Renaissance music. The majority of voice teachers still tend to encourage modern operatic technique as a universal goal for their students, and the high-pressure, high-vibrato style such students use is antithetical to the delineation of counterpoint…and to precise tuning independent of instruments. (1994, 13)

It is not quite fair to say that singing with vibrato is automatically out of tune simply because of the fluctuation in pitch, but singing with straight tone can certainly help to center the pitch, especially in the chromaticism of Romantic music or the atonality of some twentieth-century repertoire. By incorporating straight tone into a singer's daily routine, he or she will become more attuned to problems regarding intonation.

4.3 The Versatile Singer

A versatile singer is one who can sing in a variety of vocal styles.[6] The opera singer who cannot let go of her vibrato to sing musical theatre and the teenager who sings art songs while scooping in chest voice are all-too-well-known tropes of the singing world. One may argue against the need for versatility by asserting that if a singer knows she wants to be an opera star, she should focus on the *bel canto* style of singing. But versatility need not span genres; the colors and facets of the voice that training in versatile singing brings about can be applied within a single genre, exponentially expanding the expressiveness of the voice. But the most important aspect of versatile singing is that the core of the voice remains the same, whether singing Mozart, Jason Robert Brown, or Alanis Morissette.

One of the most versatile classical singers I have heard is mezzo-soprano Stephanie Blythe. She has an enormous voice, big enough to fill the largest of theaters, yet she is able to access its narrow core in a way that portrays utter straightforwardness. A lover of art song, she manages to steer through both operatic roles and song literature without getting lost in the wobbling that plagues so much of today's classical singing. Eric Simpson hit the nail on the head when he wrote of Blythe's Mozart *Requiem* performance with the New York Philharmonic (*New York Classical Review*, November 9, 2013):

> Most notable of the four [soloists] was the mezzo-soprano Stephanie Blythe. A standout as Fricka in last year's Ring cycles at the Met, the power of her voice is second to none, but nowhere did she overwhelm the music on Friday, instead singing with arresting simplicity.[7]

[6] In this dissertation, a versatile singer is defined as one who has mastered the core, straight tone sound, uses it as a base for his or her singing, and layers stylistic colors and effects over this sound to fit any genre of singing.
[7] http://newyorkclassicalreview.com/2013/11/labadie-leads-a-soloist-driven-mozart-requiem-with-the-philharmonic.

I have heard arguments that larger voices cannot sing straight tone, but Blythe is a perfect example to the contrary, proving that even the most powerful voice can and should be able to produce a lean sound that does not hide behind noisy vibrato.

Dawn Upshaw is another example of a versatile singer. She began her career perfecting soubrette roles, such as Susanna in Mozart's *Le nozze di Figaro* and Adina in Donizetti's *L'elisir d'amore* but has also recorded musical theatre and contemporary works, such as Golijov's chamber song cycle *Ayre*. Of this recording, Alex Ross of *The New Yorker* (September 26, 2005) described Upshaw's vocal flexibility:

> She assumes a half-dozen vocal guises…[S]he makes a hairpin turn from a fragile, softly glowing Sephardic song…to a bloodcurdling Sardinian number…—I had to double-check the credits to make sure that Upshaw was still the singer.[8]

In an interview with Jason Victor Serinus (November 2005), Upshaw described discovering her own voice's capabilities while working on *Ayre*:

> I thought, what a fantastic kind of adventure for myself. I played around and I realized that we're all so more capable [*sic*] of doing many more things than we ever ask of ourselves. I'm always searching for new ways or deeper expression through singing.[9]

Upshaw's ability to turn on a dime and alter the quality of her voice is admirable and a skill to which all singers should aspire.

4.3.1 Unbalancing the Balanced Voice

William Vennard, one of the twentieth century's greatest vocal pedagogues, states, in his discussion of Renaissance music, that "a cultivated singer could alternate straight tones and tones with vibrato at [*sic*] well," admitting this ability as "a useful skill today, in fact" (1967, 207). I

[8] http://www.newyorker.com/magazine/2005/09/26/sounds-from-the-studio, accessed May 16, 2016.
[9] http://hometheaterhifi.com/volume_12_4/feature-article-interview-dawn-upshaw-11-2005.html, accessed May 16, 2016.

assert that this is not only a useful skill, but absolutely necessary in the pursuit of versatility. By finding the balanced core of the voice—a resonant, straight tone—singers can then unbalance it in ways that suit particular styles of music.

