Body Mapping in the Vocal Studio: A Practical Guide for Application in Refining Alignment, Breath, and Resonance

Max A. Moreno

University of Miami, m.moreno9@umiami.edu

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BODY MAPPING IN THE VOCAL STUDIO: A PRACTICAL GUIDE IN REFINING ALIGNMENT, BREATH, AND RESONANCE

Max Aquino Moreno

Approved:

________________      __________________
Esther Jane Hardenbergh, Ed.D.     Kevin Short, M.M.
Associate Professor of Vocal Performance  Assistant Professor of Vocal Performance

________________      __________________
Robynne Redmon, M.M.     Maria Fenty Denison, D.M.A.
Assistant Professor of Vocal Performance  Lecturer of Vocal Performance

________________      __________________
Rachel L. Lebon, Ph.D.     Guillermo Prado, Ph.D.
Professor of Studio Music and Jazz  Dean of the Graduate School

Abstract of a doctoral essay at the University of Miami.

Doctoral essay supervised by Dr. Esther Jane Hardenbergh.
No. of pages in text. (94)

Current literature available in the subject of Body Mapping for singers tends to be very detailed and involved, requiring a large amount of study and time to grasp the concepts contained in the literature. This is partly why many voice teachers do not use Body Mapping as a tool in their studios. Another reason is because there are many different definitions of the term “Body Mapping” available in literature and on the web. This study defines “Body Mapping” as a supportive study that was developed by William Conable as an outgrowth of the Alexander Technique and other mind-body relationship methods. As of the date of this essay, there is a need to create a simple, hands-on guide for voice teachers to use in their studios. This guide, contained in the essay, is intended to be a quick reference for ideas contained in the concepts of Body Mapping as a supplement to the basic requirements of healthy classical voice technique. These basic requirements are defined in the essay as alignment, breathing, and resonance. Suggestions for further research are included at the end of the essay. An appendix at the end of the essay provides information about the current course offerings in Body Mapping related studies in the top 25 Music Schools in the U.S. A second appendix provides the exercises described in the narrative in a quick reference table format, with page numbers and concepts clearly labeled.
ACKNOWLEDGEMENTS

First and foremost, heartfelt and sincere thanks must be given to Dr. Maria Fenty Denison. Without your guidance and advisement, this essay would not have been possible. Also to Kevin Short, Robynne Redmon, Dr. Rachel Lebon, and Dr. Esther Jane Hardenbergh, thank you for your kind support and encouragement during my time here at the University of Miami. To my wonderful colleagues Dr. Jenna Lee Moore, Dr. Jennifer Voigt, and Dr. Vindhya Khare, thank you for your friendship, camaraderie, and your belief in me as we all finished this degree together.

To my beautiful extended and immediate family, especially my brother Wyn Moreno, my sister Cristina Lladoc, my mother Linette Moreno and my father Eduardo Moreno, thank you for your love and prayers on my behalf to help me complete this degree and all my other academic and artistic achievements. Finally, to all of my grandparents, Linelle Rose, Doyle Rose, José Antonio Flores, and Amalia Aquino Flores for your love and support from the time I started my journey in music and for providing me with such wonderful parents. I dedicate this work to all of these amazing people, without whom I would be very lost in life.
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DEFINITIONS OF TERMS

• **Body Map** – A mental representation of the body’s size, structure and function.

• **Kinesthesia** – The body’s sixth sense, also known as the perception of the body in motion.

• **Inclusive Awareness** – Conscious simultaneous organized awareness of inner and outer experience and sensations in mind and body.

• **Mismapping** – Incorrect mental representations of size, structure, or function

• **Andover Educators** – Non-profit organization of music educators, using Body Mapping to help musicians avoid injury and achieve higher efficiency in the performance techniques of their individual instruments.

• **Somatics** – studies contained in the field of movement study that focus on internal movement perception.
CHAPTER 1: INTRODUCTION

The art of teaching others how to sing, regardless of style, genre, or repertoire, can be challenging. Each new student presents a voice teacher with unique experiences and diverse challenges. It is likely wise to have a variety of vocalizes and exercises, as well as knowledge of various training methods, in order to teach students with all manner of strengths and weaknesses. Innumerable techniques and theories exist within the field of vocal pedagogy, each purporting the successful path to healthy and free sung sound.

In the introductions to many available vocal pedagogy texts, frequent descriptors like “authentic”¹, “natural and comfortable”², and even “subconscious cooperation”³ likely occur to illustrate the idea of a desirable singing sound. While some pedagogical texts are based in anatomy and physiology, others seem to distract the singer away from focusing on the micromanagement of their own bodies and toward focusing on a technique that is based in the mind and its perception of what is happening in the body.⁴

In the text Hints on Singing,⁵ considered by many pedagogues to be one of the earliest resources on vocal pedagogy,⁶ Manuel Garcia Jr. states that the object of vocal study is “to make the voice irreproachable in its intonation, firm, strong, flexible, extended, and to

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² Enrico Caruso and Luisa Tetrazzini, Caruso and Tetrazzini on the Art of Singing, (MobiPubber, 2015).
⁵ Manuel Garcia. Hints on Singing. E. Ascherberg, 1894.
correct its faults.” In addition, he also stresses the importance of teaching “the student the art of phrasing, to familiarize him with the different styles, and to develop his expression.”

In other sources available on vocal pedagogy, many of the aspects of vocal technique are stated in similar ways. Each source is valuable and reveals different individual authors’ perspectives on approaching a singer’s training. It could be said that voice teachers develop a teaching technique that is an amalgam of many methods to which they have both been exposed during their formative years as a singer and about which they have studied. There are texts that approach the relationship between good vocal technique and knowledge of anatomy and physiology. An iconic example is *Singing: The Mechanism and the Technic* by William Vennard. In the introduction to the book, Vennard states:

“As the title indicates, this book is frankly mechanistic. It is an attempt to compile under one cover objective findings from various reliable sources and to relate them to the art of singing. There are those teachers who feel that applying science to an art is quackery, but I believe that our only safeguard against the charlatan is general knowledge of the most accurate information available.”

Vennard’s text is just one of many that highlight the importance of using scientific knowledge to supplement vocal technique.

Vennard’s philosophy espouses that it is important for vocal pedagogues to base their teaching techniques on accurate, scientific information that is available. Since its publication in 1967, there have been advances in voice sciences that inform the art of singing. One of these advances is the method of *Body Mapping*. Body Mapping is a method based in physiology, derived from Alexander Technique and the Feldenkrais

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7 Garcia, 1.
8 Ibid., 1.
9 Naseth, 39.
11 Ibid., iii
Method. It applies an understanding of human anatomy and physiology to provide musicians, not just singers, with the necessary knowledge to perform healthily and efficiently.¹²

Body Mapping is a method of learning and cognition in which individuals refine their own mental representation of the structures within their own body, based on anatomically accurate information.¹³ Every point on the human body is mapped within the brain and the ability to sense, move, and act in every aspect of physicality comes from these maps.¹⁴ In addition, these maps are flexible, changeable, distributed throughout different areas of the brain, and they can seemingly alter self-perception.¹⁵

In Rita Carter’s book *Mapping the Mind*,¹⁶ she explores various facets of the field of neuroscience. Particularly compelling is the idea that one individual’s mental landscape is vastly different from another’s – even in the perception of the same task or idea.¹⁷ Carter goes on to cite a particular study, conducted by Christopher Frith and colleagues at the Wellcome Department of Cognitive Neurology in London. In this study, test subjects lay for more than two hours in a PET scan (positron emission topography scanner), simply lifting a single finger in response to a given signal. The PET scan shows how organs and tissues are working during mental activity.¹⁸ When directed to move the finger upon the auditory signal, all the subjects displayed activity in the same regions of the brain: the auditory and motor cortexes. However, when the experiment was altered,

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¹³ Andover Educators – FAQ, accessed October 10, 2015
¹⁵ Ibid., 11
¹⁷ Ibid., 24
allowing each subject to choose which specific finger to lift on the auditory cue, a completely different area of the brain was activated in addition to the aforementioned cortices. This region of the brain is located in the prefrontal cortex, which also is related to an individual’s sense of self and identity.¹⁹

Based on this example provided by Carter, inference can be made that each mind is individual in its makeup. Therefore, completing a similar physical task, one that requires both a sense of awareness and conscious decision should evoke a similar response. Singing requires both a sense of self and conscious decision-making and so, it may be considered one such physical activity. Like learning how to master an athletic ability or play a sport, singing requires specific physical training, which involves the brain’s perceptions of the motor processes of the bodily structures. This essay examines these bodily structures through the concepts of Body Mapping and its application in the voice studio.

PROBLEM STATEMENT AND JUSTIFICATION OF STUDY:

The benefits of understanding both the machinations and self-awareness of one’s own bodily structures offer benefits to singers. Body Mapping is an accepted, structured method by which teachers can introduce and engage students with physiological connections of their own body and its import to their singing. However, many vocal pedagogues and choral conductors tend not to employ Body Mapping in their teaching. This is likely due to different factors. First, the term “body mapping” is not defined clearly and consistently in the literature. An informal Google search of the course catalogs in the Top 25 Music Schools in the United States, as discerned by

¹⁹ Rita Carter, *Mapping the Mind*, (University of California Press, 1999), 24
uscollegeranking.org found only one course specifically containing the phrase “body mapping” in the title. However, most of the schools did offer courses with similar methodologies and techniques. Second, the literature is replete with texts of methods and techniques, even Malde’s book, *What Every Singer Needs to Know About the Body*, is one in which the author states that it is “a book to guide your experimentation and discovery.” While extremely helpful and useful, the book does not provide a quick look at some of the most common problems for singers as related to the body. Seemingly, no source exists that presents the common mismappings present in most singers’ technique or how this should be addressed them within the paradigm of Body Mapping. A practical guide and quick reference, written for voice teachers, is needed.

**DELIMITATIONS:**

Though the techniques of Body Mapping can be applied to all genres of singing, this study focuses on the classical voice studio. Individual ability of the student is not a consideration in the construction of the various narratives and exercises contained in each lesson on Body Mapping in chapter three. Additionally, only three areas of vocal technique are included in the narrative of the lessons. They are: Alignment, Breath Management, and Resonance.

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22. Full information on this survey can be found in Appendix A, at the end of this essay.
24. Ibid., vii
ORGANIZATION OF TEXT & METHODOLOGY OF LESSONS:

This essay is divided into four chapters of narrative, two lists of figures and definitions of terms commonly used throughout the essay, and two appendices related to the author’s research. Works cited throughout the essay are included in the last section of writing.

Chapter one is comprised of the introduction of the topic, problem statement and justification, delimitations of the study, and method and organization of the text. Chapter two contains a review of the related background literature, divided into sections on the origins of Body Mapping, its relationship to singers, and literature written on the benefits of using Body Mapping in the teaching studio for both singers and teachers. Chapter three contains three specific lessons in Body Mapping for singers, each focusing on a different area of vocal technique. These three areas are: Alignment, Breath Management, and Resonance. Within the narrative of each lesson is contained: a) a discussion of the structures involved in that particular facet of a singer’s technique, b) common mismappings that can occur in the structures in question, c) suggestions taken from Malde et al and other sources to correct specific mismappings, and d) exercises that can be done in the vocal studio to help the student correct his or her Body Map associated with the affected bodily structures. This information will be repeated for each aspect of vocal technique throughout chapter three. The lessons are compiled using the same format established by Dr. Shawn Copeland, in his doctoral dissertation “Applied Anatomy in the Studio: Body Mapping and Clarinet Pedagogy”.25

Each lesson presents anatomical information taken from a variety of medical and other related resources to Body Mapping, including some source material from Malde et al. In addition, figures illustrate each bodily structure discussed. The exercises presented in the narrative are either cited directly from Body Mapping related resources or adapted from the author’s personal experiences in both Body Mapping courses and in researching the subject. In these instances, the footnotes indicate exercises that are created through adaptation. It is intended that voice teachers will be able to use the information contained in the lessons to quickly correct common mismappings that occur in the voice studio. In addition, there are suggestions for further research and study at the end of the essay. It should be noted that these lessons in Body Mapping are intended as an introduction to more in-depth principles outlined in the various source materials available, including primarily Malde et al.

Chapter four elucidates concluding statements about Body Mapping for singers and summarizes why this information is essential for vocal pedagogues. In addition, suggestions for further research and development have been included at the end of the narrative. There are two appendices: Appendix A contains the results of Google searches of university course catalogs throughout the United States ranked as the top 25 music schools according to the popular website uscollegerankings.org. Appendix B contains a quick reference guide in a table format of all the suggested exercises discussed in the narrative of the lessons contained in chapter three. Also, a thorough bibliography of all works cited throughout this essay will be annotated in alphabetical order.

26 uscollegeranking.org, accessed October 26th, 2015
CHAPTER 2: BACKGROUND LITERATURE

BEGINNINGS AND DEFINITION OF BODY MAPPING:

Body Mapping is a method that trains musicians to use images associated with physiological self-perceptions for body alignment, which originally grew out of Alexander Technique. The concept of Body Mapping was introduced and developed, in the 1970s, by William Conable, an Alexander Technique teacher and former professor of music at The Ohio State University. It has been gaining both recognition and acceptance as a discipline within the Alexander Technique community of musicians. The work of neuroscientists confirms the existence of a body map and its importance to the performing artist.

