

A CURRICULUM OF VOICE PEDAGOGY FOR CHORAL CONDUCTORS:
THE EFFECT OF SOLO VOICE EXERCISES ON INDIVIDUAL SINGER TECHNIQUE,
CHORAL TONE, AND CHORAL LITERATURE

by

Nicole Christopher Lamartine

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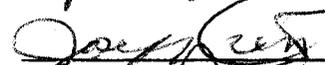
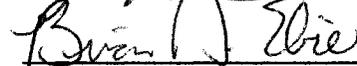
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THE EFFECT OF SOLO VOICE EXERCISES ON INDIVIDUAL SINGER

TECHNIQUE, CHORAL TONE, AND CHORAL LITERATURE

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	<u>BRUCE B. CHAMBERLAIN</u>	<u>8/20/03</u>
		Date
	<u>JOSEF K. KNOTT</u>	<u>8/19/03</u>
		Date
	<u>BRIAN D. EBIE</u>	<u>8/19/03</u>
		Date
		Date
		Date

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DEDICATION

To all of the people in my life's journey who have opened my eyes to the
wonders of the human voice

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ABSTRACT

The document presents a Curriculum of Voice Pedagogy for Choral Conductors based on the author's solo voice techniques derived from studio voice teaching. Included in the Curriculum is basic voice pedagogy for the chorister, a differentiation between choral warm-ups and voice exercises, five steps to cultivating undeveloped voices, the development of the undergraduate voice, and a sample semester outline of the curriculum.

The Curriculum's effectiveness was tested by University Singers, an entry-level collegiate choral ensemble (n=77), and a panel of six graduate choral conductors at the University of Arizona. Seven common choral tone (Color Voices, Intonation, and Vowel Modulation) and singer technique (Flexibility, Legato, Resonance, and Diction) issues and corresponding exercises from the Curriculum were chosen to be tested from an individual singer's standpoint and from a conductor's aural ensemble perspective. Each exercise was applied to excerpts of choral literature to test its effectiveness in helping a singer to develop the vocal skills demanded by choral music.

All exercises were concluded to be successful in that singers understood the purpose, the execution, and the pedagogical function of each exercise, and were inclined to use them in future vocal experiences. In addition, all tested vocal exercises helped to develop singer technique for issues encountered in the choral literature. Furthermore, four of the seven exercises were found to have a positive effect on the ensemble's sound as judged by the panel of conductors. The ensemble sound was also positively affected by the exercises for other tested issues in six out seven cases.

Results showed that a focus on building individual singer technique will improve the overall sound and vocal ability of the choral ensemble. Furthermore, individual improvement in Intonation and Legato positively influenced the ensemble sound for all other tested issues.

I. INTRODUCTION

During the past five years of employment as a Graduate Teaching Assistant for the Voice area at the University of Arizona (1998-2003), the researcher has had the enriching opportunity to learn and experience the young, developing undergraduate voice. A myriad of voice types was present in the voice studio and voice classes. The need arose for the development of exercises and techniques to address specific vocal problems and issues encountered with the voice students. Many techniques proved to be successful in the author's voice studio. The logical question was: how do the solo vocal techniques developed in the author's voice teaching relate to choral conducting?

Many undergraduate choral singers have never been in a choir or taken voice lessons, and subsequently do not understand how their vocal instruments produce sound. Oftentimes, their only experience in learning how to sing is in a group situation. The author's experience teaching the Voice Classes helped in developing the Curriculum for Voice Pedagogy to teach singing to individuals within a group setting.

During the course of study at the University of Arizona, the researcher developed many "solo" voice techniques in the voice studio and voice classes that have proven successful for the young, developing singer. These techniques were then applied to the researcher's choirs at the University of Arizona in order to produce a more refined and vocally efficient sound from the average collegiate singer, and subsequently, the entire ensemble. The majority of students in these choirs have been non-voice majors, so it is clear that these solo voice techniques can be comprehended and applied by those students

without formal voice training. The choirs that have taken part in these applications are all

University of Arizona choirs:

University Singers	60-90 SATB singers	Entry level
University Kantorei	20+ SATB singers	Selected from University Singers
Honor Choir	40+ SSAA singers	Majority non-music majors
Recital Choir	25+ SATB singers	Graduate Choral Conductors and non-music majors

In this project, a Curriculum of Voice Pedagogy for Choral Conductors (CVPCC) based on the author's research is outlined and evaluated. The Curriculum demonstrates that the author's vocal techniques derived from studio teaching can be successful when applied in a choral ensemble situation to extract vocal abilities needed by representative choral literature. Through CVPCC testing via a series of Likert-type questionnaires, results show that the individual choral student is empowered with vocal knowledge when these techniques are applied to tackle vocal challenges found in choral literature.

JUSTIFICATION

The need for this study is crucial to the choral conducting profession in that many choral conductors have not received intense training of their own voices.¹ As a result of limited voice training, conductors may be unable to teach a scientific or technical approach to their singers in order to produce a given sound or technique required by the choral literature.

¹ In the preface to *Choral Pedagogy*, Brenda Smith and Robert Thayer Sataloff explain that "surprisingly few choral conductors have had formal voice training" and that "an acquaintance with singing technique is unknown to the average choral singer." Brenda Smith and Robert Thayer Sataloff, *Choral Pedagogy* (San Diego: Singular Publishing Group, 2000), vii.

Furthermore, many choral conductors describe the sound goal without the vocal ability to demonstrate the given approach, the exercises necessary to build the sound, or the vocal pedagogy behind the techniques.² The CVPCC produced in this project will allow the choral conductor to be conversant in a variety of vocal approaches and techniques that will act as solutions to the stated choral tone and singer technique issues.

Other studies have been produced that deal with warm-ups and exercises, but this study is the first to test the effect of solo vocal techniques derived from studio teaching on a choral rehearsal situation. In addition, the exercises and concepts are tested in two ways: from the individual singer's standpoint and from the conductor's ensemble perspective. The tested exercises here are either invented by the researcher in the voice studio and voice classes, or are exercises adopted or adapted from previous teachers. The researcher has recorded success in the voice studio with these exercises, and this experiment demonstrates their success in a group situation to solve choral problems to which most choral conductors and young singers are exposed.

There has been research comparing the general acoustical differences between choral and solo singing.³ This is important because singers tend to sing differently in a choir than

² Wilhelm Ehmann and Frauke Haasemann attempted to codify their choral techniques in the book, *Voice Building for Choirs*, but these techniques are not derived from studio teaching: Wilhelm Ehmann and Frauke Haasemann, *Voice Building for Choirs*, The Westminster Choir Library, ed. Ray Robinson, trans. by Brenda Smith (Chapel Hill, NC: Hinshaw Music, 1982). In addition, University of Arizona graduate Paul Nesheim attempted to codify choral vocalizes as a means to "warm-up" the choir, not necessarily to teach specific techniques that address musical issues found in the choral literature: Paul Jonathan Nesheim, "Vocalises for choir: A collection of vocal exercises with a study of their value and of principles for their effective use," D.M.A. doc. (University of Arizona, 1991).

³ The following articles are the bulk of the comparison: T. Letowski, L. Zimak and H. Ciolkosz-Lupinowa, "Timbre differences of an individual voice in solo and in choral singing," *Archives of Acoustics* 13, no. 1-2 (1988):55-65; Paul Peterson et al., "The solo voice and choral singing," *Choral Journal* 11, no. 4 (1970): 11-12; Thomas D. Rossing, Johan Sundberg, and Sten Ternström, "Acoustic comparison of soprano solo and choir singing," *Journal of the Acoustical Society of America* 82, no. 3 (1987): 830-836; Idem, "Acoustic comparison of voice use in solo and choir singing," *Journal of the Acoustical Society of America* 79, no.6 (1986): 1975-1981.

in a solo situation. By contrast, there has been little to no research into the similarity of tonal goals in the vocal studio and the choral rehearsal.⁴ It is a logical goal, and achievable, to cultivate the same vibrant tone in a choir and in a vocal studio.⁵ It is the researcher's experience that using the same techniques and exercises from the vocal studio will produce positive similarities in the choral sound.

