

**A Voice in the Choir:
Modernizing the Language and Practice of Voice Pedagogy in the Choral Culture**

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Abstract

A VOICE IN THE CHOIR: MODERNIZING THE LANGUAGE AND PRACTICE OF VOICE
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Advancement and language in contemporary voice pedagogy have shifted significantly in the twenty-first century, and practitioners have raised concerns about updated understanding and application in the choral setting. Additionally, solo and choral voice professionals have regularly identified and deliberated over areas of divergent sound ideals and technical demands. A comparative study of contemporary language in fact-based voice pedagogy was conducted and synthesized to reflect recommended language among expert practitioners for use among all instructors of singing in solo and choral voice, followed by specific adjustments and applications needed in the choral setting. As the study progressed, two significant findings emerged: (1) aligned understanding and use of contemporary voice pedagogy is consistently found among academic choral conductors and in contemporary choral pedagogy sources; and (2) this shared understanding only partially addresses the needs and technical demands of choral singing. In

response, the author defines choral and solo singing as parallel music cultures within “studied voice.” As such, further research and resources dedicated to choral voice pedagogy are defined and recommended.

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Acknowledgments

It was not until the end of this dissertation process that I realized it is simply about things I am passionate about—good communication, deep relationship, and fully-embodied music-making. Before I could recognize this, I had to get comfortable with new challenges—areas of technical knowledge that seemed previously inaccessible, the deeply quiet, solitary environment of scholarly writing, and entry into an arena where the individual language and methods of so many talented and dedicated artists have made common ground hard to establish.

My mentors and peers during my doctoral study gave me the ability to find peace and purpose with these challenges. From Geoffrey Boers, among so many other things, I have a whole new toolkit that includes asking, “what is now possible?” and infinite ways of connecting my gifts with my scholarship. From Giselle Wyers, permission and encouragement to “go among trees” and truly be seen, all offered through her emotional intelligence and professionalism. Through Steve Morrison, Christopher Roberts, and Kari Ragan, I gained my footing as a creative researcher. Sharon Hansen, in our first and only meeting, gave me the push I needed to take on this particular challenge. Guntis Šmidchens is an example of scholarship full of generosity, humility, and joy. Through it all, my choral cohort and doctoral companions—especially Elisabeth, Gerrit, Steve, and DJ—gave me comfort, solidarity, and many laughs under stress.

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Chapter 1

Introduction

“There is no such thing as a ‘natural voice’—or, rather, a natural voice is what is natural to the singer producing it and how that singer’s culture perceives it.”¹

This statement is the overriding message chosen by John Potter and Neil Sorrell for their 2012 *The History of Singing*, in which they trace recorded evidence of singing back to hymns inscribed on clay tablets in late-third millennium BCE. In Western music, the history of teaching singing was only recorded in any scholarly way beginning in 18th-century Italy,² after more than the first hundred years of the “rise of a virtuoso class of singers and the emergence of a repertoire of solo song and opera.”³ It is very likely, however, that a gestalt of right and wrong judgments has accompanied the act of singing from the beginning. For those clay tablets to be inscribed, there had to have been a measure of correctness, an agreement around “how the song goes.”

Were the singers of the time praised or criticized for their accuracy when singing these hymns? When were the first comments made concerning the nature of the sound they produced when singing? Who proffered those comments, and how were they received? Whenever those first qualitative remarks occurred, it is essential to note that they were within the context of the singers’ culture. This simple statement is foundational to everything that follows in this dissertation.

Viewed through the lens of language, the instruction of singing is a perilous enterprise indeed. Even when a teacher and student are face-to-face, the interpretation of instructions will

¹ Sorrel and Potter, *History of Singing*, 26.

² Miller, “Historical Overview,” 203.

³ Stark, *Bel Canto*, xvii.

be impossible to fully determine and will begin a subjective and internal journey of unknown scope. The words and their accompanying interpretations gain significance when: (1) the speaker is a person of authority or reputation; (2) the subject matter is coveted or controversial; or (3) the receiver has a vested interest in either. In short, the intensely personal nature of the human voice makes offering it up for judgment a perpetually vulnerable act.

Parallel Cultures within Western Music

Teachers of classical singing might argue that they are pursuing not just a ‘natural voice,’ but a virtuosic voice, one trained to express resonant musical sound in a manner that goes beyond natural and normal ability. Taking the spirit of Potter and Sorrell’s message in a broader context, any perceived qualities of singing—including spectrums of desirable and undesirable, formal and informal, correct and incorrect—are relative to and defined by the culture doing the perceiving. In Western classical singing, the Italian tradition of *bel canto*, used here in broad definition,⁴ has remained the gold standard of “beautiful singing.” The principles of *bel canto* and the interpretation of its early masters fill the pages of the histories that Richard Miller, James Stark, and others write in more contemporary times, and the language of classical voice pedagogy⁵ is inextricably woven with *bel canto* terminology, whether authors are embracing or rebuffing it. The aural quality of *bel canto* singing is not only the measure of excellence for Western adjudicators and the objective for classical voice teachers, it is also a culturally ingrained bias for native Western listeners of European origin.

In the last few decades, formal voice training in Western music has needed to expand to embrace contemporary and commercial styles of singing, and the inclusion of these genres in

⁴ “In the broadest sense, *bel canto* represents the ‘classically’ trained voice of opera and concert singers, extending from Caccini at the dawn of the Baroque era to the best singers of today.” Stark, xx.

⁵ The term *voice pedagogy* is preferred in contemporary literature, changed from the more prevalent *vocal pedagogy* of historical sources.

formal study has challenged the aesthetic and capacity of many voice teachers. Some would say this expansion was essential for the survival of the profession; however, it may be more accurate to say the shift was an appropriate realignment of the profession to represent its broader culture.

Contemporary and commercial music (CCM) is the soundscape of a strand of musical culture in Western society, parallel to that of classical music. Historically, formal voice instruction has not been a foundational basis of learning for CCM performers; however, shifts in the industry and culture have begun to affect a change towards more structured training regimens. In a manner not dissimilar to the evolution of the vocal capacity required for classical repertoire, the demands of some CCM music forms have evolved in a way that require extensions of technique and tremendous endurance. In response to these demands, CCM voice studios are on the rise, as is the attention of vocal health practitioners.

There are many other parallel strands of musical culture in Western society. Each contains musical signatures and a shared set of desirable qualities that form the soundscape of that culture. Through the lens of music theory, all cultures in Western music share the same building blocks of melody, harmony, and rhythm, and from them adopt specific sequences and combinations that become hallmarks of their distinctive sound and style. Similarly, all human voices share the building blocks of actuator, vibrator, and resonator. It is singers' specific use of timbre, articulation, registration, and so forth that creates a culturally distinct vocal soundscape. On a global scale, it is the job of the ethnomusicologist to delineate musical sounds and structures between cultures by building bridges of understanding through the underpinnings of Western music theory and by examining the role of formal and informal music in societies.

In this dissertation, the model of parallel musical cultures is used to compare two areas of singing within Western vocal music that are usually considered homogenous—that which is

studied in solo voice studios and that which is studied in choral ensembles. Both are areas of formal *studied voice* where there is a hierarchy of vocal instruction and a shared pedagogical basis for singing—a quality not often found in other strands of musical culture in Western society. The label of studied voice is chosen with care because solo studied voice has broadened and changed to include techniques for contemporary, commercial, and traditional music as well as classical music—repertoire that has been a staple of choral studied voice for much longer. Both use the vocal building blocks of singing in similar ways, and the art forms share many points of origin and intent.

For these reasons, practitioners, listeners, and researchers have considered solo and choral studied voice as sharing a single culture. Each has demands, however, that are different enough to require unique vocal applications and understanding. Just as solo voice pedagogues have needed to expand formal voice training to embrace techniques for CCM,⁶ all voice professionals and supporting researchers need to expand knowledge and technique for choral singing. Furthermore, just as music theory and the examination of musical roles and structures help to bridge understanding between cultures in ethnomusicology, the parallel cultures within studied voice also have a powerful bridge builder—the burgeoned field of voice science.

Voice Science - The Great Neutralizer

Pedagogical historians concur that while pioneers of voice science and acoustics were emerging through the 1970s and 1980s, it was not until 1995 that, as Robert Sataloff says, “We finally have enough information to include effectively in our voice care armamentarium the most important missing component: rational thought.”⁷ Even as late as 2006, Miller continues to name

⁶ “By the early nineteenth century, as large opera houses and orchestras became commonplace, voices need to carry sound further, to be larger in size and louder in volume ... Singing techniques and pedagogy thus changed in response to the change in musical and societal demands.” Harrison and O’Bryan, *Teaching Singing*, 4.

⁷ Sataloff, “G. Paul Moore Lecture,” 230.

William Vennard's 1967 text, *Singing: The Mechanism and the Technic*, as the "reliable source for the study of anatomy, physiology, and acoustics of the vocal instrument," noting that, in many respects, he "appears to be in tune with international vocalism."⁸

The 1990s and 2000s saw wider acceptance and promotion of fact-based information and methods from a surge of contributors but also heralded the broader struggle of practitioners to apply the new knowledge. Video laryngoscopes and accessible acoustics technology were not a part of medicine or voice study until the 2000s. CCM pioneers emerged on the same timeline, and their work put more pressure on voice science to explain an expanded physiological and acoustical capacity of the human instrument, and pressure on the voice pedagogy community to embrace nonclassical styles in formal study.

The growing expansion of solo studied voice to include CCM technique is a prime example of how voice science has served as both neutralizer and bridge. Lynn Holding, widely regarded as a thought-leader in contemporary voice pedagogy and the founder/author of the "Mindful Voice" column in *The Journal of Singing*, documents a swing of perspective brought about by scientific inquiry. The National Association of Teachers of Singing (NATS) held a first conference addressing the belt singing voice in 2000, and Holding notes that "attendees ranged from the curious ... to the appalled."⁹ The fact that belt singing was so controversial mystifies her younger audiences just fifteen years later. She writes:

What changed? For starters, voice scientists began to take an objective look at the belt voice [and] a picture began to emerge of a vocal style that was on par with other robust singing styles ... Voice science has also progressed in the arena of acoustics over the past several decades, and thus has helped to corroborate what pioneers in the field of nonclassical voice ... had already discovered: the belt voice and other nonclassical vocal techniques can be taught healthfully, using resonance instead of weight and volume to power the voice.¹⁰

⁸ Miller, "Historical Overview," 213.

⁹ Holding, "Clinician's Illusion," 355.

¹⁰ Ibid.

Today's voice students studying in fact-based CCM studios have learned the appropriate posture of the vocal tract for belting, which is now regarded as simply one of several healthy sounds they can make with their instrument. In the words of Holding, "The reason that evidence-based teaching is so compelling is that facts allow both partners in the learning endeavor to begin by meeting in neutral territory; the location and function of muscles and mucosa are undisputed between teacher and student. The necessity of agreement is rendered moot by factual evidence."¹¹

The unique demands of choral singing can also be, and to some degree have been, "neutralized" with the help of modern voice science and more research and translation are needed. The same research and technology that describes how the voice navigates the challenges of robust singing styles, be they virtuosic in classical or contemporary music, can inform how choral singers become intentionally *less* individual, healthily navigate a narrower tessitura, and find blended resonance through vowel and vibrato. Recently, Kari Ragan published her design of evidence-based voice pedagogy, a framework founded on practices in medicine that bridges voice research, pedagogical experience and expertise, and the specific needs and goals of the student.¹² Such a construct could expand to include the specific goals of choral singing and expertise of the choral conductor, particularly through the mindful application of updated vocal knowledge and terminology in ensemble settings, which is the primary aim of this dissertation. For this to happen, three shifts in the cultures of studied voice need to occur: (1) the technical demands and sound ideals of choral singing need to be embraced as unique and separate in significant ways from solo studied voice; (2) research and pedagogical manuals need to advance

¹¹ Holding, "Cognitive Dissonance," 89.

¹² Ragan, "Defining Evidence-Based Voice Pedagogy."

and promote understanding of how those technical demands are produced and taught in the choral setting; and (3) choral conductors must be invited to and embrace the interdisciplinary field of vocal professionals.

Defining the Field of Voice Professionals

Interdisciplinary teams for care and instruction of the professional voice have developed concurrently with the establishment of the field of performing arts medicine. Standing on forebearers in medicine (Minoru Hiranu, Hans van Leden, and Paul Moore),¹³ pedagogy for the singing voice (William Vennard and D. Ralph Appelman),¹⁴ and principles of acoustics (Johan Sundberg and Berton Coffin), collaborative care teams and research emerged predominantly in the 1980s and proliferated quickly. The formation of The Voice Foundation in 1969 primed this movement and its subsequent annual symposia, ‘Care of the Professional Voice,’ brought together “laryngologists, voice scientists, physicists, computer scientists, speech-language pathologists, singing teachers, acting teachers, voice coaches, singers, actors, and other professionals.”¹⁵

While these early collaborations centered around care and rehabilitation of the voice, it is important to note that the necessary expertise came, in large part, from professional voice users and teachers as much as from voice scientists. Further, the capacity of the singing voice has both inspired and demanded greater understanding and expanded research, which, in turn, has improved the capacity of voice medicine to treat a global range of voice issues. The current term of *vocology*, coined by leading voice scientist Ingo Titze and otolaryngologist George Gates, is indicative of a slight, but vital re-framing of the industry. As Titze explains, “vocology is defined

¹³ Sataloff, *Vocal Health*,” 2-3.

¹⁴ “There are, of course, many more forebearers of modern voice pedagogy, but the anatomical and physiological work of Vennard and Appelman is widely regarded as a specific turning point.” Hoch, “Historical Landmarks,” 49.

¹⁵ Sataloff, *Vocal Health*, 3.

simply as the science and practice of voice habilitation, with a strong emphasis on habilitation ... more than repairing a voice or bringing it back to a former state ... it is the process of strengthening and equipping the voice to meet very specific and special demands.”¹⁶

Three categories of voice professionals form the focus of this dissertation—voice pedagogues (including the recent designation of Singing Voice Specialists),¹⁷ voice scientists (including laryngologists/otolaryngologists and speech-language pathologists [SLP]), and choral conductors. The first two are found in the list of principal contributors to The Voice Foundation’s symposia and have intermingled since Manuel García II invented the first laryngoscope in 1854.¹⁸ The inclusion of choral conductors under the label of voice professional is inconsistent at best from the perspective of all three fields. It is widely accepted, however, that choral conductors have more time with their singers¹⁹ and reach thousands more singers (amateur and professional) than ever pass through the voice studio or laryngologist/SLP office. Each field has specific and unique demands, and each of the three kinds of voice professionals has expertise specific to the vocology of their discipline.

The history, nature, and intent of each profession are distinctly different, yet inextricably linked with the other two in complex relationships that include areas of common ancestry, similar practice, and shared goals and vision. An exploration of those relationships was the focus of a juried presentation by this author in April 2019²⁰ and is not presented here in full, but in summary for essential points.

¹⁶ Titze, “What Is Vocology?,” 5.

¹⁷ “Singing and Acting Voice Specialists,” The Voice Foundation, accessed February 1, 2020, <https://voicefoundation.org/health-science/voice-disorders/voice-care-team/singing-and-acting-voice-specialists/>.

¹⁸ This event is commonly referenced as the origins of laryngology.

¹⁹ “Often by a ratio of 5 or more to 1.” McCoy, “Choir Issue, Part 1,” 29.

²⁰ A grid summarizing comparisons in history, nature, and focus/goals between the disciplines of voice pedagogy, voice science, and choral music from this author’s General Exam can be found in Appendix A.

All three professions have a focus on the care and instruction of the human voice and, in singing, all have the goal of healthy, vibrant, beautifully functional voices. All are navigating a historically invisible instrument. Elements of that instrument—the physiology and acoustical properties—are becoming increasingly visible, but critical elements of sensation, individual uniqueness, and artistry will forever remain unseen and ultimately inexplicable. Finally, all three professions place trust in a hierarchical relationship of instruction. Singers look to their master teachers, maestro conductors, and expert medical providers with reliance and respect, and their words, gestures, and methods carry import accordingly.

The origin of voice science stems in large part from voice pedagogy and is an area of both common ground and division. García’s work and his laryngoscope ushered in the “modern era” of pedagogy and the beginnings of voice science. The work of Vennard and Appelman launched the “fact-based era” that forms the basis of modern pedagogy and scientific collaboration that inspires the work of Sundberg, Miller, Sataloff, Titze, McCoy, Bozeman, and countless others.²¹ Both eras, however, also encouraged a multitude of self-proclaimed “singer-laryngologists” and a remarkable array of individual methods that claimed scientific backing but were unsubstantiated at best and harmful at worst. Thus, teachers’ ability to incorporate valuable information emerging from legitimate voice science and pedagogy has been slowed by what Miller calls confusing “McPedagogy.”²²

While choral and solo voice singing in Western classical music also share origin in venue, audience, and repertoire, the lineage of choral conductors is more varied. The specialized profession of choral conducting in America (as separate from orchestral conducting or sacred

²¹ Hoch, “Historical Landmarks,” 50.

²² Miller, *On the Art of Singing*, chap. 11.

music leadership) did not emerge until the middle decades of the twentieth century.²³ Details of this history and an analysis of the choral nature and setting are the focus of Chapter 7.

The broader differences in nature and setting between the three professions are the most fundamental to this dissertation. Voice pedagogy and, more importantly, voice science can be accessible to and impactful for a general audience. Many voice teachers have studios full of amateur and beginning voice students, and the range of voice rehabilitation offered by medical practices goes far beyond the singing voice. However, both professions are driven or inspired by virtuosic voice users. Professional singers, as described by Sataloff, are the “Olympic athletes of the voice world.”²⁴ The demands and feats they ask of their voices help to advance the care of all patients. Choral singing, by contrast, has deep roots in community and social function, and professional singers represent a tiny part of the choral culture.²⁵

The difference in setting between choral conductors and both voice pedagogues and voice scientists is the most critical. Addressing an individual’s singing voice in studio instruction or medical care can and should be entirely customized to the needs and understanding of that unique singer. Voice teachers, SLPs, and doctors plan instruction/treatment and employ remedies, methods, or vocalises/repertoire with that single voice in mind. Crucially, the communication of instruction/treatment can also be customized, and the singer’s understanding monitored by one-on-one verbal and non-verbal discourse. In fact, while endorsed language is essential in both pedagogic and scientific settings (and is the basis of the comparative study in this dissertation), a crafted language of shortcuts, vocal modeling, non-verbal instruction, and

²³ Darrow, *Four Decades*, 2-3.

²⁴ Sataloff, *Vocal Health*, 1.

²⁵ Sataloff and Smith, *Choral Pedagogy*, 20.

understood meanings for otherwise controversial terms is ultimately employed between voice teachers and their students.

In choral ensembles and choral music education classrooms, conductors and teachers also craft a language with their singers. However, the interpretation of any instruction and the execution of any “treatment” is now multiplied by the number of singers present. Some one-on-one exchanges are possible as is modeling and the development of understood shortcuts and gestures, but the variation of impact and collective takeaways among the choristers is impossible to quantify. Further, it is the nature of singing in ensemble, including the division of parts in repertoire and the coordination between voices to the interpretation of a single conductor or teacher, that dictates the technical demands that differentiate choral and solo singing. The distinction of setting, more than any other, is what drives this author’s delineation of cultures among studied voice and the need for the interpretation of language that follows.

One final difference is philosophical and harder to substantiate—that of self-regard, role, and chosen tribe among choral conductors. Sharon Hansen, conductor, master teacher, and founder of the “On the Voice” article series in *The Choral Journal*, made it her mission to document, advocate for, and personally bridge understanding and dialogue between choral conductors and voice pedagogues. After reviewing her work, and in particular, her monograph summarizing voice-related articles published in choral-focused media between 1959-2009,²⁶ this author interviewed Dr. Hansen to ask for her updated assessment of relationships in the ten years since her monograph was published.²⁷ Several insights from this conversation and others it engendered are the inspiration that led to this dissertation and the model of parallel cultures created herein. A single insight summarizes all the rest—that choral conductors, predominantly

²⁶ Hansen, *The First Fifty Years*.

²⁷ Sharon Hansen, interview by author, Kansas City, MO, March 1, 2019.

and in Dr. Hansen’s body of experience and research, do not consider themselves voice professionals.

To the extent that this is true—certainly not universally but endorsed by both scholarly and anecdotal evidence—this perspective informs: (1) the relationship between choral and solo voice professional; (2) choral professionals’ commitment to understanding and currency with vocal health and pedagogical practices; and (3) the level and nature of voice instruction that occurs in ensemble settings. Until recent times, care and instruction for individualized vocal technique have not been the prominent or consistent focus of the choral profession for a variety of reasons. At the root is the lineage of both communal and formal choral singing in America that prioritized the act of singing together and the overall ensemble sound (detailed in chapter 8). Over the last decades of the twentieth century, professional choral organizations engaged more with expanding knowledge and practice in other areas of choral music—repertoire, musicianship, rehearsal methods, progression of ensemble sound—than with vocal technique. According to Hansen, choral conductors felt that voice teaching and advanced vocal development were not in their purview, “too controversial,” and “best left to the voice teachers.”²⁸

This author concludes that not only did choral conductors face the same struggle as voice pedagogues to acclimate to the rapid pace of scientific advancement, but they also did not have a way to ultimately “resolve” that struggle under the umbrella of one culture—one acceptable set of sounds for solo and choral singers. So long as the goal for desired sound and the techniques required to produce them remains the same for solo and choral studied voice, the long-standing tension between choral and solo voice professionals will remain.

²⁸ Hansen, “The First Fifty Years,” 9.

As of the writing of this document, evidence of more pedagogical alignment can be found among contemporary choral conductors and, increasingly, more have specific backgrounds in voice and choral specialties, including the new sub-specialty of choral pedagogy found in academic texts and higher education. While proliferation of that knowledge and the updated language reported in this document are still needed, the scholarly work to align the language and shared pedagogy has been done to the extent possible between the two kinds of singing. What remains is the need for that pedagogy to extend to more specific methodology and examination of sound as it is produced in the choral setting. The relationship between choral and solo voice professionals needs to be reset—accepting the foundations that they have in common and, together, acknowledging and embracing the differences that have been the cause of disconnect in the past.

With voice-building and healthy singing now more prominent in the choral world,²⁹ it is time for choral conductors to fully embrace the mantle of voice professional. It is also critical to realize that amateur and professional singers alike have already bestowed that mantle and expect that their choral conductors and choral music teachers *are* authorities on the singing voice. According to the latest Choral Impact Study from Chorus America, of the 42.6 million adults and children singing regularly in choruses, 92% are members of volunteer community or religious choruses.³⁰ Most singers never move into professional circles, and most who do have their first introduction to singing through participation in an ensemble. Their participation is fulfilling on many levels—social, spiritual, psychological, and physiological—and they look to their

²⁹ Schade, “Usage of Vocal and Choral Pedagogies.” abstract.

³⁰ Grunwald Associates LLC and Chorus America, *The Chorus Impact Study: How Children, Adults, and Communities Benefit from Choruses*, (2009), 8, https://www.chorusamerica.org/sites/default/files/resources/ImpactStudy09_Report.pdf. The number of choral singers in America has now increased to over 54 million, according to a subsequent 2019 Chorus America study.

ensemble leaders for inspiration and guidance on all those fronts. In “The Art and Science of Lifelong Singing,” Brenda Smith says:

The newly “anointed” choral conductor may not realize that the singers are seeking much more than a leader. The singers in a choral group generally expect the conductor to be an authority on the singing voice, the choral art, and musical fundamentals. For choral conductors, this expectation may be puzzling. Instrumental conductors expect rightly that each player in the band or orchestra has had some amount of individual instruction. Choral conductors frequently assume wrongly that amateur choral singers, also called “choristers,” grasp the basics of singing.³¹

Voice science, the “great neutralizer,” can address the demands of multiple genres of singing, including those of choral repertoire and ensemble setting. Given the substantial time spent with their singers’ voices literally “in their hands,” and the demands on those voices that are unique to the choral setting, choral conductors must join the interdisciplinary voice team, in dialogue with and welcomed by their colleagues in voice pedagogy and science.

Generations of Contemporary Practitioners

This dissertation focuses on a primary barrier to a more natural and synonymous shared practice among studied voice specialties—the need for the continual updating and expansion of language and knowledge of healthy voice production based on contemporary science, including the jettison of language and concepts that no longer serve. Before moving to that task, it is helpful to acknowledge a second barrier at play among current practitioners: a classic generational issue which is enhanced in this case by the pace of scientific advancement, the expansion of studied voice culture in America, and the traditional master-apprentice nature of knowledge transfer where “the divine instrument” is concerned.

In 2014, the American Academy of Teachers of Singing (AATS), a select group of nationally recognized teachers of singing and voice experts, felt compelled to issue a paper, “In

³¹ Smith, “Art and Science,” 291.

Support of Fact-Based Voice Pedagogy and Terminology,” as a message to the broader industry.

In it, the authors say,

The Academy believes that singing teachers and other voice professionals have a tremendous opportunity as well as a professional responsibility to expand their teaching skills through a clearer understanding of the actual mechanics of the singing system. The Academy acknowledges the value of the use of imagery and kinesthetic feedback in the teaching of singing. However, the efficacy of these devices is extremely variable. Knowledge of what is actually happening in the singing system, how it is functioning to produce the desired results, empowers teachers to direct their students to work consistently toward healthy, efficient, stylistically correct, and artistic performances.³²

The need for this statement—nearly 50 years after Vennard’s seminal text and the founding of The Voice Foundation’s interdisciplinary symposia, and 15 years after the work of Miller, Titze, and Sataloff was in common use—is indicative of how long it has taken for the “fact-based era” to integrate into the profession.

Voice professionals with training in the twenty-first century are truly a first generation that has the opportunity to be teaching on new information with interdisciplinary and technological support. The older half (or more) of all contemporary practitioners, this author among them, have had even less information in their initial training. Some of that number have adapted, even pioneered, and paved the way for the current age, and many have at least kept apprised of new concepts and progress. However, a significant number of part-time teachers or full-time music educators and choral conductors whose responsibilities include multiple priorities have continued to teach as they were taught. Just one generation previous—the teachers of all contemporary teachers, regardless of age—did not have training in the scientifically-based knowledge that is known today. In a field where the master/apprentice tradition of learning one’s craft from established and cherished authorities is deeply rooted (in other words, teaching as one

³² Edwin, LoVetri, Douglas, and McCoy, *In Support*, 2.

was taught), and where the mystery of great artistry has prestige and a coveted place of its own, the change to neutralize the workings of the singing voice through science has been slow and laden with complexity.

Partly due to the stance of the profession as a whole, the change has been slower still in choral settings and publications. For ten years before the 1999 launch of Sharon Hansen's "On the Voice" article series, she faced widespread resistance to the initiative from the Board of the American Choral Directors Association. Dr. Hansen persisted, and, since then, progress has been made. Numerous articles have been published both in her *Choral Journal* series and in corresponding professional journals. Voice and choral professionals have come together to conduct joint conversations, which have been featured in publications and presentations at their respective professional conferences.

One focal point that emerged from these many interactions was a need for reconciled language. Some problematic language is linked to concerns about actual technique and not interpretation (e.g., the use of terms for vibrato that indicate the *straight* or *pure* tone of prepubescent voices and choral conductors who are still asking adult singers, earnestly but inappropriately, to imitate that sound). More problematic language, however, falls into two categories: (1) that which is a vestige of outdated concepts and knowledge; and (2) that which is used without knowledge of or regard for the unintended consequences that can occur and go uncorrected in the group setting.

It is the primary aim of this dissertation to address all forms of problematic language. The document is written for voice teachers and choral conductors with an academic level of understanding of pedagogical language for the singing voice. Within the body of this dissertation are summarized tables of recommended language for all practitioners and guidelines for

pedagogical practice utilizing that language. These resources will provide the foundation for a range of contributions to the broader field of voice professionals working in ensembles, choral classrooms, and private studios.

Chapter 2

Review of Literature

The body of this dissertation (Part I) is, by definition, a review of literature published by voice pedagogy and voice science experts from the last decade in the form of a comparative study of language. The contemporary sources used for this study are the first to be written after a long period of settling into the science-driven, “fact-based era” that originated in the 1960s and 1970s, developed over the turn of the century, and became uniformly acknowledged in the first decade of the twenty-first century. A surge of calls for aligned language and updated pedagogical practice within and between the fields of voice pedagogy, voice science, and choral conducting followed, peaking in the mid-2010s. The first three sections of the review of literature in this chapter provide the basis for (1) the lineage of comparative studies in voice pedagogy, (2) the shift from historical to scientific basis, and (3) the surge of calls for language and alignment.

In Part II of this dissertation, the differences in application between solo and choral studied voice culture are addressed and the findings of the comparative study adjusted for appropriate use. The fourth and final section of the review of literature below summarizes the body of work that describes the differences between solo and choral singing, thus providing a basis for the needs addressed in Part II.

Comparative Voice Pedagogy

Comparative voice pedagogy (CVP), a term first extensively used by Richard Miller,¹ has been conducted in the form of broad, comprehensive documentation of the history of classical voice pedagogy, and also in more targeted analysis of lineage, area of focus, and genre. The

¹ Broadwater, “Comparative Voice Pedagogy,” 209.

historical lineage of pedagogical practices is useful both as a determinate of commonly held understanding and as a way to trace the systemic origins of language in modern pedagogy.

Comparative studies within an area of focus, respiration as a typical example, provide details of descriptive language among current practitioners and in collections of past and current sources and reveal a spectrum of agreement or discord on specific instructional terminology.

Comparisons among genres is a recent inclusion, predominant only at the turn of the twenty-first century and forward. While historians and researchers have divided classical singing into national schools and sound ideals over time, those divisions remain in a cohesive genre that shares most fundamentals of aesthetic and core production. Voice pedagogy in musical theater and, in particular, the mechanics of belting led the charge for all CCM genres to enter the formal discussion. Most contemporary resources include references to CCM voice production, and the lineage of pedagogy in that area has begun to coalesce.

Historical voice pedagogy refers to all pedagogy “that predates the scientific or fact-based era of singing that emerged during the second half of the twentieth century.”² Most accounts mark the mid-seventeenth century and the work of Pier Francesco Tosi as the beginning of the modern-day profession followed by Giambattista Mancini, Manuel García I, and his son, García II. Their historical lineage, among many others from the eighteenth and nineteenth centuries, is presented and viewed through a contemporary lens in Stephen Austin’s *Provenance*³ and James Stark’s 1999 *Bel Canto*. Richard Miller’s “Historical Overview of Vocal Pedagogy” is used repeatedly by prolific author, singing teacher, and otolaryngologist Robert Sataloff, and is frequently cited as the authoritative reference for the lineage prior to Vennard and Appelman.

² Hoch, *Dictionary for the Modern Singer*, 80.

³ Austin, *Provenance*. Stephen Austin’s articles from the “Provenance” series in *The Journal of Singing* were compiled into a book in 2017. The series continues under Kimberly Broadwater.

Rachel Velarde continues Miller's work in her 2013 dissertation "Vocal Pedagogy at the End of the Twentieth Century: Revealing the Hidden Instrument,"⁴ as does Matthew Hoch in his 2019 "Historical Landmarks in Singing Voice Pedagogy" published in *Voice and Speech Review*. In both, Miller himself takes his place in the lineage as the founder of a systematic approach to voice pedagogy. He is, in the words of Hoch, "arguably the most prolific and important modern classical voice pedagogue, and inarguably one of the most influential among North American singing teachers."⁵ Hoch also notes that "more modern singing teachers affirm Richard Miller's ideas than any other single pedagogue,"⁶ and this author found strong evidence of that statement in the conducting of this study. Barbara Doscher, Clifton Ware, Kari Ragan, and Scott McCoy are all descendants of Miller's systematic concepts. McCoy's continuing editions of *Your Voice: An Inside View*⁷ are the most utilized voice pedagogy resources in current practice.

Fact-based pedagogy is generally agreed to have begun with the pedagogical work of William Vennard and Ralph Appelman in the 1960s. The work of voice scientist Johan Sundberg and voice teacher Berton Coffin in the 1970s added an acoustical dimension that has developed into an equally prominent basis of fundamental understanding in current practice. Australian Joseph Talia's 2017 *History of Vocal Pedagogy: Intuition and Science* focuses on scientific, pedagogical lineage, which directly informs his highly technical pedagogical text *Vocal Science for Elite Singers: A Tribute to the Unrelenting Pursuit of Excellence in the Art of Singing*, also published in 2017.⁸ The interdisciplinary field of vocology was established in large part by Ingo Titze over the 1990s, and the Vocology Institute has produced over 200 alumni since its

⁴ Velarde, *Vocal Pedagogy*.

⁵ Hoch, "Historical Landmarks," 52

⁶ Ibid.

⁷ McCoy, *Inside View*.

⁸ Talia, *History*; and Talia, *Vocal Science*.

inception in 2000.⁹ Titze figures prominently in Hoch and Velarde’s historical overviews, and future authors will undoubtedly name his work in parallel with García, Vennard, and Miller in compilations of history.

Another strand of comparative pedagogy are collections of interviews with teachers and performers who have been deemed experts of their craft. Two books set these experts’ answers to questions focused on elements of voice production for parallel comparison—Elizabeth Blades’ *Spectrum of Voices* (first published in 2013 and updated in 2018)¹⁰ and Donald George and Lucy Mauro’s 2015 *Master Singers*.¹¹ Blades’ book was initially a product of her 1993 dissertation, “Vocal Pedagogy in the United States: Interviews with Exemplary Teachers of Applied Voice (Voice Teachers)” and her research was continued by Jenny Dufault whose 2008 dissertation and subsequent article in the *Journal of Singing* more deeply compare the pedagogy of three expert teachers.¹²

The most focused of comparative studies are those that delve into a specific area of voice production or area of application. Some give a broad overview of a single area across history, such as Heather Lyle’s 2013 *Voice and Speech Review* article, “A Historical Look at Breathing Methods for Singing.”¹³ Of particular interest to this author are those driven by a desire to codify terminology. In the area of respiration, Kathleen Spillane’s 1989 “Breath Support Directives Used by Singing Teachers: A Delphi Study” is an earlier example.¹⁴ Her survey of 395 NATS members resulted in 92 responses to 93 specific directives in the area of breath management. Donald Freed compared breath instructives in textbooks from 1900-1910 with those from 1970-

⁹ Hoch, “Historical Landmarks,” 55.

¹⁰ Blades, *Spectrum of Voices*.

¹¹ George and Mauro, *Master Singers*.

¹² Dufault, “Practical Advice.”

¹³ Lyle, “Historical Look.”

¹⁴ Spillane, “Breath Support Directives.”

1990.¹⁵ Andrew Naseth’s 2012 survey of 2,306 American voice teachers yielded 448 responses focused on techniques for posture and breathing.¹⁶ Most similar to this dissertation, but focused solely in the area of respiration, is Shannon Coates’ 2016 dissertation, “Singing Terminology Usage: A Quantitative, Inter-Disciplinary Study, written as an investigative response to calls for systematizing terminology across disciplines in voice science and pedagogy. She concluded that “there is a higher level of consistent terminology use among voice teachers than what is presently assumed, and that there is a higher level of inter-disciplinary agreement about breathing for singing terminology than what is currently assumed. These results suggest that ongoing calls for systematization of singing terminology may no longer be warranted.”¹⁷

Two 2014 dissertations use elements of comparative study as a basis for applying genre-specific conclusions to the choral setting. Michael Fuchs describes principles of *bel canto* singing in “A Conductor’s Guide to the Incorporation of Bel Canto Methodology in the Choral Rehearsal.”¹⁸ Brian Winnie is among those working to bring consolidated practices from the CCM aesthetic to the choral field. In his “Contemporary Vocal Technique in the Choral Rehearsal: Exploratory Strategies for Learning,” he draws from scholarship in *bel canto* singing, voice science, and the Estill Voice Training System (EVTSTTM).¹⁹ Both authors describe the unique properties of the choral setting as they map pedagogical practice and language to use with ensembles and inspire this author to go one step further in defining choral singing as a parallel culture.

¹⁵ Freed, “Breath Management Terminology.”

¹⁶ Naseth, “Constructing the Voice.”

¹⁷ Coates, “Singing Terminology Usage,” iii

¹⁸ Fuchs, “A Conductor’s Guide.”