In the following section I dissect the ways in which the core sound can be molded to specific stylistic considerations by analyzing one of 2015's most commercially successful pop recordings: "Hello" by Adele. The purpose of this analysis is not strictly to define the vocal characteristics of the pop genre, but rather to get a glimpse of what vocal sounds and techniques are being used by successful recording artists. After the analysis, I will offer suggestions on how the core, straight tone sound discussed in Chapter 3 can be shaped and modified into these varying colors.

4.3.2 Adele's "Hello"

The chart-topping 2015 song "Hello" is an excellent example of the various stylistic modifications that can occur in a pop song. Adele, an English singer who rose to fame with her 2008 album *19*, has a soul and R&B-influenced pop sound that is one of the most instantly recognizable on the radio today. Her voice can be described as gravelly, deep, and powerful. It is not a perfect voice, but her innate imperfections likely contribute to her unique and identifiable sound. I posit that if Adele were to identify her core straight tone sound, as I have described it throughout this dissertation, it would have some huskiness to it because that is simply a part of her instrument's sound (likely caused by benign anomalies in her actual vocal mechanism).

Adele begins the song with straight tone on the word "hello." She colors it, however, with a highly aspirate [h] at the beginning of the word that seems to belong to a note lower than her starting pitch. The onset of the actual pitch is clean but severe; it does not blossom out of

nothing as a standard silent onset would. These modifications add a soulful character to the text that would be missing if ideal "classical" technique were used. During the bridge, from 3:26-3:50, she riffs on an [u] vowel in the upper register of her voice, up to an A♭5. This hooty sound is similar to the "Free-Flowing Air" exercise suggested by W. Stephen Smith in *The Naked Voice* (2007) and is at the heart of the core sound.[10]

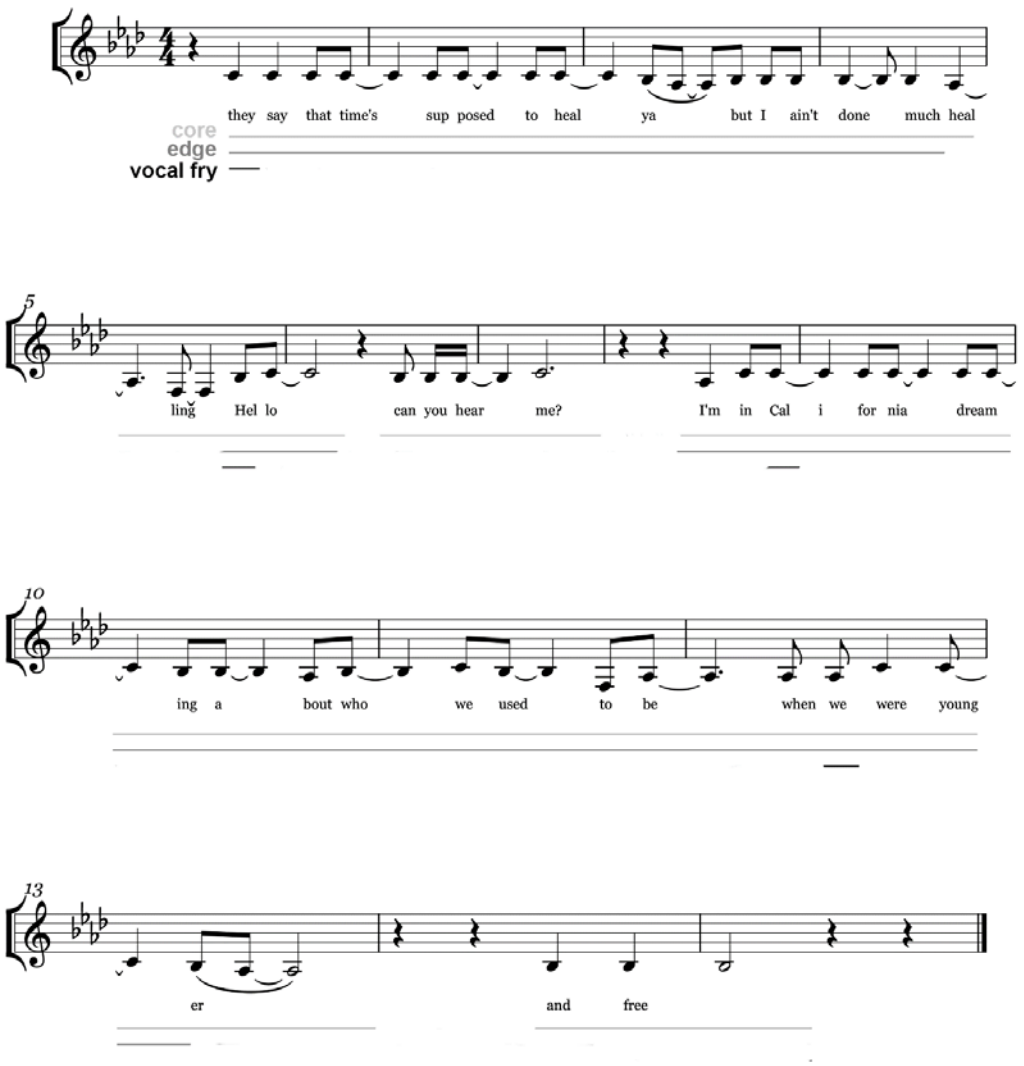
Adele uses her core sound throughout the two verses of this song (starting at 0:06 and 2:00 respectively). However, she rarely uses a truly pure sound, keeping that clarity for key words and phrases, such as "hello" (0:06), "healing" (0:28), "can you hear me?" (0:30), and "free" (0:45). She typically adds an edge to her core sound, including vocal fry[11] throughout the texture to add emotional depth. The resulting sound can be thought of as layers of earth: the core, straight tone sound is free-flowing and clear; the next layer has a bite to it; and the top-most layer uses ornamental noise, such as vocal fry. Example 4.4 shows a phrase from the first verse (0:23–0:47), dissected into three layers (light grey = core, medium grey = edge, black = vocal fry).