The origins of Body Mapping can be found in related methods concerning the mind and its relationship to the body. Three such methods are Alexander Technique, Feldenkrais Method, and Somatics. Body Mapping shares ideologies with them and, in the case of Alexander Technique, is an outgrowth of it. When learning the principles of Body Mapping, a discussion of these other techniques offers context.

The work of F. M. Alexander is likely familiar to voice pedagogues. At its core, it is an educational process that allows an individual to release and avoid unnecessary

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28 Ibid.
30 King.
muscular and mental tension.\textsuperscript{31} Richard Brennan describes Alexander Technique in the following manner:

The Alexander Technique can help us to become aware of balance, posture and co-ordination while performing everyday actions. This brings into consciousness tensions throughout our body that have previously gone unnoticed, and it is these tensions which are very often the root cause of many common ailments.\textsuperscript{32}

It is likely that singers can immediately identify with the issue of “…tensions throughout our body.”\textsuperscript{33} In the following excerpt, William Vennard in his text, \textit{Singing: The Mechanism and the Technic}, addresses the concept of muscular activity, including both positive and negative tension, during breathing:

In order to understand the muscular activity we must have a clear picture of the underlying bone structure. It is really a system of levers, which are actuated by pulleys (the muscles). The levers (bones) are held together by ligaments and moved by muscles. Muscles attach to the bones by means of tendons, which are of much the same tough tissue as ligaments, and will stretch very little. The muscles, on the other hand, are stretched when they relax and they shorten when they contract. They are long and thin when they are not working, and short and thick when they are pulling.\textsuperscript{34}

Vennard places importance on the actual physiology and anatomy of the muscles and bones, which are active during breathing. Such comparisons prevail throughout the work, and serve to inform future voice pedagogues like Richard Miller.\textsuperscript{35}

An interesting facet of Alexander Technique is the importance placed on uniting both mind and body. Ursula Weiss states the following:

Alexander himself did not separate mind and body. Alexander clearly stated that we cannot separate ‘mental’ and ‘physical’ processes in any form of human activity. The Alexander Technique influences the psychophysical mechanism of the whole individual. Alexander uses the term psychophysical to determine the impossibility of separating

\textsuperscript{31} Michael Bloch, \textit{FM: The Life of Frederick Matthias Alexander: Founder of the Alexander Technique}, (Hatchette, UK), 221
\textsuperscript{33} Ibid.
\textsuperscript{34} Vennard, 20

physical operations from mental in a human being. The body does not control the mind or vice versa. Mind and body act as a unity.36

In Alexander Technique, the individual sharpens his or her own sense of kinesthesia far beyond what many vocal pedagogy resources, before about 1975, ever had discussed. Barbara Hudson states that studies in Alexander Technique, relating specifically to singing, have been scarce before the last quarter of the 20th century, possibly because F. M. Alexander was an actor rather than a singer.37 38 Though singers did seek out his training early in the development of his method, it was not until recently that the Alexander Technique began to be researched and discussed in scholarly forums concerning vocal pedagogy.39

F. M. Alexander also discovered an important relationship between mind, body, and environment, while performing on stage. In his experience, he recognized that an individual’s attention could become so concentrated on one single activity or sensation that he or she may completely ignore all other sensations happening in both outside environments and within the body.40 Singing teachers realize this can be problematic. Frank Pierce Jones describes the concept of allowing one’s attention to process multiple stimuli, a Body Mapping principle known as inclusive awareness—knowledge of what is

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38 Ibid., 10
39 Ibid., 10
40 Ibid., 11
going on while it is happening.\textsuperscript{41} Inclusive awareness is important for singers, who because of their art, multitask every time they perform.

In addition to Alexander Technique, Feldenkrais Method is also closely related to the practice of Body Mapping and recognized as a successful approach for helping singers learn good vocal technique.\textsuperscript{42} Moshe Feldenkrais was a multi-talented individual who, in the early 1900’s, was considered an expert in the fields of neurology, physics, cybernetics, and body mechanics. In addition, he was an avid athlete and held a black belt in judo. The development of his method resulted as part of his own self-rehabilitation after a knee injury. During his rehabilitation, Feldenkrais developed a technique of using the basic principles of physical movement and mental focus to encourage greater ease of movement for everyday life.\textsuperscript{43}

The axiom of the Feldenkrais Method is awareness through movement, which is the title of a series of tapes and CD’s available that teach the official patented principles.\textsuperscript{44} In essence, through a series of movement exercises, the individual sharpens the accuracy of his or her own personal body map. These exercises tend to stimulate the visual cortex in the brain and enable participants to teach themselves how to move with greater ease.\textsuperscript{45}

Visualization principles, as a technique in teaching voice, are likely present in some form in the voice studio, so the Feldenkrais Method could serve to supplement voice lessons. Samuel Nelson and Elizabeth Blades, in \textit{The Journal of Singing}, discuss

\begin{thebibliography}{99}
\item Frank Pierce Jones, \textit{Freedom to Change--The Development and Science of the Alexander Technique}, (London: Mouritz, 1997), 174
\item Ibid., 69
\item Ibid., 69
\item Ibid., 69
\end{thebibliography}
the relationship between Feldenkrais Method and singing at length. Nelson, a licensed Feldenkrais practitioner, and Blades, an experienced voice teacher and pedagogue, describe the Feldenkrais Method in the following way:

In applying the Feldenkrais Method, individuals are led through movement sequences designed to introduce or clarify a function (e.g., sitting, breathing, reaching forward, or a more complicated function). Thus, they are led to "discover" a better way to perform this function, a way that involves more of themselves than their habitual way. Because, for the most part, this discovery involves the part of the nervous system that controls movement, as opposed to conceptual consciousness, "thinking," changes tend to be retained and often amplified. Typically, the changes in functional capacity are accompanied by greater pleasure in movement and often (for adults) an enhanced joie de vivre.

The idea that changes in functional ability can bring about a greater enjoyment in the movement involved in singing is appealing, especially when trying to reassure young singers who are experiencing self-doubt or anxiety about their own technique.

The concept of conscious correcting in mental representation, which is present in both Alexander Technique and the Feldenkrais Method, can also be traced back to the concept of somatics. The term “somatics” can be defined as, “certain practices in studies on movement that concentrate on the internal perception of what happens physically in the body.” In his book, Phenomology of Perception, French philosopher, Maurice Merleau-Ponty, discusses his theory of mental perception that explains the nature of human existence through embodiment. He proposed, “perception is a whole-body,

47 Nelson and Blades, 146
context-dependent, meaning-filled activity, which is the foundation of conscious thought and reflection.”

Merleau-Ponty gives an example in his writings that specifically relates to musicians by referring to the way an organist interprets a musical score. He explains that an experienced and confident organist or pianist is always able to play an instrument with which he is not familiar, because he has the ability to adjust his physical movements. These movements were learned through perception and hands on experience. He explains that an experienced organists and pianists are able to play an instrument that he is not familiar with because they have the ability to adjust his physical movements. These movements were learned through perception and hands on experience. The keyboardist’s body and the instrument itself become the medium through which the written score is realized.

Merleau-Ponty continues to explain embodiment through his theories on speech and gesture. Unlike earlier philosophies about speech resulting from translated thought, he states that speech is a completion of the thought process itself. To clarify, speech is part of the physical action of the thought process, which implies that thought and speech occur simultaneously.

Merleau-Ponty’s philosophy can be of value to singers. His understanding of perception and expression provides the singer with a concrete, tangible view of singing. Additionally, he states that the body is “…the perceiving subject through which one

53 Ibid., 193
54 Paparo, 3
learns and experiences the world.”55 His description of the relationship between the organist and the printed score can also be applied to singers, since the singer’s body is his or her instrument.56

In addition to Alexander Technique, Feldenkrais Method, and Somatics, singers and voice teachers often turn to principles concerning mind and body relationships that are contained in athletic or exercise disciplines. A few examples of these disciplines are yoga, Tai Chi, meditation, discussion on energy centers and chakras, Dalcroze eurhythmics, and dance. For the purposes of this essay, they will be recognized as important and related to Body Mapping, but not examined further.

To understand the benefits of Body Mapping, one must first define the concept of a body map. According to the website bodymap.org, a body map is a representation of the structures of the body within an individual’s brain. Further examination defines the term “body mapping” as, “the conscious correcting and refining of one’s own body map to produce efficient, coordinated, [and] effective movement.”57 The idea that the mind’s perception of the body can be refined and corrected is at the heart of Body Mapping ideology.

By utilizing Body Mapping strategies, students learn how to recognize minute but important sensations in their bodies during singing, and use them as cues to inform their vocal technique, thus allowing them to sing more efficiently. This is done through a process of gaining mastery of the subtle physical movements made during the act of singing, thereby gaining more accurate knowledge of the physical anatomy and physiology within the human body. Through the study of anatomy and the application of

55 Ibid., 3
56 Ibid., 3
the concept of inclusive awareness, the singer learns to observe movements freely and constantly, evaluating the effectiveness of each movement.\(^{58}\)

All musicians can use Body Mapping. Currently, the choral music community seems active in championing the practices of Body Mapping in its teaching and performance methods. Heather Buchanan, an Andover Educator in choral pedagogy, has referred to the importance of Body Mapping for all kinds of musicians and conductors,

Accuracy of the body map, one's physical self-representation, is a key element in the information governing mind-body connections for musicians. Quality of movement is a critical factor for musicians, as it is movement that is the underlying basis for all forms of musical communication and expression.\(^{59}\)

Here, she advocates that Body Mapping is worthwhile, perhaps even crucial, for musicians to incorporate into their studies and technique.

The reviewed literature reveals that Body Mapping pervades musical disciplines. Several texts, dissertations, essays, and articles exist specific to various instruments. The challenges of learning to play an instrument is likely unique. In the following excerpt from the book *Body Mapping for Flutists*, Lea Pearson describes the importance for a flutist to receive instruction for Body Mapping from a flutist’s perspective:

> As a flutist who has traveled the road from discomfort, injury, and frustration to comfortable, free, and fluid playing, I have often wished there were a resource exploring flute technique from the perspective of Body Mapping…Eventually I began studying the Alexander Technique and Body Mapping. Although the pain lessened and my body use improved, my Alexander Technique teachers were not flutists and could not help me directly with flute technique…I began to realize the importance of integrating flute teaching with principles of Body Mapping.\(^{60}\)

Pearson highlights, throughout her text, principles in Body Mapping that can be applied to flute players specifically. There are other books on Body Mapping relating to different

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\(^{58}\) Malde et al, vii


instruments. For example, *What Every Violinist Needs to Know About the Body*, by Jennifer Johnson, Barbara Conable, and William Conable;\(^6^1\) *What every pianist needs to know about the body: a manual for players of keyboard instruments: piano, organ, digital keyboard, harpsichord, clavichord*, by Thomas Carson Mark, Roberta Gary, Thom Miles, and Barbara Conable;\(^6^2\) *The Collaborative Pianist and Body Mapping: A Guide to Healthy Body Use for Pianists and Their Musical Partners*, by Jennifer Bindel;\(^6^3\) *Applied Anatomy in the Studio: Body Mapping and Clarinet Pedagogy*, by Shawn L. Copeland;\(^6^4\) and *The Balanced Musician: Integrating Mind and Body for Peak Performance*, by Leslie Sisterhan.\(^6^5\) Some of these texts, though written for instrumentalists, can be helpful for singers to understand some of the most basic principles of Body Mapping. The benefits of such study in Body Mapping are numerous for both the student and teacher of voice.

**BENEFITS FOR THE VOICE STUDENT:**

In the introduction to Malde et al, Barbara Conable contributes the following explanation to identify the need for Body Mapping in the voice studio:

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Body mapping is not technique, but it is the basis for technique; the fertile ground out of which good technique can grow. Some students will come into the studio with perfectly accurate and adequate body maps and no mention will ever need to be made in lessons about the student’s structure, function, or size. The larger portion of students will have inaccurate and inadequate body maps that will constantly frustrate teacher and student alike by producing ineffective movement. A few minutes here and there of attention to mapping the structures of balance, gesture, breathing, and articulation accurately and adequately, and resonance will amend the ground and promote proper growth of technique.

Just as body mapping provides a foundation for good singing technique, the right environment within the vocal studio also provides a foundation for discoveries in body mapping, without fear of judgment. Students discover their own body structures and movements because they are given permission to both explore and experiment freely within a studio environment. The student needs to feel safe, reassured, able to take risks, and experiment with things that may not always be successful immediately. This is further supported in Phillip B. Zarrilli’s article, “The Metaphysical Studio.” Here, he lists factors that are desirable for actors in the studio environment, with an emphasis on movement; however similar principles may be applied to the voice studio. Zarrilli further states that the successful studio is a place of hypothesis and experimentation, where failure is not only accepted as a part of the process, but also treated as valuable.