¹⁹ Winnie, “Contemporary Vocal Technique.”

The Impact of Scientific Basis

The line of demarcation between historical and fact-based pedagogy is science driven. Laryngology and voice pedagogy share a founder in Manuel García II (1805-1906) and have developed on parallel and increasingly integrated tracts in the area of singing. The work of Vennard and Appelman, Sundberg and Coffin, and many more in the second half of the twentieth century represents a coalescing of focus made possible in large part by advancements in technology. Once these scientists could consistently create physiological and acoustical processes in analytic form, including visual representation, the validity of various subjective theories could be explored through the scientific lens. Some theories, like the role of sinuses in resonance, have been largely eradicated in the face of starkly contrasting factual data. Others, like the coordinated functioning of breath pressure and glottal closure, have exploded into illustrated detail and grown exponentially. In all these outcomes, the objective lens of science has offered a neutralizing presence that has enormously changed both practice and language in studied voice.

Imagery-based language has been a targeted area of exploration. Richard Miller was famous for railing against imagery that contradicts anatomical reality and his writings in this regard are frequently cited, particularly two chapters from his 1996 *The Art of Singing*: “Imagery and the Teaching of Singing” and “The Singing Teacher in the Age of Voice Science.”²⁰ In her 2013 article “The Use of Science and Imagery in the Voice Studio—A Survey of Voice Teachers in the United States and Canada” Rachel Ware acknowledges many contributing authors to the discussion of imagery- versus science-based language and reports on her survey asking teachers to report on the relative value of both. The vast majority of the 520 respondents use a blended

²⁰ Miller, *On the Art of Singing*, chapters 1 and 70.

approach, and 81% supported the use of Ware’s proposed term “Anatomically Informed Imagery.”²¹ Of interest among her findings is the fact that actual practice of surveyed pedagogues was more aligned perception. In general, respondents believed the field to be more divided around the language of imagery and more reticent to dialogue on the subject than was in evidence. This discrepancy could explain much about the proliferation of language concerns addressed in many of the sources consulted for this dissertation that do not have correlated proof of abundant contemporary use.

The expansion of understanding offered by scientific research is most important to this dissertation in the area of inclusivity and aesthetics. Professionals working in the disciplines of voice habilitation/rehabilitation and acoustics are interested in a range of vocal qualities that extend far beyond the limited context of classical singing. A 1993 study by Johan Sundberg, Patricia Gramming, and Jeanette LoVetri compares the pharyngeal shape and acoustical and phonatory characteristics of operatic singing, belting, and *mix voice* (as developed by LoVetri). The study aimed to find evidence for using mix voice as a healthier yet effective substitute for belting.²² By 2012, Sundberg with collaborators Margareta Thalen, and Lisa Popeil, had designated five substyles of belting (*heavy, brassy, ringy, nasal, and speechlike*) without addressing the health of the overall aesthetic except to note that high subglottic pressure was only observed in *heavy belt* and not significantly in the other four.²³ Popeil continued that research with Matthias Echternach and other collaborators in 2014 to understand the vocal tract configurations of several voice qualities used in musical theater and other CCM styles.²⁴ In this

²¹ Ware, “The Use of Science and Imagery in the Voice Studio,” 415.

²² Sundberg, Gramming, and LoVetri, “Comparisons.”

²³ Sundberg, Thalen, and Popeil. “Substyles of Belting.”

²⁴ Echternach, et al., “Vocal Tract Shapes.”

study, the researchers describe a range of voice qualities, including the “uneconomic” *breathy* and *rough* sounds of rock and pop, as “valid aesthetic choices.”

This sequence of three studies, among many others over a few short decades, shows a progression of acceptance along with expanded understanding. Vocal requirements of CCM singing that were once presented as undesirable and assumed to have accompanying pathological consequences are now simply different and valid uses of the vocal instrument. Those assumptions are directly countered in a 2018 study by Philipp Caffier and collaborators, “Common Vocal Effects and Partial Glottal Vibration in Professional Nonclassical Singers.” An explicit objective of the study was the assessment of “potential of damage to the voice from nonclassical singing,” including “breathy voice, creaky voice, vocal fry, grunting, distortion, rattle, belt, and twang.” Researchers concluded that “the long-lasting use of the investigated nonclassical vocal effects had no negative impact on trained singers. The possibility of long-term damage depends on the individual constitution, specific use, duration, and extent of the hyperfunction.”²⁵ It is in this new landscape of understanding that contemporary authors Bozeman, McCoy, Ragan, and Rosenberg and LeBorgne are writing. Miller’s systematic approach is in evidence combined with an expanded and aesthetically objective lexicon from the scientific disciplines. In the words of Kari Ragan, “an approach to singing based on voice function discourages values being placed on one genre over another and encourages effective teaching practices. The voice is, in this way, considered an instrument to be trained without boundaries or limitations imposed by musical genre.”²⁶

²⁵ Caffier, et al., “Common Vocal Effects.”

²⁶ Ragan, *Systematic Approach*, 10.

Calls for Language Standardization

Many of the studies in comparative voice pedagogy and the use of imagery language cited above are part of the long-standing call for the standardizing, codifying, and reconciling of language within voice pedagogy and between the areas of voice pedagogy, voice science, and choral singing. A 1959 article by Vennard and Janwillam van dem Berg, “Toward an Objective Vocabulary for Voice Pedagogy,”²⁷ heralds the paradigm shift that his textbook would usher in ten years later. In it, they lament the volume of subjective language and show images from sonogram and x-ray to make sound and function visible as evidence for the objective language they promote. Cornelius Reid’s 1983 “A Dictionary of Vocal Terminology”²⁸ was written for the express purpose of creating a consistent terminology, but his ideas often ran counter to the scientific understanding of his time. In a 1985 article, Ingo Titze said: “At almost every voice-related scientific meeting these days, a cry is being heard that we need standardization of terminology, diagnostic procedures, and methods of teaching and evaluation.”²⁹ He offers examples more than solutions to raise an appreciation of the problem. However, thirty-two years later, in 2017, he writes another targeted piece, “Voice Science and Voice Pedagogy Vocabularies: Can They Merge?”³⁰

The details Titze focuses on in these two short pieces are strikingly different because they sit at opposite ends of a long period of transformation in voice pedagogy through scientific integration. Rachel Velarde describes the shift in detail, saying that, by the 1980s, many approaches to voice pedagogy had shifted to adopt a scientific base. The texts written in that time, however, did not reflect those shifts because “publishers and authors did not want to

²⁷ Berg and Vennard, “Toward an Objective Vocabulary.”

²⁸ Reid, “*Dictionary*.”

²⁹ Titze, “Standardization in Voice Research.”

³⁰ Titze, “Voice Science and Voice Pedagogy Vocabularies”

alienate their audience by over-utilizing unfamiliar or intimidating jargon.”³¹ The next decades would see a profusion of literature by more modern pedagogues as well as the creation of vehicles for publishing and study such as the Voice Foundation’s *Journal of Voice* and Titze’s National Center for Voice and Speech. With the stream of research from these organizations, the call for standardized language surged over the first two decades of the twenty-first century. A culmination point came in the 2014 declaration by the AATS, “In Support of Fact-Based Voice Pedagogy and Terminology.”³² More recent articles, notably Hoch and Sandage’s 2017 “Working Toward a Common Vocabulary: Reconciling the Terminology of Teachers of Singing, Voice Scientists, and Speech-Language Pathologists,”³³ have continued the process.

The call for dialogue and reconciliation of language and practice between voice pedagogues and choral conductors also accelerated into the 2010s. In 2001, two years after founding her “On the Voice” series in *The Choral Journal*, Sharon Hansen published an article in the series with collaborators Leon Thurman and Axel Theimer, “The Cart, the Horse, and a Ride in the Choral Countryside.”³⁴ The article details the work and the struggle to bring the choral profession into the fact-based era of pedagogy apace with work in that field. Over the years 2009-2014, Hansen with McCoy, Allan Henderson, Donald Simonson, and Brenda Smith gave numerous presentations and published a series of articles under the heading “Choral Directors are from Mars and Voice Teachers are from Venus.”³⁵ McCoy also published “The Choir Issue, Part 1” in 2011 and part two in 2012 in *The Journal of Singing*.³⁶ All of these pieces addressed specific instructional language and practice and offered suggestions for unification. Subsequent

³¹ Velarde, “Vocal Pedagogy,” 59.

³² Edwin, LoVetri, Douglas, and McCoy, *In Support*.

³³ Hoch and Sandage, “Working Towards a Common Vocabulary.”

³⁴ Thurman, et al., “The Cart, the Horse.”

³⁵ Hansen et al., “Mars and Venus: Top Ten Complaints;” “Mars and Venus: ‘Sing from the Diaphragm;’ Part 1” “Mars and Venus: Sing from the Diaphragm,’ Part 1.”

³⁶ McCoy, “Choir Issue, Part 1;” and “Choir Issue, Part Two.”

articles continue the dialogue, notably Matthew Ferrell’s 2015 “Choral Conductors and Voice Teachers: Finding Common Ground”³⁷ and Miguel Felipe and Maya Hoover’s 2017 “Striking the Balance: Creating and Nurturing Positive Relationships between Voice Teacher and Choral Conductor” in *The Choral Journal*.³⁸ As early in this surge as 2011, Brian Galante says: “the ‘argument’ between choral and voice teachers while certainly nothing new is becoming obsolete as the field of voice science aids both parties in finding a common pedagogical language.”³⁹

Literature Relating Choral and Solo Studied Voice Pedagogy

The pursuit of common pedagogical language and the literature that indicates when and where it has been achieved illustrate an assumption that one pedagogy ultimately contains solutions for both choral and solo singing. Indeed, this assumption forms the root of tensions between choral and solo voice professionals. If both are aspiring to the same goal—that which fully develops the vibrant, healthy, expressive solo voice—there is no room for other desirable sounds and techniques of the choral voice to be considered successful. Those sounds may be equally healthy but differ in a host of ways that require a different pedagogical application. The body of literature describing the differences between solo and choral singing is robust. Much more rare is the documentation of differences between solo and choral voice pedagogy that reflects the need for different application.

Vibrato/Non-Vibrato

The subject of vibrato/non-vibrato references and technique is, far and away, the most addressed. Authors of the majority of this literature write to express deep concern about non-vibrato directives and preference in choral singing. Surprisingly, however, none of the reviewed

³⁷ Ferrell, “Choral Conductors and Voice Teachers.”

³⁸ Felipe and Hoover, “Striking the Balance.”

³⁹ Galante, “Vibrato and Choral Acoustics,” 67.

literature advocates for a whole-sale banishment of non-vibrato use and language. Only the term *straight tone* and its interpretation (by singer or conductor) to mean an unnatural imitation of prepubescent singing is specifically—and appropriately—called out. MacDonald says outright that the era of those instructives is outdated even in the famous cathedral choirs of the UK and that it was, unfortunately, perpetuated by the boom of compact discs and worldwide distribution of those quintessential recordings in the 1980s.⁴⁰ Sublett concludes that “there doesn’t seem to be much valid scientific reason to discourage non-vibrato singing, only an argument in favor of a particular aesthetic choice.”⁴¹ A few authors concentrate on finding common ground by delineating natural vibrato that practitioners may desire in all settings from vibrato that is caused by vocal faults. (Sherburn-Bly in 2007 and Scott McCoy in 2019).⁴² John Nix and his predecessor in vibrato research, Nicholas Isherwood, go further and give comprehensive overviews of types and sources of vocal vibratos.⁴³

Most commonly, authors discuss a spectrum of vibrato and the desired training for singers to acquire the skill to flexibly apply their vibrato for expressive use, both in choral settings and a range of musical genres. Sublett and MacDonald are proponents of this approach, as is Brian Galante. Carter et al.⁴⁴ and Daffern contribute quantitative research in the volitional nature of vibrato and what factors contribute to singers’ agency in this area. Daffern’s study, “Blend in Singing Ensemble Performance: Vibrato Production in a Vocal Quartet,”⁴⁵ links vibrato to blend, another area of regular focus in the literature on choral pedagogy.

⁴⁰ Macdonald, “Refuting Misconceptions I.”

⁴¹ Sublett, “Vibrato or Nonvibrato in Solo and Choral Singing,” 543.

⁴² Sherburn-Bly, “Straight Tone;” McCoy, *Inside View*, 7-8.

⁴³ Nix, “Shaken, Not Stirred;” Isherwood, Nicholas, “Vocal Vibrato.”

⁴⁴ Carter, Hopkin, and Dromey. “Volitional Control.”

⁴⁵ Daffern. “Blend in Singing Ensemble Performance.”

Blend

The subject of choral tone and the subjectivity of blend features an extensive and sometimes contentious array of opinions on vowel matching and modification, vibrato, resonance strategies, volume/intensity, tuning, and balance among voice parts. Blend is unique to the choral culture and an area ready for the benefit of dedicated pedagogy. The 2013 dissertation by Kira Rugen traces the history of choral tone and its evolution in professional choirs from 1970 to the twenty-first century.⁴⁶ Five years prior, in 2008, Amanda Quist's dissertation, "Choral Resonance: Re-examining Concepts of Tone and Unification" worked from a traditional voice pedagogy perspective and the application of *chiaroscuro* and then concluded that "research must include a wider range of aesthetic choices with regard to choral unification."⁴⁷ Much earlier, in 1987, James Jordan introduced a rethinking of blend through new applications of pedagogy. In "The Pedagogy of Choral Intonation: Efficient Pedagogy to Approach an Old Problem," his use of audiation and approach to balance in the ensemble impacts blend and vibrato without the typical instructions that directly ask singers to manipulate their vocal tracts.⁴⁸ Kevin Skelton cites Jordan's approach in 2004 as vibrato and blend continue to be problematic areas, saying "voice teachers would generally argue that choral singing requires technical demands that conflict with those needed to sing as a soloist."⁴⁹ He then notes that, while not advocating poor vocal technique, choral conductors would like more variety in vocal color. The key concept that both authors are raising is the conversion of "conflict" to

⁴⁶ Rugen, "The Evolution of Choral Sound."

⁴⁷ Quist, "Choral Resonance."

Quote taken from the abstract.

⁴⁸ Jordan, "The Pedagogy of Choral Intonation."

⁴⁹ Skelton, "Vibrato and Voice Timbre in Choral Singing," 50.

“difference.” The use of a different pedagogy is possible, but so long as solo voice and choral singing are regarded as a single organism, the optimal blend will never be achieved.

Professional Alignment

There is a notable body of literature showing alignment among choral and voice professionals and agreement with contemporary principles of solo voice pedagogy.⁵⁰ From the choral profession, dedicated articles were collected as early as 1979 (John Davis’ “Choral Tone”) and 1988 (Donald Callan Freed’s “The Words We Use”)⁵¹ in *The Choral Journal*. Sharon Hansen’s research shows that the journal dedicated only two to three articles per year to the voice at any level of focus, and between 1960–2000, just four percent of all articles.⁵² The dissertations of John Weiss (2001), Nicole Lamartine (2003), and Michael Fuchs (2014) dive deeply into the application of fact-based voice pedagogy in the choral setting.⁵³ Weiss focuses on vocal health and Lamartine and Fuchs on the mapping of *bel canto* techniques. Jeffrey Webb published in the *Music Educators Journal* in 2007 on applied principles of vocal health and choral conductors.⁵⁴ Finally, the articles of Duane Cottrell, Lynn Corbin, and Ann Howard Jones, and the 2016 choral methods textbook by Kenneth Phillips⁵⁵ all present comprehensive understanding and alignment with contemporary pedagogy and robust applications for choral singing. In an effort to gather a broader range of perspectives from non-scholarly choral resources, a search of the archives of the *Choral Director* and *Classical Singer* trade journals

⁵⁰ Especially when the publication date is considered in the timeline of pedagogical development.

⁵¹ Davis, “Choral Tone;” Freed, “The Words We Use.”

⁵² Thurman, et al., “The Cart, the Horse,” 47.

⁵³ Weiss, “Vocal Health in the Choral Rehearsal;” Lamartine, “A Curriculum of Voice Pedagogy for Choral Conductors;” Fuchs, “A Conductor’s Guide.”

⁵⁴ Webb, “Promoting Vocal Health in the Choral Rehearsal,” 26.

⁵⁵ Cottrell, “Voice Science in the Vocal Rehearsal;” Cottrell, “Vocal Pedagogy in the Choral Rehearsal;” Corbin, “Practical Applications;” Jones, “Voice Training;” Phillips, *Directing the Choral Music Program*.

resulted in six articles on voice pedagogy over the last ten years. While general in nature, none of them presented instructions that were counter to baseline principles of accepted practice.

Pedagogues that incorporate specific references for choral application range in historical influence from *Provenance* author Stephen Austin⁵⁶ to CCM pioneer Jeannette LoVetri whose 2011 interview in *The Choral Journal* marks an early foray in applications of CCM technique in the choral setting.⁵⁷

Separate Culture

Music Education Researcher Steven Morrison designated school ensembles as overlooked “guardians of their own specific culture,” hiding in plain sight in Western music. Though he does not address pedagogy at length, he says that “it is tempting to consider organizations so historically rooted and tradition-laden ... as ‘outmoded,’ as not in step with new emphases in music teaching.”⁵⁸ His research was substantiated and expanded on two years later by researchers at The State University of New Jersey.⁵⁹ A notable number of authors from solo voice and choral disciplines (many who work in both) also acknowledge a separation of cultures and begin to indicate that this sharper distinction informs the application of traditional voice pedagogy. Fully half of the pedagogy textbooks reviewed by this author, which were limited to the publication dates of 2009–2020, support the mindset of separate cultures. This indication of significant solidarity contributes to this author’s finding that practitioners from both disciplines are once again aligned in foundational ways. Pedagogy textbooks that feature a dedicated choral approach are listed here:

⁵⁶ Austin, “Building Strong Voices.”

⁵⁷ LoVetri and Woodruff. “Contemporary Commercial Voice Pedagogy.”

⁵⁸ Morrison, “The School Ensemble.”

⁵⁹ Adderley Kennedy, and Berz. ““A Home Away from Home.”

- *Prescriptions for Choral Excellence: Tone, Text, Dynamic Leadership* by Shirlee Emmons and Constance Chase (2006), which was not drawn upon for the contemporary study but reviewed for overall approach.⁶⁰
- *Cantabile: A Manual About Beautiful Singing for Singers, Teachers of Singing, and Choral Conductors* by Katharin Rundus (2009)⁶¹
- *The Solo Singer in the Choral Setting: A Handbook for Achieving Vocal Health* by Margaret Olson (2010)⁶²
- *Vocal Technique: A Guide for Conductors, Teachers, and Singers* by Julia Davids and Stephen LaTour (2013)⁶³
- *Choral Pedagogy* by Brenda Smith and Robert Sataloff (3rd Edition, 2013)⁶⁴
- *Choral Music Methods and Materials: Developing Successful Choral Programs* by Steven Demorest and Barbara Brinson (2014)⁶⁵

A *Choral Journal* article, “Building Bridges Among Choral Conductors, Voice Teachers, and Students,” by the choral and voice team at The Ohio State University (Hilary Apfelstadt, Loretta Robinson, and Marc Taylor) was published in 2003,⁶⁶ ahead of many such collaborative conversations and was cited often by other references. While still using the pedagogy of solo voice as the foundation of their bridge, their article went considerably further in describing the technical demands of the choral singers and the need for dedicated attention than authors that followed.

⁶⁰ Chase and Emmons, *Prescriptions*.

⁶¹ Rundus, *Cantabile*.

⁶² Olson, *The Solo Singer in the Choral Setting*.

⁶³ Davids and LaTour, *Vocal Technique*.

⁶⁴ Sataloff and Smith, *Choral Pedagogy*.

⁶⁵ Demorest and Brinson, *Choral Music Methods*.

⁶⁶ Apfelstadt, Robinson, and Taylor, “Building Bridges.”

A summarizer of choral and vocal cultures can be found in the 2017 dissertation of Don Schade, “The Usage of Vocal and Choral Pedagogies in the Choral Rehearsal: Perspectives of High School and Collegiate Choral Conductors.”⁶⁷ Schade’s work, described in chapter 7, delineates cultural differences and needs in detail and conducts a study to investigate the degree to which choral conductors’ and voice teachers’ perceptions about pedagogy differ. In short, he found that they were mainly in agreement. What is of significance to this author is the fact that all of these proponents of a distinct choral culture stop short of the pedagogical next step—that of ascribing areas of difficulty to choral sounds that depart from solo voice and addressing how those sounds might be embraced and taught to singers.

⁶⁷ Schade, “Usage of Vocal and Choral Pedagogies.”

Chapter 3

Statement of the Project

Choral and solo singing are areas of studied voice defined here as parallel rather than homogeneous music cultures in Western society. Both share the building blocks of voice pedagogy and aesthetic but have technical demands that are different enough to require a unique approach and application. The advancements in voice science provide a fundamental understanding of the vocal instrument that can be applied to all vocal sounds, helping practitioners assess and teach them from the perspectives of vocal health and desirability/authenticity of musical style. The majority of language and methodology from solo voice pedagogy, in both classical and CCM aesthetics, is useful for choral singing, either directly or with adjustments for use in a group setting. However, differences that stem from the group setting itself and the nature of choral instruction require modifications that diverge from solo voice application and aesthetic. This dissertation primarily focuses on the language that the two cultures share, first by establishing a contemporary lexicon (Part I) and then by applying it to the choral setting (Part II).

Discussion and analysis presented in this dissertation assume a level of shared knowledge commonly found among voice teachers and choral conductors in the academic setting. The synthesis of language from the Part I comparative study and all applications of that language in Part II may apply to different group settings of studied voice, including choral music education, group voice classes, and to all experience levels of conductors of ensembles in school, church, professional, and community settings. Throughout this document, choral ensemble language and references are used to represent all group settings.

The three objectives of this dissertation are:

1. to conduct a comparative study of language and understanding from current expertise in voice pedagogy and science in the areas of respiration, phonation, and resonance, including selective topics within registration and articulation;
2. to summarize terminology from the comparative study with general recommendations for use among all instructors of singing in solo and choral voice;
3. to delineate differences between choral and solo studied voice cultures, define further modifications to recommended language, and provide guidelines for pedagogical application.

In all sections, the author identifies language and concepts that no longer serve healthy voice production and gives context for any recommended uses of non-scientific language. In Part I, all language that is identified as problematic (e.g., “sing from the diaphragm” or “open your throat”) has been deemed prevalent and systematic by multiple consulted sources. Given the trusted authority of these sources (as delineated later in this chapter), this author accepts that the problems generated by this outdated language are either still actively encountered, or still reputed enough to need the attention of experts in the field. It is beyond the scope of this dissertation to attempt to find and further cite resources of this outdated language or verify the amount of actual current usage. Additionally, through the work of this dissertation, the author illuminates the limitations of language alone to address needs that diverge from solo voice pedagogy. Those limitations and areas of need within the broader pedagogical culture of choral music are defined throughout.

A symbiotic relationship may exist between updated knowledge/facility with current language and a greater sense of shared profession between choral conductors, voice pedagogues,

and voice scientists. Though not a controllable outcome of this dissertation, it is the hope of this author that the provision of this resource will make it more possible for choral conductors to identify as voice professionals who both seek out and embrace a role on interdisciplinary voice teams.

Specific Scope and Limitations

Part One: Comparative Study of Language in Contemporary Voice Pedagogy

A synthesis of language and contextual understanding from current expertise in voice pedagogy and science in the areas of respiration, phonation, and resonance was conducted, analyzed, and summarized. Areas of focus were determined first by including the principal, standardized categories that describe vocal function—actuation, vibration/phonation, and resonance.

The respiratory system is the power source and actuator of the vocal instrument, and the study includes the language of inhalation and exhalation and concepts of breath support or management. Phonation happens through the vibration or oscillation of vocal folds as housed and manipulated by the larynx. The discussion here includes onset, intensity, vibrato, and selected aspects of registration. Resonance occurs as both sound and a sensation, is governed by the shape of the vocal tract, and is dynamically paired with pitch range, registration, and vowel. Discussion includes free and forced resonance, nasality, placement language, timbre and color, and vowel modification.

These areas do not function independently, and the discussion of aspects that could be included under more than one heading is determined by the context and flow of the study. Additionally, areas are not covered comprehensively or with the aim to explain the functionality found in pedagogy textbooks. Rather, they are dictated by (1) instances where scientific

understanding and language have changed significantly in the twenty-first century; (2) the demand for change or reconciliation as determined by contemporary conversations between voice specialists; and (3) areas of particular concern for choral singing.

Three areas of note were not chosen for in-depth focus for this dissertation: posture/alignment, articulation, and cognitive science. Elements from each of these three areas are included where inextricable from discussion in Part I, and where of particular importance in group settings in Part II. The decision to not include posture/alignment and articulation stemmed from the percentage of focus in consulted sources, particularly in those focused on areas in need of reconciliation, and because there has been relatively less change in these areas than in the chosen areas over the last ten years. It is important to state that attention and instruction regarding posture and alignment provides an essential foundation for all other areas of voice production. Cognitive science is the newest frontier of research and practice in voice science and pedagogy. Significant information from this research is transforming the field related to learning, memory, and attention, areas that form a “triumvirate”¹ of knowledge-bases that impact singers’ emotional, physical, and mental understanding and well-being. Given that the contributions of cognitive science are new additions to the literature, there is no basis in this area for a comparative study.

Language collected for comparison is reported with the goal of total objectivity. Direct quotation is used often, and where paraphrasing is unavoidable or the most expedient, descriptions prioritize efficiency and reflect the tone and intent of the source. Comparisons are made with the intent to identify agreement and discord rather than right versus wrong.

¹ McCoy, *Inside View*, 283.

Given an intangible instrument, a field where both artistry and technique hold sway, and a master/apprentice tradition where individual method has been cultivated and cherished for centuries, comparative studies in voice pedagogy are not new. The study contained herein is defined by its linguistic focus and strictly limited to reflect current conversations among experts at the intersection of voice pedagogy and science. As such, sources consulted have been restricted by author and by date following the parameters detailed below:

1. Contributors must be considered prominent. Prominence is determined by the number and nature of references and citation, publication type and scholarly standing, and qualifications or achievements of the author themselves, including the position of leadership and authority they hold. Examples include members of the highly selective, national AATS organization, authors of widely regarded textbooks, presidents of professional organizations and editors of those organizations' publications, and nationally recognized practitioners.²
2. Contributors must be active professionals in the field within the last ten years, and specific contributions are restricted to a publication year of 2010 and forward, with the following exceptions:
 - a. Where information/concepts originating prior to 2010 are cited by a contemporary source as currently accepted practice and understanding. In these cases, the language used for comparison is generally taken from the citation of the contemporary source. The original source has not been consulted unless clarification or context is necessary to convey the meaning or basis of comparison needed for the study. Where the original source is consulted, language taken from

² List of exact contributors and their credentials (reasons for inclusion) can be found in Appendix B. Sources consulted are marked with an asterisk in the bibliography.

that source has been narrowly constrained to the scope of the content cited by the contemporary source.

- b. Where current pedagogical language is the direct continuation of language established before 2010 by the same source or with evidence of direct lineage. In these instances, older sources have been consulted to present origin and maintain continuity for a given concept.

Respiration, phonation, and resonation are addressed in chapters 4, 5, and 6, respectively. Within each, discussion begins with the categorical terms and concepts that govern the overall system of each area. In the specific topics that follow, an overview of contemporary understanding emerges with the linguistic focus of the research evident in two ways:

- 1) Descriptions of function within each area of focus are written in contemporary language and to the degree necessary to summarize current practice. While each description is not intended to be comprehensive and much is omitted, enough is included to comprise the workings of the system as a whole.
- 2) Inclusion of each specific topic is driven by the need to address linguistic changes, both where modernization has occurred and where language of concern has been identified in the consulted sources. These factors influence the proportion of focus given to any given topic. Terminology and direct instructive phrases taken from the source material are italicized for emphasis. Within a given section, these terms and phrases are italicized upon first use, but not again within the course of that section.

The summary of terminology with current recommendations for use appears in the form of a table following each chapter. Included with recommended language are terms, phrases, or

instructions that were explicitly cited by sources with the intention of raising concern and offering more acceptable replacements. All terms and phrases listed in the left columns of the summary tables (tables 1, 2, and 4) are considered ubiquitous in the practice of voice pedagogy and would likely be recognized broadly by voice pedagogues and choral conductors. Some terms and phrases have been taken directly from consulted sources, but unless specifically cited, those sources have presented the terms as part of the common lexicon. The table is organized into categories as dictated by the subject matter and flow of the preceding chapter. Within each category, the phrases are organized and coded in descending order of recommended use.

Part II: Contemporary Language in the Choral Setting

Chapters 7 and 8 expand on outcomes from the comparative study in two ways—adjusting and applying the summarized language to the choral setting and defining the limitations on that language because of the differences of that setting. Demands unique to the nature of ensemble singing and the needs of choral conductors are examined, and a guide created for translating and updating the language and associated concepts presented in Part I. While the entirety of Part II of this dissertation may apply to all group settings of studied voice (e.g., classroom music instruction and group voice), the choral setting is the intentional focus, and choral language and references are used.

In chapter 7, choral studied voice is defined as a distinct culture. A brief overview of history and background is included to contextualize the sound ideals that emerged from distinct choral schools in American Western music and the lineage of communal music in America. Embedded within these tonal preferences are many origins of the language, aesthetic, and specific technical elements that are central to the choral culture. This history also shows areas of convergence and divergence of focus between choral and solo studied voice. Subsequent sections

then describe the attributes and demands of choral singing from the perspectives of nature and setting.

A separate body of resources was consulted to substantiate the writing in chapter 7. The history, nature, and setting sections were researched using the work of contemporary choral practitioners with the same restrictions on prominence and recency of work as used for the comparative study.³ The only exception to these restrictions is the inclusion of historical authors (e.g., Howard Swan) whom practitioners agree are the authoritative summarizers of choral history, including the lineage of sound ideals. As noted in the review of literature, an abundance of sources is already available for comparisons of solo and choral voice technique—in broad overview and technical detail. In this chapter, the objective is not to discuss differences of setting and nature in detail, but to give a foundation for the needs and adjustments of choral pedagogy addressed in the following chapter.

In chapter 8, the contemporary language presented in the comparative study is examined for use in the choral setting. An overview of shared language from each chapter of the study (respiration, phonation, and resonance) is presented, followed by specific terms and phrases that need further alteration for use in group application. In the second section, Top Takeaways for Choral Language, four salient broad themes of instruction that are directly impacted by linguistic choices are discussed. In each of these four themes, detailed examples of recommended pedagogical instruction are offered. Though not intended to be comprehensive, the set of phrases examined and takeaways offered cover a general array of concepts as well as specific concerns cited in articles that document tensions and attempts at reconciliation between choral conductors and voice pedagogues. These articles are also the inspiration for the chapter 8 section on

³ The choral pedagogy sources consulted are those detailed at the end of the chapter 2 Review of Literature that directly address history, nature, and pedagogy specific to the choral setting.

guidelines for effective communication, which is written from a broader perspective of the studied voice environment. Here, points of understanding and the impact of informal language are observed through five categories of systemic understanding—athleticism, interdependence, kinesthetics, vocal health, and this author’s recommendation of parallel cultures. These guidelines transcend specific language and endorse more global communication skills that foster understanding among voice professionals in all disciplines.

Additional Limitations

As stated above, areas of voice production are not covered comprehensively or with the aim to explain functionality at the level found in voice or choral pedagogy textbooks. This dissertation is not intended to develop pedagogical concepts or draw conclusions about the future of pedagogical terminology. In some areas, the nature of future advancement, particularly in areas of phonation and resonance, is deeply reliant on the use of technology. In others, the shift of language is the result of knowledge and analysis from acoustical physics. It is beyond the scope of this dissertation to fully disseminate these areas of study, expand the lexicon of language to include comprehensive definitions of acoustical terms, or include guidelines involving the use of technology in studied voice environments.

As outlined in the introduction, the studied voice cultures examined in this dissertation are those that are prominent in Western music. Narrowed further, these cultures are limited to the classical and CCM aesthetics that form the foundation of the professional associations for teachers of singing and choral conductors in the United States. All forms of Western classical singing are generally addressed by these associations as well as musical theater and elements of rock, pop, jazz, and other CCM styles. The foundational pedagogical practice and scientific basis for singing in these styles may well apply to other aesthetics of Western music culture (e.g.,

gospel singing) and singing in non-Western cultures. Those applications, however, have not been acknowledged in the consulted sources.

It is most important to note that all sources consulted come from the scholarly work of expert practitioners in predominantly academic environments. As noted in the Review of Literature, an exception was made to consult two choral trade magazines in the effort to determine the alignment of pedagogical understanding outside of academic and professional chorus circles. The practices and state of language and understanding in the majority of church and community choirs have not been pursued further and were not represented (or identified as such) in resources other than the statistics taken from Chorus America Impact Studies.

Part I

Comparative Study of Language in Contemporary Voice Pedagogy

Chapter 4

Contemporary Understanding and Language of Respiration

Instruction on breathing for singing and descriptions of the mechanism are highly subjective and varied throughout both historical and contemporary pedagogy. Scientific advancement has provided detailed knowledge of the muscles involved in inhalation and exhalation, the possibilities for exchanges of control between autonomous and volitional processes, and, more recently, the role and origin of the nervous system and mindful, emotionally connective breath impulses. A growing body of research in two directions is further defining nuances of breath coordination—the interdependence between systems (respiration, phonation, resonance) and the increasingly known variety of individual breath strategies dictated not only by preference and theory, but also by body type, gender, and aging of the instrument. In both areas, the same advancements that clarify the workings of breath also make complete understanding more elusive.

In comparison to phonation and resonance, areas where scientific advancement has radically changed contemporary focus and language, the vocabulary of respiration requires a more complex historical review and discernment process. Some of the oldest terminology has new popularity that may be applicable yet is laden with centuries of meaning that can become confusing. Terminology from relatively more recent times and scientific basis has become entrenched and problematic. The influence of acoustical physics and medicine has made the language of phonation and resonance less familiar to practitioners who received their training in the twentieth century; however, this shift is arguably more concrete than the language of

respiration. Therefore, the learning curve for updating knowledge and pedagogical language as presented in chapters 5 and 6 may be steeper, but more compartmentalized.

Reflecting the complexities noted above—the shifting influence of historical pedagogy, the nuances of an interdependent system trapped between autonomous and volitional function, and the uniqueness of individual vocal instruments—the analysis that follows includes both specific linguistic shifts and context for those shifts that are important to understanding the basis of language in contemporary voice pedagogy.

Categorical and Systematic Terminology

Breathing is a fundamental area in any discipline involving the voice and is almost always addressed as a separate category of focus. Even the labeling of the category, however, is inconsistent throughout pedagogical sources. A select list from consulted sources within the last ten years includes: *breathing*, *breath control*, *respiration*, *breath support (appoggio)*, *airflow*, *air compression*, and *respiratory kinematics*. In fact-based literature, breath is now often labeled the *power source* or *actuator* of the vocal instrument. These labels help to neutralize the voice as an instrument without connection to a particular philosophy or genre and as part of a mechanical system that requires power or actuation.

The terms for the overall respiratory process for singing have also progressed over time and have never found unanimous endorsement. *Breath management*, *breath coordination*, *breath control*, and *breath support* all have been widely used. Of the four, breath support is the most controversial, and many pedagogues categorically eliminated the term decades ago, believing it conveys a muscular action that is too strong or rigid. However, Scott McCoy, arguably America's leading pedagogical voice, chooses to contextualize rather than eliminate the term. He broadly defines breath support as “the dynamic interactions between the respiratory system,

larynx, and vocal tract that enable singers to produce their desired sound”¹ and notes that key to this definition is both the variability and interdependence of the concept. McCoy also agrees with James McKinney² in delineating breath support as a pulmonary function and breath control as a laryngeal function, specifically the efficiency of regulated airflow through the valve of the vocal folds. Support enables the production of sounds and control enables the sustaining of sounds.³

Outside of McCoy’s reclaimed language of control and support, the terms breath management and breath coordination appear to be comprehensive labels with the least amount of negative connotation. All authors address the two fundamental components of inhalation and exhalation; however, some add the concept of *coordination*, *readiness*, or *suspension* between inhaling and exhaling as a separate step in the cycle.