Glottal onsets are another ornamental vocal strategy. Glottals are common in English- and German-language classical singing and are often used to emphasize specific words that begin on vowels. As in classical singing, glottal use in pop music is perfectly acceptable as long as it is a conscious choice and not the default. Surprisingly, Adele does not use glottals in this recording. Rather, she replaces them with vocal fry, which can be thought of as a scooped glottal onset. Since the air is still moving in a vocal fry, as opposed to being stopped during a glottal onset, this technique softens her sound and makes it moody instead of harsh.

[10] See Chapter 3 for a description of Smith's exercise.
[11] Vocal fry is defined and discussed in section 4.4.2 on p. 100.

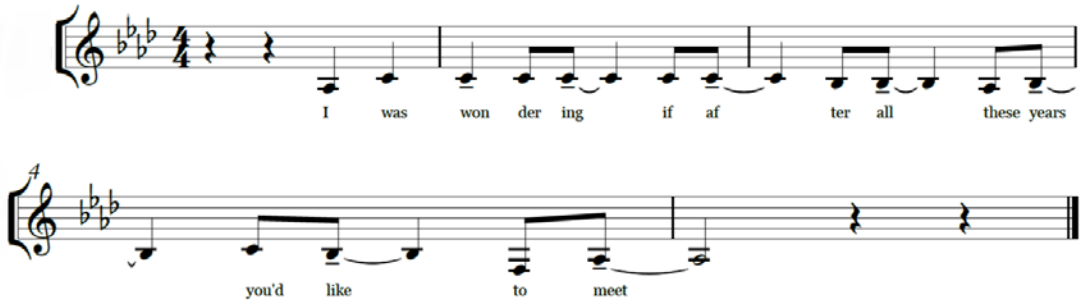
Another way in which Adele transforms her core sound is by darkening specific words in her lower register. This can be heard in the second verse on the words “typical” (2:08), “I’m sorry,” (2:11), “happened” (2:23) and in the pre-chorus on “us” (2:30). Often these words dip down melodically, but she allows herself to sing these notes in head voice instead of mixing them.