Lastly, certain choral tendencies exist and are perpetuated by conductors who tend to lack the knowledge sufficient for providing amenable vocal options for producing a given sound. These tendencies include sounding like one voice (aural feedback), vowel position and uniformity, and jaw position when singing. These practices may be misconceptions because the techniques tend not to be the most conducive and vocally efficient for the young chorister. Using the CVPCC in this document, a conductor will become a more knowledgeable teacher of the voice in the choral rehearsal, thereby making the choral rehearsal complementary and comparative to the students' vocal instruction in the private studio.

SOLO AND CHORAL SINGING

Traditionally, choral singing has differed in vocal production from solo singing. Depending on the aural preference, background, training, and vocal knowledge of a conductor, there will be degrees of difference between the two tones from the singers. The

⁴ See the following dissertation: Hugh Douglas Slusher, "A comparison of the perspectives of college choral directors, voice teachers, and voice students concerning solo and choral singing." Ph.D. diss. (Ohio State University, 1991).

⁵ In his article, Perry Smith writes: "...if an audience is emotionally and musically stirred by one singer who sings as a soloist, how much more excited would an audience be if there were ten, twenty, or more singers singing with the vibrancy and projection of a solo singer?" Perry Smith, "Balance or blend? Two approaches to choral singing," *Choral Journal* 43, no. 5 (2002): 39.

author's opinion is that choral singing has tended to employ reduced resonance, reduced amounts of vibrato, vowel modifications, reduced breath support, and reduced overtone spectrum to encourage blend and uniformity of singing tones. Solo singing has tended to employ increased resonance, vibrato, breath support, pure resonant vowels, and an increased overtone spectrum that allows the voice to carry and be heard in large spaces. A possible explanation for the apparent lack of uniformity between these two schools of singing is that an ensemble situation compensates for the active individual singer responsibility found in solo singing. Brenda Smith writes, "The singer has the opportunity to relax within the choral tone. . . Choral singers respond to the artistic demands set by the conductor. In solo singing, the individual vocal and interpretive traits are paramount. The teacher of singing is wise to train the student of singing to make appropriate adjustments in either context with comparable skill."⁶

The researcher proposes that singing in a choir should be no different in technique than singing in a soloistic manner in that both styles of singing should employ efficient use and coordination of the actuator, vibrator, resonators, and articulators. One solo voice is exciting, but a group of singers with rich, exciting sound is more able to contribute fully in an ensemble to meet the demands of the choral literature.

⁶ Brenda Smith and Robert T. Sataloff, "Choral Pedagogy and Vocal Health," *Journal of Singing* 59, no. 3 (2003): 238.

PREMISE

The premise of building the CVPCC lies in four principles:

1. To teach the voice to function optimally, whether in the voice studio or in a choir
2. To empower a student with knowledge about the voice, its parts, how it functions, how to make it stronger and to gain more control to do the things expected of it in choral literature
3. To build individual singers who contribute to the ensemble with a confident perception of one's own vocal skills and abilities
4. To cultivate a choral tone from the individual outward for the betterment of the ensemble

BENEFITS

Through thorough comprehension of the CVPCC, the researcher proposes that a conductor will:

1. Gain the skills needed to be an informed steward of cultivating inexperienced choral voices and a more confident speaker on issues of vocal pedagogy
2. Be able to speak to an ensemble with the correct pedagogical terms, promoting understanding and use of truthful and accurate statements
3. Know what to say in order to extract a particular ensemble sound
4. Encourage a group dynamic with a common goal of beautifully trained voices
5. Cultivate a wider range of vocal colors with which to work
6. Gain the ability to discern the vocal difficulty of a piece of choral literature and plan ensemble voice training to prepare for a specific project

7. Produce a larger sounding group, with a similarity of ability and approach
8. Train singers who accept and are motivated by a vocal challenge

II. CONTENT OF THE CURRICULUM OF VOICE PEDAGOGY FOR CHORAL CONDUCTORS

The content of the CVPCC includes basic voice pedagogy, a differentiation between choral warm-ups and vocal exercises, and five groupings of exercises for cultivation of the developing singing voice. The premise lies in the principle that if a conductor or singer knows how the voice functions, a singer can achieve logical goals for vocal growth and mastery in the voice studio or in the choral rehearsal.

BASIC VOICE PEDAGOGY FOR THE CHORISTER

The following outline can serve the choral conductor in teaching basic vocal physiology and science to young singers. Every singer should be given the opportunity to know:

1. Basic physiology of the voice
2. Phonatory process
3. Breathing musculature, process, and breath management.
4. Basic acoustical principles of vocal sound
5. Effect of voice physiology on sound
6. The purpose and goal for exercising and cultivating the voice

Any number of vocal pedagogy and class voice texts will explain in detail the terms in the outline below. As they are common knowledge among most voice teachers and some choral conductors, they will not be defined in the text of this document. However,

Appendix C explains some of the author's approaches for teaching the concepts. The items included in the list were compiled from the author's voice training, voice teaching, and conducting notes.

Even though these items are basic to the voice and its function, there still lies disagreement among voice experts as to the finer details. Beginning singers need only to have a basic knowledge of each item's role in the whole of voice function.

Elements of Basic Voice Pedagogy⁷

Four elements of the voice:

Actuator: brain, diaphragm

Vibrator: vocal folds by way of the Bernoulli effect

Resonators: pharynx, oro-pharynx, sinuses, nose, hard palate, soft palate

Articulators: lips, teeth, tongue (unique to voice)

Parts of the voice:

Larynx: bone, cartilage, muscle, flesh

Hyoid bone

Thyroid cartilage

Arytenoid cartilages

Cricoid cartilage

Crico-thyroid muscle

Thyro-arytenoid muscle

Inter-arytenoid muscles

Vocal folds

Composition

Size

How they function

Pitch in relation to stretch and tension

Role of arytenoid cartilages

Adduction vs. abduction

Other physiological elements:

Soft and hard palates

⁷ Nicole C. Lamartine, Notes from voice teaching and conducting, 1997-2003, ADS, Personal collection; Nicole C. Lamartine, Notes from voice training, 1988-2003, ADS, Personal collection.

Hard (alveolar): behind front top teeth; does not move
 Soft: soft mouth roof tissue; stretches to rise and relaxes to lower
 Regulates air flow into upper resonators

Glottis vs. epiglottis

Open when breathing
 Closed when sounding

Epiglottis covers the tracheal opening when eating or drinking

Pharynx and oro-pharynx

Pharynx: open space in the throat

Oro-pharynx: open space in the mouth

Breathing

Four major muscles and muscle groups:

Diaphragm

Abdominals (grouped together for simplicity)

External intercostals

Internal intercostals

Process: Antagonism between natural function of diaphragm and pulling in of abdominals creates air flow regulation, or breath management while antagonism of intercostals produces increased thoracic space for lung expansion

Air pressure

Voice Production

Vibrato

Slight wavering of pitch caused by coordination of air pressure, air flow, function of vocal folds, and resonance. ⁸

Registers

Head vs. chest

Falsetto

Blending

Cover

Passaggio

⁸ Ibid. The author's definitions follow: Vibrato: most voice scholars agree that vibrato is produced when all parts of the voice (actuator, vibrator, resonators, and articulators) are functioning together optimally. It is a natural occurrence that happens when energized air is sent through relaxed vocal folds to create sound waves which are accentuated by accessing the open spaces of the resonators. Straight tone: the lack of vibrato signifies a straight tone. According to the above definition of vibrato, in order to produce a straight tone, one of the parts of the voice must not function optimally. There are two basic ways of producing a straight tone: 1) "straighten out" the air flow to remove some of the breath energy that causes resonant sound waves, 2) adduct, or bring together, the vocal folds with more pressure than is needed to make the sound. The first option is optimum because of the reduction of an element, rather than addition of tension. However, it must be said that conductors may need to ask for straight tone to accommodate a certain style (renaissance, jazz) or for intonation purposes.

Volume

- Air flow
- Pressure on vocal folds

Vowels

- Carry sound
- Made by adjustments in vocal tract (larynx, pharynx, oro-pharynx)

Placement (Resonance)

- Physical sensations of “where” the sound is coming from
- Accentuation of sound waves by directing them to open spaces with hard surfaces

Other elements

- Basic acoustic principles
- Acoustics of vocal sound
- Styles of singing
- Vocal health
 - Hydration
 - Speaking voice
 - Cysts, nodes
 - Laryngitis: causes and relief
 - Otolaryngologist (ENT)
 - Hormones and OTCs
 - Caffeine
 - Aging

WARM-UPS VS. EXERCISES

Choral warm-ups are not technical vocal exercises in the traditional sense, i.e. they do not cultivate or refine the individual vocal sound. According to the CVPCC, there are two goals for the use of choral warm-ups: to get the voices functioning with proper air flow across the ensemble and to prepare the brain for multi-tasking. In contrast, voice exercises allow for proper voice growth specific to the individual’s age and ability. Additionally, exercises can be sung either individually or in a group situation with each singer focused on

his or her own sound whereas choral warm-ups are usually sung in a group with each singer listening to the whole of the ensemble.