The Enduring and Debated Term of *Appoggio*

Before moving to language of either inhalation or exhalation, the linguistic predicament of *appoggio* must be addressed. This simultaneously ancient and modern term originated with Lamperti and the tenets of *bel canto* singing in the Italian school. It has risen and fallen in popularity and understanding and has seen a resurgence in the twenty-first century. However, while *appoggio* is referred to in declaratory fashion by most modern sources, there are multiple definitions or concepts declared as well as several renowned pedagogues who regard the term as too broad or confusing.⁴

¹ McCoy, “On Breathing,” 321.

² McKinney, *Diagnosis*. McKinney’s resource was not analyzed as part of the comparative study as its date of publication is outside of the set contemporary parameters, however it is cited often by contemporary practitioners.

³ McCoy, *Inside View*, 131.

⁴ Han, “Principles of *Appoggio*.” Though not included in the comparative study, a 2018 dissertation includes a survey of 26 successful, young opera singers and asks them directly about their understanding of the word *appoggio*, origin for that understanding, and specific descriptions of breathing technique. Each answer is a wealth of differing terminology and concept.

James Stark, author of *Bel Canto: A History of Vocal Pedagogy*, concludes that the Italian word *appoggiare* had two specific applications for singing—“muscular antagonism between the inspiratory and expiratory breathing muscles” and the role of the larynx in “‘damming’ the breath by means of glottal resistance.”⁵ Both of these applications take place in the exhalation phase of breathing (synonymous with phonation) and, indeed, are addressed in detail in the exhalation section below. Richard Miller, both as teacher and historian, endorsed this understanding and helped bring the term back into more prolific use. Pedagogues Shirlee Emmons, Jack Coldiron, Cynthia Hoffman, Matthew Hoch, and Duane Cottrell all indicate this use of *appoggio* in their writings.

A second definition (or sometimes additional component) of *appoggio* situates the term as a descriptor of inhalation—the use of both contracted thoracic muscles and released abdominal muscles to create a *balanced breath*. McCoy uses the term in this way as does Stephen King, and co-authors Matthew Hoch and Mary Sandage in a *Journal of Voice* article on reconciling terminology.⁶

International pedagogue Janice Chapman suggests that *appoggio* has been confused over the last fifty years through applications that are synchronous with *lutte vocale*, another *bel canto* era term for the “vocal struggle” that is generally used only to refer to the muscular antagonism that occurs during exhalation. Miller’s historical accounts say that the two are analogous, that *lutte vocale* is a result of *appoggio*,⁷ but Smith and Sataloff⁸ say the opposite - that *lutte vocale* is the basis for *appoggio*. Finally, a 2018 diction textbook that compiles glossaries of Sataloff,

⁵ Stark, *Bel Canto*, 92-93.

⁶ Hoch and Sandage. “Working Toward a Common Vocabulary.” This article describes *appoggio* as a physiologically specific strategy for inhalation (either “pear-shape-up” or “pear-shape-down” in the language of Ingo Titze). Hoch, however, in other publications (Hoch, *Dictionary*), extends use of the term to balancing muscles of inhalation and expiration.

⁷ Miller, *Art of Singing*, 77.

⁸ Sataloff and Smith, *Choral Pedagogy*, 130.

Smith, Sundberg, and Titze includes the following definition of *appoggio*: “Translated as ‘support,’ in the terminology of vocal technique, refers to the point of *appoggio*, whether it be of the abdominal or the thoracic regions, where the maximum muscular tension is experienced in singing (*appoggio* at the diaphragm; *appoggio* at the chest).”⁹ While this definition is dated in many ways, it introduces the concept of shifting points of *appoggio*, which can make sense with the general meaning of the word or larger concept but adds still more angles that evade a consistent meaning among voice professionals.

As evidenced by these descriptions and more, a conclusive definition of *appoggio* is not possible. Even if it were, for this author to choose a preference between or subjectively interpret the broad and conflicting writings of contemporary experts goes beyond the statement of this project and the goal of neutral reporting. What can be asserted is as follows:

1. *Appoggio* stems from the Italian word *appoggiare*, meaning “to lean.”
2. In singing, it refers to muscular antagonism (or dynamic balance) *within or between* the respiratory, phonatory, and resonatory systems.¹⁰
3. Use of the term is broad and inconsistent. While many pedagogues endorse the concept of *appoggio* as a teaching tool, it is important for each teacher/conductor to acknowledge that multiple definitions exist and establish specific context for their use of the term.

Language of Inhalation – Part One (Within the Torso)

McCoy provides an apt description of the state of language around inhalation:

We have been advised to inhale into our toes, pelvis, lower abdomen, solar plexus, lower back, back ribs, epigastrium, stomach, chest, and of course, the bottom of our lungs. (I particularly like this last item—next time you blow up a balloon, try filling it from the

⁹ Smith, Brenda, *Diction in Context: Singing in English, Italian, German, and French*, preview, (San Diego: Plural Publishing, 2019), 289. Book unavailable, but definition found in online preview at <https://books.google.com/books?id=FxLADwAAQBAJ&q=appoggio#v=snippet&q=appoggio&f=false>

¹⁰ This definition is a modification of the Miller’s broad definition in his 1986 *Structure of Singing* as reported by Hoch, *Dictionary*, 13.

bottom up.) We then manage our inhalation by releasing the abdomen and moving it outward, tightening the abdomen and pulling it inward, taking the biggest possible breath at all times, taking the smallest possible breath at all times, lifting the chest, relaxing the chest, opening the back, opening the shoulders, sniffing a rose, or by doing nothing special at all—you already are alive, therefore, you already know how to breathe correctly.¹¹

Pedagogues divide into distinct factions of opposing terminology and instruction on inhalation ranging from specific anatomical understanding to language of reflexive response and emotional/artistic inspiration to assertions of no specific instruction whatsoever. The latter two groups promote the instinctual connection of autonomous breathing over conscious, physiological control. A few claim to avoid instruction entirely,¹² though they are by far the minority, and the language they do use often reveals a shared philosophy with those who endorse instinctual/emotionally-connective approaches. Within this faction are those who say that inhalation should be predominantly *informed by thought*, or inspired by *the need to say*,¹³ instincts which will regulate the quality and quantity of the breath. Several modern pedagogues expand this extensively into the area of primal sound, warning that more physiological instruction may lead to overbreathing and introduced tensions or inability to reflexively release abdominal or core muscles. Primal sounds are those that are triggered, produced, and coordinated holistically by natural body responses. Examples include the cries of an infant or yelps of surprise or pain. Using these instinctual responses to model efficient vocalizing is a fundamental component of Jo Estill’s methodology and Ken Bozeman’s use of affect. For Janice Chapman, primal sound is one of three “core components” that explain the vocal process. In her words,

Using primal sound gives the singer access to the basic coordination available from the emotional motor system. With primal sound as our base, pedagogical instructions of breath

¹¹ McCoy, “On Breathing” 322.

¹² Blades *A Spectrum of Voices*, 21. Most who report this philosophy note that they instruct on breathing only when substantial problems present in the singer or only after significant study. Others have chosen to remove themselves from the standard language of breath, i.e., Meribeth Bunch Dayme, who shifted her philosophy in her last years to a holistic concept of singing in which breathing was referred to as “dynamic balance.”

¹³ Hoffman, Keenze, and Saunders Barton in Blades, *Spectrum of Voices*.

that contradict or countermand this basic connection, involving instead use of the conscious brain, for example, ‘Take a big breath,’ ‘Expand your rib cage and hold,’ ‘Fill your whole body with air,’ and so forth (in essence any type of overbreathing), will probably be counterproductive. The coordination from the emotional motor system synchronizes the muscles required for breathing to take in sufficient air for the task.¹⁴

Muscular language and anatomical observations may also be used by these pedagogues, but always within the context of prioritizing the “intelligence” of autonomous breathing and the emotional motor system.

The faction of those who promote specific, anatomical language for inhalation is, in itself, broad, varied, and contentious. The most divergent subject concerns *where* inhalation is perceived and *what* specific thoracic and abdominal muscles are involved. In the broad perspective, teachers of classical voice agree that clavicular breathing is insufficient, and most modern instruction advocates for a combination of thoracic¹⁵ and abdominal breathing, often called a *balanced breath* (which some say is the definition of *appoggio*). Specifically, these terms usually mean a simultaneous contraction of the diaphragm and external intercostal muscles, also called *diaphragmatic-costal breathing*, combined with a release of the abdominal wall of muscles. It is still common, however, for pedagogues to prioritize or even singularly focus on either the thoracic (lifted sternum and expansion of the rib cage) or abdominal (expansion in the abdomen and lower torso) component of the inhalation. The divide between these schools of thought is long-established in pedagogical history, documented by Richard Miller in his 1997 *National Schools of Singing* research (*up-and-in* vs. *down-and-out*) and again by Ingo Titze in his 2000 *Principals of Voice Production* (*pear-shape-up* vs. *pear-shape-*

¹⁴ Chapman, *Singing and Teaching Singing*, 19.

¹⁵ The term thoracic breathing is generally used to mean breath activation within lower chest, the main body of the thorax or ribcage. Breathing from the upper chest is referred to as clavicular breathing.

down).¹⁶ These differing inhalation priorities, even when a balanced breath is the ultimate intent, have produced a considerable body of language and non-verbal gesture that traverse the torso—front, sides, and back, and from sternum to pelvis.

In addition to *where* and *what* language and instruction, there is variation in *how* to inhale and *how much* breath is needed. The linguistic battleground of how to inhale has centered around the imagery of how air enters the lungs—filling them from the top down or the bottom up—as well as the nature of inhalation—whether to *suck*, *gasp*, *gulp*, *take*, *invite*, or *allow* breath. The former has been eradicated in contemporary literature with the understanding that there is no way for air to enter the lungs other than from top to bottom. However, Deirdre Michael still listed *lungs fill upwards* as a pervasive myth in a 2010 article,¹⁷ and Elizabeth Blades reported many confusing variations on *bottom* versus *top* language regarding the lungs among the prominent teachers she interviewed.¹⁸ Sucking, gasping, and gulping seem to refer to the noise of inhalation, which is related to what is happening in the throat (addressed in Inhalation Part II below). Taking, inviting, and allowing seem to revisit the approaches of autonomous versus volitional breathing and are meant to encourage singers to acknowledge the natural response of the lungs to the vacuum created by exhalation. This language is counteracting a propensity to overbreathe.

The spectrum of language that quantifies *how much* breath to take ranges from proponents of small *sips*, *snaps*, and *ticks* of breath to those who advocate large breaths described as *full*, *deep*, and *to the bottom of the lungs*. Many contemporary pedagogues do not address the amount of breath specifically and, when they do, are often meaning the quality of the

¹⁶ Titze, *Principles*, 82. All four terms are drawn from Titze's text, but various references to *up-and-in* and *down-and-out* schools appear to be summarizing the national schools work of Richard Miller.

¹⁷ Michael, "Sing from Your Diaphragm," 547.

¹⁸ Blades, *Spectrum of Voices*.

breath as it relates to the quantity. For example, the primal connection of a surprised breath indicates a small, sharp intake. Among teachers concerned with fullness of breath are those who continue to be proponents of imagery language that metaphorically sends breath to anatomically impossible places (e.g., to the pelvic floor or down to the toes). These images are often connected to mindfulness or a sense of grounding and may be useful in that regard.

Contemporary pedagogues, however, always recommend that singers understand the fact-based mechanics of breathing before using any imagery that can contradict anatomical function and establish metaphors only within that context.

By and large, the language of *big breaths* has fallen away in most professional settings outside of technical reports of lung capacity and amount of breath generally taken in for singing versus speaking. Instead, pedagogues recommend words such as *satisfying* or *low and easy*, along with descriptions of a combined thoracic expansion and abdominal release that indicate a substantive breath. One exception seems to linger—the *take a big breath* instruction that has long been a part of the choral lexicon. This phrase, sometimes abbreviated as “BB,” is seen as a marking in countless choral scores. How much contemporary choral conductors use it is hard to substantiate, but the available literature falls into two categories—choral pedagogy texts that emphasize only full, deep breathing, and reconciliation articles between choral and voice professionals that address breathing “mistructions,” including excessive ideas about support and diaphragmatic breathing.

Reception of all language (where, what, how, and how much) in studied voice, across solo and choral settings, is highly conditioned by other factors of context and environment:

1. Both teacher conveyance and student understanding of accurate body-mapping and the nature of true/false kinesthetic sensations¹⁹ radically impact interpretation. In respiration, the two areas most impacted by these factors are the role of the diaphragm and the concept of an open throat, both of which are discussed in more detail below.
2. Hyperfunctioning or hypervigilance, either in specific muscle response or in general physical effort, can result in unintended consequences in addition to the desired result. Instructions using language of *keep*, *hold*, and *stay* are common, and diligent students can easily take these concepts too far, sacrificing the *dynamic balance* (Bunch's terminology), flexibility, and natural relationship between phases of exhalation and between breath and phonation, both of which are discussed in subsequent sections. The summary table (table 1) at the end of this chapter offers language replacements for these words.
3. New and continuing research on the relationship between individual singers and optimal breathing strategies has emerged. Titze incorporated research from Hoit and Hixon (1986) that body type (endomorph vs. ectomorph) may inform which of his pear-shape-up or pear-shape-down strategies are optimal.²⁰ Since then, McCoy has detailed the differences that gendered anatomy has on breathing strategy.²¹ He and many contemporary pedagogues stress that individual variability has become of utmost importance for teachers. Often cited is the 2009 research of Collyer, Kenney, and Archer

¹⁹ Bozeman, *Kinesthetic Voice Pedagogy*, 79. Kinesthesia is defined as “a person’s sensory awareness of how body parts are situated, how joints are articulated, and how movement functions.”

²⁰ Titze, *Principles*, 82. A third body-type, mesomorph, has since been added in the texts of more recent pedagogical writers. The three terms are from somatotyping, a method of describing body shape and composition through the degree of adiposity or fat distribution (endomorph), musculo-skeletal development (mesomorph), and slenderness/linearity (ectomorph). (understanding gleaned from Stewart and Sutton, *Body Composition in Sport, Exercise and Health*, 87.)

²¹ McCoy, *Inside View*, p. 134.

on the kinematic response of five individual singers to different breathing instructions.

Quoting from that research,

Studies of singers' kinematic strategies have shown that the individual singer shows strong consistency in basic kinematic pattern. However, each singer's basic pattern is distinctive, with enormous variability between singers ... It seems reasonable to assume that singers with different kinematic strategies would respond differently to the same kinematic instruction.²²

These contextual and environmental factors play critical roles in all areas of voice production addressed in this dissertation and are referred to in future sections. Staying within the discussion of inhalation, they provide a basis for examining perhaps the longest-standing linguistic and pedagogical juggernaut of singing—the mythological and actual role of the diaphragm.

The Diaphragm: A Case Study of How Language Becomes Legend

Sing from the diaphragm, along with an array of similar phrases and extensions of the concept, is an example of language that has become both epidemic and recalcitrant—unmoored from its origins and widespread as folk psychology, as well as resistant to a flexible understanding that shifts with advancing knowledge. Despite countless revisions and refutations to diaphragmatic language among voice professionals, even the most blatantly erroneous instructions advising singers to *take air into their stomachs* and *drive* or *push* sound out from the diaphragm crop up at all levels of training, from the academic classroom to the YouTube tutorial. Why is this language so entrenched, and why is that entrenchment a problem?

The latter question is simpler to address. First, though research continues to explore any volitional capacity of the diaphragm upon exhalation,²³ the accepted contemporary

²² Collyer, Kenny, and Archer, "The Effect of Abdominal Kinematic Directives," 100.

²³ A series of studies in the 1980s demonstrated that some diaphragmatic contraction may occur after inspiration, particularly with the unusual demands of breathing for singing. These studies cause some to question the inhalation-only role of the diaphragm, however the experiments had several limitations and the field, as represented by the

understanding is that the diaphragm is active on inhalation only. In exhalation, it is in a stage of passive, elastic recoil that can be slowed by the antagonism of other muscles. Therefore, any instructions to employ the diaphragm directly in exhalation will create an impossibility for the singer that results in unnecessary tension and misplaced kinesthetic sensation. It is also important to note how contemporary this understanding is. William Vennard, whose work launched the “fact-based era” of voice pedagogy and whose textbook was the primary resource for most pedagogy classrooms until well into the 1990s, “maintained, as did Francesco Lamperti before him, that the diaphragm is the chief antagonist [*sic*] of the inspiratory muscles.”²⁴

Kinesthetic understanding is the basis of another problem with entrenched, erroneous diaphragmatic language—the perpetuation of a distorted body map. Verbal and non-verbal descriptions of the diaphragm consistently indicate a lower position and a larger range of motion than is accurate. If offered without further context, singers conflate the diaphragm with the stomach, mistake displaced viscera for air, and believe the muscle moves several inches with each breath rather than a handful of centimeters.²⁵ Again, these misconceptions lead to unnecessary tensions, postural positions, and muscle recruitment that hinder efficient, healthy singing. These problems are enhanced by the fact that the diaphragm is not a muscle over which humans have direct, conscious awareness and control. It cannot be touched externally, and it has no sensory nerves attached to it. These facts make it easier and more problematic to erroneously assign motion and sensation to this fundamental breathing muscle that go beyond its actual role.

consulted contemporary sources, has not acknowledged any significant change in the overall designation of the muscle. In addition, the diaphragmatic language that is of concern stems from general use that far predates these studies. (Informed by Titze, *Principles*, 81-82 and McCoy, *Inside View*, 124.)

²⁴ Stark, *Bel Canto*, 114.

²⁵ “One-and-a-half centimeters during quiet breathing to as much as six or seven centimeters ... during deep breathing.” (McCoy, *Inside View*, 123.)

Why erroneous diaphragmatic language is entrenched and popularly employed far beyond the bounds of studied voice environments is a more complicated answer and one that is fascinating from a linguistic perspective. Explanations about this single component of breathing have been sensationalized by way of a critical mass of unique, often clichéd human behavior. First, from a cluster of behaviors around information: a little is a dangerous thing, the power of coveted information, and the “curse of knowledge.”

Addressing the first two in combination—diaphragmatic language has been synonymous with expertise since the rise of the virtuosic singers of the *bel canto* school. However, the phrase, “sing from the diaphragm” has become so common that it is widely quoted as though it is understood by the general public. The Knights of the Round Table in *Monty Python and the Holy Grail* sing confidently, “We’re opera mad in Camelot. We sing from the diaphragm a lot.”²⁶ This adage is, at once, a “simple” piece of information and one that indicates knowledge of a coveted or specialist nature. The abstractness of the phrase enhances the mysterious, proprietary nature at the same time that it purports to offer instruction. This attractive mystery combined with the soundbite ease of the phrase may be a reason that lengthier, more comprehensive context has not kept pace. For a portion of the amateur public, it may not be too much of a generalization to say that the more accurate facts are not really of interest. People can extrapolate meaning and set of sensations that are empowering even if incorrect.

Related to the power of coveted information, particularly when kept abstract, is the power of promise. So many people dream of being a better singer, and any information that demystifies the “golden instrument” could almost be considered proprietary—owned by some and not by others. The advice to sing from the diaphragm is presented as a key that unlocks the power of

²⁶ *Monty Python and the Holy Grail*, 1975.

good singing. It is a Pierian Spring²⁷ that aspiring singers have been told will confer ability and, literally, inspiration.

Third in this cluster of behavior around information, is the “curse of knowledge” that the professional voice user and teacher can fall victim to at times when they should comprehensively explain the diaphragmatic role. As explained by Melissa Treinkman in a 2019 *Mindful Voice* column, “the brain of the expert and the brain of the novice activate so differently, especially when engaging in problem solving activities, it seems natural that the expert brain takes shortcuts that the novice brain is not wired to take.”²⁸ In essence, the professional forgets the need to explain knowledge that has, to them, become basic and ingrained. As evidenced by her own experience, the author of this dissertation proposes that this curse may also deter professionals from realizing the need to update their expert knowledge or, as new information is acquired, to update their language and gesture appropriately.

Another cluster of human behavior that plays out in diaphragmatic language is a combination of categorical thinking, reactionary hyperbole, and the psychology behind the telephone game of communication. The first two combine as voice teachers and conductors convey that the feeling of breath should be lower than shallow, clavicular breathing. For decades, the concept of both abdominal release and diaphragmatic schools of breathing (down-and-out, pear-shape-down philosophy) led practitioners to use words and gestures that intentionally shift to an exaggerated low abdominal focus, rather than the more moderately lower, under the ribs location where the diaphragm is actually situated. Two commonly heard instructions defined the extremes of breathing technique, often leaving out the middle: *don't raise your shoulders* and *take a deep breath*, accompanied by indications to the lower abdomen. “Telephone game”

²⁷ A forbidden source of knowledge in Greek mythology.

²⁸ Treinkman, “Lifting the Curse of Knowledge,” 337.

communications (in this case, simply passing along what one was taught) from either of these extremes have led to an array of misconceptions, ranging from well-educated singers believing that the diaphragm lies lower in the torso than it does²⁹ to 2019 YouTube videos of “How to Sing From Diaphragm a.k.a Stomach.”³⁰

In the ways described above, diaphragmatic language from the world of singing has become legend—coveted and recalcitrant—perpetuated by public-speaking experts, yoga instructors, and meditation retreat leaders, in addition to casual singers and choristers. Other concepts in singing have suffered from false kinesthetics, over-simplified rhetoric (or categorical thinking), and the desire to unlock mysteries. Instructions to *open your throat*, *drop your jaw*, or *raise your palate* all come to mind, but none has the lineage or distinction to match the legendary status of sing from your diaphragm.

Language of Inhalation – Part Two (Above the Torso)

There are two components of inhalation above the level of the torso that are prominent in contemporary pedagogy and impacted by linguistic choices: open-throat directives and the transitional step between inhalation and exhalation, including pre-phonatory acoustical postures.

Open Throat Directives

Scientific imaging and body-mapping are providing more clarity for directives to *open your throat* that are common and of concern in voice pedagogy. While an open, unconstricted throat is, indeed, optimal, these instructions indicate an action that is not directly possible because there are no muscles that directly open the throat—all pharyngeal muscles are constrictors. It would be more accurate to use language that encourages the release of constriction and comfortable, open

²⁹ McCoy, *Inside View*, 122.

³⁰ “How to Sing From Diaphragm a.k.a Stomach,” BecomeSingers.com, 2020.
<https://www.becomesingers.com/techniques/how-to-sing-from-diaphragm>

space. However, there is difficulty with the perception of openness that needs to be unlearned and remapped because humans’ “kinesthesia (sensory awareness) of throat space is misleading—in fact, it is exactly backward.”³¹

In addition to *open your throat*, common instructions include *yawn* and *yawn-sigh* language and asking for singers to create *more space in the back*. All are in an effort to lower the larynx and create the convergent megaphone shape of the vocal tract for classical singing.³² In response, the teacher will often hear a noisy inhalation, and the singers will feel cool air in the back of the throat. This cooling sensation is created by an increase in airspeed at the narrowest part of the throat, indicating that the bulge of the tongue is, in fact, creating a more constricted rather than more open throat. A truly open throat will have a fronted tongue and a noiseless inhalation. From Bozeman, “If you ask a group of people which vowel *feels* [emphasis Bozeman] the most open-throated, most will cite /a/, or which vowel the most closed-throated, most cite /i/. This is indeed the way it feels ... paradoxically the throat is rather narrow in the /a/ and at its most open posture with the vowel /i/, primarily due to the difference in tongue shape and tongue fronting of those vowels.”³³ This false kinesthesia leads to an inaccurate body map where “the back wall of the throat seems to be located further back than it actually is—as if it is behind the ears. If while inhaling we remap our concept of the back throat wall to its actual location in front of the ears, we will have fronted the tongue and opened the throat.”³⁴

A more recommended and often-used image is that of the *inner smile*, which Bozeman says is better described as a *pharyngeal grin*. The smile refers to the feeling of lift in the palate when suppressing a laugh or feeling inwardly amused or pleased with oneself. The *bel canto*

³¹ Bozeman, “Remapping the Open Throat,” 184.

³² Laryngeal height and megaphone analogies are discussed in more detail in chapter 6.

³³ *Ibid.*

³⁴ *Ibid.*

image of *inhaling the fragrance of the rose* is believed to be parallel. This affective posture stabilizes the palate height and length, keeps an inverted megaphone sensation (further described in chapter 6), and “open[s] and stabilize[s] the throat in a favorable poise.”³⁵

Transition and Readiness Between Inhalation and Exhalation

That there is an essential distinction between passive breathing and breathing with the intent to phonate is uncontested. Highly contested, however, is how to convey the sensation of pre-phonatory readiness. In at-rest or *tidal breathing*, the exchange from inhalation to exhalation happens without muscular or conscious brain activity. The lungs naturally deflate as a result of elastic recoil and the equalizing of pressure between body and atmosphere. In preparing for phonation, muscular antagonism (described in the exhalation section below), provides a *checking action* after inhalation that slows the recoil and prepares to control the release of air. In the words of Deirdre Michael, “We all started learning this checking action of the abdominal musculature when we were six months old and began to babble. We experimented with our respiratory/phonatory mechanism, and by the time we were two years old, we were very good at the checking action of the abdominal muscles. And we never felt it!”³⁶ A slight *suspension* of the breath is a common descriptor in addition to the checking action language, and some posit that this concept is what may be at least partially meant by the long-standing, vague term of *sing on the breath*. No matter what term is chosen, voice pedagogues are universally concerned that singers will infer a holding of breath and that unnecessary tension and build-up of pressure will result.

A more specific component of pre-phonatory readiness is *pre-phonatory tuning*, a term used historically by Miller and Bunch-Dayme and in contemporary writings of Bozeman, Ragan,

³⁵ Ibid., 186.

³⁶ Michael, “Sing From Your Diaphragm,” 550.

and others. When the specific desired sound, expression, or resonating vowel is audiated with intention before and during inhalation, the torso and the muscle tone, poise, and shape of the vocal tract respond. In the words of Ken Bozeman, this response “free[s] the respiratory system for efficient reaction to the needs of the voice.”³⁷ Pre-phonatory tuning is a more scientific term for *breathe the vowel or shape before you phonate*.³⁸ For Bozeman and other advocates of affective response or primal sound, the “impulse to express” is the most efficient way to trigger an active pre-phonatory set-up. For instance, in the body’s response to an impulse to laugh or cry (an expressively activated mode), the lower abdominal musculature is already engaged, the pharynx is poised for phonation (eliminating extra breathing steps), and expansion into the back helps settle the larynx for best function.³⁹

Language of Exhalation

Although exhalation is the phase of breathing where all the sound of singing occurs and where most texts will elaborate more than inhalation, the context and environmental factors from the language of inhalation apply (see page 54-55), as well as portions of the *appoggio* and diaphragmatic sections above. The linguistic discussion that follows delves more deeply into the muscular antagonism of exhalation (one of the definitions of *appoggio*) and considers air pressure and airflow in the context of contemporary scientific terms. Finally, addressing general language of tension and resistance is most appropriate here in respiration before moving to other areas of production.

³⁷ Bozeman, *Kinesthetic Voice Pedagogy*, 3.

³⁸ Ragan, *Systematic Approach*, 206

³⁹ Bozeman, *Kinesthetic Voice* 4.

Muscular Antagonism

Central to both modern and long-standing descriptions of breath management during exhalation is the concept of two or more muscular efforts working in resistance to each other. This coordination goes by many names, among them *muscular antagonism*, *appoggio*, *antagonistic control*, *isometric resistance*, *dynamic balance*, *checking action*, and *friendly antagonism*. All refer to muscles of inhalation staying active during the first phase of exhalation to regulate the elastic recoil of the diaphragm and balance the exertion of muscles of exhalation. Over time, the scientific identification of specific muscles and muscle groups has gotten more exacting, but pedagogues vary in the degree of specificity they prefer to use.

The diaphragm itself, as generally understood by most singers, is not capable of staying active, but its recoil can be slowed indirectly. Most notably, the external intercostals remain engaged to expand the ribs as the internal and external oblique abdominal muscles and (usually later) the internal intercostals begin their work to depress the ribs and compress the abdominal viscera upward, providing pressure on the diaphragm. In addition, many other secondary muscles are involved in antagonistic relationships: postural muscles such as the quadratus lumborum provide a stabilizing structure for the lower back as well as opposition to diaphragmatic contraction; various muscles of the neck and torso elevate the thorax during inhalation and provide compression during exhalation.

Contemporary experts vary the detail and description of breath coordination according to the level and context of singing instruction. Only rarely outside of a pedagogy class will the dozens of involved muscles be explored in depth. However, as has been noted previously, another important reason for deliberately generalizing the process, in both individual and group instruction, is the variability of breathing strategies among singers. Gender, age, body type,

previous training, voice type, and genre demands will all contribute to the strategic use of primary respiration muscle groups (e.g., whether thoracic or abdominal muscles are employed in the first stage of exhalation) as well as use of numerous secondary respiration groups which “tend to work locally, influencing a much smaller portion of the body.”⁴⁰

Therefore, the language of antagonism is both critical and complex. Critical in that all singers must learn the power and nuance of regulating the breath in order to provide the steadiness and desired volume of air pressure necessary for phonation. Complex, not only in the actual mechanical structure but in all the possible applications of that structure that benefit or impede healthy voice production. In studio settings, an individual’s innate and most effective breathing strategy can be determined by the teacher, even if different from the teacher’s own. From there, monitoring for unnecessary tension or recruitment is possible. In group application, any given instruction to exert more or less specific muscular effort has a likelihood of unintended consequences due to multiple interpretations and the specific needs of the singers.

Finally, within the concept of muscular antagonism, the literature on phases of exhalation is receiving more attention. In the first phase of exhalation, the elastic recoil of the lungs and diaphragm will be at peak strength and, thus, so is the antagonist role of various muscles to regulate the pace of exiting air. To sustain longer phrases in singing, muscular assistance gradually replaces that initial antagonism for assistance with healthy breath depletion. In the words of Kari Ragan, “this response must be conditioned. Often, singers will naturally collapse or squeeze the thoracic and abdominal cavities when nearing the end of the breath cycle.” They need to “train the muscles to delay thoracic cavity collapse ... when it senses depletion of air.”⁴¹

⁴⁰ McCoy, *Inside View*, 137.

⁴¹ Ragan, *Systematic Approach*, 46-47.

The point of exhalation at which each singer experiences this change of demand and how they individually respond to it will vary, but the concept of exhalation phases is important to convey.

Breath/Air Pressure and Airflow

The singular goal of effective breath management for singing “is to provide a stable supply of air at the correct pressure for the desired pitch and loudness.”⁴² Contemporary voice science, and therefore, science-based pedagogy, has very distinct ways of delineating, describing, and measuring air pressure distinct from airflow. According to Scott McCoy, “Airflow is the measure of the volume of air passing through the vocal opening, as managed by the musculature of the rib cage and abdomen. The subglottal pressure is the measure of air pressure just below the vocal mechanism, which is managed by the laryngeal structures.”⁴³ The two are interdependent but contribute in critically different ways to the timbre, intensity, and healthy production of the voice.

The complicated relationship between airflow and air pressure (also commonly referred to as breath pressure), though largely beyond the scope of this dissertation, are discussed further in chapter 5 on phonation; however, some linguistic terms that are of concern are often couched in instructions for breathing. First, the general instruction for *more air* or *more support* is common and ill-advised. Is more volume of air desired, more breath pressure, or freer airflow? Is more engagement of abdominal muscles needed, and will it come with excessive or misplaced tension or collapse of the ribcage? If general terms are appropriate or given with a developed understanding, some contemporary authors advocate for using phrases such as a *well-supported tone* or even using *better support* over *more support*.

⁴² McCoy, *Inside View*, 35.

⁴³ This quote from Scott McCoy is from an earlier edition of his book, *Your Voice: An Inside View* as quoted in Cottrell, “Voice Pedagogy,” 10.

The semantic differences of more specific instructions regarding the exit of air from the body are significant. Most sources have largely eliminated the concept that air is pushed out. While the mechanical actions of pressure on the lungs could, in part, be accurately described in this manner, the implications of *push* language are too negative to use. Authors have used the words *expel*, *pump*, *direct*, *control*, *move out*, *whoosh*, *release*, *allow*, *take*, *let*, and even *drive*, as well as phrases that avoid a specific action verb and simply indicate that air is *provided*. These terms range dramatically between passive and aggressive action on the part of the singer. The most common solution involves the use of a simple term, such as *expel*, in combination with language that both indicates the work of muscular antagonism and encourages ease and flexibility. Though not as succinct, these combinations are appropriate for conveying the complexity of the vocal instrument.

Tension Language

The above discussion is but one example of navigating language around the need for muscular engagement or, as this author says, “the right kind of work.” In a 2017 article, Ingo Titze cites this general navigation as a central difficulty in merging the language of voice science and voice pedagogy. He says:

I began to realize that my scientific explanations of voice production contained words that were deliberately avoided by singing teachers. The language of voice habilitation was facilitative, filled with words of ease, relaxation, and minimal effort. The language of physics, in which I was trained, contained words like pressure, stress, force, tension, compression, contraction, strain, resistance, and constriction. No judgment of good or bad, or right or wrong, was attached to these words in physical science.⁴⁴

Continuing, he says, “The greatest conflicts arise when we try to explain what needs to be relaxed (limp) and what needs to be engaged (firm). Singing requires highly selective activation of muscles.”

⁴⁴ Titze, “Voice Science and Voice Pedagogy,” 291.

The rising popularity of the term *vocal athlete* provides positive language and parallels between voice training and other athletic endeavors. In their pedagogy textbook, *The Vocal Athlete*, Marci Rosenberg and Wendy LeBorgne devote a chapter to exercise physiology principles and their application for voice study, including the training of muscles for strength, function, endurance, and longevity. They are not alone in using athletic methods and terminology, and the movement to reclaim the physical work of singing is already beginning to revolutionize the language of voice pedagogy. Specific recommendations from this author's comparative study include: (1) use of buoyant instead of static terminology, e.g., encouraging the *buoyant expansion of the rib cage* during exhalation, and replacing *keep* or *hold* language;⁴⁵ (2) *firmness* instead of *stiffness*;⁴⁶ (3) *stretch* instead of *strain*;⁴⁷ (4) *narrowing* instead of *constriction* or *squeeze*.⁴⁸

Summary

In the comparative study conducted for this dissertation, disparate language and methodologies within the category of respiration were more robust than in any other category. Of critical importance is the continually expanding research on how breath management strategies vary by individual in physical ways that go beyond preference or theory. Long-standing concepts such as *appoggio* and diaphragmatic breathing may still be effectively employed, but voice teachers and choral conductors must acknowledge confusion that results from multiple interpretations and erroneous conceptions. In the case of diaphragmatic language, faulty understanding is still entrenched despite years of correction by experts. Beyond vocology, newer areas of research in kinesthetic awareness and body mapping, exercise physiology, and cognitive

⁴⁵ Ragan, *Systematic Approach*, 41.

⁴⁶ Titze, "Voice Science and Voice Pedagogy," 42.

⁴⁷ Ibid

⁴⁸ Ibid

function (including affective sounds, mindfulness, and motor-learning) are actively contributing new methods and terminology for singing, including in the area of respiration.

Respiratory instructional language from the comparative study is summarized in table 1. The terms, phrases, and instructions in the left column are those specifically raised by consulted sources either as ubiquitous language of concern or recommended contemporary language. The comments in the right column are also distilled from the comparative study as a whole and paraphrased, but not originated by this author. The table is organized by categories that follow the course of this chapter, i.e., the progression of breath in and out of the body. In each category, the phrases are organized and coded in descending order of recommended use.