Example 4.4: Layer Dissection of Adele’s “Hello” (0:23–0:47)



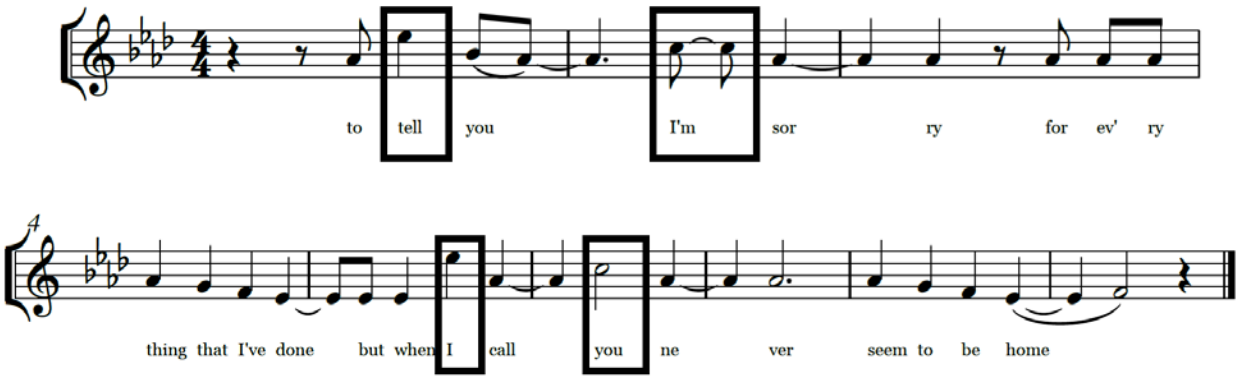
One of the biggest reasons that classical singers fail at singing pop music is the evenness with which they treat each note. This does not come as a surprise since one of the foundations of the *bel canto* style is legato singing. In pop music, however, adding and peaks and valleys within phrases can be much more stylistically convincing. In this song, for example, Adele ends most phrases by decaying into breathy phonation. She adds regular, rhythmic stress to phrases like "I was wondering if after all these years you'd like to meet" (0:10–0:17), shown in Example 15.

Example 4.5: Rhythmic Stress in Adele's "Hello" (0:10–0:17)



Another skill instilled early on in classical voice training is how to eliminate breaks in the voice (i.e., managing the *passaggio* from chest register to head register). While this can be a useful tool for pop singing, it is just as important to be able to switch quickly and noticeably between registers. An excellent example of this comes during the chorus at 1:17–1:30 (see Example 4.6).

Example 4.6: Quick Register Switches in Adele's "Hello" (1:17–1:30)



The words marked with rectangles are sung in breathy head voice while Adele sings the remainder of the phrase in a mix. She switches registers eight times in just six measures—more than once per measure! Imagine if Adele did not include these register shifts. The result would be a very different song indeed. It may fit the more classical terms of "proper singing," but it would not have the depth of emotion that has made this recording so popular and successful.