Eloise Ristad, in her book *A Soprano on Her Head*, discusses the importance of releasing initial judgment and simply allowing the body to react in a way that is free and healthy. Body Mapping principles can be used to help the voice student gain perspective of his or her own body, and observe what is truly happening as each structure moves. By recognizing and feeling the sensations in the body during singing, the student can acquire

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66 Malde et al., viii-ix
67 Ibid., 207.
69 Zarrilli, 160
70 Zarrilli, 160-161
71 Eloise Ristad, *A Soprano on Her Head*, (Moab, Utah, Real People Press, 1982), 109
invaluable insight. Such learning can be likened to mastering an athletic skill. Ristad shares the following experience from her own life:

I was reminded of the first time I tried cross-country skiing and was given a non-lesson by a friend. She was apologetic about her lack of teaching ability because she found it impossible to verbalize a set of instructions. She had skied for so many years that it seemed as natural to her as walking. That suited me fine, for I really wanted to get my own sense of the skis before I got tangled up in someone else’s ‘how-tos’. As I watched her push off in an elegant glide, I found that I could sense her rhythm in my own body…then allowing the subliminal messages to my muscles to become real ones, I fell in behind her. My body felt resilient and light as I translated what I saw into what I felt.72

Therefore, when the student allows the body to do what it naturally does, once the basic movements and positions are learned, the concepts behind vocal technique can become less of a mystery.

Because Body Mapping emphasizes self-awareness, using it in the voice studio aids in teaching students to self-diagnose and self-adjust, more quickly solidifying their vocal technique.73 This allows them to take more of an active role in their own vocal development as singers and helps them maintain vocal health.74 Learning about the structure and mechanics of singing helps combat potential injury. Dr. T. Richard Nichols, Ph.D., in an appendix to Malde et al, discusses the benefits of Body Mapping from an anatomical standpoint:

The maps in the executive areas of the cortex that represent the anatomy of the body are clearly dependent upon the motor and sensory experiences of the individual. In the case of a highly trained artist such as a musician, it is expected that the cortical areas become reorganized in a way that reflects the motor planning practices of that individual. Cortical maps are sufficiently flexible that they can represent a wide range of motor behaviors…if movement is based on an inaccurate knowledge or perception of the anatomy of the body, then pathologic changes can result. These practices can lead to alterations in cortical representation, which can then become reinforcing of the faulty motor practice…These conclusions underscore the importance of educating musicians in anatomy and physiology of the motor system so that practices that can lead to pathology in the musculoskeletal system can be avoided.75

72 Ibid., 109-110
73 Buchanan & Hays, 20
74 Buchanan & Hays, 22
75 Malde et al, 210
Body Mapping may also help singers deal with and alleviate some of the effects from performance anxiety. Many of the techniques of Body Mapping involve developing one’s kinesthetic proprioception — *proprioception* being “the unconscious perception of movement and spatial orientation arising from stimuli within the body itself” — and becoming aware of sensations felt within the body. Such awareness allows students to become observers of what occurs naturally within the body and therefore, they can learn to process these sensations and evaluate whether they are useful or harmful to singing technique. Barbara Conable addresses four specific types of performance anxiety: butterflies, self-consciousness, emotions associated with inadequate preparation, and debilitating fear, terror, dread or panic:

> When student and teacher successfully challenge fear, the results can be dramatic…Freedom from fear allows a singer to reconnect with the joy that originally sparked his or her interest in the vocal art…Helping singers free themselves from fear allows them to sing with a newfound confidence and, in time, may lead them to discover their own unique place in this most demanding of art forms.

Using body mapping in the vocal studio from the first day a student begins studying can help to alleviate many of the debilitating effects of performance anxiety.

**BENEFITS FOR THE VOICE TEACHER:**

In addition to the benefits for voice students, the literature supports several examples of the benefits of utilizing Body Mapping for the voice teacher. Texts exist in varied genres and art forms that likely inform Body Mapping methodology for the voice studio.

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76 Malde et al., 201  
78 Malde et al., I  
A primary benefit identified is the principle that Body Mapping can help the voice teacher combat physical injury and trauma in a student’s technique, as well as that of his or her own.\textsuperscript{80} Preventing injury and fatigue during singing should be at the forefront of each voice teacher’s training approach.\textsuperscript{81} Consider the following statistic: “Between one and two-thirds of college students suffer performance aches, pains, and woes, regardless of whether they study privately. Certainly music educators, much like health professionals, need to commit themselves to ‘do no harm’”.\textsuperscript{82} This includes both choral conductors and studio voice teachers.

Body Mapping helps introduce the concept of sensory awareness, proprioception, or the ability to feel the subtle movements that can happen during singing, early on in the process of working with a vocal student. If this can happen, the premise is that the student will be able to truly “know” his or her own instrument.\textsuperscript{83} As part of their study, the instructor can recommend that students learn more about the structures of the body, through independently studying them. Structures of the body can be found in the literature available on Body Mapping. Through daily application of this material as part of the student’s practicing habits, the teacher begins to help them to develop habits that are natural and aligned with the body. Awareness of the true nature and the functions of the structures involved in singing is key.

In order to encourage \textit{inclusive awareness} in outside the studio practicing, the teacher may suggest that the student try a few different methods:

\begin{itemize}
  \item Buchanan & Hays, 4
  \item Ibid., 4
  \item Judy Palac, “Promoting Musical Health, Enhancing, Musical Performance: Wellness for Music Students”, \textit{Music Educator’s Journal}, Vol. 94, No. 3 (January 2008), 18
  \item Malde et al., 207
\end{itemize}
1. Take the time to seek out any uncomfortable or tense sensations in their bodies before starting to practice.

2. Make use of outside visual sources as much as possible. Use a video camera and/or mirrors to note any visual cues that can help to identify tense areas in the body.\(^\text{84}\)

Understanding the structures of the body is paramount to Body Mapping.\(^\text{85}\) In Malde et al, Melissa Malde offers some key points of advice in order to understand the components of the basic body map. The anatomical information that is available about the individual structures of the body is important. This information is what is used to correct and refine the maps of the body within the brain.\(^\text{86}\) Malde recommends not only familiarity with this information, but assimilation, suggesting lengthy amounts of time and practice with it. In addition, there are three elements that she identifies as part of the body map: size, structure, and function.\(^\text{87}\)

Learning the information about size, structure, and function of each component of the body map gives the voice teacher, both in the choral classroom and private voice studio, more information about how to correct the perception their students have of that component, and therefore, use it more efficiently. Heather Buchanan offers the following explanation:

> The purpose of Body Mapping is to teach clear and accurate information about the body in movement, resulting in the prevention of injury and promoting facility. Cultivating ‘inclusive awareness’, the combination of inner awareness (kinesthetic, tactile, and emotional information), together with auditory and visual information results in a more embodied music movement. Heightened musical awareness is said to result from the

\(^{\text{84}}\) Lisa Marsh, *Fundamental Principles of Coordinate Movement for Pianists*, (Portland, OR: Lisa Marsh, 2010), 7

\(^{\text{85}}\) Ibid., 3


\(^{\text{87}}\) Malde, et al. 2-3
synthesis of inclusive awareness and an accurate and adequate body map. The ultimate goal of Body Mapping is complete freedom of expression through poised, dynamic, musical movement.  

It is important to remember when teaching these concepts in the studio to incorporate the idea of “thinking outside of the box.” Andrew Naseth offers a few suggestions in developing flexibility as an instructor: “The voice studio is a place where a singer goes to become the best musical instrument that they can.” In order to achieve that goal, Naseth states that the teacher must have not only a functional knowledge of vocal physiology, psychology, and pedagogy, but also the ability to put his or her own opinions and preferences aside in order to facilitate the best course of action for each individual student. He further states that a teacher who only uses methods that they were personally exposed to during their own education does their students a disservice by not being aware of the current trends and innovations in teaching techniques. All students learn in their own unique way, and the successful singing instructor must remember that in their approach.

Vocal pedagogues can agree that each student learns in an entirely different manner. Susan Bruckner, in her text *The Whole Musician*, supports the idea of scientific information as a tool within a musician’s training. This can remove a great deal of the guesswork that can be present while teaching a voice lesson. There are moments when even the most experienced voice teacher will not know how to reach a particular student who is having difficulty with a singular concept within his or her vocal technique.

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90 Naseth, 49
91 Ibid., 49
92 Ibid., 50
Consider the following statement: “Contrary to popular belief, teachers teach how they themselves learn, not necessarily what they have been taught.” This suggests the idea that in order to teach a skill effectively, the teacher must have a specific way of approaching it when they are learning it themselves. Body Mapping provides a direct way for both student and teacher to learn more concretely about the bodily structures involved during the process of singing, enabling them to communicate more effectively with students of all learning styles in a studio environment.

By using the concepts outlined in the techniques of Body Mapping, teachers of voice can more effectively help their students to understand the fine details of refining technique for classical singing. The skills learned in Body Mapping help to solidify the basics of good classical vocal technique: breath management, ideal resonance of the voice, clear diction, appropriate coloring and timbre, and refined emotional and dramatic communication. Body Mapping also helps to bridge the gap that can often occur between the choral pedagogue and the private teacher responsible for individual voice lessons, since the information used is based on actual anatomical information rather than individual concepts or abstract imagery.

The benefits of using Body Mapping in a voice studio environment are numerous for the teacher and student alike. However, as discussed before, there are two main reasons why voice pedagogues tend not to use Body Mapping more often in their teaching. The literature that exists on the subject can be difficult and there are many definitions of the term “Body Mapping.” Definitions vary from complicated explanations of the homunculus portion of the brain to simply creating stories with one’s own body.

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Voice teachers tend to have a lot on their plates and likely have little time to grapple with source material. For these reasons, there is a need for a guide to convey Body Mapping for the voice studio in a clear and concise way. Information complied in this essay provides voice pedagogues with the tools required to establish a strong foundation of Body Mapping in the private voice studio.
CHAPTER 3:  
LESSONS IN BODY MAPPING IN THE VOCAL STUDIO

LESSON 1: THE SINGER’S ALIGNMENT

The first lesson in Body Mapping is on the subject of alignment. The anatomy of the lungs, larynx, ribs, sternum, and diaphragm is often found in texts on vocal technique, yet there tends to be little specific focus on bodily structures below the upper thoracic cavity. In contrast, many texts on dancing and athletics contain detailed discussions about the alignment of the whole body structure, using this often as a basis of further instruction. An example found in the book *Dance, Mind & Body*, written by Sandra Minton. Consider the following quote, simply replacing the word “dance” with the word “singing”:

“Good alignment is the starting point for all dance movement; it is also important because misalignments can lead to physical stress and injuries. Thus, good alignment can improve your dancing by helping you move more efficiently. It can also lessen the chance of injuries and lengthen your performing life.”

Found in the second chapter of *Malde et al* is a lengthy discussion of the skeletal and muscular structures centered on both the spine and also the structures that Mary Jean Allen calls, “The Six Places of Balance.” The narrative of this lesson focuses on these seven areas within the body, providing the correct mappings for these structures, using

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95 Sandra Cerny Minton, *Dance, Mind & Body*, (Champaign, IL: Human Kinetics, 2003), 50
96 Ibid., 50
97 Malde, et al., 24
citations from different resources on vocal pedagogy along with Malde et al. Exercises that allow the singer to correct their individual Body Maps are offered.

Common Mismappings of Alignment:

According to MaryJean Allen, there are certain misconceptions that singers have within their own body maps concerning the structures involved in alignment, particularly when dealing with posture.98 Referring to “posture” does not always produce the desired alignment within a singer’s body.99 Allen goes into detail about the true meaning of the word “posture,” which is derived from the Latin words positura (fix, place, position)100 and ponere (to place).101 These definitions are problematic. A singer’s needs to be able to move not remain in a single “position.”

Exercise 1A: Making Sense of the Word “Posture”

To correct this misconception, have the student “try on,” using their sense of kinesthesia, different words in the addressing of what is appropriate alignment for singing. Allen suggests three particular descriptor words: balanced, buoyant, and springy. In addition, the teacher can suggest other descriptor words that illustrate the reality that a singer must be able to be aligned in a way that allows free, uninhibited movement.102

The Spine:

Achieving efficient alignment for singing is not possible without correctly mapping the spine. The spine is the human body’s principal center of balance and

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98 Malde et al., 12
99 Ibid., 12
101 Ibid., ponere
102 Malde et al., 12
support. It is the core of the body and the central structure of support for the entire skeletal system and the muscles that surround the skeleton. Since the body is centered on the spine, any misconceptions about its size, structure, and function can lead to tensions and inefficiency in the rest of the body.

Remember that to correctly refine a Body Map, one must understand the size, structure, and function of the body component in question. Allen suggests that the following questions must be answered to correctly map the spine:

- Where is the spine located in the body?
- What is the spine’s structure and size?
- Which part of the spine is designed for bearing weight?
- What is the spine’s role in breathing?

Figure 1: Skeleton, side view

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105 This question will be more fully answered in the lesson on breathing, contained later in this chapter.