FIVE STEPS TO CULTIVATING UNDEVELOPED VOICES⁹

The following outline is comprised of five groupings of voice exercises and warm-ups to help cultivate undeveloped voices in the choral rehearsal, voice studio, and voice class. Please be aware that singing is a process that cannot be diluted into five easy steps. These exercises are grouped in an order that will promote a logical sequence for the beginning singer to remember. Figure 1 demonstrates that a singer does not have to master one group before moving to the next. Rather, all exercise groupings are intended to be used every time a singer practices, whether in a choral rehearsal or a voice studio. Note that the tested exercises discussed later in the document are labeled primarily as “Technical Exercises.”

1. PHYSICAL PREPARATIONS

Purpose: to loosen and release muscles, get the blood flowing

Examples: stretches, movements that cross the midline of the body, rhythms

2. FUNCTION EXERCISES¹⁰

Purpose: to allow for basic functioning of coordination with non-sustained tones

Examples: breathing, rhythmic exercises, sightreading, sirens, lip buzzes, diction

⁹ Ibid.

¹⁰ Ibid. “Function” is the author’s term meaning phonation, not to be confused with the Voice Function Exercises studied in John Richard Weiss, “Vocal health in the choral rehearsal: Common ground for operatically trained singers, studio voice teachers and choral conductors,” D.M.A. doc., (University of Arizona, 2001).

3. LIGHT SCALES¹¹

Purpose: to allow for consistent functioning of phonation on sustained tones

Examples: scales within a five-note range on a variety of vowels

4. RANGE EXTENDERS

Purpose: to allow for basic functioning of coordination on non-sustained tones

Examples: quick arpeggios from top down on conducive vowels and exercises that teach an approach to the lower register

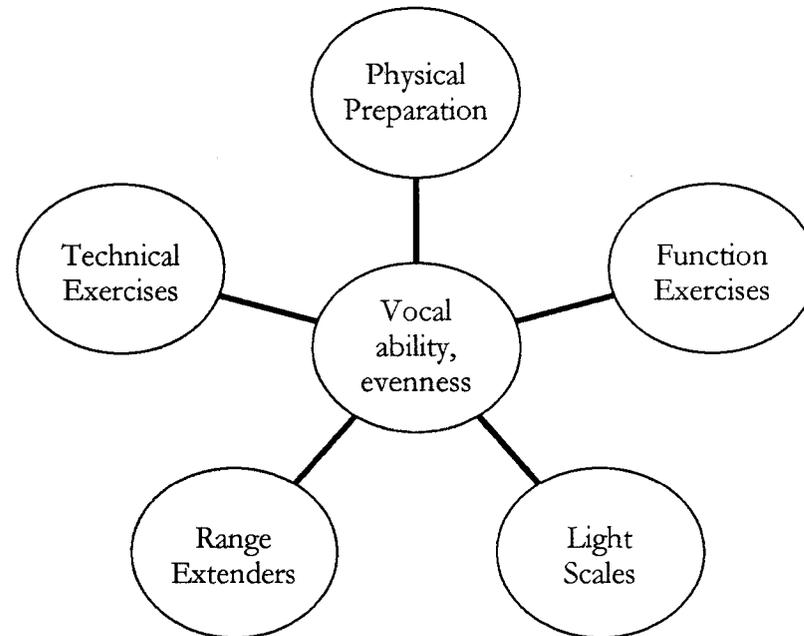
5. TECHNICAL EXERCISES

Purpose: to cultivate consistent functioning of phonation and to produce consistency of tone and timbre throughout registers

Examples: interval training, intonation, passaggio, cover, flexibility, resonance and placement, messa di voce, dynamic control, vowel modulation

¹¹ Although the term 'light' is used for this division of exercises, it is by no means a suggestion to the singer to sing with a breathy or otherwise anemic tone, but rather it is the author's term to denote an ease of consistent phonation.

Figure 2.1. Relationship of the Five Groups of Exercises



THE DEVELOPMENT OF THE UNDERGRADUATE VOICE¹²

Undergraduate choral ensembles are usually comprised of choristers with varying amounts of vocal training. Even when a conductor tries to group an ensemble by age or year in school, there are discrepancies between singers such as vocal maturity or years of training. Therefore, a chart follows of some of the most significant and usual vocal developments noted by the researcher in the development of the CVPCC. Each voice will develop in its own way on its own timeline, but by referring to this chart, conductors will be able to generalize the abilities of their choir members.

Female

Freshman Year

Semester 1:

- Basic breathing techniques
- Begin to find resonance
- Languages (Italian)

Semester 2:

- Resonant placement is more consistent
- Upper passaggio becomes apparent as middle voice develops
- Phonation becomes more consistent
- Languages (Italian, German)

Sophomore Year

Semester 1:

- Sound is bigger
- Breathing technique becomes more consistent
- Resonance becomes consistent
- Interpretation more comfortable

¹² Lamartine, Voice teaching and conducting; Idem, Voice training.

Semester 2:

- All breathiness gone from upper passaggio
- Wider range, low and high
- Vibrato becomes consistent
- Finds a chest/head mix for lower middle register
- Languages (German, French)

Junior Year**Semester 1:**

- Tendency to push phonation for a larger sound
- Reluctance to rely on air and non-pressured phonation to cultivate upper resonant placement
- Languages (any new)
- Ability to negotiate register shifts
- Sound is more open, adult, rich
- Breath management ability increases

Semester 2:

- Voice settles into a particular range
- Ability to modulate vowel for maximum resonance
- Ease of phonation production allows flexibility
- New depth of interpretation
- Perfection of diction

Senior Year:**Semester 1:**

- Sound is resonant and comfortable within *fach*
- Coordination of all elements

Semester 2:

- Senior Recital allows for ultimate focus of interpretative elements and technical elements

MaleFreshman Year**Semester 1:**

- Basic breathing technique
- Upper passaggio quite apparent
- Begin cultivating a light approach to upper passaggio
- Exploration of lower range
- Vowels tend to be spread
- Languages (Italian)

Semester 2:

- Technical work to keep pharyngeal space open and long and larynx low
- Vowels become more round and related
- Basic resonance
- Languages (Italian, German)

Sophomore Year

Semester 1:

- Sound is richer and more mature
- Vowel placement become more consistent
- *Fach* may be unclear
- Interpretation more comfortable

Semester 2:

- Intonation in upper register becomes better as lighter, more accurate approach through *passaggio* becomes solid
- Begins vowel modulation as gateway to resonance through *passaggio*
- Languages (German, French)

Junior Year

Semester 1:

- Tendency to manipulate the sound for added volume
- Breath control improves as body finishes puberty
- Vowel modulation continues as upper notes become less likely to crack
- Languages (any new)

Semester 2:

- Sound is naturally more rich and resonant
- More fundamental overtones
- Range extends lower
- Resonance throughout range is more consistent
- New depth of interpretation
- Perfection of diction

Senior Year

Semester 1:

- Voice begins to settle into a comfortable range
- Breath management becomes more consistent
- Upper *passaggio* is less apparent, but still not completely negotiable

Semester 2:

- Sound is more mature and rich
- Fach* still may not be apparent
- Senior Recital allows for ultimate focus of interpretative elements and technical elements

A SAMPLE SEMESTER OUTLINE OF THE CURRICULUM

Table 2.1 can act as a guide when planning out a semester of vocal pedagogy to supplement the music rehearsal. The researcher has found that only five to ten minutes is needed per rehearsal to present and execute the elements of the CVPCC listed for a given week. In this way, little rehearsal time is spent for the added elements, but a conductor could choose to spend more rehearsal time in elaboration and practice of the elements with the ensemble. Please note that although only one vocal element may appear on the chart for a given week, it acts as a focus for instruction, not as the sole element to be practiced. In addition, when Technical Exercises are introduced in Week 9, singers should rotate focus to a range of vocal goals.