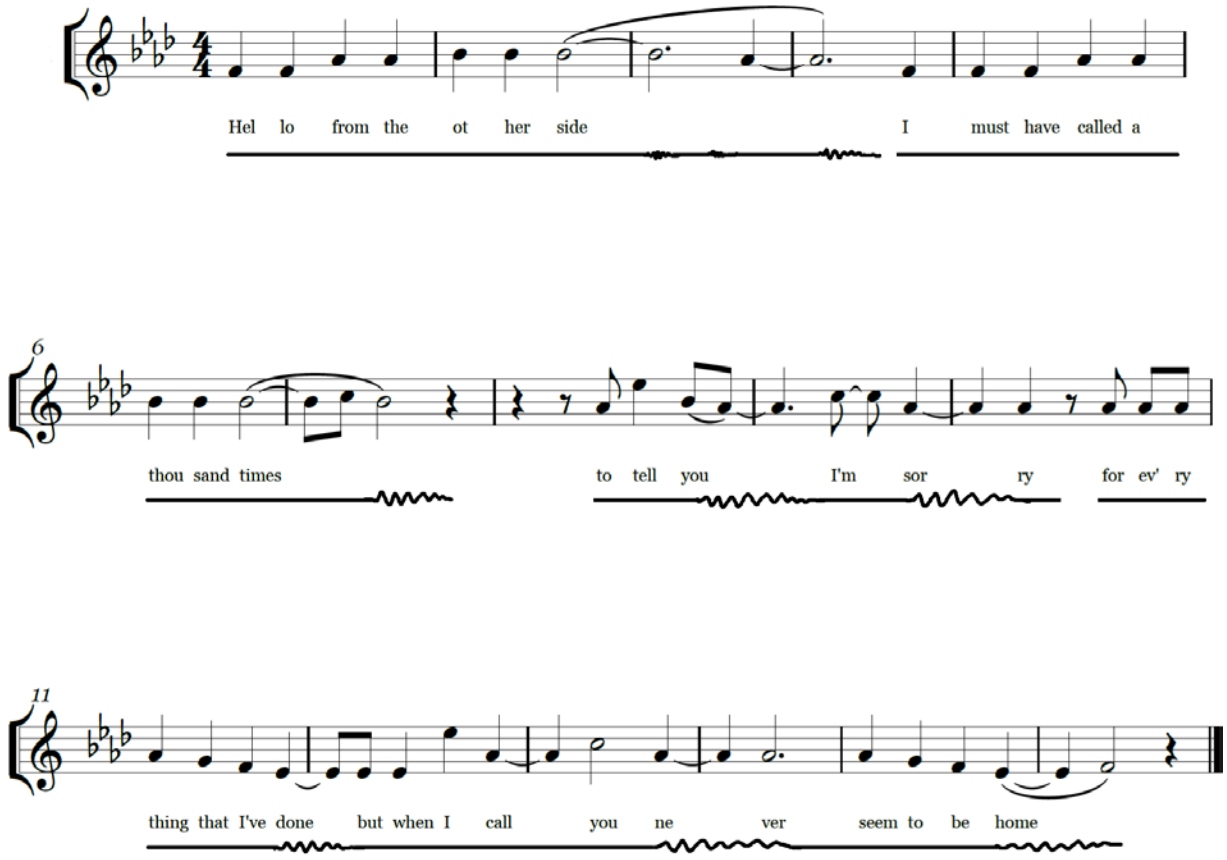
At the pre-chorus Adele starts hinting at a new register, the "high belt," or speech mix taken into her upper range.[12] She gradually transitions on the words "difference" (0:55) and "between us" (0:58). These transitory words are incredibly resonant. They are clear, focused, and buoyant; in fact, not far at all from the core sound. In the chorus Adele launches into a power ballad: "Hello from the other side / I must have called a thousand times" (1:06–1:17) before she incorporates quick register shifts in the next few phrases.

While some may assume that a pop singer like Adele avoids vibrato, this could not be further from the truth. Her R&B influences are especially noticeable in the ways that she uses vibrato to color her tone. During the high belt chorus sections, she releases vibrato into her

[12] The high belt is defined and discussed in section 4.4.5 on p. 101.

sound at the ends of each phrase, being careful to keep the preceding statements extremely straight (see Example 4.7, where vibrato is notated by the wavy line below the lyrics). Strict attention to these types of details heightens the powerful effect of this chorus statement.

Example 4.7: Vibrato in Adele's "Hello" (1:06–1:30)



Not all of these vibratos are created equally. The shimmers of vibrato on beats one and three of m. 3 sound like natural fluctuations of the voice coming through a slight increase in air pressure. The remaining, larger vibratos sound more purposeful and are likely produced consciously with the larynx.

4.4 Stylistic Modifications to Core Sound

The ways in which Adele alters her core sound in "Hello" can be summarized by the following: edge, vocal fry, darkening, register shifts, high belt, and vibrato. While some singers (including many successful recording artists) achieve these effects intuitively, I believe that approaching them by means of the core, straight tone sound is most healthy. It also allows these effects to be part of a full arsenal of colors that the versatile singer possesses instead of the default.