Table 1 Respiration Instructional Language

	Terminology	Status of Use
General Concept	Breath coordination/management	Widely recommended general terms, also references to breath energy.
	Breath support/control	Some use with context, concerns include indications of muscular action that increases unnecessary tension and recruitment.
	Engage or work muscles Athletic parallels: stretch, strengthen, firm, resist	Recommended language for activating desired muscles.
	Tense, strain, stiffen, constrict, squeeze muscles	Not recommended, even when accurate due to negative ramifications.
Open Throat Directives	Take a silent/noiseless breath	Recommended open throat directive.
	Inhale the fragrance of a rose	Recommended though achieved with a lowered soft palate.
	Inner smile imagery	Recommended. Converted from <i>inhale through a smile</i> , which could produce an excessively lateral position and cause a <i>spread tone</i> .
	Imagine suppressing a laugh, being pleased with oneself, feeling empathy	Recommended affective terms for an open throat.
	Release the throat Invite or allow air in	More accurate than <i>open the throat</i> but not specific and could be misinterpreted due to false kinesthesia.
	Open the throat	Not recommended as the conditioned response will usually lead to a tongue position that constricts the throat (indicated by cool air on the back wall and a noisy breath).
	Feel the air	An instruction or misbelief of singers to sense inhalation. Often leads to a gasp and excessive breath with laryngeal tension.
Yawn, take a yawn-sigh Use more space in the back	Not recommended. Although the very first impulse of a yawn may be useful, it leads to a distended tongue position that closes the throat and indicates an overly dark or swallowed tone.	

Table 1 Respiration Instructional Language, Continued

	Terminology	Status of Use
Inhalation	Take a balanced breath Take a diaphragmatic-costal or thoracic/abdominal breath	Recommended instruction, particularly when indicating a combination of intercostal engagement and the release of the abdominal wall. Better when also encouraging individual variation.
	Breathe low and easily	Recommended for a short, general instruction; however, beware of hyperfunctioning or conditioned responses to low breath directives. Should be preceded with contextual information.
	Release or relax the abdomen (or abdominal wall)	Recommended. Instructions to release the abdomen are particularly useful in anticipation of inhalation in addition to concurrent.
	Use a reflexive diaphragmatic inhalation	Recommended by some. An Accent Method ¹ instruction that indicates a release of tension and inviting of air in after exhalation. Beware of hyperfunctioning or conditioned responses to diaphragmatic directives.
	Buoyant expansion in the ribs	Recommended replacement for <i>keep</i> or <i>hold</i> instructives, used in as part of balanced breathing.
	Expand or flare the ribs and hold Hold the ribs with the intercostal muscles Keep the ribs expanded	Adjust and use with caution. While expanding the ribs is an essential component of inhalation, any indication of holding or keeping them expanded can lead to excess exertion, tension, and recruitment. Use more active words such as <i>sustain</i> , <i>maintain</i> , <i>continue</i> .
	Expand the waistband on inhalation	Misleading. While expansion may be felt this low with the displacement of viscera, the instruction may cause unnecessary tension and recruitment.
	The air pushes the diaphragm down	Incorrect. Contraction of the diaphragm and expansion causes air to enter the body rather than the air causing muscular action or expansion.

¹ Chapman, *Singing and Teaching Singing*, 59. The Accent Method of breathing is “widely used by speech and language therapists [and singing teachers] in Europe and in the United Kingdom but is almost unknown in the United States or Australia.” Janice Chapman promotes the language and practice of Accent Method breathing in her textbook.

Table 1 Respiration Instructional Language, Continued

	Terminology	Status of Use
<i>Inhalation</i>	Fill your whole body up with air Fill your lungs from the bottom up Expand your lungs Breathe into your toes/pelvis/lower back/stomach	Incorrect. These instructions are not anatomically possible and, therefore, can be confusing or contraindicative.
	Take a big breath	Not recommended. It is too general, not focused on the quality of the breath, and encourages overbreathing.
	Breathe from your diaphragm (or any language referring to the diaphragm and indicating the abdomen)	Not recommended. General diaphragmatic instruction invites recruitment and erroneous interpretation. Particularly dangerous when combined with any verbal or non-verbal indication of the lower abdominal area. In addition, this language is widely entrenched and should be actively countered.
<i>Exhalation</i>	Language of muscular antagonism: Balanced and opposing muscular forces Dynamic balance between muscles of inspiration and exhalation Isometric resistance, friendly/gentle antagonism	Most widely recommended terminology indicating that exhalation is controlled primarily by the coordinated efforts of the abdominal muscles and the external intercostals to regulate air supply and pressure.
	Sing with a steadier stream of air	Recommended for a short, general instruction. Should be preceded with contextual information.
	Buoyantly maintain the expansion of the ribs	Recommended to encourage the antagonistic engagement of muscles of inspiration without the negative indications of <i>keep</i> or <i>hold</i> .
	<i>Appoggio</i> <i>lutte vocale</i>	Widely and often recommended, though inconsistently used. Beware of underlying confusion and precede with contextual information.
	Use better support Find a well-supported tone	Use with caution. Can be effective as a short-hand instruction if preceded with context. Better than saying <i>more support</i> .

Table 1 Respiration Instructional Language, Continued

	Terminology	Status of Use
Exhalation	General support language: Support the sound/voice Use more support/air	Misleading and too vague. Can encourage unnecessary tension, exertion, and recruitment.
	Specific muscular support language: Strengthen/support from the abdominal muscles Raise the sternum Hold the chest high and stationary Keep the ribs expanded	Not recommended. Even when these actions are desired, the language leads to inflexibility, tension, and hyperfunctioning responses.
	Push the abdominal muscles out or pull them in Drive or push air out	Not recommended. Too aggressive, even if mechanically descriptive. Leads to unnecessary tension, exertion, and recruitment.
	Support from the diaphragm Sing from your diaphragm Help the diaphragm exhale	Incorrect and widely perpetuated language. Do not use in any context.
Readiness	Pre-phonatory tuning: Shape before you phonate Shape before breath before sound Breathe with the vowel/phrase/sound in mind Breathe the intent to say/express	Recommended language that shapes the vocal tract before phonation begins. Encourages efficiency and affective response.
	Feel a readiness before phonation Notice the checking action at the height of the breath	More general recommended language. Best when preceded with more specific context about the feeling of subglottal pressure and its connection to phonation.
	Sing on the breath	Too vague for general use. Could be useful with pre-determined understanding and context.
	Suspend the air before exhaling Contain the air The air should back up in your throat	Not recommended as can lead to holding the breath and causing unnecessary tension. Use <i>readiness</i> or <i>checking action</i> instead and all conditioned by context.

Chapter 5

Contemporary Understanding and Language of Phonation

Historically, language and instruction in the area of phonation have stayed within a relatively narrow band of focus with onset and registration at the center and vibrato and intensity on the outskirts (the latter sometimes more associated with respiration or resonance.) These areas, along with basic understanding of vocal fold adduction/abduction and pitch, are still central concepts, but the world of knowledge around that center is now immensely larger. In response, the language and instruction of voice professionals have not only changed in nature and scope but also selectiveness relative to their comfort level, training, and philosophy.

Research in the physiology of phonation has not slowed pace over the last fifty years. Vennard and Appelman's work in the 1960s galvanized the field towards detailed examinations at the level of the larynx. Research in vocal acoustics and speech science was on the same trajectory, and both were then boosted by technology and wider distribution in the digital age. Software and instruments to visualize and analyze the functions of the larynx and the nature of sounds produced are now widely accessible and commonly used in voice studios as well as in voice and speech medicine. To emphasize the rate of change in this area, consider that the first true video laryngoscope was introduced in 1999, and software for sound wave imaging, such as VoceVista[®], emerged around that same time. Today, it is common practice for vocalists to have an regular "scope" and for spectrograms to appear in a variety of venues without orientation.

Categorical and Systematic Terminology

The overall term of phonation is widely used as one of the pillar terms for voice production and study; however, subtopics covered in phonation chapters are variable.

Onset/offset is the only consistently included area, as well as detailed descriptions of laryngeal anatomy and function. Vibrato is covered under phonation in fifty percent of the sources studied, but also under resonance and, more historically, sometimes under respiration. Registration is, at its core, under phonation as a laryngeal event, but has long been an entangled and debated area often presented separately in pedagogical texts. Other related areas include discussions of intensity and voice health and pathology at the level of the vocal folds. Like registration, voice pathology is often presented separately. In general, authors are not in disagreement about content, but simply reporting the continually expanding body of knowledge in this area.

One reason for the varying proportions and rate of inclusion of the subtopics above is the interdependence of systems, a fact that has been long known but becomes more apparent and more complex as research progresses. The larynx is the *vibrator* or *oscillator* of the overall system, the mediator between the actuator of the breath and the resonance of the vocal tract. It is also referred to as the *source* of a sound signal that will be conditioned by the *filter* of the acoustical tract (i.e., resonance). As such, what happens in the larynx both affects and is affected by actions above, below, within, and around it. Examples include:

1. Resonation that occurs within the larynx, particularly at the aryepiglottic fold (the topmost area also called the laryngeal collar or epilarynx)¹ is among the most recent areas of research focus and thought to be responsible for the famous singer's formant or ring;
2. Pressed phonation can be assigned to the nature of vocal fold closure or the compression of air from the respiratory system
3. Register choices that are determined by muscle dominance in the larynx at the level of the vocal folds are successful only as a result of complementary configurations of the

¹ McCoy, *Inside View*, 161-162.

vocal tract, including laryngeal height and overall convergent or divergent resonant shapes, among other factors.

Some contemporary authors reflect this interdependence by designating more integrated language and hybrid categories of organization. In Titze and Verdolini's *Vocology*, the word phonation does not appear as a category, but instead is represented as "the union of breathing, valving, and voicing." McKinney's *The Diagnosis & Correction of Vocal Faults* (an older, but much-referenced source) includes tone quality and vibrato in a "Coordination" chapter. By way of introduction to that chapter, McKinney says, "Some areas of the art are so much the result of coordinated functions that it is hard to discuss them under one of the traditional headings—respiration, phonation, resonance, or articulation."² In Kari Ragan's 2020 textbook, *A Systematic Approach to Voice: The Art of Studio Application*, she says: "A key to teaching efficient singing includes knowledge of the dynamic nature within the phonatory system as well as a comprehensive understanding that by changing one part of the system, it affects other parts and the whole."³

A second reason for the chosen focus of many phonation chapters may indicate the most significant philosophical shift in this area—a striking and relatively new preference among voice pedagogues for talking about the structure and function of the larynx, including (1) the nature of vocal fold function in terms of closure and glottal resistance, oscillation, and valving;⁴ and (2) the role and dominance of specific laryngeal muscles. The anatomical function of the vocal instrument has been a regular center of voice pedagogy classes in academia over the last fifty years. Vennard's technical manual *Singing: The Mechanism and Technic* was published in 1967,

² McKinney, *Diagnosis*, 178.

³ Ragan, *Systematic Approach*, 73.

⁴ Oscillation is, in essence, the back and forth motion of the vibrating vocal folds. Valving is the opening and closing regulation of the folds (i.e., glottis). These are the long-standing, core terms used by Ingo Titze.

used heavily into the 1990s, and laid the groundwork for the increasingly technical texts since that time. Specific, physiological knowledge has been and remains the professional expectation for voice pedagogues for decades. How teachers convey that knowledge to singers, however, has been a topic of varied opinion and concern in the profession. In this author's earlier higher education experience (through two degrees in voice performance), specific actions of the vocal folds and any direct focus on the larynx was not included in private study, and, at times, actively discouraged. In Professor of Otolaryngology Deirdre Michael's series of articles in the *Journal of Singing* on "Dispelling Vocal Myths," physiological knowledge is reported as a "Megamyth;"

Megamyth: The more you know about the anatomy and physiology of the vocal mechanism, the more mechanistically, and less artistically, you'll sing. This myth has been soundly disproven by legions of superb singers who have excellent understanding of their own mechanism. I guarantee you, when they're singing, these artists are thinking about musical expression of the text, not their muscles or the acoustics of the vocal tract. But they base their practice on smart, efficient use of the entire vocal mechanism. Scores of my patients would have been spared vocal injury if they had learned to practice in accordance with actual physiological properties of their voice.⁵

Jo Estill's research and the creation of her EVTS™ system of voice *Figures* specifically addresses configurations of the larynx. Her terminology is only indirectly represented in this dissertation; however, it has impacted and been woven into the language of several contemporary pedagogues. Says Janice Chapman of the change from avoidance to direct address of the larynx aided by the fiberoptic industry, "This has led to a great opening up of the knowledge base not just of medicine and science, but also for singers and teachers to become acquainted and comfortable with the larynx as a strong, discrete, and highly sophisticated machine."⁶

The subtopics included in the category of phonation for the purposes of this document are contemporary and linguistic aspects of laryngeal function (including language of semi-occluded

⁵ Michael, "Sing It off the Chords," 418.

⁶ Chapman, *Singing and Teaching Singing*, 80.

vocal tract (SOVT) pedagogy), onset/offset, intensity, vibrato, and selected aspects of registration.

Language of Laryngeal Function

Similar to discussions of the diaphragm where direct sensation and control is not possible, singers do not have a sensation of the actual vocal folds vibrating or the intrinsic laryngeal muscles contracting. However, where diaphragmatic language became ubiquitous to the point of folk psychology that reaches far beyond the study of voice, laryngeal language was confined mainly to the doctor's office and the academic voice pedagogy or speech science classroom. Beginning with the turn of the twenty-first century, technology is accessible to students and voice teachers alike through which they can see the workings of the larynx and analysis of the sounds that emanate from it.

Laryngeal Position

The overall position of the larynx, particularly in terms of *raised* or *lowered*, is part of active discussion and instruction. As the larynx is the lower boundary of the vocal tract, changes in laryngeal height change the overall length of that tract which, in turn, changes the location of formants. In general, the desired qualities of the classical aesthetic are created by a longer vocal tract where the larynx is in a lower position relative to speaking or many CCM timbres. However, it is very possible for singers to go too far with an instruction to *lower the larynx* or *sing with a low larynx* and, by doing so, create tension in the throat and articulators. The understanding that a higher or *raised larynx* and the resulting shorter vocal tract is a component of more speech-based aesthetics used in CCM singing. A hyperfunctioning response from students is also possible here and also results in increased tension. Language around laryngeal position should always be used in moderation (raised and lowered heights being relative to each

other), offered with context, and monitored for over-simplified response. Palpating (touching) the larynx is encouraged to determine and regulate unwanted changes in laryngeal height and stability. In this way, singers can identify the thyroid cartilage and the gap between it and the hyoid bone, giving them direct knowledge and sensation of overall larynx position and motion. From there, potential causes of unwanted motion can be explored—including the recruitment of external laryngeal muscles and tense articulators (e.g., jaw and tongue).

Within the larynx, though the closing and opening of the vocal folds themselves cannot be sensed, there is a broadened language of glottal closure. Accompanying this language is the determination of specific exercises, indirect sensation, and sound indicators to inform both the singer and the listener regarding healthy or unhealthy adduction. First, it must be noted that the term *vocal folds* is a subtle but distinct change from the outdated *vocal cords*. In the words of McCoy, “This new nomenclature is more than a semantic change. The term *vocal fold* [emphasis McCoy] more precisely describes their true physical characteristics”⁷ and more helpfully indicates to singers that these small folds of multi-layer tissue are very different than “longitudinal bands arranged in their necks like the strings of an upright piano.”⁸

A detailed description of the vocal folds and structure of the larynx is beyond the scope of this document and can be found in multiple contemporary resources. Scott McCoy’s *Your Voice: An Inside View* is perhaps the most widely used of current comprehensive textbooks. However, it is important to state that understanding the multiple layers that make up the vocal folds and how those layers move in relationship to each other and in response to air pressure provides a critical basis for the understanding of vocal registers, range, and voice health and pathology.

⁷ McCoy, *Inside View*, 150.

⁸ *Ibid.*, 151.

Breath Pressure and Airflow

As stated in the discussion of respiration in chapter 4, the two concepts of breath pressure and airflow are distinct and almost entirely interdependent. Ingo Titze's work in this area, which led to a vast training methodology of SOVT exercises used internationally, was laid out in his *Principles of Voice Production*, which was printed first in 1994 with a second edition in 2000. On this interdependence, he says, "Lung pressure can vary greatly over the cycle, ... which would normally cause major fluctuations in the airflow. By varying the glottis continuously (more closure for higher pressures and less closure for lower pressures), the pulmonary system can regulate the flow of air to be more constant." He continues, "the important message is that laryngeal action and thoracic action are not independent. There are reflexes that tie them together into a functional unit ... this may affect phonation as well as respiration."⁹

The use of the term airflow is relatively straightforward, referring to the amount of air moving through the glottis. According to McCoy, "airflow and subglottal pressure are interrelated and often will be inversely proportional (when one goes up, the other goes down)."¹⁰ The language of pressure needs more care as it can have multiple meanings if used too generally. Air compression and breath pressure that happen in the lungs are subglottal. If in the larynx, airflow meets vocal folds that have adducted in anticipation of phonation, that pressure must exceed phonatory threshold pressure (or PTP—"the pressure required to overcome the resistance of glottal adduction and initiate vocal fold oscillation.")¹¹ Early in the development of vocal fold oscillation theory, researchers discovered that changes in supraglottal pressure (above the vocal folds) were also crucial to understanding vibration - first by acknowledging a region of low

⁹ Titze, *Principles*, 66.

¹⁰ McCoy, *Inside View*, 107

¹¹ *Ibid.*, 167.

pressure above the folds¹² and then by exploring how changes in pressure above the folds, including times of increasing pressure directed back towards the glottis, create a push-pull dynamic known as vocal tract inertance.¹³ Understanding the interplay of various kinds of pressure led Titze to discover that semi-occlusions of the mouth would increase the pressure flowing back to the glottis, lowering the PTP. Consequently, the system could self-regulate the balance between sub- and supraglottal pressure, vocal fold closure, and flow. From this discovery, Titze developed semi-occluded vocal tract (SOVT) exercises that reduce the effort of phonation. Through SOVT training, singers can identify pressed phonatory production habits, lower the collision force of vocal fold tissue, and experience better control and access to their higher range by easily stretching and strengthening the vocal folds.¹⁴

Understanding these various pressures in the vocal system can significantly improve vocal efficiency and health. However, combining the concepts of pressure and airflow creates an ill-informed usage of both and generalized pressure language could also lead to confusion and unintended consequences in voice instruction. This is particularly true in combination with tension language, as mentioned in chapter 4, or with general admonitions to *move your air*, and *use more air* or *more support*.

Language of Onset/Offset and Phonation Modes

Specific language around glottal closure is an essential addition to the lexicon and practice of contemporary voice pedagogues and choral conductors. Good closure of the glottis (i.e., sufficient or complete) is the goal for most singing. The *closed quotient* or closed versus opened phases of the vocal folds are metrics that describe the phonation mode (see below),

¹² The principle difference between the Myoelastic-Aerodynamic Model and One-Mass Model of vocal fold oscillation.

¹³ This description is largely paraphrasing Ragan's distillation of Titze's language.

¹⁴ Titze, "Major Benefits," 311.

intensity, and resonant quality of the voice. Incomplete or insufficient closure is both a symptom and result of types of pathology and a cause of breathy phonation. However, it is also a legitimate (and non-harmful) component of the male falsetto and female whistle voice.

Onsets, offsets, and phonation modes (the sustained tones in between) are all described as having three types—generally referred to as aspirate/breathy, balanced, and hard/pressed. All are the result of the varying relationship between airflow, breath pressure, and adduction.

Onset/Offset

Onset, or the initiation of vocal tone, is a primary concept of all consulted sources on phonation. Language and understanding have gotten more detailed, more genre-specific, and more reflective of technical terms from contemporary research, but have not shifted dramatically from their historical basis and the concept of three types of onset. *Attack* is an outdated term for onset and deemed to have too aggressive a connotation for vocalists, though commonly used as a term for some instrumentalists.

In an *aspirate onset*, also known as *breathy*, *soft*, or, sometimes, *airy*, the flow of air precedes the adduction of the vocal folds. The breath is audible as a hiss along with the tone, usually beginning with a distinct /h/ sound. Not typical in classical and most musical theater styles, the aspirate onset “may be appropriate for certain jazz or pop styles.”¹⁵

A *hard onset*, known usually as a *glottal onset* or *glottal stop* but also *plosive* or *harsh*, is a more forceful, abrupt meeting of the vocal folds. They adduct strongly ahead of airflow, causing a build-up of subglottal pressure and a small grunt or click accompanying the first audible sound. Though also not preferred in classical singing, varying degrees of this glottal sound are used stylistically in commercial and contemporary styles and speech, particularly for

¹⁵ Rosenberg and LeBorgne, *The Vocal Athlete*, 67.

clarity of words that begin with a vowel. However, the glottal onset is not considered efficient voice use, and pedagogues and SLPs have long cautioned that excessive or aggressive glottal attacks are a cause of or contributor to voice disorders.

The *balanced onset* is a primary goal of voice and speech training, even if aspirate or glottal sounds are used by stylistic choice. The alternative terms of *simultaneous* or *coordinated onset* more clearly indicate the physiological actions that are occurring. The vocal folds activate and gradually come together in anticipation of the flowing air, meeting as the airflow arrives. The conditioning of this process is significantly aided by SOVT exercises along with the use of unvoiced consonants (particularly an unvoiced /h/, but that is not now universally endorsed), staccato passages, and vocal fry prior to sustained sound. Advocates of primal or affective sound connections, such as Janice Chapman and Ken Bozeman, invoke the feeling of *readiness* and pre-phonatory inspiration as leading to efficient onset.

A linguistic overview of onset is not complete without addressing another term that bridges early and modern pedagogy—*coup de la glotte*¹⁶—a famous contribution to the lexicon by Manuel García II in the mid-19th century. His term is usually translated as “stroke of the glottis,” but *coup* also translates as “blow.” Both translations and interpretations of his meaning have been a source of controversy since his first writings. Many contemporary pedagogues believe that García was describing a balanced or very gentle glottal onset and actively use his term today. Others fear that he was a proponent of a harder glottal stop or simply avoid the term altogether.

Offsets, or releases of the tone, come in the same variants. *Glottal* and *aspirate* offsets, like their parallel onsets, have an audible grunt or /h/ (respectively) upon release. Neither are

¹⁶ The variation of *coup de glotte* was also encountered in reviewed literature.

recommended for consistent use, but both are used stylistically—the glottal release as a dramatic cry by some opera singers and the aspirate as an expressive sigh.¹⁷ The *balanced offset* is optimal, though more difficult at higher pitches where glottal adduction varies and air pressure is increased. Often reversing the flow of air (i.e., inhaling upon release) is recommended to train glottal stops or higher register offsets.¹⁸

Phonation Modes

The tone that originates at the vocal folds can be considered the sound *source* or *signal*. In vocal acoustics, this signal is a rich set of yet-to-be-resonated harmonics, sometimes referred to as a *laryngeal buzz*. It contains all the acoustic material that will be developed by the vocal tract—pitch, intensity, mode of registration, and timbre qualities such as breathy and pressed. It can be a *pure* or *clean* signal or contain non-harmonic frequencies that make it *noisy*.¹⁹

As the source enters the *filter* (the vocal tract above the folds) and is resonated, the embedded material develops and is enhanced, dampened, or colored in various ways. Phonation modes describe the sustained tone between onset and offset—again, using the three basic types—and provide an example of interdependence and the chain reaction of sound production from breath to final product. Quoting McCoy, “The quality of sustained phonation is strongly influenced by the method of onset; aspirate onset almost always leads to aspirate phonation, while glottal onset tends to induce a pressed sound.”²⁰

There are additions to the terminology in all three types when speaking about phonation modes. Aspirate phonation might be described as *loose*, *weak*, or *veiled* in addition to *breathy*.

Pressed phonation is the most common language for the tone that can follow a glottal onset if the

¹⁷ McCoy, *Inside View*, 168.

¹⁸ *Ibid.*

¹⁹ Bozeman, *Practical Vocal Acoustics*, 4.

²⁰ McCoy, *Inside View*, 168.

vocal folds remain too firmly squeezed, but is also termed *hyperadducted* or using too much glottal resistance. To return to the language of closure, hyperadduction increases the closed quotient (or closed phase) too much in relation to the open phase, and the opposite is true for aspirate phonation. *Firm* closure, however, is often a desirable quality—a complete closure that contributes to ring and brilliance in the voice. In this posture, the closed and open phases are in balance, and therefore, so are the airflow and adductory tension.²¹ Many voice scientists and pedagogues use the term *flow mode phonation* or *flow phonation* for this balance, from the research of musical acoustician Johan Sundberg in the late twentieth century.

Language of Intensity

There is interdisciplinary confusion around what most singers would term *dynamic* in reference to how loudly or softly they are singing. How loud a sound is perceived to be is commonly measured in decibels, which indicate a sound pressure level (dB SPL). Speech scientists and many contemporary pedagogical texts describe this as *intensity* or *vocal intensity*. *Loudness* in speech science is also confined to decibel level, but “singing teachers associate loudness with resonance, brighter vowel choices, and also registration.”²²

Contrary to common belief, an increase in intensity is not created by breath pressure alone, but in combination with glottal resistance and the thickness of the vocal folds. If breath pressure were to increase without corresponding glottal resistance, both pitch and intensity would rise.²³ Increased glottal resistance results in two changes to oscillation: both the amplitude (or range of motion) and the velocity of closure (how quickly the folds come together) are higher, the combination of which generally increases the closed quotient. The term *amplitude*

²¹ Ibid.

²² Hoch and Sandage, “Working Toward a Common Vocabulary,” 647.

²³ McCoy, *Inside View*, 168.

alone has been described as a change in decibel level²⁴ and does have the same Latin roots as the more commonly understood volume-related word amplification, but also is used to describe the *extent* (width) of singers' vibrato. Intensity also increases with the thickness of the folds, and therefore chest voice or belt resonance strategies are often perceived as being louder in volume. This is an area where complications exist and more research is needed, including the use of amplification (as in microphones) by the majority of beltters.²⁵

Resonation is also a complicating factor of intensity. Louder (i.e., higher intensity) phonations “have more harmonics, and stronger harmonics.”²⁶ Listeners perceive a sound that has ring and vibrato as more present whether or not the decibel level is actually higher. The already-vague phrase *sing with more resonance*, as is sometimes heard from choral conductors and voice teachers, is made more so by some of the reasons presented in this discussion. Is an increase in intensity wanted? A change of timbre?²⁷ More presence, ring, or vibrato? Similarly, when asking a chorus for more of these specific qualities, this author will often field the not-so-simple question, “do you want us to be louder or softer?”

Voice pedagogue Matthew Hoch and SLP Mary Sandage co-authored a 2017 *Voice Journal* article entitled “Working Toward a Common Vocabulary: Reconciling the Terminology of Teachers of Singing, Voice Scientists, and Speech-Language Pathologists.”

Loudness/Intensity was the first area they addressed, citing the complications present among the disciplines. In addition to discrepancies noted above, they observe that *vocal power* has been a term associated with loudness but has no agreed-upon physiological construct. They conclude

²⁴ Hoch and Sandage, “Working Toward a Common Vocabulary,” 648.

²⁵ Rosenberg and LeBorgne, *The Vocal Athlete*, 234.

²⁶ Bozeman, *Practical Vocal Acoustics*, 7.

²⁷ Nix, John. “You Want Me to Do What?,” 48.

that *sound level* would be a better choice than *intensity* or *amplitude* for a standard nomenclature, though that term was not encountered in other reviewed literature.²⁸

An important takeaway from this section, regardless of the inconclusive nature of the current state of the language, is that louder singing is not a function of merely applying more air. The following substantial quote from Scott McCoy sums up the concepts presented in phonation thus far and gives insight and instruction not found in any other consulted source:

Singers who simply “blow harder” to increase volume are very likely to sing sharp. The correct balance between laryngeal tension and breath pressure must be found. Unfortunately, we are neither able to sense nor directly control adductory tension within the larynx. Research, however, tells us that balance will likely occur somewhere along a continuum between a breathy and a pressed sound, perhaps at the point where the glottis remains closed for just a bit longer than it is open. Singers might discover this point by sustaining tone at a constant dynamic level while gradually shifting from aspirate to pressed phonation. A little experimentation should yield a timbre that is clear and vibrant with virtually no sensation of breath pressure or flowing air. This should be the point of optimal coordination between subglottal pressure and laryngeal tension that will enable the singer to produce his widest possible range of pitch and loudness.²⁹

Vibrato and Parallel Cultures

Writings on vibrato have a prominent place in voice pedagogy literature from historical to contemporary times. They range from technical analysis of rate and extent to stylistic comparisons between genres (including styles within the genre of Western classical music), and vibrato is a focus of virtually every discussion of the relationship between voice pedagogues and choral conductors. Reviewing this literature with the goal of describing language reveals an interesting set of observations: (1) there is very little to say about terminology; (2) there is quite a lot to say about aesthetic and health; (3) the focus of the literature about aesthetic and health is almost singularly focused on the use of some variation of *straight tone*; and (4) that focus at the

²⁸ Hoch and Sandage, “Working Toward a Common Vocabulary.”

²⁹ McCoy, *Inside View*, 171.

level of practicing academics has shifted into more neutral discussion. These observations are addressed in this order below.

Terminology

A 2009 article by Nicholas Isherwood gives an analysis of fifteen discrete types of vibrato used in twentieth and twenty-first-century Western music and acknowledges a plethora of others from centuries-old treatises and non-Western vocal techniques. What he terms the *bel canto* vibrato is “the only one allowed or even acknowledged by many voice teachers.”³⁰ It is this vibrato that every consulted source defines as *healthy, natural, vibrant, and well-balanced*. It is promoted as the desired vibrato for most all classical singing with undesirable vibratos described most often as *wobble* (which is slower in rate and wider in extent) and *flutter* (for rapid in rate and narrower in extent). Occasionally, the word *bleat* will describe a more driven version of flutter.

Non-vibrato singing is a widely used term, often interchangeable with *straight tone*, or, less frequently, with a *pure tone*. All of these terms are misleading, and the term *straight tone* is particularly loaded, especially in literature prior to the early 2000s and before inclusion of the vibrato variations in CCM genres. To be very clear, “it is not possible for a human to sing a tone without fundamental frequency variation”³¹ Sounds that are described as non-vibrato or straight are merely perceived as such by the listener. Wooding and Nix, in a 2016 study, surveyed 131 college and professional vocalists, voice teachers, choral conductors, and SLPs to determine if there was a common threshold for perception of non-vibrato and if perceptions were influenced more by rate or extent of vibrato. They concluded that a common threshold did exist for all participants, regardless of profession, and was most strongly impacted by the rate of vibrato.

³⁰ Isherwood, “Vocal Vibrato,” 271.

³¹ Wooding and Nix, “Perception of Non-Vibrato Sung Tones,” 2016.

Historically, discussions of perceived non-vibrato sounds are often set up in distinct aesthetic contrast to the “normal” vibrato of Western classical singing.

Aesthetic and Health

A discussion of varying aesthetics of vibrato usage is beyond the scope of this dissertation, and even more so if that discussion were appropriately expanded to address vibrato in non-Western musical styles. Before addressing selected points of vibrato versus non-vibrato aesthetics, it is interesting to note that even within the recorded history of classical singing, tastes on the rate of vibrato in classical singing have changed.³²

An instructor’s understanding of the healthy and unhealthy causes of vibrato and their language of instruction crucially impacts how a singer approaches this area of vocal production. If vibrato in the voice is the result of uneven airflow, excess or irregular breath pressure, hyperadduction of the vocal folds, an overly elevated or depressed larynx, tongue or jaw tension, or poor muscle tone or conditioning,³³ it should be addressed as a vocal fault. If non-vibrato is the result of laryngeal tension and pressed phonation, especially when used excessively and without knowledge or training, it may cause vocal fatigue and eventual compromise. Simply asking for more or less without diagnosing the cause or being able to provide specific pedagogical instruction is confusing to singers and can be harmful. In one of his “Choir Issue” articles for *The Journal of Singing*, McCoy says that a healthy non-vibrato demands “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.”³⁴

³² McCoy, *Inside View*. 8

³³ Nix, “Shaken, Not Stirred,” 417.

³⁴ McCoy, *Choir Issue Part I*, 299.

In a group setting, too generalized “more” or “less” instruction will undoubtedly lead to singers finding a variety of ways to comply, many of them unhealthy. Asking one singer to imitate the vibrato of another may be similarly ineffective if the asker has not (1) identified the source of healthy/unhealthy vibrato in each voice; and (2) determined that the chosen model will be one from which the targeted singer can empathetically benefit. An example that receives frequent citation in this regard is inappropriately asking mature female voices to use the sound of pre-pubescent male voices, whose undeveloped falsetto voices have no natural vibrato, as a model for vibrato imitation.

Considerations of both aesthetics and health come together in the question of singers’ volitional control over their vibrato. Many studies have pursued this question, and more are needed, but evidence suggests (1) that rate and extent are both able to be varied, either to change the aesthetic or to synchronize with other singers;³⁵ and (2) that the ability to do so develops with maturity, experience, and training. These findings have significant implications for singers’ capacity to develop (over time) a spectrum of vibrato to be used healthily over a range of aesthetic choices.

Straight Tone as a Cultural Marker

A *straight* or *pure* tone, either used consistently or, much more frequently, in combination with a more noticeably vibrating tone, is a desirable component of many vocal styles. In Western classical music, “music from the Baroque and Renaissance periods is often approached with a lighter, purer, and straighter tone.”³⁶ Isherwood, cited by John Nix as an authority on the extended vocal techniques of modern composers, describes a host of vibrato

³⁵ Walker, “Good Vibrations,” 38. She cites research regarding ability to adjust the extent and rate of vibrato. Extent was found to be easier especially by emotional expression and across genre and style. Rate has been noted to be more difficult, but also volitionally adjusted.

³⁶ McCoy, *Inside View*. 8

types being asked for in current literature, including specific non-vibrato requests by John Cage and others. Among the choral sound ideals in twentieth-century America are the straight-tone schools of the Lutheran and English cathedral singing traditions.³⁷ Conductors in those traditions believe that a discernable vibrato detracts from intonation and *blend*. Still within Western music, but moving to CCM genres, musical theater often includes an expressive use of vibrato, especially in the belt voice and often through delaying the onset of the vibrato and varying the amplitude.³⁸ Pop, jazz, and folk each have stylizations that vary in vibrato type/preference. These singers will sometimes use straight tones on single notes or to stress the tuning of single intervals.

Outside of Western music are countless examples of non-vibrato singing that are cherished signatures of their ethnic soundscape. According to Nix, “virtually all cultures outside of Europe and North America sing with no vibrato, as do North American natives. The most typical reaction to a *bel canto* vibrato in non-Western cultures is laughter, a bit like a typical Westerner experiencing Peking Opera for the first time.”³⁹ Preferences for vibrato and non-vibrato singing is a powerful example of parallel cultures in music, within and beyond the narrow category of classical music, and, more broadly, in Western as well as non-Western traditions.

The healthy production of non-vibrato sounds continues to be a stated concern of voice pedagogues in studied voice cultures of Western music⁴⁰ - solo and choral, classical and CCM. As such, it is vital that both language and pedagogy in those environments shift towards that

³⁷ These schools do not generally self-identify that bluntly but have been labeled thus by other authors.

³⁸ Rosenberg and LeBorgne, *The Vocal Athlete*, 68-70.

³⁹ Nix, “Shaken Not Stirred,” 273.

⁴⁰ It should be noted that healthy voice production and knowledge that comes from formal training is not a focus of many other cultures, both within and beyond Western music.

healthy production and away from misconceptions and confusing language that have perpetuated vocal distress. The advancements in voice science, and specifically in areas of registration and phonation, including vibrato, have considerably changed how that shift can happen. As a result, not only is the palate of healthy sounds in studied voice disciplines growing broader, but the bias against CCM styles is beginning to lessen. The role of voice science as neutralizer and bridge builder can be seen, perhaps most prominently, in these specifics of phonation.

Shift Towards Neutrality

The sources consulted for this comparative study show a progression of approach where vibrato is concerned, one that increasingly shows evidence of a more neutral stance. In some cases, this shift is overt. Pedagogues from CCM styles are now solo authors, co-authors, and primary contributors to pedagogical texts. Traditional classical singing practitioners and scholars routinely and substantively include both the language of classical and CCM styles in their publications. Articles that call for conversation and reconciliation between choral and solo voice professionals use fact-based language to offer solutions for healthy singing in both.