Table 2.1. Sample Semester Outline of Curriculum of Voice Pedagogy for Choral Conductors

Week	Pedagogy Element(s)	Vocal Element(s)
1	Four elements of the singing voice	Physical Preparations (PP)
2	Muscles and Process of Breathing	PP/ Function Exercises (FE)
3	Cartilages of the Larynx	PP/FE
4	Muscles of the Larynx	PP/FE/Light Scales (LS)
5	Process of Phonation	PP/FE/LS
6	Vocal Folds	PP/FE/LS/Range Extenders (RE)
7	Registers	PP/FE/LS/RE
8	Palates/Glottis/Epiglottis	PP/FE/LS/RE
9	Resonance/Resonators	PP/FE/LS/RE/Technical Exercises (TE)
10	Vibrato	PP/FE/LS/RE/TE including Passaggio, Vibrato, Legato
11	Vowels	PP/FE/LS/RE/TE including Passaggio, Vibrato, Resonance
12	Volume/Acoustics	PP/FE/LS/RE/TE including Resonance, Legato, Flexibility
13	Overview of Vocal Growth	PP/FE/LS/RE/TE including Vowels, Resonance
14	Vocal Health and Hygiene	PP/FE/LS/RE/TE including Resonance, Vowels, Passaggio
15	Voice Exploration/Styles of Singing	PP/FE/LS/RE/TE including Flexibility, Resonance, Vowels

The CVPCC is not presented as a step-by-step approach to teaching young singers, but rather as a gathering of information to be presented over a semester or four years to an ensemble. Each facet of the Curriculum could be presented numerous times, as students usually retain information at a higher rate with each new presentation. Simply, the CVPCC can become a vehicle for teaching the voice, communicating with the voice, and cultivating the voice if every facet is included in every choral rehearsal.

III. CRITERIA AND EXERCISES

CRITERIA FOR SELECTED ISSUES

At this point the concerns being tested must be defined. All definitions are the author's. The parameters are divided into two groups, Choral Tone Issues and Singer Technique Issues. The items were chosen on the basis of the author's impression from conducting choral ensembles and from teaching in a private voice studio of the most often-occurring vocal goals in an ensemble and in private voice study. Each problem affects the choral ensemble's tone in a potentially negative manner. In addition, there are common ways in which choral conductors treat the topics, which may be tendencies perpetuated as a result of lack of knowledge or simple tradition. Please note that the 'Conductor Tendencies' are derived from the author's observation and experience with conductors of choirs ranging in age from children to geriatric church choirs, American Choral Conductors Association conventions, workshop observations, and conducting texts.

In addition, three additional Singer Technique Issues were tested from only the singers' point of view. These items and exercises tested on them were included in the study to allow for singer results not dependent on the ensemble as a whole. Furthermore, these parameters are generally prevalent in untrained singers who comprise the average membership in an entry-level collegiate choral ensemble.

Common Choral Tone Issues Tested on the Choral Literature¹³

Color Voices

Definition: Color Voices are those in a choral situation that cut through the choral texture because the individual voice is more mature or has more training. In this paper, the term will refer to the reduction of color voice sound within an ensemble tone.

Issue in choir: Choirs tend to be compiled from a variety of different voice types and abilities. Some choristers may or may not have had vocal training, producing a choir that may not be consistent in its level of singing proficiency from one chorister to the next.

Conductor Tendencies: Conductors may ask for the non-color voices to sing up to the level of contribution (same volume level) of the color voice. Sometimes a conductor may ask the individual color voice to contribute less volume or energy.

Objective: Use a sigh-singing exercise to reduce the resonance of the color voices or use resonance exercises on those voices that do not possess the resonance level of the color voice.

Intonation

Definition: Intonation is tuning across the choir, a section, and the individual in relation to the whole ensemble. This study focuses on the intonation of the individual in relation to the ensemble.

Issue in Choir: Intonation problems occur for a number of reasons including singer fatigue, singer compensation for other singers' pitch, articulation differences, balance issues,

¹³ Ibid.

lack of overtones, too many of one set of overtones, resonance, and placement of individual voices within the choir. Ensembles with poor intonation will produce a sound that is amateur and unpleasant to the listener.

Conductor Tendencies: Conductors may suggest solutions based on what he or she believes is the cause of poor intonation. However, individual intonation in relation to matching a given pitch is most often caused by lack of the third and fourth formants of the individual's singing tone.

Objective: Use individual vocal exercises that encourage an energized vowel tone for each sung pitch. Once the first and second formants are secure (the ones responsible for vowel recognition), other formants will become stronger creating a vibrant and ringing individual and ensemble sound.

Vowel Modulation¹⁴

Definition: Vowel Modulation is relating all vowels to the most resonant one for that singer in a given range or consistency of vowel relationship by modulating through one's vowel spectrum.

Issue in Choir: Depending on range and individual resonance, individual voices or sections may dominate the ensemble texture in homophonic singing. In addition, movement from closed to open vowels may present a syllabic accent problem.

Conductor Tendencies: Conductors may have the choir sing all of the vowels through one vowel position (i.e. singing all of the words of a given phrase through an [u] mouth position) to create uniformity of sound, not uniformity of resonance.

¹⁴ Ibid. Author's term.

Objective: Use exercises to find the most resonant vowels for the individual singers and for the group as a whole. The choir will then relate all vowels to that resonant vowel found in the exercise through keeping the placement of the resonant vowel or keeping a mental picture of the resonant vowel while singing the other vowels.

Common Singer Technique Issues Tested on the Choral Literature¹⁵

Flexibility

Definition: Flexibility is the individual singer's ability to sing accurate melismatic or arpeggiated passages at a moderate to fast tempo.

Issue in Choir: When untrained singers sing a melismatic passage together, the lack of individual articulation produces a muddy ensemble sound.

Conductor Tendencies: Conductors may ask for artificial ensemble articulation such as adding an [h] before each articulated vowel, or adding a consonant sound such as [d] before each note.

Objective: Use melismatic or arpeggiated exercises to train the individual singer how to negotiate flexibility and note articulation through exercises that encourage a light, bouncy sound supported by consistent air flow.

Legato

Definition: Legato is the ability to link sound production from one note to the next with consistent phonation, resonance, and air flow.

¹⁵ Ibid.

Issue in Choir: Many untrained singers will allow for non-phonation when singing the same vowel on two or more notes. Air will escape between the change of pitch, adding “noise” to the ensemble’s sound.

Conductor Tendencies: Conductors tend to use ensemble visualization techniques such as “paint strokes that never leave the canvas” to encourage a seamless sound.

Objective: Use sliding exercises to teach the individual singer how to phonate consistently and efficiently.

Resonance (placement)

Definition: Resonance is the accentuation and amplification of sound waves by bouncing off of hard places in open spaces such as the sinusital cavities. Placement refers to the place on the face or head where a singer may feel sympathetic vibrations from the sound waves, or the area to which a singer directs his or her sound. This term will remain as “resonance” throughout the paper.

Issue in Choir: The level of natural and trained resonance varies greatly between individual choristers. The place of resonance of individual voices varies, and can be sinusital, nasal, or throaty.

Conductor Tendencies: Conductors tend to train the resonance of the ensemble’s sound through group exercises that may not encourage the best placement for an individual voice.

Objective: Use hums opening to closed vowels to teach the individual singer how to achieve optimal resonance through accessing the voice’s resonating chambers.

Diction

Definition: Diction is the ability to reproduce accurately the sounds of a non-native language in singing.

Issue in Choir: Choristers' language ability varies greatly in that they may or may not have taken a singer's diction class or classes in the language at hand. Many singers are forced to rely on simple repetition to re-create the sounds of a language.

Conductor Tendencies: Many choral conductors are instrumentalists by training and may or may not have taken language or diction classes. Many conductors are not comfortable with teaching music in languages that are unfamiliar; thus great bodies of repertoire are left untouched.

Objective: Teach a system for accurately deciphering the sounds of any language.

Common Singer Technique Issues Not Tested on the Choral Literature¹⁶

Vibrato

Definition: Vibrato is the systematic slight wavering of pitch that occurs when all parts of the voice (accuator, vibrator, resonators, and articulators) are working together optimally.