Before I break down the various effects, I review the main physiological characteristics of straight tone so that it is clear what modifications have to be made for each effect. Straight tone is made up of flow phonation, flexible registration[13], and an open resonance chamber (i.e., lifted soft palate and open throat). When working in a style of singing that demands the voice to become unbalanced, it is important to be mindful of the straight tone sound and always find ways to return to it. This balances the vocal mechanism (air flow and subglottic pressure) and can relieve the fatigue that results from singing in an unbalanced fashion for too long a time. In her article, "A System for Describing Vocal Timbre in Popular Song," Kate Heidemann breaks down the ways in which singers can alter their timbre into three ways: "varying the delivery of air from the lungs, changing the stiffness and position of the vocal folds, or adjusting the shape and position of the vocal tract" (2016, 3.2).[14] Heidemann's article is an excellent resource to further delve into the physiological ways that popular singing is produced and how expressiveness is conveyed through vocal timbre.

[13] The vocal registers can be strictly defined as chest, head, and mix. In chest voice, the vocal cords are short, thick, and vibrate along their full length. In head voice, the vocal cords are long, thin, and sometimes vibrate along only a portion of their length. Mixed voice occurs along the spectrum from chest voice to head voice. Flexible registration refers to finding the appropriately balanced registration for a given pitch.

[14] Since Heidemann's online article does not contain page numbers, I will cite sections (i.e., 3.2) rather than page number.

4.4.1 Edge

Edge is added to the core sound by closing the resonance chamber slightly. In her book, *Complete Vocal Technique* (2012), Danish contemporary commercial music (CCM) pedagogue Cathrin Sadolin breaks the voice down into four modes, the second of which she calls "Curbing." The techniques she suggests to find curbing may also be used to achieve an edge:

> In the beginning it is usually easier to find Curbing by twanging the epiglottis funnel slightly, raising the larynx a little, keeping the palate lowered, and the tongue slightly broaded[15] by placing it on the molars in the upper part of the mouth. (93)

The "twang" she refers to can be likened to whimpering like a puppy and can be useful in beginning to color the core sound.

A simple exercise to discover adding edge to the core sound is to sing an [u] on a low to mid-range pitch. The [u] vowel is useful for establishing the core sound because the resonance mechanism naturally stays open. While you sing the [u] vowel, experiment, one at a time, with dropping the soft palate, broadening the tongue, and lifting the larynx. You may discover that one or more of these actions causes some noise to enter your tone. While not preferable as a constant state for the voice, this noise can add roughness to the tone, which can be appropriate for pop music.

4.4.2 Vocal Fry

Vocal fry is, in fact, a register all its own, the lowest vocal register, below chest voice. During vocal fry, glottal closure is so loose that air is allowed to bubble through, creating a creaking or popping sound. There has been a recent outcry against vocal fry in the media because it has become engrained in the ways teenagers speak. While it is true that constantly

[15] It is my interpretation that Sadolin's use of the word "broaded" means flattening out the tongue and raising it towards the top of the mouth.

speaking in this way can be harmful to the voice, using it as an effect on certain words is both stylistically appropriate in pop music and adds vulnerability to the sound. As Sadolin writes, vocal fry is "used to give the impression of intimacy and nearness or that the singer is about to break down emotionally and cannot go through with the song" (192).

Vocal fry can be discovered by means of a five-note descending scale on [a]. The singer should continue well past his or her lowest singable pitch to unveil the vocal fry, which does not have a defined pitch. It is important to keep the larynx at speech level when going for vocal fry because a tense mechanism does not allow the vocal cords the freedom to vibrate loosely enough to produce the effect.

4.4.3 Darkening

Darkening is achieved by over-defining the resonant chamber, especially lowering the larynx. This sound is effective when head voice is brought into the lower range of the voice. In core sound, flexible registration keeps the voice in balance; when darkening, bringing head voice below its natural placement can give a dark and mysterious effect to the sound.

A simple exercise to practice darkening is to sing an [a] vowel on a low to mid-range pitch and experiment by, one at a time, lifting the soft palate and lowering the larynx. Darkening can cause a lot of tension in the tongue, so it should be used sparingly and only for effect.

4.4.4 Register Shifts

Registration shifting, also known as yodeling, is achieved by switching registration quickly and suddenly. In order for these shifts to be noticeable, the chest and head registers should be as pure as possible, with little to no mixing. Sadolin recommends practicing a break

slowly first and then speeding up the process to achieve a yodel. It should be noted that Adele does not yodel in "Hello," but she does switch between registers quickly and often. The difference between this and yodeling is merely how connected the two pitches are to each other. In Example 4.6 (see page 96), she prepares each head-voice note with a separated onset.