In other ways, the shift is noticeable by omission. Less qualifying of the inclusion of CCM material is in evidence, and there is less mention of entrenched areas of disagreement. When ongoing areas of concern are included, it seems possible that they stem as much from outdated assumptions as from known current practice. In the area of vibrato, Scott McCoy's widely used textbook lists it only under "voice characteristic" in the index, and his short, neutral description is part of his opening chapter on listening. The terms "vibrato/non-vibrato" and "wobble/flutter" are two of fifteen continuum pairs that are "not necessarily qualitative."⁴¹ By

⁴¹ McCoy, *Inside View*. 2.

contrast, James Stark’s history of voice pedagogy, *Bel Canto*, lists vibrato as a separate entry in the index with 32 sub-areas before saying “*see also* tremolo; tremulousness.”⁴²

Language of Registration

Registration has long been a disputed area of both language and practice, often presented separately in pedagogical textbooks, and described by more than one author as a “semantic minefield.”⁴³ In addition to numerous terms remaining in place from historical roots, knowledge of laryngeal function and CCM genres have continued to expand the lexicon without a clear consensus around any one system of language. A full discussion of the workings of registration is beyond the scope of this dissertation; however, the underlying basis from which many contemporary terms have evolved is included. This section also contains important shifts of understanding that differentiate between laryngeal and acoustical registration events and address developments in falsetto. All of these discussions are presented here with the sole aim of clarifying language.

Contemporary Names and Definitions of Registers

Remarkably, given the significant variation in both the number of identified registers and their labels, García’s definition of a register from 1847 is still a generally accepted norm—contiguous pitches, produced in the same physiological manner, and sharing the same basic timbre.⁴⁴ Throughout most of both scientific and voice pedagogy history, practitioners have accepted two principal physiological registers—one for lower tones, including most of the male vocal range and the lower portion of the female vocal range, and one for higher tones, including most of the female vocal range and the male falsetto. In 1983, a committee of physicians, voice

⁴² Stark, *Bel Canto*, 323-324.

⁴³ McCoy, *Inside View*, 229.

⁴⁴ *Ibid.* This is a paraphrase based on McCoy’s modernized enumeration of García’s definition.

scientists, voice coaches, and voice pathologists from the Collegium Medicorum Theatri added two more on either end (*fry* and *whistle*). They also added a quasi-middle register and suggested simplified language and an overall numbering system. French acoustician Nathalie Henrich drew from their work in 2006 to suggest a four-mode system that has gained traction in Europe, but not as much in the United States. Her article gives a comprehensive account of register language and demarcation leading to her system.⁴⁵

Over the first years of the twenty-first century, language from CCM pedagogues has further expanded the definition and lexicon of register labels. Table 2 reflects a compilation of language encountered in this study. Henrich’s labeling system is denoted as it gives a structure that can accommodate the language of all others, either in sets of contiguous tones or by the placement of some labels between two others, indicating a mixing of those registers.

Table 2 Compiled Registration Labels⁴⁶

mode 0	mode 1	voix mixte	mode 2	mode 3
fry	chest	mixed voice	head	whistle
pulse	modal		loft	flageolet
stroh bass	belt	middle	legit	bell
click	heavy mechanism		light mechanism	flute
glottal rattle	TA-dominant		CT-dominant	small
slack	thick folds		thin folds	
	lower		upper	
	<i>voce di petto</i>		<i>voce di testa</i>	
		opera head voice	falsetto	
		reinforced falsetto (opera)	reinforced falsetto (CCM)	
	open timbre	close timbre	whoop timbre	
	<i>voce aperta</i>	<i>voce chiusa</i>		
	yell timbre (↑F1)			

⁴⁵ Henrich, “Mirroring the Voice.”

⁴⁶ Henrich et al. designations in the top row. Spacing allows parallel terms to remain in relationship across columns. Bozeman designations in the last row.

Laryngeal Versus Acoustic Events

Henrich's four registers describe purely laryngeal events as that are produced by the same laryngeal mechanism or with the same glottal configuration. *Mode 0* for the lowest *fry* sounds, *Mode 1* and *Mode 2* for the low and high core-voice registers respectively, and *Mode 3* for the highest *whistle* sounds. These categories come from the portion of García's definition that states tones are "produced in the same physiological manner" or, in his original words, "produced by the development of the same mechanical principle."⁴⁷ McCoy and Bozeman both refer to laryngeal registers using these mode numbers and branch out with supplemental terms of their own—*glottal source mode* for McCoy and *vibrational mode* for Bozeman. In all cases, these authors are focused exclusively on what is happening at the level of the larynx, most notably between Mode 1 and Mode 2 and the thickness or thinness of the vocal folds, respectively. Two sets of muscles have predominant roles in determining a thick or thin vocal fold configuration. In Mode 1, the thyroarytenoid (TA) muscles contract to shorten and thicken the folds and in Mode 2, the cricothyroid (CT) muscles to elongate and thin the folds. With each configuration comes changes in vibration, tension (pitch range), timbre, and glottal resistance, among other qualities. All of these factors contribute to the language created over time for registration labels.

Henrich, McCoy, and Bozeman (among many others, including Titze) delineate other registers who share the same basic timbre (García's second principle) but do not involve a core or wholesale change of laryngeal configuration. What changes instead is the acoustical or resonance strategy above the folds. Some changes involve adjustments to the overall length of the vocal tract, including the positioning of the larynx as a unit in the throat. More discussion in this area opens the door to the flourishing field of modern vocal acoustics and the associated

⁴⁷ McCoy, *Inside View*, 229.

language of harmonics and formants, which are discussed, to the extent fitting for this setting, in chapter 6 on resonance.

Chest, Head, and Falsetto Terminology

A separate look at concepts and language around the particular system of *chest/head* labeling and *falsetto* is of value for the following reasons: (1) these terms have a more extended history than most of the registers identified in table 2; (2) falsetto/head voice usage in male choral singers is more consistently needed; (3) confusingly diverse opinion and instruction are present in both solo and choral studied voice cultures; and (4) conversations about these terms have advanced in voice science and pedagogy literature.

Chest and head voice designations were among the pioneering work of Manuel García II and have remained in the lexicon ever since, sometimes widely condoned and sometimes with fewer, but ardent supporters through times of denunciation. A primary factor cited by denouncing factors is the terms' basis on sensation over actual sound source.⁴⁸ While some contemporary pedagogues, including McCoy and Bozeman, now mostly avoid the terms in favor of the more neutral Mode language, a return to chest/head usage is a current trend in the overall voice pedagogy profession. McCoy acknowledges the value of this common usage and, in his explanation below, succinctly describe the placement of these terms in modern understanding:

Great controversies have arisen among singers and teachers over the terms chest and head voice. Many eschew them because they do not accurately represent the source of the sound, preferring terms such as modal and loft voice. Register names typically have been derived from sensation, not function ... While neither chest nor head accurately describes all aspects of a register, they are common to our singing lexicon. In this author's experience, few people misunderstand the basic concept of *chest voice*; the same is not necessarily true for alternate terms, including modal and heavy mechanism.⁴⁹

⁴⁸ More will be discussed on sensation versus source in the section on free and forced resonance in chapter 6.

⁴⁹ *Ibid.*, 230.

Contrary to chest voice, in McCoy's estimation, head voice and falsetto have not escaped misunderstanding, and these terms, along with a relative newcomer—*reinforced falsetto*—continue to have multiple meanings for male voices.

Before proceeding, it is necessary to dispel the myth that falsetto is, in any way, produced with the false vocal folds. Like diaphragmatic language, this myth is woefully outdated but has endured continuous attempts to dispel it. In all usages, male or female, falsetto is a product of the true vocal folds when in their elongated, thinned configuration (Mode 2 with primary engagement by the cricothyroid muscles). This is true regardless of differences in tone quality, be they *hooty* or *breathy*, *weak* or *strong*, smoothly or disjointedly connected with other tones. In some falsetto usage, the vocal folds may not completely close, but oscillation still occurs in close enough proximity that sound is produced.⁵⁰

In female voices, falsetto and head voice are sometimes synonymous, though head voice is by far the more widely used of the two. In the consulted sources, there is generally not a confusion of meaning between the two, merely a preference for other terminology, as noted in table 2. This author has anecdotally heard promotion of a separate falsetto for female voices, described as a *breathy*, unsupported or insubstantial tone. While that may have origins in a historical resource, any separate register designation was not substantiated by the contemporary literature reviewed. The described qualities are simply those may emerge from untrained singers.

In male voices, there is endorsement for both two- and three-register designations across their middle to upper vocal range. In the three-register model, a separate head voice exists between chest voice and falsetto, reserving falsetto for the highest pitches that sound similar to female voices in that range. The writings of Chapman, Titze, and, historically, Vennard all lend

⁵⁰ Ibid., 232.

support to this theory, and the term *operatic head* is reported by Hoch & Sandage. Various descriptions of the laryngeal configuration (Mode 1, Mode 2, or in a mix of the two) are presented. Chapman says, “usually, men are using Laryngeal Mechanism 1 with resonance adjustments that make this singing register different from modal register.”⁵¹ Titze uses a broader language of a mixed voice, with both TA and CT muscles engaged, while still researching the detailed contributions of those muscles and other factors.

The essentially two-register model that McCoy and Bozeman use for this area of core vocal range offers a solution that accommodates a broad array of classifications. Says Bozeman, “If we understand *mix* to be a subcategory of mode one and *false alto* to be a subcategory of mode two, we should be able to get past semantic differences and continue productive conversation.”⁵² Following this suggestion, all versions of male falsetto timbres would find a home under the Mode 2 category, “including countertenors, male sopranos, female impersonators, barbershop tenors, and some commercial singers such as Smokey Robinson, members of the Bee Gees, and various *a cappella* groups such as Take Six.”⁵³

Finally, the term *reinforced false alto* has appeared among singers and voice teachers. According to McCoy, usage of this term among rock and blues singers means a “loud, well supported Mode 2 production with efficient glottal closure.”⁵⁴ By contrast, it is being used in classically-oriented voice pedagogues to mean “a light, easy voice production that can serve as a bridge into the upper extension and Mode 1 vibration.”⁵⁵ These nearly-opposite meanings do not

⁵¹ Chapman, *Singing and Teaching Singing*, 75.

⁵² Bozeman, *Practical Vocal Acoustics*, 79.

⁵³ McCoy, *Inside View*, 235.

⁵⁴ *Ibid.*, 245.

⁵⁵ *Ibid.*

have a resolution and, as such, nicely demonstrate the perpetual shifts of language in the area of registration.

Summary

The singular change of more frequent and specific use of laryngeal language in contemporary voice pedagogy is the underlying driver for all other changes covered in this chapter. Advancements in voice science that contribute to this change have been brought about by vast increases in technology, including digital imaging and fiber optics. Chief among increased understanding is the interplay of sub- and supraglottal pressures, airflow, and vocal fold closure. When in optimal relationship, these factors create easy and efficient vocal production through vocal tract inertance. The consequent development of Titze's SOVT practices has revolutionized the field of voice pedagogy and encouraged voice professionals to engage with the language of vocal acoustics.

The language of onset/offset and phonation modes has broadened, but the basis of understanding remains the same. In the area of vibrato, there is evidence to suggest that it may be trained as a volitional voice characteristic outside of addressing unhealthy practices that are caused by tension, recruitment, or other conditioning factors. More importantly, in this author's opinion, is the need to acknowledge and situate the broad spectrum of vibrato to non-vibrato preferences within cultural norms and understand that non-vibrato is a matter of perception and not physiological reality. The neutrality of understanding and language in this area and in the area of registration that science offers is compelling.

Phonatory instructional language from the comparative study is summarized in table 3. The terms, phrases, and instructions in the left column are those specifically raised by consulted sources either as ubiquitous language of concern or recommended contemporary language. The

comments in the right column are also distilled from the comparative study as a whole and paraphrased, but not originated by this author. The table is organized by order of presentation in this chapter. In each category, the phrases are organized and coded in descending order of recommended use.

Table 3 Phonation Instructional Language

	Terminology	Status of Use
Laryngeal Function	Vocal folds	Current and accurate term (changed from <i>vocal cords</i>).
	Airflow/Breath Pressure	Current and accurate terms that are recommended and are not synonymous. When appropriate, should be used in place of simply <i>air</i> or <i>breath</i> with their specific meanings: airflow to describe the stream of moving air and breath pressure to describe the build-up of air below the glottis or resistance to the stream of air. They are inversely related.
	Sing with a steadier stream of air	Recommended for a short, general instruction. Should be preceded with contextual information.
	Raise or lower the larynx Sing with a raised/lowered larynx	Caution and context needed. While laryngeal height is a component of vocal tract length and differing postures for classical and CCM aesthetics, instructions to raise or lower the larynx easily lead to hyperfunctioning response and added tension. Should be preceded with contextual information, offered in moderation, and monitored for understanding and appropriate response.
	Sing on an /i/ vowel to get rid of breathiness	Misleading. Closed vowels may increase efficiency and therefore perceived breathiness, but better to determine if an aspirate onset or phonation mode is the root cause.
	Use more air Move your air	Misleading and too vague. Is more airflow wanted? More or less breath pressure? Can encourage unnecessary tension, exertion, and recruitment.
	Sing on/off the cords	Not recommended for general use. May stem from singers wanting to be aware of subglottic pressure and resistance, but feeling sensation of the actual vocal folds is not possible and may lead to unintended manipulation.
	Get your cords together	Not recommended. Too vague and includes outdated terminology. More effectively approached through exercise/experience than through this directive.

Table 3 Phonation Instructional Language, Continued

	Terminology	Status of Use
Onset/Offset	Onset - Aspirate/Balanced/Glottal	Accurate terminology for the three possible initiations of sound. <i>Breathy/Coordinated/Hard</i> are also widely used.
	Offset - Aspirate/Balanced/Glottal	Accurate terminology for the three possible releases of sound. <i>Breathy/Coordinated/Hard</i> are also widely used.
	Phonation Modes - Aspirate/Balanced/Pressed	Accurate terminology for the three possible modes of sustained sound, often correlated to onset used. Also, <i>Breathy/Flow Mode/Hyperadducted</i> .
	Glottal attack	Not recommended. Former word for glottal or hard onset that has negative connotations.
Intensity	Intensity or sound level	Recommended terms for dynamics
	Sing with more resonance	Too vague for general use. Instead, be specific about what change is wanted - more intensity, different timbre, more presence, ring, clarity, vibrato
	Sing louder	Use with caution for the reasons above. If more dynamic intensity is wanted, be aware of how that intensity is produced.
Vibrato	Natural (<i>bel canto</i>) vibrato	Recommended more specific term for the kind of vibrato generally wanted for classical singing. Also, <i>well-balanced, easy</i> .
	Modify your vibrato	Recommended short instruction instead of <i>no vibrato, straight tone</i> , or similar. Best when accompanied by specific instruction, exercise, or appropriate modeling.
	Non-vibrato	Recommended term instead of <i>straight</i> or <i>pure</i> tone. Not recommended to ask for wholesale or without instruction and monitoring.
	Match vibrato	Not recommended for general use as not possible or health for many singers. Could be used with caution between like voices.
	Straight or pure tone	Not recommended. Use Non-vibrato or vibrato modification instead. Not recommended to ask for wholesale or without instruction and monitoring.

Table 3 Phonation Instructional Language, Continued

	Terminology	Status of Use
Registration	Mode 1	Current preferred register terminology in Europe and by McCoy and Bozeman in the US. Synonymous with <i>chest voice, modal, mix</i> .
	Mode 2	Current preferred register terminology in Europe and by McCoy and Bozeman in the US. Synonymous with <i>head voice</i> and <i>lofted</i> (among others). Sometimes synonymous with <i>falsetto</i> .
	Chest Voice	Widely used but with some variance of interpretation. Synonymous with <i>Mode 1</i> and <i>modal</i> .
	Head Voice	Widely used but with some variance of interpretation. Synonymous with <i>Mode 2</i> and <i>lofted</i> . Sometimes synonymous with <i>falsetto</i> .
	Mixed Voice	Widely used but with some variance of interpretation. Most current definition described as a subcategory of <i>Mode 1</i> .
	Falsetto	Widely used but with some variance of interpretation. Most current definition described as a subcategory of <i>Mode 2</i> . Sometimes synonymous with <i>head voice</i> . NOT produced by the false vocal folds, but by elongated, thin, true vocal folds that may not meet entirely.
	Sing like you speak	Use with caution. If the intention is not to overwork, singers may confuse this instruction by decreasing elements of singing that require more athleticism, sustainment, or breath management. In some registers for some voices, comparisons to speech are beneficial, but not in others.
	Reinforced Falsetto	Confusing term with conflicting meanings in CCM and classical voice. Not recommended for use, particularly without established specific meaning.
	This piece/passage sits in your break	Not recommended. Use <i>transition area</i> instead.
	Raise/lower the larynx	Not recommended. Though the larynx is capable of raising or lowering and different aesthetics do shift the position, this general instruction is too broad for any group instruction and, in any instruction, likely to lead to incorrect and excessive effort. Adjustments of laryngeal height should be for individuals only and with caution.

Chapter 6

Contemporary Understanding and Language of Resonation

Historically, the area of resonation has been dominated by sensation—an invisible and entirely subjective guide that has encouraged a multitude of imagery-based terms. As in the area of phonation, technology has made the invisible visible and radically changed the analysis and language of resonation. Sound is the invisible target here, more than muscles, and the field of vocal acoustics has experienced significant growth in the singing profession. Richard Sjoerdsma, in his foreword for Ken Bozeman’s *Practical Vocal Acoustics*, says that Bozeman shifts away from “acoustics in an external sense ... and narrows the definition toward an internal orientation, requiring examination of the voice as an acoustic instrument consisting of power source, sound source, and sound modifiers.”¹

Historical concepts and theory still form the base and, in many cases, have been simply explained by the science rather than refuted. The role of vowels and concepts of modification, theories on the internal adjustment of the vocal tract, and even some aspects of the controversial language of placement—all find “A-ha!” moments with the information that contemporary acoustical science provides. Other images and their related language, particularly color words and placement language that goes beyond the physical mechanism, have less basis in fact-based pedagogy and are being called into question.

Once again, the inclusion of CCM aesthetics in studied voice cultures has inspired the expansion of both research and lexicon. Aspects of tone that were once dismissed as faults in

¹ Sjoerdsma in Bozeman, *Practical Acoustics*, xi.

classical voice production, such as brassy or yell timbres and twang, are serious focal points of pedagogy and contemporary writing.

Categorical and Systematic Terminology

The vocal tract is the *resonator* of the human instrument. It is the *amplifier* and enhancer of the vibrations powered by breath and given sound by the vocal folds. It is the *filter* for the *source* of our sound signal. The highly flexible “tube” of the human vocal tract is continuously modified, both organically and volitionally, as sound is produced—a quality that no other instrument shares, and that makes each individual human instrument unique.

Many contemporary writers use a rudimentary device when beginning explanations of resonance—that of reaching to standard dictionaries for definitions. These provide the building blocks of the acoustical concept, namely “the intensification and enriching of a musical tone by supplementary vibration.”² This author also used the dictionary as a starting point in her 2018 *Choral Journal* article entitled “A Language That Resonates: Building a Pedagogy of Resonance for Adult Avocational Singers in a Choral Setting,” but for different reasons. The broader perception of resonance often involves qualitative definitions such as *deep*, *full*, *loud*, and *clear*, and these are the descriptors that one first encounters in the Oxford and Merriam Webster dictionaries. One has to scroll deeper to encounter the above practical definition from a scientific discipline.³ Both qualitative and practical definitions are present in the language of resonance used in voice pedagogy and found in the comparative study.

The vocal tract, generally defined as the area between the glottis and lips, is the resonating tube of the voice, but resonating spaces exist beyond the physical tube itself. The first section below gives an overview of those spaces and two corresponding types of resonance.

² Merriam-Webster online dictionary.

³ Rodgers, “A Language That Resonates,” 64.

Within that topic, particular attention is given to nasality and the types of nasal resonance and the concept of placement. The language of timbre follows, divided into two sub-topics of color/tone quality and focus. The final topic covers the mapping of vowel and vowel modification language to contemporary terms. The robust and still highly technical language of vocal acoustics, including understanding and manipulation of formants, are discussed in general terms. Though increasingly embedded in the language of voice professionals, it is still a relatively new and rapidly developing sub-specialty. As such, widespread use is limited, and voice professionals need to acquire language in this area more than they need to re-map from historical pedagogy.

The Vocal Tract

The end product of the voice, that which is heard by the listener, is a complex sound wave consisting of frequencies enhanced by the various spaces and overall shape and length of the vocal tract. The spaces where air can travel through consist of the larynx, pharynx (or throat, which is divided into three subsections), the oral cavity, and in a few sounds, the nasal cavity. Each space has unique properties, most notably the overall size, possible shapes, and the nature of the walls in terms of hardness and thickness, which amplify and dampen different frequencies of the sound wave passing through it. The ability for vibrating air molecules to flow through these spaces is the key to this process. Air vibrates in three other spaces in the body—the chest, the trachea, and the sinuses⁴—but their location outside the direct phonatory tube, among other factors, prevent those vibrations from contributing to the external sound.⁵ They do contribute to the singer’s experience of singing as do many other areas of the body that vibrate with the sound

⁴ Referring here to the nasal sinuses. The piriform (or pyriform) sinuses between the collar of the larynx and the thyroid cartilage are thought to contribute significantly to “ring” or the singer’s formant. These are considered part of the larynx rather than the vocal tract.

⁵ Research is ongoing in this area including acoustical impedence that may be caused by tracheal resonance, as noted by James McKinney and Janice Chapman.

being produced. The delineation of which vibrations impact resonant sound and which contribute only to the internal experience of singing is the key to understanding much of the language and imagery that has been so controversial throughout pedagogical history. As with many other areas discussed, allowance for individual variation and experience in combination with understanding the physical workings of the vocal instrument is the primary guide for good contemporary teaching.

The overall length of the vocal tract contributes to the frequencies that characterize the produced sound. The tract can be lengthened or shortened at either end by the height of the larynx and the shaping of the mouth and lips. A *megaphone* shape is a common analogy for these broader configurations. Figure 1 shows Ingo Titze's anatomical and graphic representations of the megaphone and inverted megaphone vocal tract shapes. An *inverted megaphone* creates a *convergent* shape that features a longer overall vocal tract. At the bottom, as described by Bozeman, it is "dependent upon a relatively settled, open throat, in which the thyrohyoid space has not been compressed, and upon some elevation of the soft palate."⁶ At the top, shaping of the mouth and lips contribute to a narrowing and lengthening of the tract. Some vowels such as /i/ and /u/ are more naturally convergent, and more open vowels can be adjusted to stay within the overall convergent shape. In general terms, a convergent vocal tract configuration creates elements desired in the classical voice aesthetic and the formation needed for the *ring* or *squillo* quality referred to as the singer's formant.⁷

By contrast, a *divergent* or simple *megaphone* shape features a shorter overall tract, raising and constricting the laryngopharynx (the lowest sector of the throat just above the larynx)

⁶ Bozeman, *Practice Voice Acoustics*, 44.

⁷ *Ibid.*, 107. *Squillo* is a term used almost exclusively in opera. The singer's formant is a specific cluster of formants that align and "increase power in the high frequency components of a sung sound."

can be a shortening factor or by using a wider mouth opening, often prioritizing more open vowels such as /a/, /æ/, and /ɛ/. This configuration is closer to speech and, while useful for a variety of sounds, is a fundamental set-up for belting and the formation of *twang* (sometimes called *brassy timbre*), the highly resonant CCM parallel to the classical singer’s formant cluster.

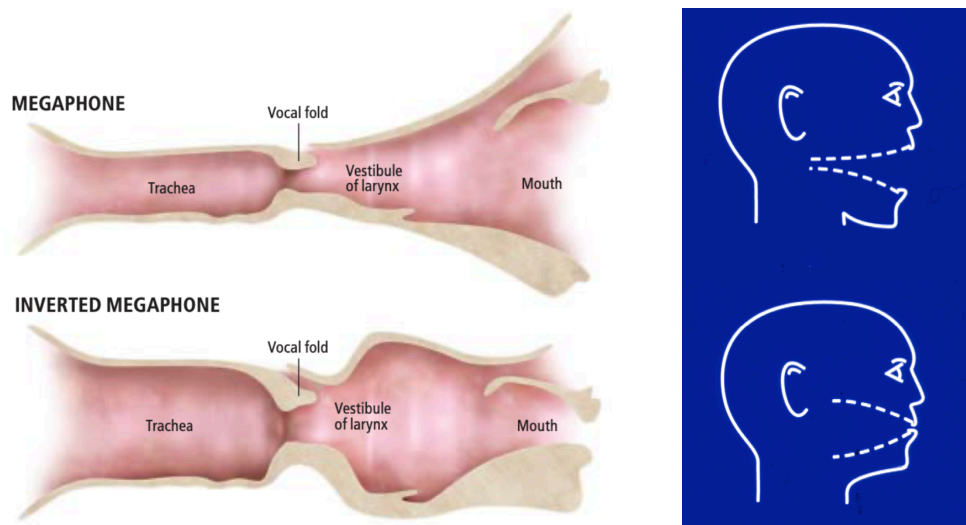


Figure 1. Megaphone and Inverted Megaphone Vocal Tract Shapes. Both images reproduced by permission from the National Center for Voice and Speech. *Left*: Titze, I.R. and Worley, A.S. (2009). Modeling Source-Filter Interaction in Belting and High-Pitched Operatic Male Singing. *Journal of the Acoustical Society of America*, 126(3), 1530-1540. *Right*: Titze, I.R., Worley, A.S., and Story, B.H. (2011). Source-Vocal Tract Interaction in Female Operatic Singing and Theatre Belting. *Journal of Singing*, Vol. 67(5): 561-572.

Of note, both overall megaphone shapes are capable of producing high-frequency clusters of sound, the terminology for which is becoming increasingly diverse as research expands. Hoch and Sandage propose use of the single term *ring* in place of singer’s formant, *squillo*, *twang*, *brassy timbre*, and *mask resonance*. “This term represents the perceptual phenomenon that is present when training both the speaking voice (resonant voice) and singing voice for a variety of singing styles, including classical, music theater, and CCM.”⁸ Also, *ring* avoids confusion with terms for resonant voice used in speech language pathology and aerodynamic science.

⁸ Hoch and Sandage, “Working Toward a Common Vocabulary,” 648.

Two Types of Resonance

The resonance from vibrations that impact the finished sound that the listener then perceives is specifically designated as *free resonance*, also known as *sympathetic resonance*. McCoy uses *public resonance* as a teaching tool and defines it as “the result of vibrations of air molecules and reflections of soundwaves within a void.”⁹ The freedom that this term refers to not only applies to the movement of air within those resonators but is dependent on an opening where air can freely exit the resonator. The filtering of the soundwave by these resonating spaces is the subject of vocal acoustics.

Free resonance is used by pipe organs, wind, and brass instruments, though each of those has singular, regimented ways in which the filtering process happens. In the vocal instrument, each resonating space has multiple ways to change—in size and shape (on its own and through the involvement of articulators), stiffness or softness of the surfaces that reflect the sound, and physical condition (e.g., congestion, hydration level). Each change alters the resonance, and the combined options for resulting sound are virtually limitless. A few of the major agents of change are discussed further in this chapter, including:

- The shaping of the oral cavity (most notably by the tongue) and creation of vowels—a central component of resonant voice and a primary area of instruction and linguistics.
- The control of the velum or soft palate in shaping the oral cavity and determining whether or not the nasal cavity contributes to the produced sound.

Smaller and more integrated spaces such as the collar of the larynx and the subcategories of the pharynx (laryngopharynx, oropharynx, and nasopharynx) contribute in specific ways to the complex timbre of each individual voice. The detailed acoustical components of timbre and the

⁹ McCoy, *Inside View*, 49.

effects contributed by these spaces cannot be adequately covered here, but elements of timbre language are discussed in a separate section below.

The second type of resonance, called *forced resonance*, *conductive resonance*, or in McCoy's teaching examples, *private resonance*, does not contribute to the finished sound that leaves the singer. As such, it is not a focus of vocal acoustics, which is the primary subject of the resonance chapters in contemporary sources. However, the sound and sensation of forced resonance contribute to the singer's experience and understanding of their voice in a way that cannot be underestimated. These subjective sensations significantly impact the language of resonance in voice pedagogy. As implied by the terms, vibrations are transferred (or conducted) to other supplemental areas of the body beyond those where free resonance is occurring, forcing those areas to vibrate sympathetically.

In the human body, the chest and the head feel the vibration of sound most keenly, sensations that led to the oldest of the register labels—chest voice and head voice. Any sound created by these vibrations is dampened by skin, muscle, fat, and other tissues,¹⁰ and thus does not transmit to the external listener. These vibrations can intensify in narrower spaces. For instance, the narrow passage between a fronted tongue and the hard palate during an /i/ vowel can create more *forward* vibrations that are felt *in the mask*, but also vary distinctly in each individual. Descriptions arising from these and other distinct sensations are the basis for many examples of imagery-based language. McCoy neatly sums up the impact of forced resonance on pedagogy as follows,

While these sensations—caused by forced resonance—can be extremely helpful to individual singers, they are less reliable when used for teaching. There is a simple reason for this dichotomy: no two people share the same body. Because we are unique individuals, one

¹⁰ Ibid., 48.

singer's experience of resonance often is very different from that of another, even if both produce similar sounds using the same fundamental vocal technique.¹¹

Nasality and Types of Nasal Resonance

Before discussing broader imagery language of placement and color, the forward and mask feelings of the /i/ vowel provide a transition into the area of nasality and nasal resonance. Practitioners often cite nasality as a broad quantitative descriptor, which can be misleading when nasal resonance is not actually occurring. According to Deirdre Michael, "Singers come to the clinic with a variety of misconceptions about the term 'nasal,' and often are terrified of 'nasality'Whatever 'nasal' means, it is highly stigmatized."¹² Her article gives an efficient and comprehensive description of the spectrum of nasality from hypo- to hypernasal, including how nasal sensations are stronger than acoustic changes and how those sensations play out in singers' language and communications.

Appropriate nasal resonance involves air flowing through the nasal cavity, made possible by the lowering of the velum (or soft palate). This occurs naturally on the /m/, /n/, and /ng/ sounds, as well as some French vowels. In CCM styles, according to Rosenberg and LeBorgne, "increased nasality in tone production is often perceived ... [however] other than utility for stylistic or character choices, nasality is not a desired quality in commercial music."¹³ Here, it is important to understand the concept of *twang* and the difference between *twang* and nasality. Nasality, or a *nasal murmur*, is responsible for the nasal consonants and is the result of the "acoustic energy propagated through the nose ... *twang*, on the other hand, is not inherently a nasal quality although it can be nasalized." This description, from Titze and Verdolini's *Vocology*, is extended as follows:

¹¹ Ibid., 49.

¹² Deirdre "'Sniff to Raise the Palate.'"

¹³ Rosenberg and LeBorgne, *Vocal Athlete*, 101-102.

Perceptually, there is a lack of warmth and depth in twang, but ample brilliance. Jazz and country singers like it because it simulates the sound quality of a brass instrument, or the twang of a guitar string. It is quite unfortunate that twang has been associated with nasality because this association has led to much of the confusion about voice qualities and so-called ‘resonance disorder.’”¹⁴

The additional descriptors of *bright* and *forward* that also accompany both nasality and twang are the product of vowel and formant tuning, discussed below.

Hypernasality has been considered a form of *inappropriate nasal resonance* (as is *hyponasality* when the nasal resonance of sounds is desired and unable to be accessed) and can be misidentified. Referring again to Michael’s article,

“When the velopharyngeal port is opened, even partially, when it should be closed for non-nasal phonemes, we say there is hypernasality. When the velopharyngeal port is closed, even partially, for nasal phonemes, we say there is hyponasality. So, nasality describes the degree to which the velopharyngeal port is open or closed, that is, the degree of nasal resonance, and the prefixes hyper or hypo describe the appropriateness of the nasal resonance ... A student may be told by his singing teacher that he is too nasal, when the teacher is referring to a sound that is excessively constricted and tight, or insufficiently warm/round/open. He may then go to his choir rehearsal and be told, “Tenors, stop being so nasal!” when the director is referring to a sound that is indeed hypernasal, which is acoustically quite different.”¹⁵

The most straightforward test for inappropriate or unwanted nasality, in both voice study and speech therapy, has not changed with contemporary understanding. Plugging the nose while singing or speaking (except for during appropriately nasal sounds), reveals any airflow through the nasal cavity. Sensations and instructions that describe feelings of singing in the mask, bright, or forward, can be so easily confused with nasality, but may not actually involve inappropriate nasal resonance.

Jo Estill’s research in this area translates the clinical designations of hyper- and hyponasality into a more nuanced examination of the velum (soft palate) and its role in different

¹⁴ Titze and Verdolini, *Vocology*, 288.

¹⁵ Michael, “‘Sniff to Raise the Palate,’” 321.

vocal qualities for singing and speaking. Hyponasality or raised palate is Estill's *High Velum* position and regarded as the norm for most classical singing sounds. *Low Velum* sounds, when the palate is low (the velopharyngeal port is open) and the tone is entirely nasal, happens fleetingly in speech. However, the use of these nasal sounds (e.g., humming) and the imagery of nasal resonance is foundational to modern singer training, including a core component of SOVT methodologies. What Estill explores (found in no other documentation reviewed by this author) is the use of *Mid Velum* positions. Sustained Mid Velum singing, considered hypernasal in clinical and classical voice arenas, is a state of air flowing through both oral and nasal cavities. It is the more accurate description for the anatomical configuration of the French nasalized vowel sounds and also the configuration for the more nasal resonance heard in American pop and country singing. Intriguingly, according to Estill, "even in classical singing, the rule for High Velum is not as strict as it might appear. Mid Velum can be very useful for high soft singing and in diminuendos."¹⁶

The velum or soft palate, the action of which determines the amount of nasal resonance, has long been referenced in a singular way in classical music with the simple instruction to *raise the soft palate*. While it is true that a raised palate will create most of the desirable sounds of the classical aesthetic (remembering, with the expansion of studied voice cultures, that raised-palate sounds are only one of many desirable aesthetics), a generalized instruction to raise it needs two primary cautions. First, the muscles that raise the palate also easily raise the larynx. Only with training do singers learn to uncouple these actions. Second, raising the palate is often perceived as a vertical action, and, accordingly, non-verbal gestures by both voice teachers and choral conductors will communicate an upward-only motion. In reality, the raising of the palate is also a

¹⁶ Steinhauer, Klimek, and Estill. *The Estill Voice Model*, 166-167.

flattening created by the muscle that retracts the uvula.¹⁷ While there is no language offered to replace *raise the palate*, the use of that phrase and accompanying gestures should be clarified or modified.

A slight detour is appropriate here to briefly address the nasal sinuses. In historical pedagogy, resonance has been assigned to the sinuses along a spectrum from supplemental enhancement to total production of sound. While these outdated assignments were not encountered in consulted sources, several authors were still explicitly debunking that language and instruction. For that reason, it is stated here that the sinuses are closed cavities, not capable of contributing to the sound wave produced by free resonance. They can, however, contribute noticeably to singers' sensations through forced resonance that is felt but not heard. The summary table (table 4) at the end of this chapter includes outdated phrases involving the sinuses.

Placement Language

As noted, individuals' internal sensations of singing are the origin for most imagery-based language and particularly of placement language. McCoy's description of forced resonance, stated earlier, is echoed in every consulted source—that any given singer's experience of vibration will differ from another, making the communication of these sensations highly variable and, therefore, an unreliable teaching tool. Practitioners use the concept of *placing the voice* in many ways—singing in zones, directing the sound to the front, back, inside, or outside of the head, and developing specific formulas or triangulations to point the sound or use targeted places in the mask. While not related to the placement language referenced here, an accepted translation of the *bel canto* term *messa di voce* is the “placing of the voice.” Perhaps the

¹⁷ McCoy, *Inside View*, 255-256.

sophisticated control that *messa di voce* work requires was a contributor to the origins of that language.

For decades now, explicit instructions to place or direct the tone have been discouraged by voice pedagogues. However, as evidenced by contemporary sources—most notably the formal declaration by the AATS in 2014—there is still a need to raise that misleading instructional language and continue to discourage use without fact-based context. Authors frequently note, however, that *within* a fact-based context, imagery and exploration of private resonance can be effective.