Issue for Singer: Some singers do not have a natural vibrato until they reach the early stages of vocal maturity (females, about age 19; males, about age 21). Some singers have a natural vibrato from a very early age and some never develop a natural vibrato.

¹⁶ Ibid.

Issue in Choir: Many young singers are not encouraged to use and develop a vibrato as the voice matures. Conductors tend to prefer the intonation that a straight tone produces in the ensemble. However, a pronounced wobble or tremolo can be difficult to blend into the ensemble's sound and can greatly affect intonation.

Objective: Coordinate phonatory elements and release of laryngeal tension to cultivate and encourage vibrato. Reduce tremolo and wobble by relaxing tension and encouraging consistent breath management.

Passaggio

Definition: Passaggio is the shift of register from one area of vocal fold vibration to a larger or smaller area of vocal fold vibration by way of an increase or decrease in surface tension on the vocal folds.

Issue for Singer: Sudden changes of phonation, resonance, and placement from the passaggio shift cause insecurity in the vocal sound, as well as a possible area of non-phonation in the voice.

Issue in Choir: Young voices may feel awkward about singing through a passaggio. Large breaks or huskiness in a changing voice can be apparent in the ensemble sound. Intonation may suffer.

Objective: Employ the use of vocal slides and vowel modulation to teach the singer how to negotiate the shift through registers.

Range Extremes

Definition: Range Extremes are negotiation of the highest and lowest notes of a singer's vocal range.

Issue for Singer: Singers may feel insecure about singing notes in the extremes of their ranges, or they may approach these notes in a non-efficient manner that may cause vocal fatigue.

Issue in Choir: A conductor's choice of repertoire may be limited by the comfortable singing ranges of the ensemble. The singers may sound strained or the ensemble out of tune.

Objective: Teach singers how to approach the extremes of range through specific exercises and techniques for each voice type.

CRITERIA FOR TESTED EXERCISES

1. The exercises are the researcher's, or an interpretation of another's concept
2. The physiological explanation is simple, and the principle(s) behind the exercise is easily accessible to the untrained singer
3. The exercise is easily accomplished by the young singers
4. The explanation is easily transferable to other conductors and singers
5. The exercise is a solution to a specific problem in the choral literature being tested
6. The exercise can be sung in a group or individually

Explanation of Tested Exercises¹⁷

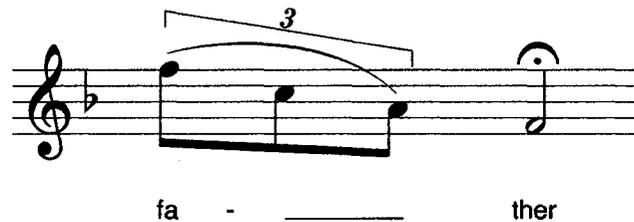
Please notice that all exercises, save for one, are written in F major so that most exercises could be notated within the staff. Exercises employ the use of the International Phonetic Alphabet to notate single vowels and consonants.

The following exercises represent the one exercise chosen by the researcher for each tested Choral Tone and Singer Technique issue. See Appendix A for a complete listing and explanation of all the exercises given to the subjects.

Color Voices

Father Arpeggio

Figure 3.1. Father Arpeggio



Objective: To allow for an energized and functional singing tone with reduced overtones

Process: -While singing, allow some of the buzzy resonance felt in the mask to relax, while keeping constant air flow
-“Sigh into the sound”

¹⁷ Ibid.

Derivation: John Allman, Lamartine

Pedagogy: By allowing for a relaxed approach, the vocal folds will adduct slightly less to produce fewer overtones. Slightly less energized air will reduce the amount of sound waves accessing the upper resonators.

Intonation

Tapping the Vowel

Figure 3.2. Tapping the Vowel



Objective: To iterate the pure vowel

Process:

- Anticipate articulation of consonant
- Sing consonant through vowel that follows it
- Sing vowels without consonants

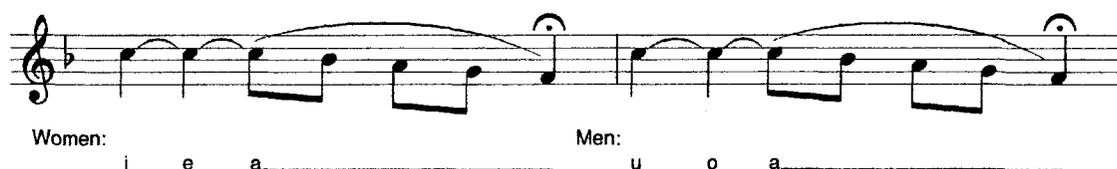
Derivation: Prof. Faye Robinson, Lamartine

Pedagogy: Reiterating the vowel allows for vocal folds to adduct slightly for each vowel with a consistent air flow underlying phonation. Air flow remains consistent so that each time the folds approximate they are given an extra amount of air flow, creating a slight accent on each vowel.

Vowel Modulation

Vowel Relations

Figure 3.3. Vowel Relations



Objective: To allow for the most resonant vowels that are acoustically appropriate for a given range

Process: -For a given passage, find the vowel that “works” and is comfortable
 -Remember the feeling and sound of that vowel while singing the actual vowels of the passage or think the first vowel while singing the actual vowels

Derivation: Lamartine, common, Berton Coffin¹⁸

Pedagogy: Muscle memory and auditory feedback act as monitors while singing the actual vowels of the passage. The vowel that works tends to be the most acoustically appropriate vowel for that singing range.

¹⁸ Berton Coffin mastered the acoustical appropriateness of vowels and their subsequent ‘modification’ along a given spectrum of pitches. Berton Coffin, *The sounds of singing: Vocal techniques with vowel-pitch charts* (Boulder, CO: Pruett Publishing Co., 1976).

Flexibility

Five Note Circles

Figure 3.4. Five-Note Circles



Objective: To cultivate a feeling of moving notes being in the same vocal place

Process: -132435421 three times, once each on [i, e, a]

-Sing in “circles” with the upper notes moving up and over

-Imagine the notes are not up and down, but moving out away from
the body in the same plane

Derivation: Prof. Faye Robinson, Lamartine

Pedagogy: The imagination of the notes being in one place allows for less laryngeal adjustment during rapid passages. Less adjustment produces more consistent phonation and sound placement.

Legato[ni ne na no nu]

Figure 3.5. [ni ne na no nu]



Objective: To allow for consistent phonation between notes

Process: On a five note scale or 132435421 or 1356531 slide ever so slightly
from one note to another, reducing the 'h' between notes

Derivation: Lamartine

Pedagogy: By sliding slightly between notes, the vocal folds never stop vibrating.

This creates consistent phonation which reduces breathiness and breath loss.

Resonance

Nose Syringe

Figure 3.6. Nose Syringe

1. n n n n n

2. n n ni _____

3. ni _____

Objective: To access upper resonating spaces of sinuses

- Process:
- Imagine two syringes filled with air are placed up the nose
 - On 'n': Five note scale down allowing a puff of air to escape through the nose
 - On 'n': 5554321 two staccato 'n' hums followed by the five note scale on [ni]
 - On [ni]: 8531 each arpeggio begins with a slight 'n' hum
 - Be sure that there is not tension in the back of the tongue

-Be sure that tension in the pharynx/larynx does not create the 'ping'
or 'ring' in the sound

Derivation: Lamartine

Pedagogy: By closing off the oro-pharyngeal opening with the 'n,' air escapes
through the nose. If soft palate is lifted, the energized air can access the
upper resonators, creating a more resonant sound.

Diction

International Phonetic Alphabet¹⁹

Figure 3.7. International Phonetic Alphabet

Symbols used in "La Biche"

[o]	=	oh	phone
[a]	=	ah	British "ah"
[i]	=	ee	eat
[ə]	=	uh	the
[e]	=	eh	bet
[e]	=	ay	chaotic
[oe]	=	open e on tongue, o on lips	
[u]	=	oo	boot
[ɔ]	=	open oh	ought
[ŋ]	=	ny	canyon
[ã]	=	nasal a	
[ã̃]	=	nasal open e	
[ɔ̃]	=	nasal o	
[ʃ]	=	sh	shake
[j]	=	y	yellow
[ʒ]	=	soft [dz]	azure

¹⁹ The International Phonetic Alphabet and its usage for French followed the rules in Joan Wall, Robert Caldwell, Tracy Gavilanes, Sheila Allen, *Diction for Singers: A Concise Reference for English, Italian, Latin, German, French, and Spanish Pronunciation* (Dallas, TX: Psst... Inc., 1990), 175-231.