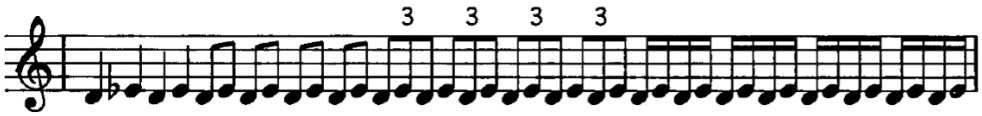
4.4.5 High Belt

High belting, a powerful vocal effect, is more of an illusion than an actual technique. Belting is defined as bringing the chest register up into the higher range of the voice but high belting (in women, from B4 to as high as C6) is more of a color change than a registration change. Dewey Moss, a Broadway performer and voice teacher, suggested that mixed register tones can actually pass for a high belt if they are sung without vibrato and with slightly closing of the resonance chamber (interview with author, March 7, 2015). By lowering the soft palate and keeping the air flow efficient, high notes can sound belted without the physical strain of bringing the chest register past a singer's comfort level.

4.4.6 Vibrato

Straight tone has little to no natural vibrato, so vibrato can be added ornamentally in two ways: by manually raising and lowering the larynx or by adding more airflow and subglottic resistance in tandem. Moving the larynx up and down is similar in technique to trilling. Example 4.8 shows an exercise designed to facilitate the flexibility required for laryngeal vibrato:

Example 4.8: Laryngeal Vibrato Exercise (from Sadolin 2012, 195)



Equally increasing airflow and subglottic pressure results in a rise in volume, so a classic exercise, the *messa di voce,* is the perfect vehicle for practicing this skill. The *messa di voce* is sung on one pitch on one vowel. It begins *pianissimo*, crescendos to *fortissimo,* and diminuendos back down to *pianissimo*. Airflow naturally increases with intended volume, so to keep efficient flow phonation, subglottic pressure must increase as well. The resulting sound has little to no vibrato at the beginning and end, with beautiful, natural vibrato in the middle.

4.5 Conclusion: The Well-Rounded Singer

Vibrato aesthetic differs from genre to genre, from one era to the next, in its extent, speed, and consistency. Singers of Baroque music might sing without vibrato at specific instances, like a dissonance, leading tone, or expressive interval, such as a tritone. In the Baroque era, "the finest singers could alter their technique and their sound in order to adapt to the musical or dramatic context" (Baird, 37). This is the type of adaptable technique that modern singers should be striving for, with the vast amount of cross-genre repertory that exists nowadays. Choosing to control one's vibrato is not only an aesthetic and stylistic choice, but also a pedagogical one. While firmly anti-vibrato, Bethell presents the idea of the well-rounded singer as well:

> Anthony Rooley gave a good example in his presentation, pointing out that any self respecting professional lute player has to master a variety of instruments, ranging from the renaissance lute to the very different Baroque theorbo, with its unstopped diapason strings. He didn't develop the point, but the implication was clear. Professional singers with HIP[16] pretensions need a broader skill set in order to interpret properly music from different periods (part 1).

William Vennard, one of the twentieth century's greatest vocal pedagogues, states, in his discussion on Renaissance music, that "a cultivated singer could alternate straight tones and tones with vibrato at [*sic*] well," admitting this ability as "a useful skill today, in fact" (1967, 207). By becoming keener to the variety of ways that vibrato can be manipulated, today's singers can better adjust their tone qualities to the aesthetics of many different styles while filling out their expressive palette with colors and nuances that can be used for music of many genres and time periods.

[16] "HIP" stands for historically informed practice.

Conclusion

Straight tone—a round, resonant, minimally vibrated sound—is a vital tool for all singers, but particularly the versatile singer looking to be able to switch easily from one style of singing to another. By learning how to sing with straight tone in a healthy way, versatility can be achieved by using balanced straight tone as the basic, core sound of the voice and layering colors, effects, and other devices to positively unbalance the voice in ways appropriate for different genres.