106 Malde et al., 16
Figure 1 demonstrates the position of the spine as it relates to the other bony structures of the skeleton. By studying the figure, one can see that the human spinal structure is curved, with the cervical or neck portion and the lumbar or lower back portion contained centrally within the skeleton. Many singers perceive their spines incorrectly. They may imagine a straight structure that is primarily located along the back of the skeletal framework. Since the lumbar and cervical areas of the spine are in the center of the body, they are primarily associated with the task of supporting the body’s weight. The weight of the head, torso, and arms rests on these structures. The other portion of the spine runs from the bottom of the cervical spine to the bottom of the rib cage. This section of spine, called the thoracic spine, curves backward in order to allow for room of the organs within the abdominal cavity. It is also the bony process that one can feel when running fingers along the skin surface of the back. The last section of the spine, located in the bottom of the structure as seen from the side view, is the sacral-coccygeal spine, or tailbone area. This section of spine is not located in the center of the body and has no weight-bearing responsibilities.

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108 Malde et al., 16
110 Ibid., 48
111 Ibid., 49
112 Ibid., 53
113 Ibid., 53
In Figure 2, the difference in size, when comparing the top sections of vertebrae with the lower sections, can be observed. Using exact units of measurement is not helpful, since each individual varies in size and shape, however, relative size is important. The lumbar section of the spinal structure is considerably larger in relation to the upper sections. Many singers do not map this section with the correct size and, in general, musicians tend to underestimate its size. A suitable exercise to correct this perception of size would be the following:

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114 Malde et al., 21
115 Zemlin, 48
116 Conable, 20
Exercise 1B: Mapping the Size of the Lumbar Vertebrae

Have the student make a circle with the hands using the index fingers and thumbs. The circle produced by the singer’s hands is roughly the size of a lumbar vertebra, including all of its bony processes. This information, along with the true location of the lumbar section of the spinal structure, is the beginning of correcting a singer’s Body Map for alignment.\textsuperscript{117}

The function of the spine is threefold: it allows the human body to move in different ways, it protects the spinal cord, and it provides support and distribution of the body’s weight.\textsuperscript{118} For the purposes of this essay, it is unnecessary to discuss the vertebral structure. Rather, it is sufficient to state that the spine be perceived as segmented and flexible, allowing the torso to move in all different directions and manners – forward, backward, sideways, twisting, bending, and spiraling.\textsuperscript{119}

Figure 3 below, illustrates one of the many extreme movements of the spine due to the segmented nature of its structure:

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{image1.png}
\caption{Dancer’s back bend spinal position\textsuperscript{120}}
\end{figure}

\textsuperscript{117} Malde et al., 16
\textsuperscript{118} Pearson, 31
\textsuperscript{119} Conable, 10
\textsuperscript{120} Stock image taken from www.fromupnorth.com.
The flexibility and springiness of the spine allows the human body to move with range, while still maintaining the protection of the spinal cord and healthy distribution of the weight of the body.\textsuperscript{121}

The last question is: what happens to the spine during the process of breathing? This is addressed in Lesson 2: The Singer’s Breath. The first step, perceiving the gathering and lengthening of the spine during inhalation and exhalation, is enough to further correct spinal maps. Physically, the spine \textit{gathers} upon inhalation and \textit{lengthens} upon exhalation.\textsuperscript{122} Consider the following exercise to teach the student to observe this movement:

\textbf{Exercise 1C: Learning to Sense the Gathering and Lengthening of the Spine}

\textit{Instruct the student to bend in half at the torso. With the arms hanging down freely in front of the body and the head down, have the student breathe in deeply and focus their attention on what is happening in the spine as they breathe in and out. They should be able to feel the gathering and lengthening as they inhale and exhale.}\textsuperscript{123}

Mary Jean Allen also suggests the following exercise to help compare inaccurate and accurate body maps of the spine:

\textbf{Exercise 1D: Comparing Accurate and Inaccurate Spine Maps}

\textit{The student can “try on” the following inaccurate map: Imagine and perceive that the location of the weight-bearing portion of the spine is completely along the bony processes of the back. With their back against the wall, instruct the student to flatten the natural curves of the spine (with caution). They will most likely notice that most of the weight of the body will be transferred to the heels of the feet in this position. Ask them to verbalize how the body feels in this position and have them sing a simple vocalise. Then, the teacher should ask the student to correct the map by moving away from the wall and}

\textsuperscript{121} Johnson, 18-19
\textsuperscript{122} Malde et al., 66
\textsuperscript{123} Lisa Marsh and Max A. Moreno. \textit{Body Mapping for Musicians}. August 2012. Class taught by Lisa Marsh at Portland State University, exercise adapted by Max A. Moreno, Portland State University, Portland, OR.
changing the mind’s perception to how the natural curvature of the spine was before it became flattened against the wall. Allow the student to reposition the center of the lumbar section of the spine where it should be in the core of the body and have them try the same vocal exercise again. There should be a noticeable improvement in the quality of the singing and movement.124

The teacher may also use this adapted exercise to help the student feel the difference between a rigid spine and a moveable one:

**Exercise 1E: Feeling the Difference Between a Rigid Spine and a Flexible Spine**

Have the student picture their head on top of a broomstick, trying to consciously eliminate all movement and flexibility from it. With extreme caution, ask the student to sustain a neutral vowel of their choice on a comfortable note. Ask them to describe the sensations in their neck and torso as they do this. Then take time to correct the map for them, asking them to specifically focus on the natural curvatures and movement of a segmented, flexible spine and sing the same neutral vowel on the same note. Have them describe the difference between a rigid, non-moving spine and a flexible, segmented spine to you in their own words. This will assist to identify the sensations that indicate a free spine in the student’s body map.125

After trying on incorrect body maps, the teacher should allow the student to try on the “correct map” for the structure in question in order to facilitate true change.126 For the spine, a correct map will allow the musculature in the front and back of the body to remain free, thus achieving a healthier, more balanced sound that is absent of tension in these areas.127

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124 Malde et al., 24
125 Marsh & Moreno, exercise adapted
126 Johnson, 16
127 Pearson, 19
The Six Places of Balance:

In addition to the spine, there are six other areas of the body that are crucial to the singer’s alignment.\textsuperscript{128} These six areas are: the atlanto-occipital joint, the shoulders or arm structures, the thorax (in relationship to the lumbar area of the spine), the hip joints, the knee joints, and the ankle joints.\textsuperscript{129} Five of these six areas are defined anatomically as actual joints and all six contain a numerous kinesthetic receptors, which make it easy for the brain to perceive movement and tension.\textsuperscript{130} Typically, many singers may have created accurate maps for some of these six areas, but not for all of them.\textsuperscript{131} The narrative and exercises that follow will focus on each one of these areas of balance individually.

The Atlanto-Occipital Joint:

The first place of balance is the atlanto-occipital joint, also known as the A-O joint. It is helpful to note that joints in the body are named for the two structures that they connect; in this case the two are the atlas, or the top cervical vertebra, and the occiput, or the bottom portion of the skull.\textsuperscript{132} The location of this joint must be perceived correctly to free the neck muscles from tension. Lack of tension allows the singer to move the head freely and easily during singing. Figure 4, on the following, page shows the location of this crucial place of balance:

\begin{table}[h]
\centering
\begin{tabular}{|l|l|}
\hline
\textbf{Reference} & Page No. \\
\hline
Pearson & 19 \\
Malde et al. & 25 \\
Ibid. & 24 \\
Ibid. & 24 \\
Zemlin & 41 \\
\hline
\end{tabular}
\caption{References for the Six Places of Balance}
\end{table}
As can be seen from Figure 4, one half of the skull balances in front of the A-O joint and the other half balances behind it. The jaw is located completely in front and below the joint. The following original exercise may be used to map the correct location of this structure:

**Exercise 1F: Mapping the Neutral Position of the AO Joint**

*Have the student rotate their head in various different directions, exploring how each position affects the sensation of tension in the neck and facial musculature. In particular the movement of tilting the head too far backwards and too far forwards may be beneficial in aiding the student to recognize sensations of mismapping. To further illustrate the importance of correct head alignment on the AO joint, the teacher can also ask the student to sing a single note on a neutral vowel of their choice. Ask the student to describe how each incorrect position affects their sensation of the sound.*

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134 Marsh & Moreno, exercise adapted.
One final note of importance is the natural curvature that happens visually in a well-balanced A-O joint position. Referring back again to Figure 4, it is easy to visually recognize that the neck is not completely straight in the neutral, balanced position. The teacher should immediately address the position of the A-O joint when the curves of the neck are not visible. When the neck muscles are released, they naturally will lengthen and adhere to a curvature. An interesting discussion on why this curvature exists can be found in *Vocology: The Science and Practice of Voice Habilitation*, written by Titze and Abbott.  

**Thoracic Balance and the Lumbar Spinal Area:**

Next is the concept of thoracic balance, because the arm structures cannot be properly balanced until the other five places are mapped correctly.  

**Notes:**  

136 Malde et al, 31  
138 Malde et al, 31
Exercise 1G: Achieving Healthy Thoracic Balance

This slight modification to what is known as the “crescent moon” position in yoga is quite effective for feeling the full flexibility of the spine from a lateral angle. In a comfortable standing position, have the student place one hand on the hip and reach over the head toward the middle of the body with the opposite hand, allowing the spine to bend to the side of the hand on the hip. Repeat for the other side. It is important with each bend to counterbalance the lean of the body by energetically committing weight onto the opposite foot. After leaning the body into both sides, instruct the singer to find a balanced position in the core of the body and walk backwards five steps. This will encourage the student to find balance of their thorax over the hip joints.139

Hip Joints and Pelvis:

The pelvis is designed to distribute the weight of the upper body to the legs.141

Figure 5, below, demonstrates the direction of the weight distribution in the pelvic area. Looking at the illustration, one can see the way body weight is distributed when standing with proper alignment:

![Figure 5: Distribution of weight in Hip Joints](https://www.ekhartyoga.com/blog/understanding-our-sacroiliac-joint)

To find the location of the hip joints, the teacher can try the following exercise:

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140 This exercise also contains original adaptations of the above source by the author.

141 Zemlin, 53

Exercise 1H: Mapping the Location of the Hip Joints

Direct the student to palpate the top portion of the pelvis (also known as the iliac crest). From there, the student can work their hands downwards to find the bulbous structure known as the greater trochanter. The actual hip joint is located two to three inches higher and deeper than this point. Though it cannot be felt directly from the outside of the body, kinesthetically it can be detected through the simple exercise of moving the joint in all different directions while keeping the hand on the point of the greater trochanter.\(^{143}\)

The type of movement used in the exercise can vary depending on the teacher’s preference. For the purposes of this essay, sitting and weight distribution will not be discussed. Detail about the sitting bones can be studied in Chapter 2 of the Malde et al text.\(^{144}\)

After successfully mapping the hip joints and the pelvic area, the singer can, in turn, successfully map the whole torso. The torso can be defined as the portion of the body that excludes the head, arms, and legs.\(^{145}\) Therefore, the torso runs all the way from the most superior vertebra of the spine to the bottom of the pelvis.\(^{146}\) Many singers mismap the torso believing it much shorter than it actually is, and therefore, are affected negatively by the movements that involve it.\(^{147}\) Some examples of movements involving the torso can include breathing, bending forward, and creating physical gestures to display dramatic intention. Clearly mapping the hip joints further clarifies movements such as taking a bow, which requires movement from the hip joints and not from the waist.\(^{148}\)

\(^{143}\) Malde et al., 32
\(^{144}\) Ibid., 32-36
\(^{146}\) Ibid.
\(^{147}\) Malde et al., 36
\(^{148}\) Ibid., 36
**Knee Joints:**

The location of the knee joint can be surprising to students. Most will assume that the kneecap is the knee joint. In reality, the joint is located directly behind the kneecap, which floats in front of the lower portion of the thighbone.\(^{149}\) This is clarified in the illustration below:

![Figure 6: Location and Positions of Knee Joint\(^{150}\)](image)

The kneecap is connected solely by a series of ligaments to the top of the tibia, or the larger bone in the lower leg, and the bottom of the thighbone.\(^{151}\)

The actual joint of the knee has three possible positions: locked, balanced, and bent. To feel the difference between these three positions, the teacher can try the following adapted original exercise:

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\(^{149}\) Conable, 30

\(^{150}\) Malde et al., 36

Exercise 11: Finding Balance in the Knee Joints

*Have the student place the hands on the hips and move the knees in a circular motion, going from the locked position to the bent position. The knees tend to lock as a reflex to when the thoracic balance is too far back, so in addition, the teacher would be wise to check that balance again if the knees are locking. Kinesthetically, the singer should be able to sense the additional work on the muscles surrounding the knees when they are not in balance.*\(^{152}\)

Ankle Joints:

One of the most common misconceptions about the ankle joints is their location. Most people tend to map this location as precisely at the two bony lumps located where the lower legs meet the feet. In reality, these two lumps are not the joints at all, but rather the bottoms of the two leg bones, named the tibia and the fibula.\(^{153}\) Like the hip joints, the ankle joints cannot come to their place of balance when the thoracic region and the lumbar spine are out of balance.\(^{154}\) If the thoracic region is not properly balanced, the muscles around the ankle joints will stiffen, eliminating the possibility for free movement in that area.\(^{155}\) The two figures on the following page help to clarify the true nature of this joint and the foot structure in general:

\(^{152}\) Marsh & Moreno, exercise adapted
\(^{153}\) Malde et al., 38
\(^{154}\) Ibid.
\(^{155}\) Ibid.
It is important to understand the composition of the foot structure beneath the ankle joint and how the weight of the body is distributed in the feet. Figure 7 illustrates the three arches of the foot. Each arch bears a third of the weight from above in the ankle joint. Note that the toes are not included in this system of weight delivery. Often, singers may grip the floor with their toes to give themselves a sense of “being grounded.” As can be seen in Figure 7, this will only create unnecessary tension in the musculature of the foot. Rather than gripping with the toes, it is important to adjust the weight of the body evenly among the three arches of the foot. Simply, when balance is achieved between the two “balls” of the feet and the heel of the foot, the weight distribution is mapped successfully. In order to achieve balance between these three points of the foot, the following exercise is useful:

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156 Malde et al., 38
157 Ibid., 39
159 Ibid., Web
Exercise 1J: Mapping Correct Balance in the Feet

Have the student stand in front of a full-length mirror with most of their body weight shifted back toward the heels of the feet. Then instruct them to inhale and prepare to sing in this position. Ask them to describe how they look, feel, and sound with this mismapped position. Repeat the exercise, this time with the weight shifted forward to the balls of the feet. Finally, instruct the student to use their kinesthetic sense to find balance between all three points. The student and teacher should both be able to perceive a difference in tone quality and overall appearance in the student’s performance.¹⁶⁰

Arm Structure:

The arms are last alignment because, in order to achieve the proper balance with these structures, the rest of the places of balance in the body must be mapped correctly.¹⁶¹

The skeletal structure of the human arm contains many parts: the collarbone, the shoulder blade, the upper arm bone, two lower arm bones, a wrist (collectively made up of many smaller bones), and the bones of the hand.¹⁶² This is illustrated in Figure 9:

![Arm Structure Diagram](image)

Figure 9: Arm Structure¹⁶³

¹⁶⁰ Malde et al., 40
¹⁶¹ Ibid., 40
¹⁶³ Malde et al., 41.
While the arm structure is involved in the art of singing, through movement and gesture, for the purposes of alignment, it is enough to know that the collarbone structure specifically is designed to rest centered over the lumbar portion of the spine, which, again, is responsible for bearing the weight of the body.\textsuperscript{164} Therefore, the position of each collarbone should be roughly parallel to the ground beneath the singer. Many singers make the mistake of holding the shoulders in a position out of this central resting state, whether it be too high, low, forward, or back.\textsuperscript{165} Any movement out of the central position will cause the surrounding musculature to tense up, interfering with the singer’s breath and resonance.\textsuperscript{166} This is discussed in more detail in the narratives for Lessons 2 and 3 in this chapter.

\textit{Figure 10: Collarbone Alignment Resting Position}\textsuperscript{167}

\textsuperscript{164} Malde et al., 40  
\textsuperscript{165} Ibid., 40  
\textsuperscript{166} Ibid., 40  
\textsuperscript{167} Ibid., 42
As can be seen in the figure above, the collarbones and shoulder blades rest directly above the ribcage. Students can feel this with their own sense of kinesthesia.

To find the central balance of the arm structures, the following exercise may be helpful:

**Exercise 1K: Mapping the Correct Position of the Arm Structure**

*Have the student stand in front of a full length mirror. First, check all the other places of balance discussed previously, then, instruct the student to raise the shoulders as close to the ears as possible, using their kinesthetic sense. Now have them look in the mirror and match the visual information with the physical sensations they experience. It would also be beneficial to have the student try to sing either a vocalise or a passage of their repertoire in this position to observe the effects that the mismapping has on the other places of balance in the body. The student can then lower their arms to the place of neutrality and sing the same vocalise or passage in the correct position. Repeat the exercise, having the student lower their arms out of balance, as if they were carrying heavy weights in each hand. After this incorrect position, again have them return to a place of balance with the collarbone and shoulder blade structures. This exercise can also be modified to include positions of the arms that are too far forward and too far back.*

**Conclusion:**

In the search for correct alignment for singing, neither the singer nor the teacher should think of these balanced positions as static. According to Malde, “Even in perceived stillness, there is micromovement.” When the alignment of the six places of balance is achieved, the singer can begin to correct the mismappings of breath and resonance.

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168 Malde et al., 42
169 Ibid., 43
LESSON 2: THE SINGER’S BREATH

In *Malde et al.*, Melissa Malde writes, in great detail, about each individual structure involved in the process of breathing for a singer’s technique. A common myth that exists in teaching breathing for singers is that they should breathe “naturally,” as they would for average speech. The first concept addressed in mapping a singer’s breath is that breathing for singing is neither average nor “natural.” Malde states that it is important to understand each of the structures involved in inhalation and exhalation, so that a singer is free to make choices about their breathing based on truth’s contained in their own bodies, rather than relying solely on an outside technique that claims to be the best perception of the singer’s breath. Since the breath is the source of power for the instrument that is the human voice, learning the nuances of the structures involved in breathing is critical for a vocal artist, in order to make informed, creative choices.

Common Mismappings of Breathing for Singers:

The most common mismappings that occur when singers breathe have to do with imprecise location, function, and interstructural relationships of the bodily structures associated with inhalation and exhalation. Malde lists five in particular: the idea of “tanking up”, keeping the ribs out during exhalation, misplacing the diaphragm perpendicularly to the floor, perceiving the ribs as immovable, and pushing out with the ribs in order to facilitate inhalation.

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170 Malde et al., 47
171 Ibid., 47
172 Ibid., 47
174 Malde et al., 47
In order to combat incorrect perceptions of the singer’s breath, the student must understand the basic principles of muscle elasticity. In order for muscular structures to work efficiently with one another, the body must first be balanced and buoyant, hence the reason for the ordering of the lessons contained in this chapter.\textsuperscript{175} After finding a sense of true balance in the body, the singer can begin to understand the elastic nature of the muscles of the body. When a muscle works, it contracts or gets shorter.\textsuperscript{176} After its work is done, a contracted muscle can release back to its resting state.\textsuperscript{177} A comparison is an elastic band stretching and recoiling. Many muscles in the body are paired together to work in opposition to each other. In other words, in order for these paired muscles to work efficiently, one has to release fully in order for the other to contract — dynamic equilibrium. Inefficiency in muscles occurs when both sets try to contract or release at the same time. When dynamic equilibrium is achieved in the requisite muscle groups, the student can feel a true singer’s breath.\textsuperscript{178} The principles of muscle elasticity and dynamic equilibrium are paramount to the discussion of breathing for singing.

Ribs:

The correct mapping of the singer’s breath begins by addressing the bony framework of breathing, or the ribs. The ribs house the heart and lungs and are attached directly to the spine.\textsuperscript{179} The first learned principle is that the structures of the ribs and spine move during the process of breathing.\textsuperscript{180} Often, singers mistakenly perceive the ribs

\textsuperscript{175} Vennard, 19  
\textsuperscript{176} McCoy, 77  
\textsuperscript{177} Ibid., 77-78  
\textsuperscript{178} Malde et al., 48  
\textsuperscript{180} McCoy, 81
as non-moving, static structures, thereby causing unnecessary tension in the surrounding musculature.\textsuperscript{181} There are 24 ribs, 12 on each side of the body, made up of both bone and cartilage, which allows them to be flexible and move with each breath.\textsuperscript{182} The ribs are connected by cartilaginous joints to the vertebrae in the spine, allowing for further movement.\textsuperscript{183} Similarly, the top 10 ribs connect through a series of cartilages to the breastbone or sternum, allowing for movement in the front of the chest, as well.\textsuperscript{184} The bottom 2 ribs, the floating ribs, do not connect to the sternum and are shorter.\textsuperscript{185} The cartilage that connects the ribs to the vertebrae and the sternum are \textit{gliding} joints, which allow for minimal movement in an up and down direction, and accounts for the “up and out” moving action that can be felt during inhalation for singing.\textsuperscript{186}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure11}
\caption{Ribs \& Spine: Back View\textsuperscript{187}}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure12}
\caption{Ribs \& Spine: Front View\textsuperscript{188}}
\end{figure}

\begin{thebibliography}{9}
\bibitem{Malde} Malde et al., 48
\bibitem{Ibid} Ibid., 48
\bibitem{McCoy} McCoy, 82
\bibitem{Ibid} Ibid., 81
\bibitem{Ibid} Ibid., 81-82
\bibitem{Malde} Malde et al., 48
\bibitem{Ibid} Ibid., 50
\bibitem{Ibid} Ibid., 51
\end{thebibliography}
The two figures above show the structures that make up the ribs. As can be seen above, the cartilage attached to each rib is an appreciable part of the structure. This is useful in reimagining the nature of the ribs. To correct the map of the ribs, the following exercise can be employed:

**Exercise 2A: Correcting the Map of the Ribs**

_Instruct the student to stand with the torso bent in half, the arms dangling freely. In this position, have them inhale deeply. Stand behind the student and place your hands (with permission of the student) on the lower and lateral parts of the student’s ribcage and press firmly. Instruct the student to breathe in and out against your hand pressure on their body. This will not only help them to understand the location of the ribs, but also the correct movement of the ribs during breathing._

Remember, when mapping out the ribs in the mind, the arm does NOT connect with the ribs or spine in any direct way. The arms connect directly to the sternum via a joint attached to the collarbone. Therefore, any movement in the arms or shoulders will be ineffective for helping a singer breathe. It is physically impossible to connect the two.

**Spine:**

The spine moves during the processes of inhalation and exhalation. When the student takes air into the lungs, the spine reacts by gathering together vertically, because of the movement of the ribs. As the ribs come closer together, the space between the

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189 Titze & Abbott, 262  
190 Malde et al., 51  
191 Ibid., 51  
192 Ibid., 51  
193 McCoy, 80
thoracic vertebrae compresses.\textsuperscript{194} In addition, the curvature of the spine becomes more intense as the core of the body deepens, resulting from flattening of the diaphragm.\textsuperscript{195}

Upon exhalation, this gathering or curvature is released, allowing the spine to lengthen back to its original position.\textsuperscript{196} To assist the student in finding the sensation of this lengthening and gathering of the spine, the following exercise is useful:

**Exercise 2B: Feeling the Gathering & Lengthening of the Spine During Breathing**

*Instruct the student to lie on the floor with their head on their left hand. In this position, have them breathe deeply, making sure that the back and abdominal muscles are released. They should be able to feel their head moving up and down their hand as evidence of the lengthening and gathering of the spine. The exercise can be repeated for the opposite side of the body as needed to fully integrate the correct map into the student’s mind.*\textsuperscript{197}

In addition to the bony framework of the ribs and spine, the singer should be aware of the muscles involved in the process of breathing. In Body Mapping, the primary muscles for breathing are the diaphragm, the intercostal muscles, the abdominal muscles, and the muscles of the pelvic floor.\textsuperscript{198} It is important to know the function and nature of each one.

**Diaphragm:**

The diaphragm is the primary muscle involved in the singer’s breath. It’s size and location are illustrated in the figure on the next page:

\textsuperscript{194} Malde et al., 51 
\textsuperscript{195} Pearson, 85 *Note: There is a helpful diagram on this page that demonstrates this principle visually. 
\textsuperscript{196} Ibid., 87 
\textsuperscript{197} Pearson, 87 *Note: Pearson, in her text, credits Barbara Conable for this particular exercise. 
\textsuperscript{198} McCoy, 83-88
Figure 13: The Diaphragm

The diaphragm is a dome-shaped muscle that is like an arch, sloping at an angle inside the ribs. It is the principal breathing muscle and divides the thoracic cavity from the abdominal cavity. The lungs connect to it at the top of the dome structure, the abdominal organs (or *viscera*) nestle underneath the dome, and the central tendon attaches the heart to the center of the dome superiorly. Since the diaphragm cannot consciously be controlled, the following exercise can help the singer get a better grasp on this mysterious structure within the core of the body:

**Exercise 2C: Mapping the Diaphragm**

*Have the student form their hands into a dome shape with the palms facing down and place this dome shape against their body right underneath where the heart is located. The student should then tip the dome shape slightly so that the front is higher than the back. Have the student inhale and flatten the dome shape in their hands as they*

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199 Malde et al., 52  
200 Miller, 265  
201 Ibid., 83  
202 Miller, 262
do so. Point out that the circumference of their “dome” gets larger as it flattens. As the student exhales, have them restore the dome back to its original shape gradually as air is exhaled. This is a very accurate mirror of what actually occurs in the actual diaphragm during exhalation. The physical manipulation of the hands also allows the student to add another tactile dimension to their learning.203

Intercostal Muscles:

The muscles in between the ribs, or intercostal muscles, are also important in constructing the singer’s body map. Allowing for free rib movement is key to accessing the breath for singing.204 In breathing, the singer should engage the muscles surrounding the ribs more fully than he or she would in normal, everyday activities.205 When contracted, the intercostal muscles bring the ribs closer together.206 (More specifically, the internal intercostal muscles contract for exhalation and the external intercostal muscles contract for inhalation.) The ribs glide in their joints at the sternum and spine and come closer together, which causes the sides of the ribs to rise up.207 To model the action of the ribs, the teacher can use the following exercise:

Exercise 2D: Mapping the Action of the Ribs

Have the student place their hands in front of the thorax with the palms facing the chest and their elbows at the sides of their body. Put the pinkies and fourth fingers together and adjust so that the hands are positioned at the low end of the sternum. Have them inhale and swivel their arms so that the elbows rise during the breath in. As they exhale, let them drop the arms back down to the starting position. They can repeat this until they understand the action of the ribs and how that feels within their own body.208

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203 Malde et al., 55
204 Malde et al., 55
205 Sundberg, 28
207 Ibid., 17
208 Malde et al., 56 *The same exercise is cited in Pearson, 78.
Abdominal Muscles:

In addition to the intercostal muscles, the abdominal muscles are also working intensively during breathing for singing. They are lean, but strong muscles that form three layers around the abdominal cavity, which contains the intestines and other digestive and endocrinal organs, known collectively as the *viscera*.\textsuperscript{209} Though there are technically three separate muscles within the abdominal group, Malde states that it is acceptable to treat and map these as a single unit.\textsuperscript{210} Consider the cross-section below:

![Layers of Abdominal Musculature](image)

*Figure 14: Layers of Abdominal Musculature (Cross-Section from Top)*\textsuperscript{211}

Though perceived as a single unit, it is important to recognize that the abdominal muscles are located in the front, back and sides of the abdominal cavity, illustrated above. A common perception is too think of them in the front only, which does not allow the singer to access important sensations in the sides and back of the cavity. In addition, it should be noted that these muscles extend all the way from the lower ribs to the pubic

\textsuperscript{209} Miller, 277  
\textsuperscript{210} Malde et al., 57  
\textsuperscript{211} Ibid., 58
bone at the bottom of the cavity. The abdominals function best for singing when tension is absent. Like the other structures involved in breathing, these muscles display constant movement during the process of inhalation and exhalation. The key to the release of the diaphragm and intercostal muscles is dependent on the abdominal muscles’ ability to release during the process of inhalation. Conversely, on exhalation, these muscles begin to contract, which provides the singer with a sense of — the term, sometimes elusive, that voice teachers use — “support.” To model the action of the abdominal muscles, the voice teacher may try the following exercise:

**Exercise 2E: Mapping the Action of the Abdominal Muscles**

Have the student palpate their abdominal muscles from the front of the body all the way around the arch of the hip bone and back to the spine. Then have the student palpate the upper region of the muscles along the bottom side of the ribs, in a similar manner all around the body. To further model the movement of these muscles, have the student form a circle with the tips of their fingers, with the tips of the fingers meeting in the front and thumbs in the back. Once the shape is achieved, have the student separate the hands, still in the same shape, until they approximate the rough circumference of the abdominal region of their own body. As they inhale, instruct them to widen this circumference by making the angle of the fingers steeper and expand the distance between the hands. Reverse the process upon exhalation. Repeat this process until the student has a clear tactile and visual understanding of the abdominal muscles’ movements during breathing for singing.

**Pelvic Floor:**

The bottom of the abdominal musculature, or the pelvic floor, is the final piece of the puzzle when trying to organize how a singer’s breath. These muscles roughly mirror the appearance of the diaphragm, forming a shallow bowl-like shape, and connecting to

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212 McCoy, 87
213 Ibid., 87
214 Ibid., 86
215 Doscher, 25
216 Ibid., 26-27
217 Malde et al., 59
the bottom edges of the bony pelvic structures. Similar to the abdominal muscles, in order for the diaphragm and intercostal muscles to contract fully upon inhalation, the pelvic floor must be released. The movement that occurs in the pelvic floor is subtle, not as noticeable as the movement of the abdominal muscles, yet, its recoil and elasticity contributes to the efficiency of the singer’s exhalation. By adding this movement in our inclusive awareness, while breathing for singing, we are ensuring that the torso, in its entirety, is involved in the process of making a singing sound. This structure is easily mapped by applying the following exercise:

**Exercise 2F: Mapping the Pelvic Floor**

*Have the student cup their hands very shallowly, interlacing the fingers with the palms facing up. Adjust the hands so that they are at the low end of the pelvis. As the student inhales, deepen the cup shape ever so slightly and reverse for the exhalation process.*

Malde does not include the lungs in her discussion of the musculature of the singer’s breath, because the lungs are not muscles. However, in beginning lessons with singers, much of the inefficiency within breathing technique has to do with lack of a clear map in their minds of their lungs. The lungs are made up of a spongy material that reacts to its surrounding structures and are not capable of drawing air into the body on their own. In reality, the way that air is drawn into the lungs is by the movement of the

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218 Malde et al., 60  
219 Ibid., 60  
220 Ibid., 60  
221 Ibid., 60  
222 Ibid., 61  
224 Ibid., 26  
225 Malde et al., 62
diaphragm and ribs, using the musculature discussed in this lesson.²²⁶ By creating the “up and out” movement in the ribs and the flattening action of the diaphragm, the lungs will fill up with air and expand.²²⁷

**Neck & Vocal Tract:**

Many singers assume that the neck and the vocal tract, itself, must be involved in the process of breathing. Malde states that the extrinsic musculature of the neck plays absolutely no role in breathing for singing.²²⁸ This may be revelatory to many young singers. The vocal tract contains sensory receptors that can give information to the singer about the quality of the air he or she is inhaling into the lungs.²²⁹ Other than that, however, the vocal tract should simply remain open and unobstructed, allowing the air to travel directly down into the lungs.

**Conclusion:**

Many subtle movements and sensations occur during the process of breathing of which the singer should be aware. Perhaps the greatest challenge in discussing breathing for singers is creating a sense of ownership of the breath mechanism without creating the need for rigid control of the muscle structures involved. Like many other processes involved in singing, breathing requires the subtle awareness within the singer’s own body of what is happening and how it is happening. This information should be used to inform

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²²⁶ Malde et al., 62
²²⁷ Appelman, 25
²²⁸ Malde et al., 66
²²⁹ Ibid., 66
the body’s responses and actions, rather than strictly control or force a certain behavior out of the structures involved.
LESSON 3: THE SINGER’S RESONANCE

Many components make up the perception and excitation of a singer’s resonance. It should be noted that while this lesson will serve as an overview for the concept of resonance in classical sound, it is not meant to contain all of the components that make up singer’s resonance.

Laryngeal Map & Vocal Tract Shape:

When speaking about resonance, it is important that both the teacher and singer have an understanding about the laryngeal map. Since the larynx is where phonation originates, it can be used as a starting place when refining one’s perception of resonance.\(^{230}\) Resonance is dependent upon the size and shape of the vocal tract. Even though the larynx is only responsible for the origin of a singer’s sound, each singer should have a basic understanding of its size, function, and location.\(^{231}\) Melissa Malde states that there are three reasons why a singer should bring their laryngeal map into their conscious thought while learning how to resonate optimally:

1. The singer may have misconceptions about the structure itself that may be interfering with effective and healthy phonation within the vocal folds.\(^{232}\)

2. The laryngeal map can help the teacher of singing refine his or her own understanding of the instrument and thereby, become more effective as

\(^{230}\) Zemlin, 99
\(^{231}\) Malde et al., 133
\(^{232}\) These misconceptions are usually characterized by specific audible symptoms that are easily recognized by an experienced vocal instructor. These include but are not limited to: persistent hoarseness, difficulty in negotiating register changes, problems with onset or the beginning of a tone, and inconsistent vibrato patterns in the sound.
an instructor. In so doing, the instructor will be able to articulate more directly the result that they are looking for in a student’s sound.

3. It is important to consider the laryngeal map in order to better guide artistic choices, both as teacher and singer.233

It is interesting to note that, even though the nerves in the larynx only carry general sensation signals back to the brain, it is still possible to send specific and direct commands from the brain back to the larynx.234 Therefore, the more refined and definite a laryngeal map the singer develops, the more he or she will be able to guide the movements needed within the larynx to create optimal resonance, using visualization and intention.235

The anatomical and physiological details about the larynx are not included in this lesson. However, they are outlined in great detail and clear description in chapter four of Malde et al. Further study of this chapter is encouraged, in order to fully integrate a complete map of the laryngeal structure within the brain. Salient points are provided regarding size, location, and function of the larynx.

The larynx is a walnut-sized structure made up of hard cartilages located at the front of the collective structures that make up the human neck.236 The larynx is attached inferiorly via the cricoid cartilage to the trachea, or breathing tube, leading down directly to the lungs.237 Superiorly, it attaches via the thyrohyoid membrane to the hyoid bone.

233 Malde et al., 77
234 Ibid., 77
235 Ibid., 77
236 Zemlin, 99
237 Ibid., 99
which is located near the base of the tongue. Figure 15 below, illustrates the exact location and relative size of the larynx in relation to other structures around it in the neck:

![Figure 15: The Larynx in Context](image)

As far as function is concerned, the larynx serves three purposes: to prevent food and liquid from entering the air passages, to assist in balancing thoracic pressure during defecation and childbirth, and to make sound for communication. It is this third function that is used during the act of singing. Singing can be considered elongated, resonated, verbal communication executed over specific pitches. Once the laryngeal map is refined and understood, the concept of resonance can be addressed. The term “resonance” is one that tends to elude vocal students. One way to find it is to perform the following exercise:

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238 Zemlin, 99
239 Malde et al., 78
240 Zemlin, 100
241 Malde et al., 78
Exercise 3A: Making Sense of the Term “Resonance”

Take a rubber band and ask the singer to stretch it out and pluck it. Ask the student to describe the sound the rubber band makes as it is plucked. Continue by taking a glass or container with a lid. Remove the lid and stretch the rubber band across the top, asking the student to pluck the rubber band and describe the new sound. Variations can be added by using containers of different shapes and sizes with different size openings. This is how resonance works. By changing the shape and size of the opening and the container itself, the band made different sounds. In a singer’s body, the vocal folds act as the rubber band, the breath traveling through the vocal folds acts as the plucking action with the rubber band, and the shape of the vocal tract becomes the same concept as the shape of the container.²⁴²

The shape of the vocal tract is what makes the sound of the human voice different for each singer and for each style.²⁴³ Scott McCoy mentions a few different descriptor words that vocal pedagogues often use to describe these different shapes, including such terms as “bright vs. dark,” “twang vs. loft,” “clean vs. raspy,” and “healthy vs. damaged.”²⁴⁴ While these may be helpful to describe the way a particular voice sounds to a listener, each individual singer should be encouraged to discover the sensations that inspire his or her own optimal resonance and kinesthetic awareness.²⁴⁵ The first step in this discovery process is the understanding of the map of the vocal tract. The figure on the following page provides a visual aid to mapping the structures that make up the vocal tract, which acts as a resonator for the vocal folds:

²⁴² Malde et al., 107-108  
²⁴³ McCoy, 26-28  
²⁴⁴ Ibid., 2-3  
²⁴⁵ Malde et al., 77
The human vocal tract is made up of seven different moveable structures: the pharyngeal constrictor muscles, the soft palate, the jaw, the tongue, the lips, the buccinator muscles on the inner cheeks, and the larynx. Using all of these structures together in different ways create the shape that produces the resonance of a singer’s voice. This physical process is often described by words such as *timbre* or *color*, when referring to the quality of the sound.

In mapping the vocal tract, it is important to first understand the nature of it both at rest and in motion, as these sensations will feel very different. While at rest, the vocal tract takes on certain qualities, which the teacher can encourage the student to notice during periods of silence in the lesson. The lips are either closed or slightly open, but not pressed together. The jaw is slightly open, creating a small space between the teeth the

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247 Malde et al., 108
248 Ibid., 108
249 Ibid., 109
The tongue lies relaxed in the “cradle” of the jaw, touching the bottom teeth all the way around the jaw. The buccinator muscles are released and relaxed, allowing the cheeks to be free and long. The soft palate is suspended, but not consciously raised, allowing for free airflow from the mouth and nose. The pharyngeal constrictors are released. The larynx is suspended neither low nor high.

The vocal tract in motion takes on a variety of different qualities, which can vary greatly depending on the style of music being sung. In this lesson, only the classical style of singing is addressed. For classical singing, the lips remain released and forward. Because of this desired position, the buccinator muscles in the cheeks must also be released since they are connected. The larynx is neutral, without tension in the constrictor muscles, and the soft palate is buoyant. This position results in a sound that will cause a singer’s vowels to tend toward a rich, more rounded quality, different from the vowels used in everyday speech. Through a comparison of aforementioned pedagogical sources, Malde concluded that the following positions made for desirable, healthy sound in the classical style of singing. In order to find each one of these positions efficiently and healthily, the map of each structure must be known. This lesson addresses the size, structure, and function of each bodily component involved in resonance.