Objective: To learn and recognize IPA characters which represent sounds and apply them to the text of the foreign language

Process: Learn the vowel symbols and some consonant symbols

Derivation: Common

Pedagogy: By linking a symbol to a sound, singers have a visual, oral, and aural reference of how to produce that sound in the context of the music.

Explanation of Additional Exercises²⁰

See Appendix B for a complete listing and explanation of all the exercises given to the subjects for these three Singer Techniques issues. The following exercises represent the one exercises chose by the researcher to test for the additional Singer Technique issues.

These exercises were not tested on the choral literature.

²⁰ Lamartine, Voice teaching and conducting; Idem, Voice training.

Vibrato

Encouraging Vibrato

Figure 3.8. Encouraging Vibrato



Objective: To encourage all parts of the voice (actuator, vibrator, resonators, and articulators) to function together optimally

Process: -Five-note scale down on [i] or [u], ending in a shake at the bottom
 -Work for a lack of laryngeal control

Derivation: Lamartine

Pedagogy: Vibrato is a natural occurrence that happens when energized air is sent through relaxed vocal folds to create sound waves which are accentuated by accessing the open spaces of the resonators. Other types of vibrato (diaphragmatic pulsations, bleat, tremolo, wobble) are manufactured alterations of tone and/or pitch caused by deliberate function or as a result of other tensions within the vocal mechanisms. In order for a natural vibrato to occur, laryngeal tension must not be present.

Passaggio

Slides of a Fifth on [u]

Figure 3.9. Slides of a Fifth on [u]



Women's Upper Passaggio

Objective: To blend the transition into and out of head voice (b^1 to $f\#^2$ for sopranos, a^1 to e^2 for mezzo-sopranos)

Process: -Slides of a fifth working chromatically upward and downward
-More air, less voice (less vocal fold adduction)

Derivation: Lamartine

Pedagogy: Slides allow for consistent vocal fold vibration while the change from heavy to light mechanism occurs. While ascending through the passaggio, lighter adduction will allow the transition into head voice to occur more smoothly. Any exercise from the top down will create muscle memory with a penchant for the lighter mechanism. Once the lighter mechanism is solid, cultivating resonance is almost automatic.

Men's Upper Passaggio

Objective: To blend the transition into and out of the lighter mechanism to create head voice (c^1 to g^1 for tenors and b to e^1 for baritones/basses)

Process: Slides of a fifth up and down, keeping consistent air flow and low laryngeal positioning

Derivation: Prof. Charles Roe, Lamartine, common

Pedagogy: The transition in men's voices into the upper passaggio is more dramatic than in women's voices. Therefore, as men learn how to approach the upper register, care must be taken to keep the larynx low and to keep the sound light. Young male singers have a tendency to lift the larynx as the pitches ascend. A lighter production will produce less adductive pressure on the vocal folds, allowing for a more smooth transition between register productions. Vowel gradation is helpful in that the singer learns to transfer muscle memory of a low larynx to all vowels in the spectrum.

Range Extremes

Five Note [ui] Scale

Figure 3.10. Five Note [ui] Scale



Objective: To cultivate an “off the cords” approach to the lower range extremes

Process: -Five note scale down on [uiuiuiui], allowing resonance to take over on the descent

-Men: practice on [o] with a slight protrusion of the lips

Derivation: Lamartine, common

Pedagogy: As singers descend into a comfortable lower range, they tend to relax the placement and allow the vocal folds to vibrate without any “lift” in the sound. This creates a “gravelly” sound, especially in men and altos. By cultivating palatal lift and ease going into the lower range, the transition of registers coming out of the lower range occurs with more ease. In addition, placement stays consistent, allowing for a connected sound throughout the range. For men, the protrusion of the lips creates a longer pharynx, allowing for more resonance with less effort.

CRITERIA FOR SELECTED CHORAL LITERATURE

1. Repertoire that could be learned and performed confidently with little rehearsal time
2. The concept or tested principle occurred several times within the piece, and in every voice part
3. One or more Choral Tone and Singer Technique issues were prevalent in the piece
4. Each excerpt was no longer than sixty seconds to allow for complete concentration on the issue at hand
5. A variety of styles, periods, and languages

Issues Tested in the Choral Literature²¹

Choral Tone Issues

Color Voices: Johannes Brahms, “Abendlied,” from *Vier Quartette, Op. 92*. Text by Friedrich Hebbel.²²

Issue in Music: Melodic lines include long, suspended, soloistic vocal lines over a contrasting accompanimental figure. Lush harmonies with added or chromatic tones are present. See figure 3.11.

Tendencies: More mature or more developed voices will dominate the choral texture, leaving an unmatched and varied choral tone across the choir.

Objective: Use the “Sigh-singing” exercise to cultivate free and energized phonation with a slightly less resonant sound from mature and developed voices.

²¹ Ibid

²² Johannes Brahms, “Abendlied,” from *Vier Quartette, Op. 92*, text by Friedrich Hebbel (Choral Public Domain Library: <http://www.cpdll.org>, 2000), 1-6.

Figure 3.11. Color Voices

The image shows a musical score for a four-part vocal setting of 'The Lamb' by John Tavener. The score is written in G major and 4/4 time. It consists of four vocal staves (Soprano, Alto, Tenor, and Bass) and a piano accompaniment. The lyrics are: 'wie das zu lö - sen ver - mag,'. The vocal parts are arranged in a four-part texture, with the Soprano and Bass parts starting in unison and the Alto and Tenor parts starting in unison. The piano accompaniment provides harmonic support for the vocal lines.

Intonation: John Tavener, “The Lamb.” Text by William Blake.²³

Issue in Music: Voice crossing of two different melody lines creates successive major and minor seconds. Intonation is crucial on an individual basis as related to the unison section to create the intended harmonies. The two individual lines are retrograde inversions of each other, which causes each line to begin and end in unison. A four-part texture follows. See figure 3.12.

²³ John Tavener, *The Lamb*, text by William Blake (London: Chester Music, 1982), 1-5.

Tendencies: Singers will concentrate on singing the “correct pitch,” while disregarding the vowels. Non-resonant vowels and vowels that do not lock-in for the duration of a note allow pitch to modulate on any given note.

Objective: Use the “Tapping the Vowel” concept and exercise to create an individual, section, and choral clarity of intonation stemming from concentration on vowel duration and purity. Giving energy and a re-articulation to each vowel sung on an individual note will energize and correct intonation.

Figure 3.12. Intonation

The image shows a musical score for four voices: Soprano (S), Alto (A), Tenor (T), and Bass (B). The lyrics are: "He is meek, and he is mild, He be-came a lit-tle child." The score is written on four staves. The Soprano staff has a *poco* marking and a fermata at the end. The lyrics are written below each staff. The music is in a common time signature and features a melodic line with various note values and rests.

Vowel Modulation: Emma Lou Diemer, “Take, O take those lips away,” from *Three Madrigals*. Text from *Measure for Measure* by William Shakespeare.²⁴

Issue in Music: Homophonic declamation including text with both closed and open vowels in recurring word succession is prevalent. Slow tempo tends to reduce energy within the vowel stream. See figure 3.13.

Tendencies: Singers will tend to treat each word individually, resulting in jaw flopping from over-pronunciation. Musical line is lost as a severe change of resonance occurs in the change vowels from word to word.

Objective: Use the “Vowel Relations” exercise to find the most resonant vowels for the individual singers and for the group as a whole. The choir will then relate all vowels to that resonant vowel found in the exercise by keeping the placement of the resonant vowel or the mental picture of the resonant vowel while singing the text. The consistency of resonance will create a legato musical line with an exciting vocal quality.

Figure 3.13. Vowel Modulation

The musical score is for a four-part choir (Soprano, Alto, Tenor, Bass). It is marked 'Slow' with a tempo of quarter note = 80. The music is in 4/4 time and begins with a piano (p) dynamic. The lyrics are: 'Take, O take those lips a - way That so sweet-ly were for - sworn;'. The score shows the vocal lines for each part, with the lyrics written below the notes. The music is homophonic, with all parts moving together in a similar rhythmic pattern.

²⁴ Emma Lou Diemer, “Take, O take those lips away,” from *Three Madrigals*, text from *Measure for Measure* by William Shakespeare (n.p.: Boosey and Hawkes, 1962), 6-7.