A discussion of vibrato and straight tone can be broken down into four parts: (1) acoustics; (2) physiology; (3) pedagogy; and (4) style. Perception plays an important role in the acoustics of vibrato because the uninitiated ear does not recognize narrow vibrato for what it is. Rather, the tone sounds straight with a pleasing shimmer. Understanding how little vibrato is needed to affect a sound's color is key to acknowledging straight tone as the vital player that it is in voice pedagogy. Equally as important is understanding the mechanics behind vibrato and the various physiological ways that it can manifest. A manufactured vibrato, resulting from forced laryngeal movement, sounds different from a natural vibrato that is a result of airflow. Considering these physical differences, along with the perceptual intricacies of sonance, allows straight tone take its place among the vocabulary of natural vibratos. Pedagogical exercises that lead to discovering healthy and easeful straight tone can be used to work towards a resonant, core sound that the versatile singer can modify to achieve a palette of stylistic colors and effects for any genre.

The key to vibrato and straight tone that sound easeful and natural is sonance, the acoustical phenomenon that merges undulation of pitch into tone color, which is a combination

of pitch vibrato, intensity vibrato, and timbre vibrato. Straight tone is defined in this dissertation as a minimally perceived vibrato that remains resonant, focused, and balanced. Vibrato is created through a combination of bioelectric energy and airflow that causes the larynx to undulate slightly. Flow phonation is achieved through an equal balance of subglottic pressure and airflow. This efficient glottal resistance is balanced in overtones and has a naturally occurring vibrato. Problematic vibratos (wobble, tremolo, diaphragmatic vibrato, and pathological nonvibrato) are a result of manipulating airflow or laryngeal movement instead of allowing them their natural course brought on by the ideal conditions of flow phonation.

The aesthetics of vibrato, including extent, speed, and consistency, differ based on genre, style, and historically informed practice. Vibrato extent and speed tend to widen and slow down, respectively, from the 17th century to the early 20th century. In recent years, the idea of adaptability based on style and genre has grown in popularity. To achieve this, however, singing technique must be pared down to its bare minimum, without affect or manipulation. This type of adaptable technique allows for singers to seamlessly switch styles while remaining true to their core sound.

Straight tone is a practical aspect of singing today. Choral singing is a valuable source of income for emerging professionals, so learning how to sing straight tone healthily is vital to a working singer. Vibrato can most effortlessly be minimized by keeping airflow and subglottic pressure low. Slides and sirens are beneficial strategies for finding this minimally vibrated sound.

Besides being a great base for stylistic singing, straight tone allows the singer to focus on aspects of technique that may become masked by vibrato, such as resonance and vowel tracking. Additionally, soft singing and intonation may be improved by solidifying the core, straight tone

sound. Once straight tone has been developed, it can be used as a base for other styles of singing, such as musical theatre, pop, and rock. Modifications of straight tone (as analyzed in Adele's "Hello") include edge, vocal fry, darkening, register shifts, high belt, and vibrato. By using the core sound as home base, the versatile singer can layer multitudes of vocal effects to achieve sounds suitable for almost any style, spanning *bel canto* opera, acoustic folk rock, contemporary musical theatre, and Gregorian chant.

Further research into the acoustical properties of core sound, especially intensity vibrato and overtones, would provide an interesting backdrop for the discussion of what acoustical changes take place when shifting from straight tone to other styles. Finding correlations among acoustical, physiological, and stylistic qualities could give an even more well-rounded view of the versatile singer. Analyses, similar to those found in Chapter Four, could be performed on recordings of countless categories of singing, including opera, musical theatre, and commercial genres, like punk rock, acoustic folk, and country. I would like to see a wide variety of these analyses done and then compiled into charts, demarcating the vocal effects required to layer on top of the core, straight tone sound from one unbalanced extreme (such as Wagnerian operatic singing) to another (like high pop belting) with the balanced straight tone sound at the very center. Through this kind of thorough analysis of stylistic conventions mixed with pedagogical thought on how to modify the core sound to achieve these effects, the boundaries of versatility in singing are able to be stretched even further.

The versatile singer is an endangered species in today's musical world that often binds people into severe specialization. By paring down the voice, by finding the core of the vocal instrument, singers can expand their horizons into unexpected styles and genres and, by doing so, discover a depth of colors and emotional nuances from within.

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