Following the nasality discussion earlier, instructions to *sing in the mask* without context “can lead to pressed phonation, constriction of the oropharynx or laryngopharynx, or actual hypernasality.”¹⁸ Other examples of placement language that are still reported and of concern include: *bounce the tone off the hard palate, send the sound out through the eyes or the top of the head, place vibrations at the end of the nose*, or point the voice in a particular way. Some language of concern discussed in chapter 4 on respiration is also about placement, such as *direct the air to the pelvic floor* (or lower) or *focus the air down the spine*.¹⁹

A fascinating and contemporary resource regarding placement is Donald George and Lucy Mauro’s *Master Singers: Advice from the Stage*.²⁰ Twenty-one successful professional singers, ranging from young professionals to international stars (Thomas Hampson, Denyce Graves, and Joyce DiDonato among them), were interviewed about elements of the craft of singing including a specific question on “ideal placement of the voice for resonance.”²¹ Many of

¹⁸ Michael, “Sniff to Raise the Palate,” 322.

¹⁹ Edwin, et al., *In Support*, 7. This example and most in the paragraph above were cited in the 2014 AATS Declaration.

²⁰ This resource was considered for this dissertation, but not used in the comparative study because the language spanned many generations of contemporary pedagogy and could not be fully situated within the stated guidelines for inclusion.

²¹ George and Mauro. *Master Singers*, 11.

the interviewees acknowledge the individuality of their sensations, and some do not think in terms of placement at all, but others use specific placement locations that correspond to the examples above. Bass-baritone Alan Held says, “placement is the most important aspect of my singing. I try to have my inhalations start ‘in place,’ and my vocalization be exactly in the same place, in the mask.”²²

The contemporary sources consulted offer linguistic and contextual bridges to imagery-based and placement language. In all of them, the primary change is to note the “illusion” of placement (McCoy’s word choice) but also the value of individual sensation, asking singers to report where they are feeling vibration and helping them map those sensations to desired sounds. McCoy addresses placement only in his explanations of forced or private resonance and is cited by several others. Bozeman, after urging caution and flexibility with any placement suggestions, goes a step further and says, “Though sound cannot actually be placed, there is a possible basis for variation in sensation of vibration along the vocal tract, due to the pressure nodes of the resonated sound waves.”²³ He discusses the specific locations that different vowel sounds may be felt depending on the formant set-up and says that, within an overall balanced sensation, these locations “can help keep vowels’ aligned,’ the tongue fronted, the larynx and first formant low, the resonator convergent, and the timbre balanced.”²⁴

The recommendation of most contemporary teachers is to ask singers to name their own feelings of where the sound is vibrating or map it by using touch to follow vibrations in different areas of the body. Also, practitioners should not underestimate small linguistic choices that make imagery and placement concepts useful. Brian Manternach recommends placing one’s *attention*

²² Ibid., 13.

²³ Bozeman, “Remapping the Open Throat,” 186.

²⁴ Bozeman, *Practical Voice Acoustics*, 67.

rather than placing the sound: “I reinforce that they do not need to purposely make mechanical adjustments to do this; they simply need to shift their focus and observe what happens.”²⁵ Deirdre Michael finds it useful to ask clients to *pretend* to send sound or air to an imaginary place or take on the feeling of something they are not (in her case, a giant kelp). She says, “an anatomically incorrect image, with the proper caveats, is useful. In my pedagogic and clinical experience, we can use imagery of all sorts. But what we must do is examine every one of our images, and make sure that it doesn’t promote a myth.”²⁶ She endorses the phrase *Anatomically Informed Imagery*, proposed by Rachel Ware in her research survey of 520 singing teachers regarding their use of imagery and scientific fact.²⁷

Finally, an important distinction made by consulted sources is the understanding of action (or cause) and result in terms of placement. Cause and result language is used by McCoy, Titze, and Nix and is the lineage of Richard Miller as cited in the writing of Manternach:

Another key element to determine with students is whether they understand placement (the sensations created by forced resonance) as an action or a result—a first step or an outcome. As Miller indicates, singers should rely upon these sensations as they self-monitor the sounds they produce, “but those sensations should be the result of coordinated function, not of attempting to ‘put’ sound in places where it cannot go.”²⁸

Timbre, Tone, and Color

Timbre, *tone*, and *color* (or *tone color*) are all subjective terms which, in a general sense, are used interchangeably. None seems to be the preferred singular term in either voice pedagogy or scientific resources, although color seems to be used less neutrally and often includes references to affect. Some authors, like Titze, do not make broad use of any of the three, and others define specific labels (like Bozeman’s *whoop timbre* and *yell timbre*) with specific

²⁵ Manternach, “Loaded Words,” 66.

²⁶ Michael, “Sniff to Raise the Palate,” 323.

²⁷ Ware, “The Use of Science,” 415.

²⁸ Manternach, “Loaded Words,” 65.

parameters. Vennard's 1967 definition of timbre as a "subjective aspect of the harmonic structure of musical tone"²⁹ and detailed description of various colors and timbres is quoted in more than one primary source, as is a 1998 study by Bloothoof and Plomp that used 21 bipolar semantic pairs of descriptive terms. The structure of their study seems to have inspired McCoy's approach to tone. He presents his own pairs of semantic, comparative terms in the first chapter of his textbook as the introduction to subjective listening to the human voice. Examples include *bright/dark*, *forward/back*, and *conversational/ringy* in McCoy and *light/dark*, *metallic/velvety*, *sharp/dull*, among many more in Bloothoof and Plomp.³⁰

Color and Tone Quality Language

Concern with qualitative words for tone quality such as *warm*, *bright*, *dark*, *round*, and *tall*, among others, has arisen in a few voice pedagogy publications, at conferences, and empirically over this author's experience in classes and lessons. Though these words often appear, both historically and in contemporary literature, the overall concern is about their subjectivity and lack of systematic physiological meaning. A few terms, such as *bright*, *forward* and *dark*, have a more specific lineage and, consequently, more suggestions for current use. However, for those words and many others, the primary recommendation for proper use is regarding how to contextualize the words rather than to replace or remove them. Titze and Verdolini, citing "color words" among others with multiple definitions, say, "It is probably fruitless to argue about which words are most beneficial for effective teaching or therapy. One should experiment and vary the approach from case to case ... Most important, every effort

²⁹ Rosenberg and LeBorgne, *The Vocal Athlete*, 96.

³⁰ Bloothoof, and Plomp. "The Timbre of Sung Vowels."

should be made to define our personal usage of words. Beginning sentences with ‘By _____ I mean’ and using, as much as possible, *more agreed-upon words* in the definition.”³¹

Titze’s preference for those “agreed-upon words” are those that “describe the sensory or motor physiology,” including harmonics and formants, acoustic energy, subglottal pressure, and anatomical references. By contrast, for many of the performers cited in George and Mauro’s *Master Singers*, color is almost entirely the product of artistic and emotional intent. Ken Bozeman agrees, saying that instructions for coloring the voice are “more likely to induce artificial manipulations of the vocal tract that are less speech-like. The safer way to achieve variety of color is to motivate the sound with a variety of genuine affects.”³² For other authors and teachers, simply more specific, systematic language that “helps singers to understand what needs to be done or avoided is recommended.” John Nix cites the example of instructing students to *sing with tall vowels*. He says that singers “might wonder ‘Tall where?’ Is this something one actively creates? Is this a feeling (a result) or an action? Are tall vowels associated with an elevated soft palate or a wider jaw opening?”³³ More specific instruction is needed; however, individual differences must, once again, remain at the forefront. A sound that might be aided by a palate adjustment in one singer might be an adjustment for the jaw, tongue, or vowel for another. When working in a group setting, as is addressed in Part II of this document, specific instructions require even more diligence.

Bright and *forward* are particularly charged words further complicated both by long and variable lineage and by their relationship to physiological realities. Contemporary authors call out these terms specifically, but with opposite preferences for use—some now explicitly

³¹ Titze, *Principles of Voice Production*, 50-51

³² Bozeman, *Kinesthetic Voice Pedagogy*, 50.

³³ Nix, “You Want Me to do What?” 47.

removing them from use and some using as primary instruction. Physiologically and acoustically, high-frequency sounds, including those associated with the *ring* or singer's formant cluster that is so coveted in classical solo voice, "are more likely to generate high, possibly frontal vibratory feedback to the singer."³⁴ Less scientific terms used to speak to that same sensation include *brilliance*, *focus*, *white*, *open*, and the controversial versions of *mask* resonance, as previously mentioned. Pedagogues who avoid forward and bright language feel that "chasing the ring" has gone too far, that singers "shove the sound 'forward,'" and that there is "a lot of 'faked masque singing' in the conservatories/schools."³⁵ These quotes are taken from Stephen King's responses on tone in Elizabeth Blades' *Spectrum of Voices* but are echoed by several consulted sources. Janice Chapman addresses concerns about bright sounds from an articulation point of view. She talks about the higher tongue position for an Italian articulatory setting, saying, "pedagogues who urge singers to make bright, clear Italian vowels are correct in their demands but often try to create this brightness by the manipulations of facial muscles."³⁶

Dark and *back* language, though not as frequently referenced, is also of concern and is also somewhat supported by desirable acoustic configurations. Bozeman's *whoop timbre* is described as full and deep, with lower partials and felt more centrally in the pharyngeal column (which is further back than frontal vibratory feedback of high-frequency sounds).³⁷ These darker sounds, sometimes described as *rich*, *round*, or *warm*, can be produced with optimal resonance strategies, but singers also can go too far, causing the voice to be *overly dark*, *swallowed*, *woolly*, *bottled*, or *muffled*. They do this in overzealous pursuit of an "operatic sound," produced, among other ways, by unnaturally lowering the larynx, tensing the tongue root, or pursuing a fuller

³⁴ Bozeman, *Practical Vocal Acoustics*, 67.

³⁵ Stephen King in Blades, *Spectrum of Voices*, 39.

³⁶ Chapman, *Singing and Teaching Singing*, 94.

³⁷ Bozeman, *Practical Vocal Acoustics*, 23 and 67.

sound in their own ear that is not truly resonating to the listener.³⁸ This description overlaps with that of *cover*, as discussed later in this chapter. Overly dark sounds, overaction of the tongue, and consequential closing of the throat (remembering that kinesthesia of a truly open throat is misleading) are among the concerns that pedagogues express regarding any variation of *yawn* language, even those that advocate just the first part of a yawn or a *yawn-sigh*.

Every consulted contemporary author, be they voice pedagogue, choral conductor, or voice scientist, agreed on one desired quality of timbre, tone, or color for classical singing—that it be *balanced*. By this, they mean between bright and dark, brilliance and warmth and, sometimes, forward and back, and they reach, once again, to a centuries-old *bel canto* term to convey this balance: *chiaroscuro*. Unlike *appoggio* in the area of respiration and *coup de la glotte* in phonation, no controversy was found with the use of *chiaroscuro* and, while practitioners use the above descriptions variously, there is no conflict in meaning.

In the classical aesthetic, this balanced resonance strategy is dependent on a convergent resonator shape and depth that accompanies even the brightest of high-frequency sounds.³⁹ In some CCM singing, most notably in belting, the convergent, lofted resonance strategy that results in *chiaroscuro* is not used. However, a balanced and complex sound is still desired. While *brassy* and *bright* are critical components to the sound, overly bright sounds, including nasality, are generally not endorsed. It was also noted that sounds using the divergent resonance shape, including the spread posture of lips and teeth, are perceived as both brighter and louder than those in classical singing even if analysis does not reveal higher intensity readings.

³⁸ Chapman, *Singing and Teaching Singing*, 109.

³⁹ Bozeman, *Practical Vocal Acoustics*, 18.

Focus

Placement and color language are often interchangeable with that of *focus* and *clarity*. In the area of phonation, these terms may be more narrowly defined as the amount of noise in the signal source produced at the level of the vocal folds. In the realm of resonance, focus may be in reference to similar noise in the overall sound, usually in the form of breathiness, but is also a more general, subjective term indicating *tonal core*, or sounds that are *sharp, clean, clear, pointed*, and, again, *bright* or *ringing*. For Edward Baird, in Blades' *Spectrum of Voices*, vocal tone is entirely about focus: "the core in the middle of the tone that's going to make (1) the basis of uniformity of quality throughout the range and (2) the thing that is going to make it project."⁴⁰ For other teachers in Blades' interviews, focus ranges from a specific and manipulated adjustment (such as a particular frequency level achieved, a pinpoint of whiney sound that expands, or the fine-tuning of *chiaroscuro* like the treble/bass knob on a stereo) to a concept that is never addressed directly but shows up as a result of good singing and work in other areas.

For Rosenberg and LeBorgne, whose work in *The Vocal Athlete* is directed mainly to the twenty-first century CCM vocalist, focus is a qualifier for placement and has two categories of meaning. The first concerns the amount of breathiness in the tone, which they name *tone clarity*, and is "associated with the nature and degree of glottal closure." The second is "focusing a tone or vowel in order to intensify the brilliance of a given sound."⁴¹ The authors develop the latter into a discussion of formant, but, in general, they are careful to situate placement, focus, and clarity as "perceived events or mental illusions utilized by singing teachers to evoke a desired perceptual quality." They cite Vennard's analogy of a figurative lens for singers to imagine "a sensation, illusory perhaps, that when the tone is well produced it 'comes to a point.'"

⁴⁰ Baird in Blades, *Spectrum of Voices*, 32.

⁴¹ Rosenberg and LeBorgne, *Vocal Athlete*, 98.

As Bozeman linked feelings of placement to areas of vibrational pressure, Titze does the same for the concept of focus. “A vocalist’s sensation of where the vowel is localized (focused) is quite possibly related to the localization of pressure maxima of the standing waves in the vocal tract.”⁴² He maps regions of the vocal tract with the pressures for /i/, /u/, and /a/ vowels and says singers may rely on the feeling of these pressures to modify vowels, just as they may use forced vibrations in the mask, cheekbones, and hard palate. All may be related to seeking out the optimum acoustic pressure maxima.

Cover

Discussion of the term *cover* is appropriately situated here between color, focus, and vowel as it has lineage in all three. When used neutrally, sometimes synonymous with *turning over*, *cover* refers to the navigation of the *secondo passaggio* in the upper male voice when a smooth transition towards head/whoop/falsetto is desired. This timbral shift happens by a natural closing of the vowel to some degree and stabilizing of the vocal tract length. In reference to color, “if a singer does not cover, the tone quality will likely become too bright and spread and be incongruent with the classical aesthetic.”⁴³ In reference to clarity or focus, too much cover (overclosing) can result in a dull, muffled tone.

Controversy with the term stems from both misuse of the concept and inconsistent use. A singer may employ cover as an artificial darkening of the voice in a misguided attempt to sound older or more formal. To achieve this, the singer overcloses the vowel or the mouth, which also overly tightens the voice, adding tension, and producing a swallowed tone. This *heavy cover* is broadly considered an undesirable sound. Therefore, using the term *cover* for both a natural,

⁴² Titze, *Principles*, 182.

⁴³ Hoch, *Dictionary*, 46.

healthy turning of the voice and an unnatural vocal manipulation has led to confusion and caution.

Vowels and Vowel Modification

A singer's governing of their vowel, both cognitively and physiologically, is at the heart of the singing process. The sustaining of vowels most differentiates singing from speaking, along with the breath management to do so. Discussions of vowel have been central to voice pedagogy literature throughout its history and have changed radically in nature with advancements in technical understanding. However, the impact on linguistics is limited mainly to the shift to resituate vowel language within the modern acoustical realm of source-filter theory. Among the principles that are unchanged: vowels are still categorized as *closed* or *open*; the coding of vowel sounds across languages has been long and accurately represented by international phonetic alphabet (IPA); and the cardinal vowel set of /i/, /e/, /a/, /o/, /u/ still forms the pillars of the vowel spectrum.

Within the shift of language to modern acoustics are several categorical definitions of vowels. As the *primary filter* of the sound signal produced at the source, vowels *tune the resonator* and have the majority of influence on what frequencies are enhanced or prohibited in the outgoing sound. The spectrum of vowel sounds that the human voice can produce (encompassed by the cardinal vowels above) is approximately the same for all humans. Each one is “really nothing more than a specific timbre or spectral envelope—an acoustic signature, so to speak”⁴⁴ and are formed by a combination of the first two formants, a.k.a. resonances of or amplifications/enrichments of the sound signal by the vocal tract.

⁴⁴ McCoy, *Inside View*, 67.

The production of vowels, and thus vowel formants, involves the shaping of the vocal tract by the tongue, followed by the lips and opening of the jaw.⁴⁵ The defining of vowel formants occurred over the second half of the twentieth century and, by the year 2000, the specific high-low and front-back positions of the tongue were consistently mapped and associated with the clustering of frequencies created in the pharynx (the first formant) and the mouth (the second formant). In Bozeman’s first book (2013), he reports the general understanding that the “first formant is responsible for timbral depth and the second formant for vowel clarity.”⁴⁶ However, research in this area continues to unfold rapidly. Just four years later, Bozeman explains the emerging understanding that “individual harmonics have absolute spectral tone colors—that is, vowel-like qualities.”⁴⁷ In other words, vowels themselves have inherent pitch that naturally aligns at the level of the larynx before being resonated by the vocal tract.

This finding adds a new dimension to the discussion of vowel modification, which, in general, is the area of vowel language most referenced in sources consulted for this study. Authors vary widely in their opinions on whether or not to address vowel modification at all as well as their approach and specificity when addressing it. Interview responses in Blades’ *Spectrum of Voices* and in a 2013 survey of exemplary voice teachers by Jenny Dufault⁴⁸ range from active avoidance of vowel modification (Helen Swank) through general imagery (e.g., keeping vowels aligned and letting them find their freedom [Edith Davis Tidwell] or shading them with emotion [Oren Brown]), to many specific explanations of the ideal sensation and acoustic formation.

⁴⁵ Ibid.

⁴⁶ Bozeman, *Kinesthetic Voice Pedagogy*, 28. This quote is taken from Bozeman’s second publication in 2017 where he provides this simplified reflection on his first publication, *Practical Vocal Acoustics*, from 2013.

⁴⁷ Ibid, 29.

⁴⁸ Dufault, Jenny. “Practical Advice,” 33.

The historical understanding of vowel modification refers only to the “change in the vowel quality accomplished by moving the vowel formants from their normal speech locations by means of changes in the shape of the vocal tract.”⁴⁹ Bozeman suggests new subcategories designating this definition as *active vowel modification* and the change that happens by leaving the vocal tract stable and changing the pitch (and therefore, the harmonic set) as *passive vowel modification*. In this author’s experience, active and passive vowel modification are not new terms, though Bozeman proposes them as such. However, the context learned by this author may have been based on the same principle before it was substantiated by current research: that vowels may either be allowed to change without conceiving a new vowel (passive) or actively migrated to a neighboring vowel choice (active).

In refining the role of the two vowel formants,⁵⁰ Bozeman also offers the terms *under vowel* and *over vowel*, which can helpfully describe the distinct vocal qualities that each formant source lends. The first formant or cluster of frequencies that is formed primarily in the lower pharynx “contributes a warming, rounding, deepening /u/ or /o/-like quality to every vowel.”⁵¹ This *under vowel* has a “back room” orientation that singers could perceive as more vertical with sensations in the “mid-head, in front of the ears.”⁵² The second formant “is both actually and perceptually associated with the oral cavity and sensations along the hard palate and above.”⁵³ Bozeman calls this an *over vowel* that has a naturally brighter, clearer quality that helps differentiate perceived vowels other than /u/ and /o/. These two formants should be in balance with each other, much like the general concept of *chiaroscuro*, and, in fact, Bozeman develops

⁴⁹ Bozeman, *Kinesthetic Voice Pedagogy*, 83.

⁵⁰ Work that is fundamentally based on the vowel source and filter work of Ingo Titze

⁵¹ *Ibid*, 29.

⁵² *Ibid*, 30.

⁵³ *Ibid*

his vowel concept into an alternative understanding of that term. While a continuation of this discussion is beyond the scope of this dissertation, Bozeman’s descriptions give new specificity and use for the color and timbre language (e.g., bright, clear, front, back, warm) cited earlier in this chapter.

In the literature on aligning pedagogical practice and language between choral and solo voice professionals, vowel modification appears several times. Most authors are concerned that *pure vowels*, in this case meaning unmodified, are asked for when not vocally healthy or feasible. The most common example involves asking sopranos for closed vowels (/i/ and /u/) in their high tessitura, particularly approaching G5 where “the sung pitch exceeds the expected first formant for all vowels except /a/. Therefore, no matter what vowel is intended—and what shape is maintained in the vocal tract—the vowel that is perceived most closely will resemble /a/, *even when no modification is employed*” (emphasis McCoy).⁵⁴ Teachers or conductors who insist on no vowel modification not only are placing singers in an impossible situation but also causing tension and fatigue that can lead to vocal injury. Another frequent concern cited is the instruction to “match your vowels,” whether through mouth shape or a uniform conception, not allowing for the tessitura across multiple sections that requires modification for healthy singing. Felipe and Hoover cite vowel modification as one of the top three areas where “coming together on vocal matters” is most needed between choral conductors and voice teachers, saying that “this complex topic has been studied by many and probably truly understood by few.”⁵⁵ They recommend that teachers and conductors acquire and use technical terminology that allows specific explanations for their singers. As vowel matching is a concern predominantly in an ensemble setting, more is addressed in Part II of this dissertation.

⁵⁴ McCoy, “The Choir Issue, Part 1,” 299.

⁵⁵ Felipe and Hoover, “Striking the Balance,” 50.

Pure Vowel

The term *pure vowel* has acquired multiple meanings that need clarification. As noted above, it is used to mean an unmodified vowel, sometimes even limited to one of the five cardinal vowels. Barbara Doscher defines it as a vowel “whose vibrato is even and can hook up to other vowels.”⁵⁶ Other authors mean a pure vowel as one unobstructed by the anticipation or retention of connected sounds (e.g., voiced consonants or diphthongs). Given all of these interpretations, teachers and conductors need to give specific context when using the term.

The communications used to define and designate individual vowel sounds more precisely was also raised as an area needing attention by a few authors. Asking singers, for example, to “say ah as in father” or similar assumes not only shared language but shared dialect. These instructions can be confusing and subjective, and also insensitive and counter to broadening inclusivity practices. Most authors advocate for learning IPA as the measure to standardize the language; however, some regard IPA as a valuable guide but one that only describes the fundamental of the vowel sound. Marvin Keenze advocates for IPA plus, noting that the color of the voice colors the vowels, which, in turn, bring meaning and emotional content. He also cites the work of Paolo Zedda, who studied the differences in the standard speech vowels when sung by native speakers of respective languages.⁵⁷

Articulatory Concerns

One final example of language that impacts vowels stems from the area of articulation and is a cited concern from the 2014 formal AATS declaration. Directives about rigid control of the articulators, particularly the tongue, are still in evidence and need to be eradicated from practice. Two specific examples noted are *keep the tongue flat during singing* and *press the*

⁵⁶ Doscher in Blades, *Spectrum of Voices*, 76.

⁵⁷ Keenze in Blades, *Spectrum of Voices*, 73.

tongue against the lower teeth. These instructions, along with other generic and singular instructions to *drop the jaw* or *raise the soft palate*, often lead to hyperfunctional and inflexible corrections with negative results. This is true in the solo voice teaching environment and, as is discussed in Part II of this dissertation, has magnified effects when those instructions are employed in the group setting.

Summary

The language of resonance, laden with sensation and imagery, has shifted to *Anatomically Informed Imagery* and acoustical maps, made possible by the technology to visualize sound. Additional terminology has been enhanced by the inclusion of CCM pedagogy and by new research and understanding in the area of vowel formants. The delineation of free and forced resonance is a key takeaway, particularly the acknowledgment that sensations caused by forced resonance are both highly subjective for each individual singer and undetectable in the sound perceived by the listener. This singular understanding underscores most of the recommended changes for instruction and terminology in the areas color, focus, and placement language. In addition to *Anatomically Informed Imagery*, all use of imagery must be informed by the experience of the singer rather than dictated by the experience of the teacher. Tonal preferences exist, as they always have, but must be achieved by aligning the language of instruction with inquiry and developed understanding of the singer's physiology and direct reporting of their sensations.

Teachers and conductors should continually ask themselves to consider what is meant (or could be meant) by instructions that use subjective language. Color and timbre words, such as *warm* or *tall*, may have acoustical foundations but, if left without this basis of explanation, can be interpreted in a host of ways that impact the muscular and cognitive choices of the singer.

Though initially daunting, an understanding of vowel and vowel formants in acoustical terms is the way of contemporary pedagogy and language. Vowels are the heart of sustained sound in any aesthetic, and it may be that acquiring this area of competency and the language associated with it becomes a top priority for voice professionals in any setting.

Resonatory instructional language from the comparative study is summarized in table 4. The terms, phrases, and instructions in the left column are those specifically raised by consulted sources either as ubiquitous language of concern or recommended contemporary language. The comments in the right column are also distilled from the comparative study as a whole and paraphrased, but not originated by this author. The table is organized by order of presentation in this chapter. In each category, the phrases are organized and coded in descending order of recommended use.

Table 4 Resonation Instructional Language

	Terminology	Status of Use
General Concept	Anatomically Informed Imagery	Recommended term and guide for the kind of imagery language helpful in pedagogical settings. When using imagery language, check for assumptions and alternative interpretations. Ask yourself and your singer, “what does that mean?”
	Free (or public) Resonance Forced (or private) Resonance	Recommended when identifying sound versus sensation. The sensation of forced/private resonance will be unique to individuals.
	Convergent or Inverted Megaphone Megaphone or Divergent Megaphone	Metaphorical images that correspond to the overall shape of the vocal tract. Convergent/inverted megaphone for lofted/classical aesthetic; megaphone/divergent megaphone for belting and open timbre/belt aesthetic.
	Ring	Recommended term for the desirable cluster of high frequency sounds in both classical and CCM aesthetics. Sometimes equated with brilliance.
	Singer’s Formant/ <i>squillo</i>	Alternative terms for <i>ring</i> in the classical aesthetic.
	Twang/Brassy Timbre	Alternative terms for <i>ring</i> in the CCM aesthetic.
	Sing with more resonance	Too vague as it could refer to timbre, volume, vowel alignment. Be specific about the change you wish to hear.
	Sing like you speak	Use with caution and context. Can be effective for reducing inappropriate effort, affectual mapping, or to situate chest registration. Not applicable if could indicate less work than is needed to sustain vowels and good breath management.
	Full/Deep/Loud	Use caution when referring to resonance. Consider how else these words could be interpreted and unintended consequences.
	Tone it down Take the soloist out of the voice (choral)	Too vague and possibly unnecessary. Be specific about volume, vibrato, timbre, nasality, etc. Resonant voices do not always have ring.

Table 4 Resonation Instructional Language, Continued

	Terminology	Status of Use
Nasality	Appropriate/inappropriate nasal resonance	Recommended instead of <i>too nasal</i> , however be sure to have identified if the undesirable sound actually involves nasality.
	Hyper-/Hypo nasality	Accepted terms for too much or too little nasal resonance.
	Raise the palate (and accompanying gestures)	Use caution not to indicate an overly vertical motion. The actual mechanism is both broad and raised. While a raised palate is necessary for most sounds in many aesthetics, it varies in closure, cannot be felt directly, and hyperfunctioning responses to this instruction are frequent.
	Nasal	Not recommended on its own, often confused with <i>twang, bright, forward</i> . Identify the source of the undesirable sound (which may not be hypernasal) and be specific about the change desired.
	Sniff to raise the palate	Incorrect. Sniffing lowers the palate.
	Sinus language (sing/resonate from your sinuses or put the sound in your sinuses)	Incorrect. While forced resonance may be felt in the mask/sinus area, no sound or resonance emits from the sinuses.
Placement	Anatomically Informed Imagery	Recommended term and guide for the kind of imagery language helpful in pedagogical settings. When using imagery language, check for assumptions and alternative interpretations. Ask yourself and your singer, “what does that mean?”
	Place the voice in the mask or cheekbones Bounce the tone off the hard palate Point the sound Direct towards other internal places (eyes, head)	Reframe and contextualize. These sensations may all be caused by forced resonance and have anatomically informed accuracy depending on where the pressure maxima of the sound occurs. Use <i>place your attention</i> or <i>pretend/illusion</i> language instead of placement.
	“It feels as if ...”	Not recommended. Use “Where do you feel it?” instead.
	Place the voice [anywhere outside the body or where resonance cannot be felt]	Not generally recommended. Use with specific context and understanding. Be clear that directing sound/breath to these places is not possible and specific about your intent - to relax/free, inspire, focus, change timbre, etc.

Table 4 Resonation Instructional Language, Continued

	Terminology	Status of Use
Color/Timbre	Timbre, tone, tone color, color	Interchangeable, subjective terms. <i>Color</i> is sometimes less neutral and more associated with affect.
	<i>Chiaroscuro</i>	Widely used <i>bel canto</i> term referring to balanced resonance between <i>brilliance/depth, warm/bright, etc.</i>
	Turning over/The turn of the voice	Recommended term for the acoustical transition between <i>chest</i> and <i>head</i> (or chest and mix) in the upper male voice. More neutral than <i>cover</i> .
	Color words in general (e.g., warm, round, bright, dark)	Use with caution and context and specific changes as possible. Ask yourself, “what does that mean?” and consider multiple interpretations. Recommended use in spectrum pairs to establish specific meaning.
	Forward/Bright	Use with caution - has many uses and interpretations. <i>Fronted/bright/forward</i> vowels are often appropriate instructions, however overly bright, <i>shoved forward</i> responses are possible. Use in <i>balance/chiaroscuro</i> .
	Back/Dark	Use with caution - many uses and interpretations. More timbral depth may be wanted; however, overly dark sounds can cause/be caused by overaction of the tongue or inappropriate <i>cover</i> . Use in <i>balance/chiaroscuro</i> .
	Cover	Multiple, conflicting uses. Appropriate for the natural “turning over” of the male voice to head/mix registration. Can mean artificially darkening the voice or overclosing the vowel to create a weightier, muddied sound.
	Yawn/Yawn Sigh	Misleading. Can easily go beyond the desired opening of space and involve inappropriate tongue action. Use <i>inner smile</i> or affective terms of self-satisfaction or empathy.
	Don’t swallow your sound	Too vague. If used in reference to color, identify the imbalance of dark/bright. If used in reference to tongue tension/obstruction, address that problem directly.

Table 4 Resonation Instructional Language, Continued

	Terminology	Status of Use
Timbre	Focus the sound	Widely used term with multiple meanings. Use with context. Possible references include <i>noisy/clean</i> signal (excess breathiness), <i>ring/dull timbre</i> , clarity of vowel, efficiency of sound to effort, <i>bright/open timbre</i> .
Focus	Modify the vowel Active/passive vowel modification	Recommended and needing context. Modifying vowels is necessary in areas of the voice where some vowel formants are not possible (e.g., above G5). Both allowing vowel modification without active changes to the vocal tract (passive) and changing the tract to shift to neighboring vowels (active) are methods used. Very specific instruction is possible in this area. Blanket instruction to not modify vowels are not appropriate.
Vowels	Over and under vowels	Possibly recommended language to refer to the two vowel formants and balancing of depth and clarity in vowel sounds.
	Sing “ah” as in father (and similar)	Too subjective. Use IPA symbols when possible. At minimum, model and determine mutual understanding for specific vowel sounds.
	Use pure vowels Keep the vowel pure	Use with context. Can be misleading. May be appropriate in reference to sustaining vowels without compromise towards diphthong or consonant, or indicating that no modification is needed (mindful of and specific to tessitura). Inappropriate when asking for unmodified vowels in areas where modification is healthy and necessary.
	Sing with tall vowels	Too vague. What action is needed to create the desired sound? If more space, where? Better closure of the palate? Different timbre?
	Match your vowels Match your mouth shape	Not recommended for general use. Does not allow for appropriate individual adjustments to accommodate tessitura and voice type.
	Keep the tongue against the lower teeth Keep the tongue flat during singing Drop the jaw/two-finger jaw height, etc.	Not recommended. These uniform directives encourage inflexible, hyperfunctioning responses and do not allow for necessary adjustments for healthy singing.

Part II

Contemporary Language in the Choral Setting

Chapter 7

Defining the Culture of Choral Studied Voice

Through a lens of formalized vocal music in Western society, choral singing and the classical solo voice would appear to share a single culture. In traditional academic environments, core study in music history and theory focuses on the European origins and periodic timelines of classical music development. Voice performance, conducting, and education majors are practicing and performing works from the same composers with standards of beauty and pedagogical correctness that share the same aesthetic. All of these disciplines produce working professionals who teach and perform on this shared fundamental base, even as they increasingly expand both study and repertoire to include music from other cultures and aesthetics. There is already precedent for parallel cultures within the current academic structure, most notably jazz, ethnomusicology, and, more recently, musical theater/CCM-dedicated study. In each of these sub-disciplines, the worlds of these musicians are expected to be different—different soundscapes, communities of performers/participants, venues, and, to the point of this dissertation, languages. The building blocks of notation and theory are the same but applied to create the unique sounds and musical structures of each culture.

Vocally, the same building blocks of the human instrument are accepted as the basis of all vocal sounds. Though every voice is capable of yodeling, throat singing, crooning, belting, yoiking, and a host of extranormal sounds, traditional American and European choral and vocal departments have predominantly worked within the sphere of *bel canto* singing and shared the language of voice pedagogy that has been analyzed and presented in its most contemporary form in Part I of this dissertation.

The recent addition of CCM formalized study is the first “other” to truly challenge the pedagogical system of applied voice in the academy,¹ and language from that genre has already added significantly to the lexicon, as also evidenced in the Part I comparative study. In substantial ways, choral singing requires a similarly delineated application of vocal language and principles of production. Much of *bel canto* technique is, indeed, utilized. Some of this technique would be deleterious to an ensemble, however, particularly that which highlights the full ring and individual interpretation of a single voice. The variety of sounds and associated techniques employed by CCM styles can also contribute to understanding ensemble voice, but, again, not those that produce the full power of a belt or invite the individual interpretation of rhythm, melody, or tone. These differences and more, which are detailed below, lead this author to deem choral and solo studied voice as parallel rather than homogeneous cultures.

Fundamental differences between the disciplines have been acknowledged from a variety of perspectives. Brian Galante, prefacing a discussion on the use of vibrato, says, “choral singing and solo singing are two distinctly different modes of musical performance. Without hesitation, singers admit to using a different sound—lower glottal pressure, less vibrato, less articulation—in a choral setting.”² Margaret Olson, speaking about career paths and intended use of the voice, says, “If voice teachers and choral conductors can freely admit that solo and choral singing are distinct and separate art forms—and concurrently, that these art forms are very similar—an amicable discussion can take place about the real differences between them, and the challenges that each presents to young singers.”³ James Daugherty, in an article entitled “Rethinking How Voices Work In a Choral Ensemble,” considers a difference in fundamental psychology, saying

¹ Jazz voice has been an area of study that is a specialized major in a small number of institutions and therefore not considered to have systematically impacted traditional study.

² Galante, “Vibrato and Choral Acoustics,” 67.

³ Olson, *The Solo Singer in the Choral Setting*, 8.

“if, however, as sociologists have long noted, people often behave differently in groups than they do as individuals, perhaps singers behave differently in ensembles than they do as soloists.”⁴ He goes on to present those behavioral differences in terms of acoustics and voice production.

Among the most significant differences between choral and solo singing is the agency of interpretation. In solo voice, it is the goal for each singer to pursue the fullest spectrum of vocal color, expression, and ability applied to repertoire that best suits their individual voice (or vocal development) and their desired aesthetic. The pedagogy of their voice teacher, building on the fundamentals of voice production, guides them in that process. Their sessions together focus solely on the functioning and nuance of the student’s individual sound. For a successful choral experience, individual singers must subscribe to the proffered sound ideal of the ensemble’s conductor and align their actions and instruments in service of that goal. The choral conductor’s choice of repertoire, their focus of preparation, and their instruction (both verbal and non-verbal) are driven by what they wish to hear from the podium—at the “fulcrum of the sound” where the collective voices create one product.

Achieving this sound ideal is a pursuit of great joy for both conductors and singers and also a very different goal from that of the voice studio. Healthy voice production is possible in both settings but only if (1) the difference of agency and demand is embraced—pedagogically and philosophically—by conductors and singers; (2) conductors know how to make the sounds they wish to hear; and (3) conductors know how to apply this knowledge to instruct multiple singers in the choral setting. The change in agency from singer to conductor is fundamental to choral music. As voice teachers have lineage in the master/apprentice-based craft of studied voice, so do conductors in the lineage of choral sound ideals and singing traditions. Both have

⁴ Daugherty, “Rethinking,” 70.

the responsibility to discern from that lineage, the concepts and technique that best serve the modern-day singer and pair their craft with the advancements in science and teaching. It is, therefore, essential to understand the lineage of modern choral sound because the idolization of certain desired sounds has preceded the language and pedagogical methods needed to produce those sounds.