Singer Technique Issues

Flexibility: René Clausen, “Quicksand Years,” from *Three Whitman Settings from “Leaves of Grass.”* Text by Walt Whitman.²⁵

Issue in Music: Quick tempo presents a challenge with recurring sixteenth note scalar melismas on one or two vowels per quarter note beat. See figure 3.14.

Tendencies: Singers will tend to slide through the melismas without any articulation of individual notes. The result is unclear notes and intonation coupled with lack of rhythmic integrity and vitality.

Objective: Use the “Five-note Circles” exercise to cultivate an ability to connect the vocal tone from one note to the next, imagining that the notes are traveling in circles (melismas) out away from the body on one stream of consistent air flow. The “circles” prevent the student from thinking of the notes as high or low or through an area of the voice.

Figure 3.14. Flexibility



²⁵ René Clausen, “Quicksand Years,” from *Three Whitman Settings from “Leaves of Grass,”* text by Walt Whitman (Champaign, IL: Mark Foster Music Company, 1992), 7-12.

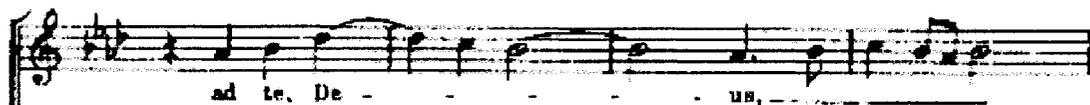
Legato: Palestrina, “Sicut cervus desiderat” (*prima pars* only)²⁶

Issue in Music: Unaccompanied, long suspended lines are interrupted by relatively faster passages of two to four notes, some with dotted rhythms. Individual musical lines are interwoven within a moderately slow tempo. See figure 3.15.

Tendencies: Singers will tend to inadvertently accent the faster notes because they are seemingly different in character from the preceding long notes. A lack of phonation occurs between notes as the line is sung on one vowel, producing a slight “h” sound, or an escape of air between notes.

Objective: Use the “Legato” exercise to cultivate consistent phonation between moving notes sung on one vowel. The consistent phonation will alleviate the apparent accent on the faster note passages because all sound will be connected.

Figure 3.15. Legato



²⁶ Giovanni Perluigi da Palestrina, *Sicut cervus desiderat*, (Brooklyn, NY: Arista Music Company, 1969),

Resonance: J.S. Bach, “Sicut locutus est” from *Magnificat D-dur, BWV 243*.²⁷

Issue in Music: The permutation fugue has three main themes, each with a large leap in the melody of at least a fourth, and as much as an octave. Each voice part sings all three main themes. Figure 3.16 illustrates the first theme.

Tendencies: Singers will tend to change vocal placement or stop phonation between notes with the large leaps. The lack of consistent resonance caused by the change in placement or lack of phonation causes certain notes to emerge out of the context of the melody.

Objective: Use the “Nose Syringe” exercise to cultivate consistent resonance throughout vocal registers and while singing arpeggios with wide melodic leaps. A consistently placed, resonant sound will allow for each theme to carry the same vocal energy throughout the melodic leaps.

Figure 3.16. Resonance



²⁷ Johann Sebastian Bach, “Sicut locutus est,” in *Magnificat D-dur, BWV 243* (Kassel, Germany: Bärenreiter-Verlag, 1956), 55-60.

Diction: Paul Hindemith, “La Biche,” from *Six Chansons*. Text by Rainer Maria Rilke.²⁸

Issue in Music: French text is presented in mostly homophonic declamation.

Syllabic text setting is presented in a moderate tempo. See figure 3.17.

Tendencies: Singers who have not sung in a particular language tend either to mimic those students around them or write English words and phrases into their music to cue a particular vowel or consonant sound. They usually do not have a systematic process for interpreting the sounds of a language.

Objective: Teach a basic introduction to the International Phonetic Alphabet and use the symbols as an aid for French pronunciation.

Figure 3.17. Diction



O thou doe, — what vis-tas of sec - u - lar for-ests ap-pear in thine
 O la - bi - che; quel bel in-té-rieur d'an-ci - en - nes fo-rêts dans tes

²⁸ Paul Hindemith, “La Biche,” from *Six Chansons*, text by Rainer Maria Rilke (New York: Associated Music Publishers, Inc., 1943), 2-4.

IV. EVALUATION OF CURRICULUM: METHODOLOGY

TESTING OVERVIEW AND TIMELINE

This experiment took place February 24 through March 12, 2003 with the University of Arizona University Singers, a mixed ensemble of eighty-six singers. During the course of seven, fifty-minute rehearsals, the students learned seven pieces of music, learned all of the tested and non-tested vocal exercises, recorded 'before' and 'after' excerpts, gave opinions on the questionnaires, and performed the music and demonstration of exercises in a Lecture Recital entitled "Improving the Choral Experience: Implementing Solo Voice Techniques in the Choral Rehearsal."²⁹

Three accompanists collaborated on the project. The first accompanist played for the first rehearsal only, and then added his voice to the ensemble to anchor the tenor section. The second accompanist played for the majority of rehearsals and for the performance. A third accompanist acted as substitute for Rehearsal #6, in which the choir recorded the 'after' excerpts.

University Singers was unbalanced as an ensemble, having only three male tenors and eleven basses. Two graduate choral conducting colleagues and one undergraduate voice major were asked to act as ringers for the tenor section, and one graduate choral conducting colleague anchored the bass section. They all took part in the entire experiment, including the questionnaires.

²⁹ Nicole Lamartine, conductor, "*Improving the choral experience: Implementing solo voice techniques in the choral rehearsal*," Doctoral Lecture Recital, University of Arizona, Tucson, 12 March, 2003.

Each rehearsal, save the first one due to technical difficulties, was videotaped. Students were invited to speak in front of or into the camera at the end of each rehearsal to ask any questions or to give feedback. No comments or feedback were recorded, possibly because of time constraints on the students before and after rehearsals.

Unless stated in the breakdown of each rehearsal plan, each rehearsal began with a generic choral 'warm-up' that did not use any of the exercises taught for the experiment. Singing preparation included the exercises once they were introduced.

During the course of the experiment rehearsal periods, some students had to arrive at the rehearsal late or leave the rehearsal early. Students were told that it was imperative for each student to be present for every minute of every rehearsal. The researcher made arrangements with other professors and teaching assistants on the campus for common students to make University Singers the priority class for the two weeks of the experiment.

In addition to the Lecture Recital rehearsals, a number of sectional rehearsals were planned. Students were encouraged, but not required to attend, as these extra rehearsals were not stated in the syllabus for the class. Each rehearsal ranged in attendance from four to 42 people. A listing follows:

Sunday, March 2, 7-8:30 pm, SATB

Tuesday, March 4, 7-8:00 pm, TB

Wednesday, March 5, 7-8:00 pm, SA

Tuesday, March 11, 7-8:00 pm, SATB

During the two week experiment, the choir sat in their usual assigned rows and sections. The placement remained the same, whether the choir sat in chairs or performed on the risers:

Soprano II	Bass	Alto II
Soprano I	Tenor	Alto I
Conductor		

The timeline of the experiment was as follows:

Rehearsal #1 (Monday, February 24, 12-12:50pm)

1. Students received their music packets and a calendar of events and expectations for the Lecture Recital Rehearsals. The choir sat in their usual assigned rows and sections.

2. Rehearsed “The Lamb”: Sopranos/Tenors and Altos/Basses learned the two melodies that make the structure of the piece. The overall use of retrograde inversion and ‘mirroring’ was introduced. Students were excited that they could see the compositional techniques so clearly in what seemed to be a difficult piece of music. The choir then read the interspersed four-part music. Having explored the structure and combinative melodies, the choir was able to read the entire piece.

3. Rehearsed “Quicksand Years”: The choir learned the opening canonic melody first by speaking the text in rhythm with correct articulation. After the choir mastered the rhythm and articulation, melodic content was added. The choir read through measure 17. After pointing out that the music retains the basic melodic content with a change of texture to melismatic homophony, the choir was able to read to the end of the section, ending at measure 27. The rehearsal resumed with an exploration of the new, but similar melodic content at measure 36. All choristers read the alto part in rhythm with correct articulation. Pitch was added to the unison rendition. The choir then read the ending section from measure 36 through the end on their respective parts.