250 Malde et al., 109
251 Ibid., 109
252 Ibid., 109
253 Ibid., 109
254 Ibid., 109
255 Zemlin, 229
256 Ibid., 299
257 In various descriptions, Miller, McCoy, Smith, Garcia, Lamperti, Doscher, and the other vocal pedagogy resources cited in this essay agree that this is generally the idea behind a resonant, healthy singing sound.
Pharyngeal Constrictors:

The term, *pharynx*, can refer to both the space within the throat and also the muscles that surround it, known as the pharyngeal constrictors.\(^{258}\) The nature of the space within the throat be mapped correctly. Many singers perceive it as a tube when, in reality, it is completely open at the front, creating a more horseshoe shaped structure, with the opening of the horseshoe located towards the mouth and nose anteriorly. This can be seen in the figure on the next page, which shows the entire vocal tract posteriorly:

![Figure 17: Back View of the Vocal Tract (Pharyngeal Constrictors)](image)

\(^{258}\) Malde et al., 111  
\(^{259}\) Malde et al., 112
In this figure, the pharyngeal constrictor muscles can be seen. In singing, the role of these muscles is simple: they should not be engaged or contracted. Their primary function is for survival, more specifically, swallowing, and contract in a surging motion from top to bottom, in order to assist food traveling down the esophagus towards the stomach. They also assist in regurgitation or the action of vomiting, engaging in reverse order. Neither of these physical activities is desirable during the act of singing. Therefore, in order to map these muscles correctly for the act of singing, a singer must release all tension within them, even letting go of sensation completely.

Soft Palate:

The soft palate is the next structure relating to singer’s resonance. The soft palate acts like a valve creating barrier between the nasal and oral cavities. It is essential to map this structure properly, because its use can affect directly the quality of a singer’s sound.

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260 Zemlin, 277
261 Malde et al., 111
262 Zemlin, 262
263 Ibid., 262
Exercise 3B: Mapping the Soft Palate

To help the student find his or her soft palate, instruct them to run their tongue along the roof of their mouth. The hard, bony surface they feel in the front of their mouth is the maxilla, or hard palate. Just behind it is the soft palate, which is soft and slippery under the tongue. Have them attempt to yawn, and ask them to feel how high they can perceive their soft palate resting right before the actual yawn (they will most likely follow through with an actual yawn). This is the position of the soft palate most desired for a typical classical sound.

For the purposes of this beginning lesson on resonance, it is enough to locate the soft palate and feel the difference between high and low positions. To further map the desired position of high soft palate for classical singing, the teacher can integrate the following exercise:

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264 Malde et al., 114
265 Ibid., 114
Exercise 3C: Mapping the Concept of High Soft Palate

Ask the student to find their alignment for singing as outlined in Lesson 1. With the head completely in balance, instruct the student to keep their mouth closed and their teeth apart, with the tongue relaxed and touching the lower teeth. In this position, instruct them to imagine how the beginning of a yawn feels. They should feel a subtle yet definite lifting sensation in the area of the upper throat. Explain that this is the soft palate lifting up to close the passages to the nose. Ask the student to then sing a speechlike vowel of their choice on any comfortable pitch. After the first tone, ask the student to produce a more nasal example of the same pitch and vowel, while asking them to also observe how the two feel in comparison and contrast. Have the student describe the difference to you. If the student has difficulty feeling the soft palate moving, take a flashlight and shine it in their mouths while having them observe in a mirror during each vocalization. Repeat as necessary to correct the student’s map.

One important note is the common mismapping that many singers have about the relationship of the facial muscles to the muscles that lift the soft palate. Malde stresses that the instructions many voice teachers use to “raise the eyebrows” or similar facial engagement are not helpful for a correct map for resonance. This is because the muscles responsible for expression and movement in the face are not in any way connected to the muscles of the soft palate. Teachers should use caution not to use any of these instructions so as to not confuse the student’s soft palate map.

Jaw:

The jaw is commonly mismapped, which can lead to a variety of tensions in the facial and neck muscles. The human jaw is a separate bone from the rest of the skull. It is attached to the skull by rounded structures called condyles, which fit into facets just in

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266 Marsh & Moreno, exercise adapted
267 Malde et al., 116
268 Zemlin, 229-233, 262
269 Ibid., 198-199
front of the ears. The bony part of the jaw is not very thick, and the bone of the jaw does not extend under the tongue, but rather sits in front of it. Knowing this seems to allow the singer to explore more freedom of motion in the tongue. In addition, many singers confuse the nature of the jaw when creating a map for it in their minds. It should be remembered that the top row of teeth is attached to the upper portion of the skull, also called the maxillae, and is not considered part of the jaw. Perceiving the upper teeth as part of the jaw leads, incorrectly, to the thought that the jaw opens both up and down. As a result, unnecessary stress on the surrounding musculature and joints may occur.

*Malde et al* contains comprehensive information about the musculature and movement of the jaw. Primary is the masseter muscle, which can be felt from the outside by placing the hands on the face on the jaw area. See the figure following, for the location of this muscle:

![Figure 19: The Masseter Muscle](http://www.chegg.com/homework-help/questions-and-answers/masseter-muscle-masseter-muscle-principal-muscle-chewing-one-strongest-muscles-size-human--q4671716.)
The execution of consonants interferes with freedom of the movement in the jaw. Therefore, consonants are likely to be a primary interruption in fluid jaw movement.

According to Malde, when singers choose to have a wider jaw opening for execution of high notes or open vowels, the jaw will, in turn, need to close again in order to form most consonants intelligibly.\textsuperscript{276} Releasing the muscles surrounding the jaw, which the singer can do through perception of movement and their sense of kinesthesia, creates a neutral jaw position. In this neutral position, the musculature that allows the jaw to open downward, enunciating efficiently, most consonant sounds with very little movement.

Consider the following exercise for the execution of consonants:

**Exercise 3D: Avoiding Overactivity in the Jaw**

*Have the student find the neutral position in the jaw by releasing the muscles that both open and close the jaw. (This can be explained by instructing the student to open the jaw wide and then clench it closed. The released position is in between these two extreme positions.) Then ask the student to place both hands on either side of their jaw, making sure the student is placing their hands in the right place directly over the masseter muscles. Figure 19 can be used to aid in finding the right position. With the hands over the jaw on either side, have the student recite the alphabet in order in their normal speaking range. While doing so, they should notice how much jaw movement is required for each consonant or vowel. The teacher can point out visually any particular letters that are causing overworking of the jaw muscles. Once the desired jaw movement is achieved, the student can then try singing on each alphabetical letter’s sounds.\textsuperscript{277}*

Finally, the singer should avoid any sense of hyper-movement of the jaw during classical singing, including both extremely lateral and vertical positions.\textsuperscript{278} When a teacher sees visual cues of this behavior, it tends to signal mismappings of the jaw musculature.

\textsuperscript{276} Malde et al., 123-124
\textsuperscript{277} Malde et al., 124
\textsuperscript{278} Doscher, 101-103
Lips:

Lips are a crucial element to singer’s resonance, as they both elongate and truncate the vocal tract. Inexperienced singers may be surprised to learn this. The musculature directly connecting to the lips extends from the bridge of the nose and to just above the chin.\textsuperscript{279} Underneath the surface of the skin, the muscles involved in moving and shaping the lips cover the entire area of the face, in front of the front teeth.\textsuperscript{280} For a clear picture of this, please see below:

\textit{Figure 20: Lip Muscles and Buccinator Muscles}\textsuperscript{281}

\textsuperscript{279} Zemlin, 228-229
\textsuperscript{280} Ibid., 229
\textsuperscript{281} Malde et al., 126
Visually, one can see the difference in the lip shape of a classical singer as compared to a contemporary singer can be observed during singing. Classical singers tend toward a rounded and forward shape to the lip, which elongates the resonating chamber of the mouth. A different formant results, creating the round, tall timbre is perceived as classical style in singing. The following exercise can help the student map the lips more accurately:

**Exercise 3E: Mapping the Lip Muscles**

*Using Figure 20 as a guide, ask the student to trace with their index finger the outline of the lip muscles, starting above the chin and traveling along the natural indentations as it curves up underneath the nose. Now ask the student to use the whole entire musculature of the lips to form an “ooh” vowel and a closed “oh” vowel on any comfortable pitch. Try a few consonants and then have them try the “m” consonant using first only the surface of the lips, followed by the full musculature again. Ask the student to explain to you in their own words how the different muscle groups affected the sensation of their sound.*

Cheeks:

The cheeks are involved in the production of healthy tone for singing. The insides of the structures known as the cheeks are made up of two muscles, one on each side of the face. These are called the buccinator muscles. Both Figure 20, on the previous page, and Figure 21, on the next page, illustrate the location and relative size of these muscles:

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282 Malde et al., 126  
283 Ibid., 126-127  
284 Zemlin, 230-231
When engaged, these muscles pull back the sides of the lips and create a wide, lateral opening in the mouth. The resulting resonance is aligned typically with contemporary (CCM) styles of singing. Authorities on classical style tend to agree that this resonance is not desirable for a sound culturally perceived as “classical.” In order to map these muscles and learn to release them for classical singing, the student and teacher can apply the following exercise:

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Zemlin, 230


While not desirable in classical sound, the resulting resonance from the activated buccinator muscles is important because it allows the singer to sustain more pure vowels in the upper registers of the voice in more contemporary styles.
Exercise 3F: Mapping the Buccinators

Have the student find proper balance and alignment in the head. Instruct the student to place both hands on the cheeks and say the word “cheese”, resulting in a wide grin on the face. Instruct the student to attempt to round the lips while sustaining the word “cheese”. Notice how difficult it is to pronounce the word correctly while the cheek muscles are engaged. Now have the student move on to the word “choose”. Have the student sing the word while contracting the cheek muscles and releasing them, having them describe the difference to you between the two sensations.288

Tongue:

The tongue is a curious structure. Often, one revelation to a young singer about the tongue is its size and girth. Efficient resonance for classical singing can be achieved if the singer has a detailed “brain map” the tongue’s size and patterns of movement.

Figure 22: The Tongue (Cross-Section, Right Side View)289

The tongue is a thick muscle that, generally speaking, originates at the chin and inserts at the hyoid bone.290 It is made up of dense fibers that move up and forward to

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288 Malde et al., 129
289 Ibid., 130
290 Ibid., 131
form the portion of it that we can see. This visible area of the tongue contains a high concentration of nerve endings, and so, singers tend to forget about the root of the tongue, below the visible portion. The following exercise can help singers to correctly map the bottom portion of the tongue:

**Exercise 3G: Mapping the Tongue**

*After achieving proper balance and alignment in the head, ask the student to place their thumbs in the hollow spot on the bottom of their jaw, behind the chin. While pressing against the area gently, have the student swallow. They should immediately perceive movement against their thumbs, which is the motion of the root of the tongue assisting with the action of swallowing. In addition, by using the index fingers and walking along the jaw line towards the neck, the student should be able to feel a very strong muscle resisting against the press of their fingers. This muscle is the tongue. By using the fingers and thumbs to palpate the bottom of the tongue in this manner, the student and teacher can then use different combinations of tongue action until the student grasps the concept of how the tongue is moving and how large it really is.*

Once students understand the nature and size of the tongue, they may learn that they are using the tongue to do the work of other muscles in order to achieve proper resonance. Malde states that one of the most common examples of this is using the tongue to “push” down on the larynx with the back of the tongue. Since the tongue is a connected directly to muscle groups that lower and raise the larynx, this can create reek havoc with timbre. A primary responsibility of the tongue during singing is to form the vowels and consonants for articulation. Use the following exercise to help a singer with any of these incorrect mappings of the tongue:

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290 Zemlin, 248  
291 Ibid., 248  
292 Ibid., 248  
293 Malde et al., 130-131  
294 Ibid., 131  
295 Malde et al., 132  
296 Doscher, 95-96
Exercise 3H: Exploring Different Tongue Movements

Have the student explore the different movements of the tongue by trying on some of the mismappings just discussed in the last paragraph. For example, the singer can pull the tongue far back into the mouth towards the soft palate, press the tip of the tongue against the lower teeth, or attempt to “lower” the larynx with the tongue. While trying on these incorrect maps, it is important that the teacher emphasize to the student that these sensations are completely incorrect for the act of singing. To further engrain the understanding of incorrect sensation, the teacher can have the student try to vocalize in some of these mismapped positions, asking the student to articulate back to them what happens to the sound while doing so.²⁹⁷

Position of the Larynx:

The final component of singer’s resonance is the position of the larynx itself. As discussed previously in this lesson, the larynx is responsible for the vibration of the vocal folds from which the sound of the human voice originates. The concept of how the larynx moves as a whole unit is also important to resonance. Voice science studies reveal that the lowering of the larynx provides a natural acoustical boost in the singer’s sound.²⁹⁸ This acoustical boost or anomaly is also known as singer’s formant. It can also be called squillo, ping, and many other descriptors. In order to lower the larynx healthily, the singer must use certain muscles that connect to it. To become more familiar with these muscles, study the figure below:

²⁹⁷ Malde et al., 132
²⁹⁸ Sundberg, 132-133
These three muscles, the sternohyoid, sternothyroid, and omohyoid, are the only ones in the neck that are responsible for moving the larynx as a whole unit.\textsuperscript{299} There are also other muscles in the neck that are involved in other physical activities besides singing, such as turning the head, lifting the arms, or swallowing. In order to map the muscles that lower the larynx correctly, it is important to realize that the names of most muscles correspond to the two structures they connect. Therefore, the sternohyoid muscle connects the sternum with the hyoid bone. The sternothyroid muscle connects the sternum with the thyroid cartilage of the larynx. The omohyoid muscle connects the hyoid bone with the front part of the shoulder blade in front of the arm socket. By engaging these three muscles, three of the infrahyoid muscles, the larynx can be lowered healthily and safely by decreasing the distance between the hyoid bone and the thyroid.