History of Choral Sound in America

Formal choral singing in America developed from European models, particularly the oratorio societies and sacred choirs of England. When the first descendants of those choirs were formed (the Handel and Haydn Society in Boston followed by the Mendelssohn Society in Philadelphia and the Bethlehem Bach Choir in Bethlehem, PA), the choral forces of British oratorio and the expanded dramatic forces of symphonic choirs and opera choruses were in full demand. These bravura styles, however, were “not appreciated in all circles of music making,”⁵ and both choral and solo singing had proponents of the lighter, more blended approach needed for art song and sacred chamber and cathedral choirs.

In the choral conducting and pedagogy texts consulted for this dissertation, the above description is all the basis required to set the stage for the rapid ascent and proliferation of choral music in America over the early and middle decades of the twentieth century. That rise includes the formation of the six schools of choral singing famously documented by Howard Swan⁶ and bookended by the transparent “straight-tone” sound of F. Melius Christiansen and his St. Olaf choir and the full-bodied, mature sound of John Finley Williamson and his Westminster Choir. Both men’s sound ideals and resulting conducting pedagogies, along with prominent others that are discussed below, greatly influence the vocal traditions and language found in choral settings

⁵ Phillips, *Directing the Choral Music Program*, 11.

⁶ Swan, “The Development of a Choral Instrument.”

of the last one hundred years, including in modern-day ensembles. However, in this author's opinion, a third influencer has been too often omitted.

Prior to the influence of European choral traditions, communal singing had already been well established in American churches, most notably in the shape-note societies of the rural South and the singing schools of the Northeast. Both were formed to improve group singing and musical literacy. Kenneth Phillips includes this history in his accounting of choral music in the "American Scene"⁷ as part of the lineage for music education and, indeed, they significantly contributed to literacy, shared learning, and harmonic capacity for thousands. He stops short of delineating a place for the spirited, full-bodied, rough-edged sound ideal of these communities among the other iconic sounds of American choral music. One does not need to look far for the influence of that energetic, often over-produced vocal quality in choral culture today and the pedagogy of enthusiasm that inspires choral conductors and singers alike.

Returning to Swan's schools, Brenda Smith efficiently sums up the impact of Christiansen and Williamson: "The St. Olaf Choir and Westminster Choir sound ideals served as opposite poles in the choral philosophy and pedagogy of the time. Because both educational institutions produced generations of alumni dedicated to serving amateur singers, the American choral scene remained divided into two very contradictory camps for decades."⁸ These two "camps" are inspired explicitly by models of singing that are evident in the language and the product of their sound. Christiansen idolized the tone quality of the unchanged male voice that he encountered in the choirs of the *Thomasschule* in Leipzig, Germany. Though he reportedly never used the term *straight tone*, the non-vibrato singing he emulated and the directives he made asking for that sound—particularly from adult female voices—have caused perhaps the greatest

⁷ Phillips, *Directing the Choral Music Program*, 12.

⁸ Smith, "Art and Science," 294.

divide among choral conductors and between choral conductors and voice pedagogues in modern history. By contrast, Williamson emulated the sound of Wagnerian dramatic soprano Kirsten Flagstad, and his choir was famous for its darker, heavier, more mature sound.⁹ While more soloistic and freer in production than the St. Olaf sound, asking for this mature quality from 18-22-year-old singers can result in compromised vocal health. As Smith notes, neither sound “was based upon thorough knowledge of the human voice.”¹⁰ It was Howard Swan, a contemporary of both Christiansen and Williamson, and himself a famous conductor, who raised national awareness for healthy voice pedagogy in the choral setting after suffering a voice disorder early in his career.

Swan became a strong advocate for a fact-based choral/vocal pedagogy that would protect singers and conductors from vocal injury. He consulted leaders in the field of voice science and vocal pedagogy, seeking to preserve the voices of choral singers and their conductors. His determination to protect vocal health earned Dr. Swan the title of “Dean of American Choral Music.”¹¹

Swan’s influence and strongest admonitions to his colleagues run parallel to the work of Vennard and Appelman in the 1960s and on the heels of the conductors of his fifth of six delineated schools—the voice scientists Joseph J. Klein, Douglas Stanley, and John C. Wilcox.¹² The 1960s also saw the peak of the career of Robert Shaw, the singular force behind Swan’s sixth school, whose legacy among American choral conductors is unparalleled. Shaw combined the rich, mature tone of Williamson with energy and rhythmic precision to create a vibrant sound with natural, unstressed vibrato. Importantly, he also insisted on a spectrum of sound driven by

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

¹² All three were voice teachers, but referred to as voice scientists by Phillips, saying they were “among the first to study singing from a scientific perspective.” (Phillips, *Directing the Choral Music Program*, 17.)

stylistic authenticity which, Phillips writes, “had a tremendous impact upon the choral world; choral conductors have become aware that no one ‘correct’ sound will do for all choral music.”¹³

Through the lens of history as cited above, which was widely consistent across consulted sources, it would appear that the movement for fact-based pedagogy in the choral setting was poised to parallel that of the voice studio. However, over the remaining decades of the twentieth century, according to the research of Hansen, Theimer, and Thurman, choral training mainly focused instead on “musicological analysis and stylistically accurate practice in Western choral music,” including rehearsal methods and standardized gestural conducting patterns.¹⁴ Shaw’s commitment to stylistic variation undoubtedly influenced this focus. Hansen et al. attribute some of the reticence to engage in vocal instruction to confusing messages coming from the voice pedagogy community as practitioners there struggled to incorporate the rapidly developing understandings from voice science. Both factors resulted in choral conductors continuing to pursue a sound without a comprehensive supporting pedagogy.

In the twenty-first century, it would appear that the voice and choral disciplines have largely realigned regarding the language of studied solo voice. The range of choral pedagogy textbooks and articles by choral conductors in both scholarly and trade-based publications reviewed by this author do not conflict with contemporary voice pedagogy sources. The documented tensions between the disciplines seem to have reached a peak between 2010-2015 and, logically, reflect concerns that were established over the decades prior. Many of these concerns are those that stem from the assumption that choral and solo studied voice share the same palette of desired sounds and technical demands.

¹³ Ibid., 18

¹⁴ Thurman, et al., “The Cart, the Horse,” 45.

In a 2017 dissertation, Don Schade thoroughly documents the historical dialogue between voice teachers and choral conductors, including perspectives on compatibility between choral and solo singing, details of nature and setting between the disciplines, and areas of agreement and discord regarding the use of fact-based pedagogy in the choral setting. He substantiates observations by prominent authors in both disciplines that (1) “evidence that choral singing is detrimental to technique or abusive to the voice thus far has lacked scientific exploration and support;”¹⁵ and (2) “a paucity of research exists that represents the perspective of the choral conductor on the issue.”¹⁶ In response, Schade’s study surveys choral conductors in high school and college environments on their agreement with and use of fact-based voice pedagogy. Among his conclusions are the following:

- “Choral conductors and voice teachers, who share no statistical difference in training, essentially share the same perspectives on vocal and choral pedagogy and strive to maintain good vocal health and technique by teaching the same principles of proper vocal production in voice lessons and the choral rehearsal.”¹⁷
- While vocal tenets and techniques employed are the same, the application of technique differs for use in the choral setting.¹⁸
- “Although the majority of choral conductors believed that vocal health is important and indicated that they address it frequently in choral rehearsal, the two vocal techniques (vibrato and straight tone) that have a great deal of impact on vocal health are the two least addressed techniques in the choral rehearsal. This suggests that possibly many

¹⁵ Schade, “Usage of Vocal and Choral Pedagogies,” 15

¹⁶ *Ibid.*, 16

¹⁷ *Ibid.*, *iv.*

¹⁸ *Ibid.*, 12

choral conductors are not aware of the vocal health risks associated with the use of straight tone or with minimal use of vibrato.”¹⁹

Perceptions of unhealthy pedagogy in choral settings certainly stem from the specific areas of concern as stated by Schade—predominantly those of vocal fatigue and demands in the area of vibrato/non-vibrato singing and, of lesser note, mixed pedagogical focus in areas of balanced onset and “singing with formant.” Other areas of concern cited by Schade and numerous others are the implications of restricted tessitura and dynamics often called for in the choral setting and how conductors assign individual voices to choral sections. Updated pedagogical language and understanding can greatly impact all of these concerns—a fact that is undisputed among contemporary authors.

Chapter 8 focuses on suggested updates to the choral language that reflect contemporary, shared areas of pedagogy with solo studied voice. What the comparative study of contemporary language contained herein cannot reflect and what many authors do not adequately address are the aspects of both choral sound and choral culture that need to depart from the study and teaching of solo singing—areas of a specific choral pedagogy where more research and instructional resources are needed. Developing those areas is beyond the scope of this dissertation but they are summarized below to underscore that the efficacy of pedagogical language in the choral setting depends on practitioner’s understanding of this unique context. This point cannot be overstated as it is crucial to acknowledge how singing in ensemble changes not just the sound, but also the functioning of the vocal instrument.

¹⁹ Ibid., 111-112. Schade’s statement of risk is valid and the straight tone sound ideal inspired by boy choirs is unquestionably problematic. However, healthy vibrato modification including minimal use is also possible and an area where more research and resulting pedagogy for choral singing is needed. CCM pedagogy already directly addresses use of non-vibrato singing.

Nature of the Choral Culture

The nature of the choral field can be represented by the immense variety of tasks that make up the job of a choral conductor, which, in turn, can be summarized by considering the difficulty this researcher had in finding a concise definition for choral pedagogy. In 1999, Robert Sataloff declared it as the newest field in performing arts medicine, addressing “the need for choral conductors to be better informed about vocal health.”²⁰ According to the 2017 *Oxford Handbook of Choral Pedagogy*, it is an interdisciplinary field of study for choral conductors that includes “coursework, participation in choirs, and serving as an apprentice to an established conductor.”²¹ The *Handbook* is a collection of essays considering that study from multiple angles, among them voice pedagogy, voice science, and psychosocial and philosophical ideologies. In an applied sense, the pedagogy of choral conductors is reflected in the tables of contents of the textbooks used to train them. In these, the pedagogy of vocal instruction is generally a sliver of content²² among numerous chapters on the administration of a choral program, rehearsal technique, performance planning, and the teaching of choral history, theory, and musicianship skills.

Rather than an exploration of any of these approaches to choral pedagogy, this author offers three categories of observation that describe the unique nature of the choral environment and are pertinent to the discussion of language—namely, that it is mediated, varied in more and fewer ways than solo singing, and communal.

²⁰ Smith and Sataloff. “Choral Pedagogy and Vocal Health,” 215.

²¹ Abrahams and Head, *The Oxford Handbook of Choral Pedagogy*, 2.

²² Of note, voice pedagogy is also only one chapter of the twenty-seven in the *Oxford Handbook* as well.

A Mediated Experience

The choral conductor's "agency of interpretation," as noted earlier, is a cornerstone of their complex, multi-faceted role in the ensemble—a role that is both adopted by the conductor and granted by the singers. In Dag Jansson's research, singers want the conductor to be a "sense-maker" of their musical experience.²³ Three of the areas of sense-making he identifies are conceiving significance, mobilizing singers, and staging sound. As a conceiver, the conductor is a spokesperson between composer and singer, pursuing their own musical idea (i.e., interpretation) but also negotiating, both gesturally and verbally, the musical ideas of each singer.²⁴ As a mobilizer, the conductor balances control and empowerment of each singer, moves them "from deep musical knowledge to corresponding embodiment,"²⁵ and liberates them to make the necessary sounds by knowing where, when, and how to intervene. The sounding of the music "is not only material manifestation of the musical idea but also the manifestation of the ensemble's capabilities, will, and effort."²⁶ The conductor has responsibility in this area, given both their physical position at the fulcrum of the ensemble sound and their expertise. It is their role to balance, concentrate, amplify, and correct the individual contributions of each singer.

The very existence of this leader, interpreter, and "sense-maker" and the acceptance of that leader's authority by participating singers, denotes a radical difference between the nature of solo voice and choral singing. Authors Smith, Lamartine, and Olson all note that in accepting these elements of leadership from the conductor, it is vital that singers do not also give over responsibility for their athletic singing body and their own commitment of energy and

²³ Jansson, "Choral Singers' Perceptions of Musical Leadership," 5-6.

²⁴ *Ibid.*, 7.

²⁵ *Ibid.*

²⁶ *Ibid.*, 8.

accountability.²⁷ Also, the largely non-verbal communication of the conductor in these roles means that they, quite literally, have the voices of their singers “in their hands.” Numerous studies explore the specific impacts of gesture and conductor’s non-verbal expressivity on ensemble sound. To cite only one, the 2013 study by Daugherty and Brunkan showed that over 90% of participating singers mirrored the conductor’s expression of more rounded /u/ vowels, which resulted in a significant change in the ensemble sound. Of note, the singers in the study represented a full range of experience, age, and gender, and only 22% could precisely identify the nature of the change they saw between the neutral conductor and the /u/-enhancing conductor.²⁸

A More and Less Varied Experience

Both singers of choral music and the music itself differ from the solo studied voice and widely vary in nature. These are separate points that have an array of impact on pedagogy in the choral setting.

Regarding singers, the demographics of participants in the Daugherty and Brunkan study are indicative of the broader field of choral music, ranging broadly age and experience. The 2019 Chorus Impact Study of Chorus America reports that “more than one in six Americans over the age of 18—over 43 million—sing in one or more choruses or choirs. One in 20 say at least one child living at home sings as well, which adds another 11+ million to that number.”²⁹ In addition, 44% sing with more than one chorus with the primary group having more than seventy members, 36% are in multiple rehearsals per week, and the mean number of years respondents had been

²⁷ This consolidated description of Smith, Lamartine, and Olson’s writings is true to their meaning but a modernization of their sentiments by this author. (Smith, “Choral Pedagogy and Vocal Health,” 219; Lamartine, “A Curriculum of Voice Pedagogy,” 20; Olson, “*The Solo Singer*, 33.)

²⁸ Daugherty and Brunkan. “Monkey See, Monkey Do?”

²⁹ Grunwald Associates LLC and Chorus America, *The Chorus Impact Study: Singing for a Lifetime*. (2019, 5), https://www.chorusamerica.org/sites/default/files/resources/ChorusImpactStudy_SingingforaLifetime.pdf.

singing in choirs was 28. In a study of the community chorus directed by this author, ninety-one singers, ranging in age from 24-85, reported a balanced spectrum of private voice experience (from none to intensive study) and years of choral experience from less than five years (9 responses) to more than fifty years (20 responses). When asked about their confidence or desire to sing in a solo capacity, over 40% reported that they would not.

There are two ways to consider this last statistic—considering the confidence/ability to sing as a soloist and the desire to do so. For those who desire to sing solo, but do not have the confidence and ability to do so, they often look to their choral conductor to contribute to this training. The language of contemporary voice pedagogy—both classical and CCM—would undoubtedly be central to that instruction. For others, solo singing is in no way a goal of participating in a chorus. They are there for a host of reasons (detailed in the Communal Experience section that follows) and, while they care about their vocal ability, they do not relate to solo singing in ways that are important to those who teach and study in the voice studio. Critically, language and instruction used by the choral conductor must accommodate this full spectrum of perspective as well as the vast range of experience and ability found in most ensembles.

Regarding choral music, it is at once both more and less varied than the repertoire for solo voice. It is more varied in that most choruses are asked to sing, and revel in singing, a range of repertoire that would be inappropriate to ask of a single, professionally minded singer. From large, dramatic works with orchestra to popular and folk music to the sounds from multiple cultures around the world, the choral musician aims to produce authentic sounds to the best of their ability—most relying on the guidance and knowledge of their conductors to do so. Choral music is less varied in that singers must produce this range of authentic sounds in a much

narrower pitch and dynamic range than that of classical or CCM solo singers. This demand requires specific training that uses the same principles of healthy voice production and the same terminology of voice pedagogy but is applied very differently than in the voice studio.

A Communal Experience

Singers flock to the choral environment in the numbers reported by Chorus America for the fulfillment of many needs, going beyond the music to the satisfaction of making music together. In the 2019 Chorus America study, which focused on adult singers, reasons for singing included social connection, feelings of optimism and resilience, stress relief, and simple happiness. Only seven percent responded that they are in a chorus for a job/money/future in music.³⁰ Also, in choosing to participate in a chorus, many singers are mindfully choosing their form of social action—through initiatives to support their community, show their commitment to diversity and inclusion, and offer their time and skills as a volunteer. These priorities are more than just concurrent with learning musical material, they contribute directly to singers' investment in the singing, their energy and interest, and their receptivity to the rehearsal management and instructional style of the conductor.

The majority of choral participants embody the robust, historical role of communal singing, bringing with them those uniquely inspired components of sound and sound ideal. The passion for singing together is an act of expression and solidarity, be it for worship, rally, protest, or pure enjoyment. This passion easily translates to elements of technique that a choral conductor needs to address pedagogically in ways solo voice instructors do not. Runaway tempos, overbreathing during inhalation and excess breath pressure during exhalation, unnecessary vocal effort compounded by excitement, peer pressure, and lack of awareness for one's individual

³⁰ Ibid., 10.

sound—all are examples of challenges that are unique to the choral setting and can lead to vocal fatigue at the same time that they excite and inspire the singers. Different pedagogical language—in content and application—is required of the choral conductor to balance the minds and bodies of their choristers without dampening the athletic energy that the vocal instrument requires and the spiritual energy that the human being desires.

All these elements of the nature of choral singing begin to illustrate how the pedagogical goals, application of language, and sound ideas that form the basis of solo studied voice are not ones needed for the choral environment. The calls for unification and common understanding/terminology between choral and vocal pedagogues over the last many decades, however, have been based on the assumption that the desired product is the same; and that the language and technique employed by voice teachers will translate directly to successful choral singing if only choral conductors have the same basis of understanding and practice. Three factors challenge this assumption: (1) in fact, many contemporary conductors (perhaps primarily those in educational and professional choral positions) do share this basis of understanding; (2) that shared understanding cannot directly translate from individual to choral application; and (3) many conductors in the broader field either do not have access or do not choose to access contemporary voice pedagogy resources. Beyond these factors of understanding, application, and access, it is also true, and only recently being acknowledged, that conductors need a pedagogy for the technical demands of choral singing that differs from solo singing. Accordingly, acceptable practices of professionals in these parallel cultures should be recognized as neutrally and scientifically distinct.

The Ensemble Setting

The ways in which singing in ensemble fundamentally changes the singers themselves and the sound they produce have been studied from multiple angles, full reporting of which is beyond the scope of this dissertation. Among the factors that can be most impacted by language and the findings of this document are coordination of sound, behaviors and associated instruction of some typical choral personalities, and addressing the needs of voices singing in different ranges simultaneously.

Coordination of Sound

The coordination of vocal sounds (e.g., onset and release, rhythmic breath and stagger breathing, blending of tone, vowel, and resonance) affects every area of a choral singer's vocal production in ways not encountered in solo singing. In respiration, the rhythmic breaths demanded by the music may also be dictated by the conductor's gesture, which will impact the quality and quantity of breath taken by each individual. Longer phrases in choral music are made possible by staggered breathing, meaning that choral singers learn to breathe in illogical places that are not timed to natural breath cycles. This breath technique calls for subtlety and dispassionate precision rather than a soloist's focus on expressivity and rubato. Coordinated onsets and releases are a basic, yet challenging skill at any level of choral singing. Not only must singers understand the alignment of breath and vocal fold closure and vibration that leads to a balanced onset, they must have the discipline to perform that alignment in unison with many others and in response to the conductor's gesture. Freedom to lengthen, nuance, or delay ending sounds is not able to be accommodated and, in fact, leads to the most noticeable "errors" in ensemble singing.

Coordinated resonance or *blend* is the area of ensemble singing that is, arguably, the most cherished and the most difficult. The term *blend* itself is a point of great controversy as it can imply a variety of techniques and preferences that disrespect individual singers' vocal needs and colors. Conductors have approached blend through the matching of vowels, mouth position, vibrato, non-vibrato, passive and active vowel modification, and through instructives for registration and the use or disuse of formant clusters. Many of the approaches to a blended sound are misguided and not recommended for vocal health, but no one way is the solution for all singers, all desired sounds, or all passages of music.

Table 5 below summarizes applied differences of nature and setting between solo and choral studied voice, a portion of which are explicitly addressed in chapter 8.

Table 5 Applied Differences Between Solo and Choral Studied Voice³¹

Area	Solo Studied Voice	Choral Studied Voice
Posture	Standing	Sitting for portions of rehearsal
	Freedom of movement	Holding music folder
	Direct address to audience	Focus on conductor (head angle and sightlines in ensemble)
Breathing	Expressive breath	Non-obtrusive breath
	Coordinated with phrase or timed to starvation	Staggered within longer phrase and timed for coordination
Onset/Offset	Singer agency within style	Conductor agency
Intensity	Suggested by repertoire and interpreted by singer	Suggested by repertoire and interpreted by conductor/ensemble
	Full range within style and healthy capacity	Generally overall reduced range and balanced within musical role
Vibrato	Heavy/present (classical) Light/varied (CCM)	Less present overall, but variable within the repertoire
Tessitura	Varied within and across repertoire. Generally isotonic.	Confined within all repertoire. Generally narrower/isometric.

³¹ Table inspired by and some content in solo studied voice column taken from: Harrison and O'Bryan, *Teaching Singing*, 37.

Table 5 Applied Differences Between Solo and Choral Studied Voice, continued

Area	Solo Studied Voice	Choral Studied Voice
Resonance Strategy	Singer's Formant (Classical) Twang (some CCM)	Acoustic energy/efficiency, but less use of Singer's Formant (no Twang)
Vowel Modification	Singly interpreted as appropriate to voice needs and style	Adjusted by conductor for ensemble sound, ³² but concurrent with different instructions across sections
Diction/Text	Singer agency within style	Conductor agency within style and driven by musical role of the voice part in polyphonic music.
Tuning	Melodic tuning, a cappella or with instruments	Melodic and harmonic tuning, will change within chord when a cappella
Warm-Up	Focused on freeing the voice	Balanced with or focused on ensemble building and musicianship
Instructional Setting	One-on-one Usually not more than once/week for 30-60 minutes	Ensemble Often more than once/week for 1-3 hours
Rehearsal Setting	Time spent driven by singer	Within instructional setting with time spent driven by conductor
	Often several hours per week	Outside work variable
Rehearsal Technique	Singer agency. Content and repetition driven by individual need	Conductor agency. Content and repetition driven by ensemble need
Experience Level	Individual progression as determined by voice teacher	Mix of experience levels (sometimes significant) navigated by conductor at all times
Repertoire	Often focused by genre chosen by singer and teacher to meet individual pedagogical goals	Often broad mix of genre chosen by conductor to meet ensemble's pedagogical goals
	Difficulty, range, and tessitura driven by singer voice type and capacity	Difficulty, range, and tessitura driven by capacity of ensemble sections
Interpretation	Singer agency within style for tempo, expression, movement, etc.	Conductor agency
Improvisation	Cadenzas/da Capo (Classical) Ad. lib/riffs (CCM)	Rare, but occasional aleatoric sections in contemporary music
Aural Feedback	Instruments and acoustics of the venue	Same as solo, but primary feedback from other singers and combined choral sound
Role	Singular role on melody	Varying harmonic/melodic role, balanced within ensemble

³² Beyond and within healthy/appropriate modification for singer's individual voice, modifications to adjust the timbre of the section are often needed

Choral Archetypes

The choral setting inspires some archetypes among singers that directly impact vocal production and need pedagogical attention, most notably leader and follower roles. Leader singers seek to help their section by providing vocal and behavioral initiative and modeling. Examples include over-articulating to demonstrate rhythm or pronunciation, over-producing to be audible to less confident peers or represent the section to the conductor or chorus at large, and over-correcting to adjust tempo or enhance a directive to which they perceive the section is not responding. Leader singers are often valuable members of a chorus and, indeed, leaders in many ways, even if their modeling is counterproductive or detrimental to their vocal health. Follower singers, naturally or after becoming dependent on leader singers, seek to contribute through a “do no harm” philosophy. In their efforts to not make mistakes, they can often under-produce in intensity and appropriate effort, hesitate on rhythms, compromise articulation and vowel (through hesitancy around pronunciation), and shy away from notes they consider outside their comfort zones. All of these actions, of leaders and followers alike, need attention and instructional language from conductors, often resulting in situations where opposite instructions are required for the same group of singers on the same passage. Both the language chosen and additional context for that language are crucial.

“Loud Leaders” and “Diction Dictators” are two of the several choral archetypes documented by Elizabeth Schauer as she describes common issues encountered in clinical environments.³³ Most choral conductors would recognize the stereotypical behaviors that she identifies, many of them focused on vocal production and typical sounds by choral section. Even as conductors expect these sounds, they also must guard against blanket assignment and

³³ Schauer, “From the Judge’s Chair.”

sweeping instructions that would disregard the needs and struggles of individual singers within each section.

Simultaneous Singing Across Extended Range

Lastly, attention to the needs of individual voices singing simultaneously in different ranges is an acquired skill of choral conductors that may present the biggest challenge to their general use of pedagogical language. Before assembling the chorus, the conductor has the task of determining how individual voices will be best served by the available choral sections and vice versa. Inevitably, even with careful consideration, each section will be made up of voices that handle the challenges of the part's tessitura differently. Once in rehearsal, the conductor needs to meet those individual challenges with flexible language and instruction at the same time that they address the section as a whole and different sets of challenges in other sections. A key example is in the area of vowel modification and registration: sopranos need to open a closed vowel on a G5 at the same time that tenors need to keep that vowel closed on their E4 to successfully navigate a change of registration.

The narrower range of tessitura is chief among the characteristics of choral singing that require a distinctly different approach from solo studied voice. This is especially true in combination with a general need for consistently softer singing relative to solo voice. Chapter 8 provides specific examples of language adjustments and contextual instruction.

Additional Factors of the Choral Setting

Fascinating aspects of choral sound and how it changes vocal production cannot be addressed within the stated purpose of this document. Acoustically, the composite sound heard by the singers and the feedback they seek to monitor their voice are greatly affected by choral formation, spacing, the “chorusing effect” of Sten Ternström, and the “Lombard” effect

documented by Stephen Tonkinson. The “chorusing effect” is, in essence, a phenomenon where the choral sound is a separate entity created by the discrete individuals but disassociated from them, meaning that any sound they can hear does not accurately reflect the sense of their own voice.³⁴ The “Lombard” effect is a “masking of an individual voice by the sound of surrounding voices” that often results in a tendency for singers to push or sing louder in order to hear themselves.³⁵

Postural aspects include both the holding of music folders and the sound reflection that produces as well as the amount of sitting while singing in most choral rehearsal settings. Finally, and of great import, are various aspects of vocal health, some related to rehearsal length and frequency, but more related to rehearsal management. These include (1) warm-ups necessary to establish ensemble sound and mindset that are beyond (and often replace) warm-ups that prepare and free the individual voice; (2) an abundance of repetition to solve ensemble issues (well beyond what an individual would need in a one-on-one setting) and using repetitive syllables for long passages; and (3) slowing tempi for rehearsal in areas of tessitura that may cause a build-up of tension. Overall, it is crucial for practitioners to consider vocal health consequences to any rehearsal technique that changes the musical material, including vowel, tempo, intensity, and pitch range/tessitura. Such changes alter the technical demands and the fundamentals of voice production. Most often, these instructions are chosen specifically for the purpose of easing production, but if they are used to fix other elements (e.g., rhythm, balance, diction), compromised vocal health and production may occur as an unintended consequence.

³⁴ Daugherty, “Rethinking,” 70.

³⁵ Tonkinson, “The Lombard Effect in Choral Singing,” 24.

Summary

As with the differences in the nature of choral singing, these elements of the ensemble setting that diverge from the solo studio illustrate the need for a discrete pedagogy for choral conductors. Even when using language and technique that is shared by solo voice pedagogy, choral conductors need to adjust context and application in critical ways. If the cultures of solo studied voice and choral studied voice are not treated as separate but equally valued environments, unnecessary judgments and comparisons will keep professionals in both disciplines from respecting and supporting each other's craft. A succinct example: lighter singing for choral application becomes "lesser" singing in comparison to the ring of solo voices. Yet singing with the high frequency of the singer's formant cluster would not only defeat the ensemble sound but also lead choral singers to over-effort and cause unnecessary fatigue.

All sounds required of both solo and choral musicians are valid and can be produced, through the expanded platform of voice science, with health and artistic integrity. Voice professionals in both cultures must feel empowered to find and apply the pedagogical solutions that work and accept the responsibility to do so.

Chapter 8

The Language of Choral Voice Instruction

In the comparative study that forms the base of this dissertation, language and understanding of contemporary voice pedagogy were initially compared among 30 authors from 28 sources, restricted to works within the last decade. The standard areas of respiration, phonation, and resonance were described in depth from a linguistic perspective to document new terminology and substantiate or caution against outdated terminology. The premise was two-fold: (1) that changing language reflects changing understanding, and (2) that shared language would, thus, reflect shared understanding between solo and choral voice professionals. Further, that this shared understanding substantially supports the pedagogy of voice training in the choral setting. These premises bear out in large part. Discussions in this chapter show the ways in which that shared language and understand already exists and does support a fundamental portion of needed pedagogy, particularly when applied with appropriate adjustments for multiple interpretations.

The “old dogs” of frequently cited concern—inappropriate diaphragmatic language, contention over vibrato and the harmful use of straight tone, and uniform/one-size-fits-all directives of articulation and the sensation of resonance—are still discussed as problematic areas, but are either not in evidence or are explicitly countered by both voice and choral professionals in contemporary literature. All of the recommended language found in the summary tables at the end of each chapter can apply to the choral setting, and the literature suggests it may already be in use. Recent advancements, particularly those associated with the acoustical science of the voice, are as slow to find integration into the choral classroom as into the studio. Emerging areas of focus, whether new to the field or receiving new attention, include primal sound, pre-

phonatory tuning, cognitive science, and techniques from the aesthetic of commercial and contemporary music. The summary tables reflect much of that language, and the body of the chapters in Part I cover that which does not yet have concise terminology.

It is also important to note that the sources reviewed for this dissertation almost exclusively represent the language and understanding of scholars, experts, and academics in studied voice. Outdated language and pedagogy may well be in continued use by those who do not have or do not use access to contemporary training; however, this is true in both choral and solo voice disciplines. For some choral conductors, as introduced in chapter 1, reluctance to identify as a voice professional may be an additional barrier. This barrier may be diminishing, again among academic and expert conductors. However, it also may be that a conductor's understanding and endorsing current pedagogy is not synonymous with their comfort or commitment to teaching voice production in the choral setting.

Beyond the language of the summary tables, some areas of discord or uneasy agreements linger between the sound ideals and technical demands of choral and solo voice. This author concludes that these difficulties are not a factor of language, but application, and are unresolvable without separating the cultures and recognizing the distinct pedagogies needed by each. In a 2012 *Journal of Singing* article, Scott McCoy offered "Some Thoughts on Singing and Science" in which he cites areas of research (e.g., vocal fold vibration and non-linear models of resonance) where the theories of earlier times were not wrong, just incomplete. "Science is catching up,"¹ he says, and then reminds voice pedagogues that their experience and empirical evidence are of value, helping scientists know where to focus next. The time is ripe for scientific and pedagogical expansion in the area of choral singing, related to but separate from that of solo

¹ McCoy, "Some Thoughts," 528.

voice pedagogy, and the experience of vocally astute choral conductors is needed to focus those initiatives.

The following sections offer adjustments for use of the shared language from each area of the comparative study in the choral setting, simultaneously highlighting needed areas for research. What is evident in these brief discussions and in the key takeaways that follow is the crucial and continual need to acknowledge and accommodate the individual voices that make up the ensemble. Lastly, a guide for effective communication offers elements of choral voice instruction that are not always directly reflected in pedagogically specific language but are critical to health and excellence in the culture of choral singing.

Analysis of Contemporary Pedagogical Language in the Choral Context

Respiration

The mechanics of respiration and the fundamental principles of *breath coordination* or *management* for singing are shared by voice and choral pedagogy, and all of the recommended language in the summary table for chapter 4 (table 1) is applicable in the choral setting. Understanding the diaphragm's active role during inhalation and essentially passive role during exhalation has been a long-established area of attention for decades. While erroneous language is no longer in evidence in scholarly sources, it can be seen anecdotally in musical and non-musical settings. The critical addition for choral conductors is ensuring that their non-verbal language is not counterproductive. Any gestures of abdominal engagement, particularly those that show force during exhalation, may well be interpreted in unintended ways because of the prevalence of outdated *support* language. Gestures that correspond with a release of the abdomen during inhalation are not of concern unless they indicate a loss of good posture or an inappropriate

“tanking up.” As discussed in chapter 4, there is a cultural relic in choral singing around taking a *big breath* that may require countering not necessary in the solo voice studio.

Both interpretations of *appoggio* (muscular antagonism during inhalation and, more common, during exhalation) are useful and recommended in the choral setting, but conductors should clarify their concept with each new group of singers. Not only will many be hearing the term for the first time or need to know the conductor’s specific meaning, they will also need assistance in body mapping their experience of the breathing components involved. Body type will impact individual sensation and breathing behavior. This truth not only needs to be explicitly stated but also acknowledged as the conductor models their own feeling of breath. Instructions involving muscular action are most susceptible to multiple and hyperfunctional responses. A prime example in the area of respiration is the concept of maintaining a feeling of expansion in the ribs. Singers may overcommit to antagonism in a more literal sense, and their enthusiasm, along with the *keep* and *hold* language that is so naturally associated with breath, can result in unwanted tension and inflexibility that prevent them from well-managed and responsive breath.

Conductors should carefully avoid and contextualize *hold* language when discussing the feeling of *readiness* or *suspension* that occurs between inhalation and exhalation. The concept of good vocal fold closure, subglottal sensation, and the relationship of *breath pressure* and *airflow* to efficient phonation are generally new to inexperienced singers. Some demonstrations and language can lead them to over-compress or create a full stopping of breath and, therefore, a build-up of tension. The *leaning* translation of *appoggio* can help, as can the addition of pre-phonatory tuning and primal sound language.

Both conductors and solo voice teachers need to use caution around open throat directives, including *yawn* language and incorporate explanations of misleading kinesthesia in that area. In choral settings, silent collective breathing is desired, and conductors must recognize that a truly open throat (rarely achieved by the directive *open your throat*) is the chief antagonist they need to address.

Finally, ensemble singing has the unique requirement of *choral breathing* or *stagger breathing*. Outside of these general terms themselves, new language is not required, but the application, as described in the chapter 7 section on coordination of sound, is contrary to the cycle of starvation for long phrases and more natural, expressive breathing that occurs in solo singing.

Phonation

The use of pharyngeal language in singing pedagogy is the most notable paradigm shift in the area of phonation and one that continues to develop. Voice and choral instructors need to understand vocal functionality at the level of the larynx as well as the interdependence of that functionality with respiration and resonation systems. All of the recommended language in the summary table for chapter 5 (table 3) is applicable in the choral setting. That being said, an individual's sense of the high/low position and stability of their larynx is careful work in the one-on-one setting, and conductors must handle this work with even more care when instructing a group of singers. This is another area where a hyperfunctional response can lead to depressed larynxes and the associated consequences.

Onset/offset and phonation mode language needs no adjustment, only coordination among multiple singers. Also, it is important to correctly diagnose *breathy* or *pressed* sounds, which can be rooted either in incorrect breath pressure or the nature of vocal fold closure and

might differ among individuals within the ensemble. *Balanced onset* and *balanced phonation* are the norms for most desirable singing in both choral and solo settings.