\textsuperscript{299} Malde et al., 133
\textsuperscript{300} Zemlin, 119-121
However, it is more accurate to think of these muscles in terms of balance. The infrahyoids (4) are the muscles that offer balance in response to the suprathyroids and constrictor muscles (7), which raise the larynx.\textsuperscript{302} In order to reflect the balanced laryngeal position, the current accepted nomenclature is “neutral.”\textsuperscript{303} However, Malde, in 2008, uses the terms “low and stable” to provide a description of the ideal laryngeal position for singing.\textsuperscript{304}

The three infrahyoid muscles mentioned are the only ones that factor into resonance. All other muscles in the neck should be released and free. While trying to map out the optimal position in the larynx for singing, the student and teacher should both be aware that this position is not static or held. While the larynx should be neutral and stable, especially for classical styles of singing, there should always be a sense of allowing it to move, as it needs to do. Even in stillness, there is always perceived micromovement.\textsuperscript{305} The following exercise can help the singer more clearly understand this position and freedom of movement:

**Exercise 3I: Finding Correct Position and Movement in the Larynx**

*With the head in balance and aligned, the student can release the tongue and place a finger in the hollow just above the sternum. Instruct the student to think about yawning without actually inhaling. This action should activate the sternohyoid and sternothyroid muscles, which can be felt beneath the finger. From there, have the student spread the index finger and thumb far apart, placing them on either sides of the neck in the area where the collarbones meet the neck. In this position, have the student repeat the imagined yawn action. They should be able to feel the omohyoid muscle contracting underneath their fingers. These muscles are what are used to lower the larynx safely and efficiently.*\textsuperscript{306}

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\textsuperscript{301} Zemlin, 120  
\textsuperscript{302} McCoy, 87  
\textsuperscript{304} Malde et al., 133  
\textsuperscript{305} This concept is referred to not only in Malde et al, but also in Johnson, Pearson, and also Conable. It is one of the most basic concepts of Body Mapping in general.  
\textsuperscript{306} Malde et al., 134
Conclusion:

The majority of this lesson on resonance has focused on the individual structures used in the search for optimal tone production within classical styles of singing. By using the anatomy discussed in the previous pages of this lesson, the teacher and student of singing may discover new truths about singer’s resonance. Further study and experimentation with the anatomical information available in Malde’s writings and the sources cited throughout this essay is encouraged to solidify the singer’s body map and provide an array of tools that can be used for achieving a desirable and healthy sound.
CHAPTER 4: CONCLUSIONS

Body Mapping is an important tool for learning, which can enable the classical singer to take ownership of his or her instrument.\textsuperscript{307} The preceding lessons are intended to act as gateways to further discovery and research. By studying Malde et al, and other works cited in this essay, singers and voice teachers can gain both a better understanding of the machinations of human voice, during the act of singing, and a clearer self-perception of body movement, while singing.

A review of the available research on Body Mapping has led to several findings. First, the literature is vast, as evidenced by the array of material cited in chapter two. Under the umbrella of Body Mapping is a plethora of resources on related subjects, branching into multiple disciplines. Its relationship to Alexander Technique and Feldenkrais Method, accounts for a large part of the literature available on the subject of mind and body relationships. More approaches exist that are not covered within the narrative of this essay. Therefore, by studying the extensive literature available on Body Mapping, the possibility of enriching a singer’s understanding of technique, from a variety of ideologies, exists.

Second, even casual study of Body Mapping principles can have an effect on a singer’s technique and a teacher’s pedagogical skills.\textsuperscript{308} Since Body Mapping is based on the perception of the bodily structures involved in a physical activity and is readily approachable to the casual user, more in-depth study is encouraged for students as they achieve progress in their overall musicianship and efficiency in playing their respective instruments, including voice. Newcomers to Body Mapping principles may find it

\begin{footnote}{307} Malde et al, vii \end{footnote}
\begin{footnote}{308} Ibid., ix \end{footnote}
beneficial to simply concentrate on one bodily structure at a time, adding the opportunity to refine their knowledge as time allows.³⁰⁹

Third, Body Mapping technique encourages correction of an individual’s body map from a variety of approaches, using multiple human senses to provide the brain with concrete information about the structures studied.³¹⁰ Visual, tactile, and kinesthetic senses are at the forefront of Body Mapping exercises, allowing each participant to see, touch, and also kinesthetically sense accurate body maps. By employing different senses, Body Mapping creates multiple pathways in the brain to these corrected maps; thus enabling the voice student (and teacher) to find the correct map quickly.³¹¹ This aids both student and teacher in combatting injury, frustration, and fatigue during performance.

The author of this essay has experienced success in his own studio using Body Mapping principles. It is usually helpful to introduce the concepts of alignment and breath management right away, often in the first lesson, with a new student. It has also been observed that, for students, being mindful of how things feel, while attempting to solidify a concept in vocal technique, is more beneficial than consciously attempting to fix the problem. A useful phrase to remember is “trying fails, awareness cures.” These conclusions are the result over five years integrating Body Mapping principles into this author’s voice studio. In addition to personal experience, they are based on research and classes in Body Mapping and Coordinate Movement with certified Andover Educator Lisa Marsh, at Portland State University in Oregon. The observed results are:

1. A better sense of ownership in the student’s body and a conscious pride in his or her own unique sound.

³⁰⁹ Malde et al., ix
³¹⁰ Johnson, 2
³¹¹ Blakeslee & Blakeslee, 11
2. More confidence in the student’s presence on stage.
3. Overall improvement of technical skills such as alignment, breath management, resonance and coloring, diction, dramatic expression, and movement on stage.

SUGGESTIONS FOR FURTHER READING:

In addition to the text *What Every Singer Needs to Know About the Body* (Malde *et al*), the other texts cited in this essay will help to refine a singer’s understanding of their own body. In particular, *The Body Has a Mind of its Own*[^312] by Blakeslee, is an in-depth study of how body maps can affect and aid the brain in executing physical tasks. Also highly recommended is the book *A Soprano on Her Head*[^313] written by Eloise Ristad. This particular text is helpful for voice teachers looking to improve their communication skills in lessons. Written for musicians in general, it is a chronicle of the workshops given by the author of the book in order to aid musicians struggling with various roadblocks in technique, from memorization problems to battles with performance anxiety.

In addition to books on Body Mapping, teachers and singers can refer to the website [bodymap.org][^314], the official website for Andover Educators. It is a non-profit, international organization of music educators dedicated to “saving, securing, and enhancing musical careers by providing accurate information about the body in

[^313]: Eloise Ristad, *A Soprano on Her Head: Right-Side Up Reflections on Life and Other Performances*, Moab, UT: Real People Press, 1982
movement”.315 The website contains multiple resources, including books, tangential websites, and articles relating to Body Mapping for all musicians. It also houses a roster of instructors certified as official Andover Educators. Any voice teacher interested in becoming certified as an Andover Educator has access to this information through this cite.

SUGGESTIONS FOR FURTHER RESEARCH:

Topics concerning singers and voice pedagogy from which further research in Body Mapping could emerge are many. Barbara Conable writes on the subject of performance anxiety in Appendix A of What Every Singer Needs to Know About the Body. Heather Buchanan in her article “The Influence of Body Mapping on Student Musicians' Performance Experiences”316 discusses a part of her original research in which performance anxiety was a factor. Further exploration within this topic could prove both useful and beneficial to voice teachers and singers.

Another suggestion is the application of body mapping principles as relates to contemporary voice technique, including belting, musical theater, jazz, and popular styles. While Malde does allude to these styles in her book, a more in-depth application of the technique to the individual styles could prove useful for contemporary pedagogues, coaches, and singers working in contemporary genres.

In addition, the use of Body Mapping principles as a tool for actors would be beneficial to singers. Though Body Mapping is an outgrowth of Alexander Technique,

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which was developed by an actor for delivering healthier speech patterns on stage, a Body Mapping resource for actors would continue this process even further. Alexander Technique mainly addresses the head, neck, and back, suggesting that the rest of the body will follow in sequence. Body Mapping methodology would bring attention to the rest of the structures in the body specifically. Singing, like acting, requires communication. Stephen Smith states that a great vocal performance occurs when the singer is able to strip away any form of pretense, connect emotionally to the music, and communicate something that is authentic to the audience. By applying the principles of Body Mapping to a singer’s acting and communication skills, the same effect can be achieved in the physical act of singing itself. This is the true ownership of a singer’s body — relating to dramatic coloring and intent. Stage actors, who are not singers, could also benefit from such a study.

CONCLUSION:

Vocal pedagogues and singers alike should be aware of Body Mapping and its benefits, because it creates a starting point from which the voice teacher can begin. By teaching the true anatomy and physiology of the body, voice teachers unravel much of the mystery that plagues many beginning voice students. In other words, Body Mapping provides an alternative to the ineffective communication that can often occur, because of the lack of a clear picture, with concrete information, when learning about beginning concepts. Like learning any other athletic skill, singing is an activity that requires keen awareness of the body and the conscious training of the muscular and skeletal structures

317 Brennan, 3
involved. Body Mapping is a clear, practical path to achieving healthy and efficient vocal technique.
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APPENDIX A:
COURSES RELATING TO BODY MAPPING
FOUND IN THE TOP 25 MUSIC SCHOOLS OF THE U.S.
(ACCORDING TO USCOLLEGERANKING.COM)

The following appendix is a summary of the author’s findings when researching the various course offerings related to Body Mapping, Alexander Technique, or body awareness in the top 25 music schools according to the above website. The presented information can be used for further research into Body Mapping through resources that already are in place within these schools. In addition, it can be used to illustrate the schools that are currently lacking in courses relating to Body Mapping or Alexander Technique. Uscollegeranking.com collects its data from various different resources and ranks each school based on ten areas of evaluation, outlined in the following list:

1. Teaching Quality/Teacher Ratings
2. Staff to Student Ratio
3. Median Salary of Graduates
4. SAT/ACT Test Scores of Incoming Freshmen
5. Graduation Rate Performance
6. Undergraduate Academic Reputation
7. Student Selectivity
8. Notable Alumni
9. Academic/Research Performance
10. G-Factor – an indicator of the popularity or importance of each university’s website from the combined perspectives of other institutions

The information is presented in the following list containing the name and location of each school, followed by the school’s location and the titles of the courses offered in the

319 These resources include both printed and online media from the following publications and organizations: U.S. News and World Report, ARNU, HEEACT, The New York Times, Princeton Review, Newsweek, Forbes, Wall Street Journal, College Navigator, College Prowler, Human Resources & Labor Reviews, SCImage Institutions Rankings, Collegeboard, Academic Analytics, Fisk Guides to Colleges, United States National Research Council, Top American Research Universities, Google, etc.
2015-2016 course catalogs of these institutions, which were all available online and found by the author of this essay:

1. **Eastman School of Music (Rochester, NY)** - Keys to Healthy Music, Yoga for Musicians
2. **The Juilliard School of Music (New York, NY)** – Performance Enhancement
3. **New England Conservatory of Music (Boston, MA)** – Body Mechanics & Awareness for Singers, Yoga & Alexander Technique
4. **Oberlin College Conservatory of Music (Oberlin, OH)** – no courses
5. **Curtis Institute of Music (Philadelphia, PA)** – no courses
6. **Indiana University Bloomington (Bloomington, IN)** – no courses
7. **University of Michigan Ann Arbor (Ann Arbor, MI)** – Yoga for Performers
8. **Northwestern University (Evanston, IL)** – Alexander Technique
9. **College Conservatory of Music University of Cincinnati (Cincinnati, OH)** – Intro to Alexander Technique
10. **Berklee College of Music (Boston, MA)** – Vocal Technique and Wellness, Yoga for Musicians, Tai Chi for Musicians, Body Mapping
11. **Yale University (New Haven, CT)** – Dramatic Movement for Singers
12. **Florida State University (Tallahassee, FL)** – no courses
13. **University of Illinois Urbana Champaign (Champaign, IL)** – no courses
14. **Manhattan School of Music (New York, NY)** – Alexander Technique
15. **University of Southern California (Los Angeles, CA)** – no courses
16. **Peabody Institute at Johns Hopkins University (Baltimore, MD)** – no courses
17. Mannes College of Music (New York, NY) – Care of the Professional Voice: Vocal Production & Vocal Health

18. Cleveland Institute of Music (Cleveland, OH) – no courses

19. University of North Texas (Denton, TX) – no courses

20. Arizona State University (Tempe, AZ) – no actual courses listed, but their music department website contains many useful links to websites about wellness for musicians, including a link to bodymap.org

21. University of Texas – Austin (Austin, TX) – no courses

22. Rice University (Houston, TX) – Music & Performance: The Mind/Body Connection

23. University of Colorado Boulder (Boulder, CO) – Advanced/Graduate Studies in the Alexander Technique, Advanced Alexander Technique for Grad Students

24. University of Wisconsin Madison (Madison, WI) – Dalcroze Eurhythmics

25. Ohio State University (Columbus, OH) – no courses
### APPENDIX B:
**EXERCISES:**
A QUICK REFERENCE GUIDE TO CHAPTER 3

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