The language of intensity is a matter of technicality at the linguistic level (not confusing the terms *sound level* and *dynamic* with *vocal intensity*, *amplitude*, *loudness*, and more) but, in practice, is an area with many more complications for choral singing than solo study. Choral conductors need to understand the relationship between breath pressure and closure and a more acoustically energized sound (resonation) and increased amplitude of the vocal folds (phonation). Also, they need to know what change they are seeking from their choir when they ask for more volume or the ambiguous *more resonance*. Voices in ensembles often need to be consistently softer than in solo settings, and healthy management of this technical demand is necessary to avoid vocal fatigue. Holding back airflow is a typical response to the instruction to *sing softer* and one that pedagogues acknowledge is problematic; however, solutions for sustained soft singing are generally not addressed by contemporary authors. Research in this area is greatly needed to meet the demands of choral music. In addition, the feedback and conversion of simultaneous voices into a collective choral sound radically alters an ensemble singer's sense of individual sound level. Learning to feel and otherwise sense their intensity level and how to make healthy adjustments without being able to hear the results audibly is an acquired skill of the choral singer.

Language around vibrato has been documented in the chapter 2 review of literature and explained at length in the chapter 5 section on vibrato and parallel cultures. *Straight tone* terminology has too many negative associations for general use,² and clarification of vibrato sounds that are the result of vocal faults should be discussed with a voice teacher if the singer

² Acknowledging that straight tone language has valid usage in CCM genres and an understanding of that may be specifically developed with a choir.

studies privately. Until a language of volitional vibrato and flexible use across genres and historical styles is developed as a pedagogy, this author recommends that all voice practitioners understand that vibrato can be modified along a spectrum of possible healthy sounds, clarify that non-vibrato is a matter of perception rather than physiological reality, and employ language that continues to desensitize the topic.

Registration and associated concepts of range and tessitura in the choral setting are both beyond the scope of this dissertation and in need of expanded research and pedagogy.

Linguistically, it is advisable to choose a consistent set of terms for registers, explain those choices to singers, and help them situate the chosen terms among others that are used and available. It may also be helpful to adopt the use of *choral soprano*, *choral alto*, etc. when assigning voice parts. In this way, conductors signal a categorical use of these terms that differs from solo singing and may invite a discussion of their reasoning behind placing an individual in a particular section. It is also important to note that, when working on registration with a choral section, there is a tendency for singers to drop the octave when they feel the range is getting uncomfortable. While there may be times when dropping the octave is encouraged to preserve vocal health (e.g., while working on rhythm, pronunciation, or note-learning), the conductor must realize that all registration instructives will then instantly be out of alignment for that singer.

Resonation

The area of resonation is, at once, the most individualized and the most collective when applied to the choral setting. While all of the recommended language in the summary table for chapter 6 (table 4) does apply, entirely new applications of that language come into play when discussing the collective resonance or *blend* of an ensemble, as discussed in that section of

chapter 7. Reminders for choral conductors to attend to the individuality of vocal instruments and subjectivity of sensation are vital in every area of vocal production, and nowhere more so than in the area of resonance.

First and foremost, the concepts and chosen terms for *free* and *forced* resonance must receive open and continual dialogue, and subjective, blanket observations of “it feels like ____” must be avoided. The next section of this chapter offers translations and adjustments to that language. Placement language (based mainly on individual sensation) is one of the primary areas where imagery that is not anatomically informed originates. It is confusing for solo singers when used in the studio setting, and that confusion is both amplified and masked in the ensemble setting.

Color language is another area of unhelpful imagery—sometimes found in the form of sounds being *warm* or *cool* or even *blue*, *red*, etc.—and conductors and voice teachers can always benefit from asking themselves, “what do I mean by ____” followed by more specific directives. A balance of *color* (also *timbre*, *tone*) is often referred to as *chiaroscuro* from the Italian tradition. This author and many others recommend the use of that term and other spectrums of timbre exploration in choral settings; however, some evidence was found that practitioners who associate *chiaroscuro* with singer’s formant do not consider it a choral sound. Specific to choral application, it should be noted that the color or timbre of individuals in service to an overall ensemble sound may differ from what solo singers would want on that same music.

Nasality language and diagnosis are the same for choral and solo singers, though again, the presence of multiple voices can mask a correct diagnosis of perceived *inappropriate nasality*. Choral instructives for palate/velum height require the same cautions regarding gesture as diaphragmatic/abdominal breathing. As mentioned in chapter 6, a typical gesture for a raised

palate sound indicates vertical motion only and can have the unintended consequence of also encouraging singers to raise the larynx. Conductors need to understand that the motion of the velum is lateral as well as vertical, incorporate training to uncouple the motions of velum and larynx, and align their verbal and non-verbal language.

The handling of vocal acoustics and associated concepts of vowel modification and formant tuning are beyond the scope of this dissertation. Much research is available in this area, and the expansion of language is made possible by the expansion of understanding by voice teachers and choral conductors alike. The adjustments needed to choral language in this area have to do, once again, with acknowledging the simultaneous production of sound by individual singers. When different pitches are sung together on the same vowel sound, the most efficient acoustic posture will be different for each choral section.³ Matching of vowel formants and exact mouth shapes is generally ill-advised, and instructives for using *pure vowels* can be misinterpreted and lead to inappropriate inflexibility. It is widely accepted that choral singing features less use of the high-frequency clusters of *ring*, but a lack of singer's formant does not and should not constitute a lack of acoustic energy and vibrant sound. Multiple healthy sounds, resulting from a host of possible vocal tract configurations are acceptable and should be encouraged. This is true for CCM aesthetics and should also be true for a myriad of compelling and beautiful choral sounds.

Top Takeaways for Choral Language

Broader themes of instruction that are directly impacted by choral conductors' linguistic choices emerged over the course of the comparative study. The four that this author has deemed the most crucial are presented as key takeaways below. The first three come directly from the

³ Differences will also be apparent for individual voices and voice types within each section that may need assistance depending on where in their range the pitches occur.

repeated advice and cautions gleaned in the comparative study from contemporary voice pedagogues and scientists. While applicable in any private voice studio, these categories of instructional language are greatly augmented in the choral setting. The fourth theme concerns the non-verbal language of gesture, which, while does occur in the studio setting, is a developed construct of central importance in choral conducting. Examples for the use of each takeaway are included, particularly those that feature adjustments not discussed in detail earlier in this document.

Takeaway #1 – Individuality of Instrument and Subjectivity of Sensation

Research on the ways an individual's body experiences the act of singing has changed predominant areas of pedagogy. Optimal breathing strategy, muscular engagement, and sensations of resonance all must be learned corporally well after they have been learned cognitively. Regardless of expertise, an instructor must not dictate the exact language that a singer develops to describe their own instrument. The very best way for an instructor to assist a student's learning comes from soliciting and accepting that student's feedback—asking for their impressions, testing their response by moving along a spectrum of options, and using *might* and *could* language. Only then can the instructor help a singer translate their sensations and impressions to terminology used by the instructor or other professionals in the field. It also must be noted that the singer's acclimation to their sensations and how they relate to their successful production of desirable sound is a gradual and kinesthetic process. Pedagogies based on body mapping and awareness have long been in evidence, and emerging cognitive research in motor learning and procedural learning is a new focus for voice study. These areas of instruction can also be of immense value in choral environments and help conductors convey respect and

understanding for the individual experiences of their singers. Examples of language adjustments using this takeaway include:

- Use “What do you feel?” instead of “It feels like ____.” This is especially helpful for inhalation and sensations of vibration associated with resonance.

Teacher: “That was a beautiful sound, John, where did you feel the vibration?”

Student: “I felt it in my cheekbones, kind of up by my eyes.”

Teacher: “Great! Who else felt it there? Who felt it someplace else? Show me where.”

- Test responses along a spectrum of options.

Teacher: “I could hear breathiness in your sound. Could you feel that?”

Student: “I’m not sure.”

Teacher: “Try singing with too much air in the sound. What did that feel like?”

Student: “It was windy.”

Teacher: “Now sing with not enough air. What did that feel like?”

Student: “It felt kind of creaky and squeezed.”

Teacher: “Okay, so let’s find the smooth place in the middle between too windy and too creaky.” (model appropriately and have everyone try the windy/creaky/smooth sounds)

- Replace one-size-fits-all instructions with conditional language.

“Stand taller” – instead say “Some of your chests look collapsed. Can you find that expansive/buoyant/noble feeling from before?”

“Drop your jaw” – instead say, “Check to see if your jaw is released.”

“Don’t swallow your sound” – instead say “I’m hearing an overly dark timbre. As we sing it again, think about *chiaroscuro* and raise your hand if you made a change.”⁴

- For corrections that might have more than one solution, confirm a diagnosis before instructing a change.

Example (1) Unwanted brightness that may be due to hypernasality: test by having singers pinch their nose shut with their fingers, make sure those fingers don’t feel vibration, and listening for a desirable change. If the undesirable quality is still present, the solution may be found by addressing constricted space in the throat or a brassy timbre in individual singers.

⁴ Example inspired by Nix, “You Want Me to Do What?” 47.

Example (2) Excess breathiness in the sound (*aspirate phonation*): check efficient closure by having singers move from a purposefully breathy sound to a pressed sound and find the efficient place of balance in between. If breathiness is still present, do the same exercise on a spectrum of airflow from too much breath to too little breath.

Takeaway #2 – Multiple Interpretations and Unintended Consequences

In addition to considering how differently many singers will experience their singing body, choral conductors must consider how those same singers will interpret meaning. Where generality of language may be beneficial in adjustments for the former, more specificity is needed for the latter. Instructors should examine their instructions for vagueness and consider them from multiple angles, especially in light of the range of experience, age, voice types/stages present in their ensembles. This examination is especially true for metaphorical and imagery-based language. When instructions that have multiple meanings are unavoidable, the instructor should check in through sight, sound, and inquiry to ascertain how singers have received the instruction. Spectrums are helpful again here, but now to offer flexibility rather than pinpoint a desired sound. Synonyms and parallel phrases can help groups of singers find a connection.

Examples of language adjustments using this takeaway include:

- Follow subjective or vague terms with “What I mean by ____ is ____.”

“Suspend the breath. What I mean by suspend is that you don’t exhale all your air when you start to sing. You will feel a checking action just before you phonate. Make sure that you are still connecting/leaning/moving through the breath. I don’t mean that I want you to hold your breath!”
- Determine possible unintended consequences of a term and check them.

“Warm up that sound” – singers may use cover, change the vowel, darken the timbre, change the intensity, relax their effort.

“Support the voice” – singers may increase airflow, breath pressure, or intensity; tense abdominal/core muscles; recruit shoulder, jaw, or neck muscles.

- Avoid broad *more/less* and inflexible *keep/hold* language when possible and watch for hyperfunctioning responses.

“Sing with more space” – do you want the singer to drop their jaw, raise their palate, release their throat, or open the vowel? Watch for overcorrecting and for singers who did not need the instruction to make unwanted adjustments.

“Keep the ribs expanded” – use flexible language like “buoyantly maintain” or “continually expand” that implies a sense of dynamic motion. Watch for singers who have stiffened their upper torso and introduced tension or held breath.

- Offer spectrums of opposite terms to clarify the aspect of meaning.

“Can that sound be lighter?”

[Students adjust by singing more softly]

“Ah. That *was* lighter on the loud-soft spectrum. Can you keep the same sound level but sing lighter rather than heavier?”

[Students adjust by singing more detached]

“What if I said, ‘lighter rather than darker?’”

- Offer synonyms and like examples for a singular concept.

“I want you to experience an open throat, which may not feel like you expect. Try a few things with me and notice the space in the back of your mouth and your throat: feel the lump of your tongue is in front of your ears; smell a rose; suppress a laugh; look around like you are up to some mischief; feel pleased with yourself.⁵ Do these feel similar to you? Which one feels the most like you are ready to sing?”

Takeaway #3 – Consistency of Variable Terminology

Inconsistency of pedagogical language has not only been a source of confusion for centuries, it is the very reason for the comparative study contained herein and those of many other authors. While conductors and voice pedagogues may have concluded that a complete standardization of language will not be possible, each instructor can choose among the options, define their choice to their singers, and then be consistent in their controlled environment. Their choices include those that are proactive (e.g., registration language, onset and phonation mode,

⁵ These examples are from Bozeman, *Kinesthetic Voice Pedagogy*, 14.

and respiration terms of coordination, management, support, *appoggio*) and reactive (e.g., translating terms brought into their environment by others, including the singers themselves.)

Examples of language adjustments using this takeaway include:

- Proactive choices among variable systems.

“There are many labels for what mode or register you are singing in. I use the terms *thin folds* and *thick folds* and mean them in the same way as *head voice/chest voice* or *Mode 1/Mode 2*. To me, they help us visualize what’s happening in the larynx.”

- Mapping the language of others.

Teacher: “Tenors, let your voice turn over into *thin folds* in this passage.”

Student: “Are you saying you want me to sing falsetto?”

Teacher: “Yes, or you might call it *head voice*. All of those are *thin fold* configurations.”

Takeaway #4 – Aligning Verbal and Non-Verbal Instruction

The language and communication of gesture is the subject of entire conducting curricula from first lessons through doctoral study. A substantial and increasing body of research shows the many and specific relationships between gesture and sound, which can be equally or more impactful than verbal instructions. Conductor Rodney Eichenberger based his career on teaching conductors, “What they see is what you get.”⁶ This body of non-verbal language not only can speak on its own but also can confuse and override even the most explicit verbal language to the contrary. Two primary examples are found in the opening section of this chapter—gestures that indicate incorrect diaphragmatic engagement and a constricted visual representation of raising the palate. Though this takeaway goes far beyond the scope of this dissertation, a few categorical examples of non-verbal instruction that will communicate to singers include:

⁶ Eichenberger, Rodney, André J. Thomas. *What they see is what you get: Linking the visual, the aural, and the kinetic to promote artistic choral singing* [Videotape]. Chapel Hill, NC: Hinshaw Music, 2007.

- Vowel and mouth shapes that counter the acoustical need of the desired sound or that are meant for the needs of one section but impact the response of another.
- Hard onsets/glottal attacks where hand shape, weight, and sharpness of gesture can “cause” singers to over-effort on an entrance, disrupting the desired balanced onset.
- Intensity/sound level gestures that either do not represent the desired sound or cause singers to produce it in a way that constricts or over-energizes vocal production.

Dampening gestures for softer singing, e.g., holding a flat palm up to the singers, or seeming to compress the produced sound with downward or closing motions of their hands are common occurrences among conductors.

- Suboptimal posture and energy in the conductor’s stance and bearing. Facial energy, the motion of breath in the body, collapsed sternums, rounded shoulders, shifted weight—all these will be reflected in the singers if transmitted by the conductor.

Guidelines for Effective Communication

A desire for robust and open communication is at the heart of this dissertation and what inspired its writing. One component of such communication is found through common language. The comparative study herein is simply the latest addition to the ongoing series of dictionaries, comparative studies, and joint task force reports seeking to establish that common ground. More fundamental to any language of communication is the willingness to communicate and the fostering of environments where communication is invited. In these settings, those conversing together can overcome many language barriers by sharing an intent to understand one another and align their meaning.

Staying current with advancements of language and understanding in one’s field, as represented for voice pedagogy in the details of Part I of this dissertation, will help practitioners

with their technical discourse and how to navigate the many semantics of that field. Less technical, but equally important, is fostering the environment where the language lives. The guide that follows offers a few areas where broad, interdisciplinary areas of communication can establish and sustain elements that are critical to vocal health and excellence for choral singers.

Athleticism

The “vocal athlete” is becoming a standard term in modern voice pedagogy. It is shorthand for a basic stance of athleticism—that singing requires application of toning, stretching, balancing, and exerting. There are many times when singers need flexibility and agility in place of power, where “less not more” is a concept that goes far beyond dynamic intensity, and where endurance and balance are more valuable than virtuosic displays. This understanding may be even more crucial for choral singers. While they do not often pursue the ring of singer’s formant, they must understand what vibrancy is and how to maintain it. While they are not the sole interpreter of a song’s meaning, they have a myriad of ways to engage and contribute with their bodies, hearts, and minds. While their sound is coordinated by a conductor, their bodies are their own to govern and be accountable for. Talking to them as athletes and encouraging an athletic mindset is hugely beneficial for any singing they do.

Interdependence of Systems

A systematic approach to singing provides a pedagogical framework that is helpful for teaching, diagnosing, and understanding the process in detail. As pedagogues from Richard Miller through Kari Ragan and many in between will attest, while working within any given system (e.g., respiration, phonation), it is crucial to realize how that system is both independent and interdependent from the others. Voice teachers and choral conductors should consider any given vocal instruction from a systematic perspective: Is the need contained within one system?

Could it be coming from another? If the desired change is made, what other systems will be affected? These considerations will not only impact their thinking but will also come through in their communication—helping transitions in and out of targeted work, bridging concepts in the longer term, and encouraging their singers to think in a similar fashion.

As a point of illustration, posture/alignment and articulation were not chosen for in-depth focus for this dissertation but have enormous impact on the underpinnings and final composure of any sound. If a singer's posture is out of alignment, any changes being pursued “down the line,” from respiration to resonance strategy to tension in the articulators, may not find success. Aspects of posture are amplified in choral rehearsals and classrooms where sitting is more common.

Kinesthetics and Motor Learning

Non-verbal language should not be limited to the modeling and gestures of conductors and voice teachers but encouraged for use by the singers and promoted by an instructor's verbal prompts. When talking about posture or breathing, pre-phonatory tuning, vowel shape and space, and more, singers should be absorbing with their active bodies, doing as they are listening. Conductors asking singers to show with their hands what they are experiencing or to copy the conductor's motions with them as they perform a vocalise are efficient ways of communicating without verbal explanations. These actions move singers into the realm of procedural learning, where they experience the *know-how* of the body that deepens the *know-that* of declarative learning.⁷ Further, observations of singers' gestures can alert conductors and teachers to each singer's sense of their body map and areas that may need realignment.

⁷ Holding in McCoy, *Inside View*, 282.

The practice and process of doing and repeating is the philosophy of motor learning and is increasingly emphasized in the study of voice. Key to the development of habit and corporeal understanding is time and space to experience and repeat. Despite the multiple goals within any choral rehearsal, short moments of motor learning are possible. Examples include: (1) pausing for singers to absorb what they did and then prompting them to “try it again;” (2) asking them what they noticed and give them space to consider without verbal response, and (3) allowing singers to experience a concept immediately after verbalizing it, not stringing multiple instructions or pieces of feedback together before singing again.

Vocal Health

Of paramount importance to singing for any studied environment is the fostering of good vocal health. Describing all that entails is outside the scope of this dissertation and ranges from direct instructions about healthy practices to the underlying design of rehearsals and structural decisions about the choir. Specific methods and discussions about vocal health should be a non-negotiable fundamental of singing environments and an area of formal communication—represented on class syllabi and online materials, and with lines of communications open to a team of professionals in voice pedagogy and medicine. Attention to vocal health is also communicated informally. Examples include checking in with singers individually or as a group to determine their level of fatigue, reminders in transitional moments to breathe and reset or remember small practices that help release tension, and easy allowances for singers to mark or take a vocal rest as needed. All of these will not only keep good vocal health practices present in rehearsal but also will convey the instructor’s care and priority for their singers’ well-being. Integrated vocal health language also invites an open-door policy for questions and concerns,

which fosters the overall practice of open communication within the chorus and between disciplines of studied voice professionals.

Parallel Cultures

Finally, it is crucial to state simply that communication about the differences between choral and solo studied voice cultures and between those voice professionals should happen freely. It is not only permissible, but imperative for the two cultures to have different sound ideals, pedagogies, and goals. Allowance for these differences needs to be both encouraged and desensitized. To this end, consider the many ways that communication skills used in these conversations have bearing on the conversations themselves. Verbal and non-verbal inflection, spaciousness for finishing thoughts and active listening, defensive questioning versus curious questioning, competitive versus collaborative language—all of these profoundly impact the nature of these important conversations. It is an asset to both disciplines that they share so much history and an extensive lexicon of pedagogical language and practice. The progression of each culture from that shared base to their respective peaks of excellent artistry should be to the benefit of both and the deficit of neither.

Chapter 9

Conclusion

This dissertation was undertaken with the primary goal of updating the language of contemporary voice pedagogy in the environment of choral music in two ways:

1. Performing a comparative study of contemporary language in fact-based voice pedagogy and synthesizing the results to reflect recommended language among expert practitioners.
2. Applying the recommended language to the choral/classroom setting, including adjustments for use with multiple singers and translations to areas of choral pedagogy that differ in nature and setting from solo voice pedagogy.

Two kinds of problematic language were investigated: that which is a vestige of outdated concepts and knowledge, and that which is used without knowledge of or regard for the unintended consequences that can occur and go uncorrected in the group setting. By addressing both areas, it was the larger goal of this dissertation to contribute to a greater sense of shared profession between choral conductors, voice pedagogues, and voice scientists, and, ultimately, for those professionals to guide singers in both settings to realize their vocal potential.

Over the course of preliminary research and increasingly evident as the comparative study progressed, two fundamental discoveries changed the significance and framing of the project:

- 1) Numerous scholarly publications over the last ten years continue to reflect long-standing concerns about disparities between the pedagogy of choral and solo voice practitioners. These concerns, however, are not substantiated in choral textbooks and

pedagogically focused literature and research of the same period. In fact, when seeking to apply language from the comparative study to a choral setting, direct evidence of aligned understanding was consistently found.

- 2) Addressing the needs and technical demands of choral singing requires a distinct pedagogy of which shared language and understanding of contemporary solo voice study is but a small part. While both areas share a basis of functionality and many elements of aesthetic, the overall discipline must expand to explain and instruct distinct techniques and components of choral singing. Such an expansion has precedent in the addition of CCM vocal techniques to a craft historically devoted to *bel canto* singing.

These discoveries led to the delineation of two cultures within “studied voice”—that of solo voice study and that of choral singing. The two cultures share many points of historical and pedagogical lineage but are parallel rather than homogenous systems.

The synthesis and practical application of the comparative study to the choral culture remains a valuable result and the chief contribution of this research. It will serve the goal of helping choral conductors update their language and understanding both in the academic setting and through the dissemination of these findings in the areas of music education and community-based ensembles. More shared language should, in turn, facilitate ease of communications between choral conductors, voice pedagogues, and voice scientists and contribute to the contemporary practice of choral conductors as voice professionals. What changes most significantly in light of this research is two-fold: (1) a new marker of perspective on the relationship between choral and solo voice practitioners, and (2) identification of future work needed in the area of voice-specific choral pedagogy.

New Perspectives on Choral Voice Practitioners

Choral conductors and voice pedagogues need to acknowledge that previous areas of concern and perceived differences of practice are not in evidence in contemporary scholarly sources. Choral conductors surveyed by consulted sources¹ agreed with and reported use of the majority of contemporary pedagogical practices, and numerous authors from the choral profession are promoting the same points of focus with the same solutions as authors from solo studied voice. Literature and formal reporting, therefore, reflect an alignment of understanding and method.

In primary areas of disagreement and concern—vibrato/straight tone and issues of tessitura and dynamics that lead to vocal fatigue—differences have been acknowledged and solutions offered. The ultimate solution, however, will be found when researchers and practitioners develop a distinct pedagogy with more specific applications of voice production principles that would better serve choral singers.

Finding such evidence of alignment in the available literature is encouraging and significant, but also reveals a deeper level of inquiry that is needed. How well and how often do choral conductors address voice-building and use pedagogical language with their ensembles? How can their pedagogical practice be compared to their theory of understanding? How comfortable do they feel as voice professionals regarding their own voice and those of their choristers? How would responses to these questions differ between academic and community or church choir settings?

¹ Schade, "Usage of Vocal and Choral Pedagogies" and Coates, "Singing Terminology Usage" both report detailed surveys of contemporary practitioners.

Opportunities for Future Research

Until the twenty-first century, the acknowledged priority in choral conducting was prescriptive, describing by gesture and instruction the sound that conductors wished to hear. Changes over the past decades, inspired by the same scientists and pedagogues as in solo voice, position the field to shift focus and address the workings of the voice and how to make the desired sounds. Thus far, published resources have “caught up” with contemporary science and pedagogy and mapped the principles of *bel canto* singing in every way possible to choral voice pedagogy. A few, notably Jeannette LoVetri, Marci Rosenberg and Wendy LeBorgne, and Brian Winnie, have gone further and given guidance for CCM application and cross-training for choral singers. *Bel canto*, CCM, and choral singing share all of the fundamental principles for how singers produce and sustain the voice. Much of the range of sounds desired in choral voice share resonance strategies and phonatory and respiratory postures with both of the other two aesthetics. However, additional sounds used in choral singing exist and require a more precise definition and distinct pedagogy. These are areas where voice science and voice pedagogy need to do some “catching up” in order to add the choral voice to a comprehensive understanding of the singing instrument. Some choral techniques need fundamental research, but many call for the reorienting of current research to reflect a culture separate from that of solo voice pedagogy. Specific areas include:

- Voice classification and the role of tessitura in choral singing. Models for this research include the work of Herbst et al.² with amateur choral singers and Winnie’s work with the Estill Voice Model in choral settings.³

² Herbst et al., “Quantitative Voice Class Assessment.”

³ Winnie, “Contemporary Vocal Technique in the Choral Rehearsal.”

- Acoustic energy and efficient phonation strategies for choral voice, building on the choral SOVT exercise used by Manternach et al.⁴
- Volitional use and variations of vibrato in choral singing, including relationship to overall ensemble sound (sometimes referred to as *blend*), building on the research of Helena Daffern.⁵
- Sustained soft and moderate intensity singing, particularly as related to the tessitura of choral voice parts.
- The relationship of effort, breath pressure, airflow, and closure in choral singing, including the impact of ensemble sound and intensity on an individual’s vocal effort and efficiency.
- Delineation of choral warm-ups that ready the ensemble versus those that ready the individual voice, including the impact of ensemble-focused warm-ups on vocal readiness and warm-ups that specifically address systemic needs of choral singing (e.g., isometric work, sustained soft intensity, coordinated onsets among multiple voices)

Another area of need is more training of choral conductors for voice-building in ensemble settings. Voice pedagogy requirements for choral conducting students are highly variable in academic programs, and the need for training may be significantly higher for conductors who are not in academia or who do not participate in the professional associations where contemporary pedagogy is being published and presented. Not much is known, for example, about the practices and state of language/understanding in the majority of church and

⁴ Manternach, Maxfield, and Schloneger. “Semi-Occluded Vocal Tract Exercises.”

⁵ Daffern, “Blend in Singing Ensemble Performance.”

community choirs. It is the intention of this author to use the findings of this research in such training and across a broader scope of publication.

Finally, a separate investigation and additional research on the importance of language in musical instruction and, in particular, in the choral or music education classroom setting would help to clarify the need for changes recommended in this document. Medical studies in areas of pain management, nursing, and rehabilitation, among others, have all shown that a practitioners' choice of words have significant impact on clinical outcomes.⁶ Parallels to voice pedagogy could be drawn from elements of these studies, including monitoring individual interpretation, psychological perception of one's physical body, and the effectiveness of context and accessible wording for technical language.

In the introduction to this dissertation, the claim was made that a portion of choral conductors may not identify as voice professionals. What they do identify as, or perhaps more telling, how their choristers identify them, is wonderfully summarized by Brenda Smith.

Choral conductors represent more to choir members than just professional musical leaders. Whether choral conductors wish to be or not, they are often therapists, role models, teachers, advisers, and inspirers.⁷

What would it take for all choral conductors to embrace the title of voice professional and feel a joyful obligation to seek out their role on interdisciplinary voice teams? Consider the charge by Kari Ragan to the twenty-first-century voice teacher:

While voice science makes a significant contribution to understanding the mechanics of singing, it is still incumbent upon the teacher to know how to disseminate the information within the structure of a lesson. Voice teachers must be skilled at translating a science-informed approach in the context of studio application.⁸

⁶ Stewart, Michael, and Stephen Loftus. "Sticks and Stones," 2018 and Minden, Pamela, "The Importance of Words," 2005.

⁷ Smith and Sataloff, *Choral Pedagogy*, 3.

⁸ Ragan, *Systematic Approach*, 9.

It is incumbent upon choral conductors to do the same in the choral setting. It is the hope of this author that this resource greatly aids them in their work and that, looking into the near future, science and scholarly pursuit continue to “catch up” and add to the body of science-informed mechanics of choral singing.

Appendix A - Comparison of History, Nature, and Focus Among Voice Disciplines

	<i>VOICE PEDAGOGY</i>	<i>VOICE SCIENCE</i>	<i>CHORAL MUSIC</i>
<i>HISTORY</i>	Centuries old: defined by rise of virtuoso class of singing and associated techniques, e.g., <i>bel canto</i> , Manuel Garcia II, and late 20th-century advancements in voice science.	Centuries old: defined by ancient science (Hippocrates, Galen, Aristotle), Renaissance discoveries, Manuel Garcia II, and scientific advancement in the 1970s.	Communal singing is centuries old, but the choral field is not. Defined by church and theater (in Westernized cultures), 20th-century <i>a cappella</i> movement and associated schools of thought in America.
	Close associations with science throughout history.	Close associations with singing throughout history.	Roots in orchestral conducting. Choral conducting now separate, but prioritizes music education, conducting, and management
	Modern pedagogy still polarized by scientific development. First generation of Singing Voice Specialists and any teaching coordinated with modern voice science.	Still new as a field and particularly as a division of performing arts medicine.	Choral pedagogy (which involves voice pedagogy in a limited way) is among the newest fields in performing arts medicine.
<i>NATURE</i>	Divine Art: ego, fame, individual method leads to master/apprentice model. Primarily for direct application. Selective access.	Broad field of specialists working in team approach. Both research and applied practice.	Largely amateur participants. Conductors divided among maestro, volunteer, and education mindsets/backgrounds. Broad access.
	Invisible instrument: sensation, imagery, empirical knowledge.	Technology-driven: making the invisible visible.	Working with the invisible instrument in ensemble. Sound ideals of one leader/school.
	Western music canon focused on solo repertoire. Genre expansion is expanding, but also dividing the field.	Interdisciplinary: driving rapid advancement through informing/inquiring.	Western music canon for ensembles, expanding to include multi-cultural music. Different genres included over the long-term.
<i>FOCUS/GOALS</i>	Centered on the individual student: developing maximum range, capacity, and artistic expression of the solo instrument.	Centered on the individual patient: scientific diagnosis and solutions for voice distress and disorder.	Centered on the ensemble: coordination of sound and rhythm, love of singing with others, development of musicianship skills.
	Customized language. Blend of scientific foundations, experiential knowledge, and heuristic practice developed between teacher and student. Standardization making inroads.	Standardization and technical accuracy: generator of language and instrumentation to advance the field.	Specific functions in churches and schools, development and care of community. Measures of assessment, but subjective.
	Tailored studios: field and study divided by genre.	Broad impact: knowledge of “Olympian” voice use provides solutions for all.	Encouragement and education of diverse levels. Broad impact and base of repertoire and aesthetic across the field.

Appendix B - Credentials of Contributors to the Comparative Study

Selective credentials of contributors are provided showing prominence as defined in the chapter 3 Statement of the Project. Where primary criteria are met (e.g., seminal textbook authorship, position of national leadership), additional qualifications will not be listed. National associations and journals are abbreviated as follows:

American Academy of Teachers of Singing (AATS)
National Association of Teachers of Singing (NATS) - *Journal of Singing* (JoS)
Pan American Vocology Association (PAVA)
The Voice Foundation (TVF) - *Journal of Voice* (JoV)

Kenneth Bozeman – Author of *Practical Voice Acoustics* and *Kinesthetic Voice Pedagogy*. Member of AATS. Chair of *Journal of Singing* Editorial Board. Vice President of the Pan-American Vocology Association.

Janice Chapman – Author of *Singing and Teaching Singing: A Holistic Approach to Classical Voice*. Founding member of the British Voice Association. Honorary President of The Association of Teachers of Singing in the UK.

Duane Cottrell – Author of “Vocal Pedagogy in the Choral Rehearsal” in *The Oxford Handbook of Choral Pedagogy* and numerous articles. Editor of “On the Voice” column in the *Choral Journal*.

Wendy DeLeo LeBorgne – Co-author of *The Vocal Athlete*. Editor of the JoV. Member of the NATS Voice Science Advisory Committee.

Jan Douglas – Member and former chair of AATS. Former President of NYC NATS and the New York Singing Teacher’s Association.

Robert Edwin – Member of AATS. Associate Editor of the JoS. Past Secretary/Treasurer of NATS. Faculty member of TVF’s Annual Symposium: Care of the Professional Voice.

Miguel Felipe – President-Elect of the National Collegiate Choral Organization. Past President of the Hawai‘i Chapter of ACDA. Director of Choral Activities, University of Arizona. Active clinician and author.¹

Sharon Hansen – Author of numerous articles and chapters. Founding editor of “On the Voice” in the *Choral Journal*. National clinician and conductor.

Allen Henderson – Executive Director of NATS, Member of AATS.

Matthew Hoch – Author of *A Dictionary for the Modern Singer* and numerous articles. Editor of the *Voice and Speech Review*. Former member of PAVA.

¹ Felipe and Hoover’s article was endorsed for contribution by other contributing authors as representative of contemporary language and dialogue between choral conductors and voice pedagogues.

Maya Hoover – International vocalist and professor of voice at University of Hawai‘i at Mānoa. Active clinician and author.²

Jeannette LoVetri – Nationally recognized expert, CCM voice consultant, and author. Member of AATS. Founder of the LoVetri Institute for Somatic Voicework, Advisory Board member of the Voice Foundation.

Brian Manternach – Associate Editor of the JoS. Western Governor of PAVA.

Scott McCoy – Author of *Your Voice: An Inside View*, Member AATS, Immediate Past President of NATS and Associate Editor of the JoS. Member of the NATS Voice Science Advisory Committee.

Deirdre Michael – Author of numerous articles. Member of the NATS Voice Science Advisory Committee and monitor of Vocapedia. SLP and Director of the Lions Voice Clinic at the University of Minnesota’s Medical School.

John Nix – Editor of the JoS, Member of the NATS Voice Science Advisory Committee. Former Vice President of PAVA. Author of more than 40 articles and editor/contributor to five books.

Kari Ragan – Author of *A Systematic Approach to Voice: The Art of Studio Application*. Organizing member of the Northwest Chapter of the Voice Foundation. Recipient of the Van L. Lawrence Fellowship (TVF and NATS). Host and moderator of the NATS Chat series.

Marci Daniels Rosenberg – Co-author of *The Vocal Athlete*, Former Vice President of PAVA

Mary Sandage - Author and co-author of numerous articles and studies. Renowned SLP and clinician. Article used published collaboratively with Matthew Hoch.

Donald Simonson – AATS, Former President of NATS. *Journal of Singing* Contributing editor of the JoS for “Recent Research in Singing.”

Brenda Smith – Co-author of *Choral Pedagogy, Vocal Health and Pedagogy. Volume I, Science and Assessment*, other collaborations with Dr. Robert Sataloff, and numerous articles. Editor of the JoV.

Ingo R. Titze – Author of *Principles of Voice Production*, co-author of *Vocology*, and numerous other books and articles. Founder and director of the National Center for Voice and Speech. Editor of the JoV. Associate Editor of the JoS. Past President of PAVA.

Katherine Verdolini Abbott – Co-author of *Vocology*. Editor of the JoV.

² Felipe and Hoover’s article was endorsed for contribution by other contributing authors as representative of contemporary language and dialogue between choral conductors and voice pedagogues.

Contributions from Elizabeth Blades' *A Spectrum of Voices*:

In 2002, Blades surveyed the NATS leadership and prominent voice programs in the country to determine an endorsed list of exemplary voice pedagogues. Of the 257 names she received, she crafted a list of those with multiple endorsements (at least three) whom she interviewed for the first edition of her book. For the second edition, in 2018, initial contributors, if still living, were given the opportunity to update their answers to reflect changes in their pedagogy. Six new contributors, all with national reputations and endorsements, were added, as was an additional question: "In the last twenty-five years, advances in technology, voice science, and medicine have had an impact on our profession. Please speak as to how thee fit into your own teaching."³ For the comparative study, only the new contributors and those who accepted the invitation to update their initial answers were consulted. While these practitioners have multiple credentials to their name, Blades' process for including them in her study is accepted as prominence for their contribution to this dissertation:

Meribeth Bunch Dayme
Robert Edwin
Cynthia Hoffman
Stephen King
Marvin Keenze

Jeannette LoVetri
Laura Brooks Rice
Mary Saunders-Barton
Edith Davis Tidwell

³ Blades, *Spectrum of Voices*, vii.

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