4. Rehearsed “Take, o take those lips away”: As this piece is in ABA form and harmonically not very challenging, the choir was able to read the piece through with aplomb. The choir sang a second reading of the piece after the conductor pointed out the recurring phrase structure. Some choristers missed the added measure of music at measure 26.

Rehearsal #2 (Wednesday, February 26, 12-12:50pm)

1. Rehearsed “La Biche”: The rehearsal began with an explanation including a diagram on the board to show how to calculate the shift from quarter note triplets to a half note triplet within a diminuendo as seen in measures 10-11. This proved to be confusing to some, especially the non-music majors who do not read music. The choir then spoke the rhythm on [du] and subsequently added pitch to that middle section. The realization that the piece was in ABA form allowed the choir to read with pitch through the piece on [du]. The singers then went back to the pickup into measure 5 to rehearse in their resultant duets of Soprano/Bass and Alto/Tenor. Then the choir rehearsed the A sections without the soprano melody to cultivate an unseamed legato. Finally, the choir read the entire piece again on [du]. The syllable [du] was chosen because it has an explosive consonant that allows the conductor to hear rhythm and the vowel [u] which is conducive to keeping the larynx in a low, relaxed position while singing through the *passaggio* (especially for men).

2. Rehearsed “Sicut cervus”: The author drew the choir’s attention to the three textural and structural phrases of the *prima pars*, and divided the piece according to those divisions. All parts read the soprano melody of Phrase 1, adding the axiom that accented

syllables tend to diminuendo while unaccented syllables tend to crescendo.³⁰ The choir then read their own parts, making an effort to sing correct notes while singing musically. Phrases 2 and 3 were read briefly.

3. Rehearsed “Sicut locutus est”: The choir listened to Robert Shaw’s recording of this section of *Magnificat*, paying close attention to style and articulation. After listening, the three tunes of this permutation fugue were presented with the choir singing the tune in their octave, focusing on the particular articulation for each phrase. Then the conductor announced the split of the three part women would correspond to their assigned voice part. In this way, there would be twice as many altos singing their part as would be singing either soprano part, and thus would create a better balance. Knowing the three tunes allowed the choir to read through the downbeat of measure 37. The accompanist then played from measure 37 to the end of the piece while the choir listened. The choir then attempted to read the last section of the piece.

4. Rehearsed “Abendlied”: Before singing, the choir listened to a recording of this piece, noticing the full and rubato Romantic style. The accompanist then played the Tenor and Bass parts together from measure 3 through 13 while they listened. The men then read their parts for the same section of music. A repeat of the procedure helped the women to become familiar with their opening section. The four parts then sang together with the piano doubling their parts, followed by one time through with the piano playing accompaniment.

³⁰ This axiom for choral music of the Renaissance was learned and borrowed from Dr. Bruce Chamberlain.

5. The researcher ended the rehearsal with an announcement of the excerpts of each piece of music to be recorded during the following rehearsal.

Rehearsal #3 (Friday, February 28, 12-12:50pm)

1. Before the choir arrived, nine sections of Wenger risers were set up to form a semi-circle in the rehearsal space. The Steinway grand piano was set in the middle of the semi-circle of risers, approximately ten feet away from the center riser. The conductor's ten-inch high podium was set directly behind the piano. An Audio Technica AT822 stereo omni-directional microphone was set on a stand three feet to the right of the piano (stage left) at a height of six feet from the ground. A small stool on which was placed the MZ-R70 Sony mini-disc recorder was set next to the microphone stand for easy connection to the microphone cable. The microphone connected to the mini-disc by way of two stereo inputs. The placement of the recording equipment enabled better pickup of the weaker sections (altos, tenors and basses) and easy access to the recording buttons. Volume on the mini-disc was pre-set for recording levels, and the microphone was set in the mode to increase recording of the low (bass) sound spectrum.

2. The choir began the rehearsal with a five-minute warm-up.

3. A 'before' recording of each selection followed a short review and rehearsal of the excerpt. In the case where the tempo was slowing because of singer insecurity with notes, rhythm, or diction a second "take" was recorded. The same was the case if the singers were presenting wrong notes. Table 4.1 illustrates the order in which the selections were recorded, the number of takes, and the reason for the extra recordings.

Table 4.1. Recordings of 'Before' Excerpts

Selection	Excerpt	Number of recordings	Reason for extra takes
The Lamb	mm. 11-18	1	n/a
La Biche	mm. 1-8	2	Basic Diction and Rhythm
Quicksand Years	mm. 36-end	1	n/a
Take, o take those lips away	mm. 1-18	1	n/a
Sicut cervus	Phrase 3	3	Notes, Rhythm
Abendlied	mm. 1-13	1	n/a
Sicut locutus est	mm. 1-29	0	n/a

4. Time did not permit the recording of the last excerpt, "Sicut locutus est."

Rehearsal #4 (Monday, March 3, 12-12:50pm)

1. Before students arrived for the rehearsal, the risers, piano, podium and recording equipment were set up in the same manner and place within the room. In addition, each student's subject number was posted as a list at the front of the room. Subject numbers were assigned as consecutive numbers throughout the choir membership.

2. As students arrived, they were asked to make note of their subject number, as it would be used as a tracking number for each questionnaire.

3. The 'before' excerpt recordings resumed with a polishing rehearsal and subsequent recording of "Sicut locutus est." It was recorded twice to correct a tempo issue in the first take.

4. A Singer Pretest was distributed to each chorister. There was some confusion as to what experiences constituted choir, voice lessons, and voice class. A detailed explanation ensued for each element.³¹ The students were given five minutes to complete the questionnaire.

5. A presentation of basic voice pedagogy followed, with particular attention paid to the muscles and process of breathing, cartilages of the larynx housing, vocal fold physiology, process of phonation, arytenoid cartilages, resonators, palates, and register shifts. The students seemed to enjoy the demonstrations of Bernoulli effect, pitch manipulation, and resonators. It was clear that this information was new and exciting to many students, as inquisitive and thoughtful questions were asked throughout the discussion.

6. The Testing Exercises handout was distributed. The researcher presented each exercise and explanation of pedagogy with a reiteration of the pedagogy the students had just learned. The researcher asked for volunteers to demonstrate each exercise, and interjected only to correct the presentation, or to inquire of the choir if they heard a difference in the sounds produced by the chorister. The exercises dealt with the Choral Tone issues of Color Voices, Intonation, Vowel Modulation, and the Singer Technique issues of Flexibility, Legato, Resonance, and Diction. Although all choristers learned and experimented with all of the exercises on the handout, it was made clear that only one exercise from each category would be tested on the literature. Students were not told in advance which exercises would be tested.

7. No rehearsal time was left for music preparation.

³¹ As responses were tabulated, it became clear to the researcher that the confusion of classification was apparent, so some questions were discarded within the results of the questionnaire.

Rehearsal #5 (Wednesday, March 5, 12-12:50pm)

1. Each student was given a handout with a basic explanation chart of IPA with relevant English words to use as comparisons. Only the symbols used in the transliteration for “La Biche” were included on the chart to minimize confusion over the numerous syllables. On the back of the sheet was a line-by-line listing of the French text of “La Biche,” a literal translation, and the IPA transliteration. About five minutes was spent going through the syllables and speaking the French text while looking at the IPA for symbol reference.

2. The Additional Exercises handout was distributed. The choir explored these exercises as the day’s warm-up. These exercises dealt with purely singer technique issues of Vibrato, Passaggio, and Range Extremes. The students were told that these exercises would not be tested on the choral literature, but were rather for their own benefit and perusal.

3. Rehearsed “Sicut cervus”: Special attention was placed on Phrases one and two which had not been rehearsed since the previous Wednesday. The choir continued to work on shaping the lines through the text axiom presented previously. In addition, the choir rehearsed a staccato articulation of the first note in a reiterated pair of notes.

4. Rehearsed “Sicut locutus est”: The choir focused on measures 26 through the end of the piece. The women perfected their entrances at fourths in measures 33 and 34, and the entire choir worked slowly through the sequential material in measures 37 to the end. Working without the first sopranos in the texture seemed to allow the other voice parts to execute their melodic material more clearly. Overall, the choir worked towards a light and buoyant texture.

5. Rehearsed “Abendlied”: Much time was spent learning and correcting notes and rhythms from measure 15 to the end. Many of the singers were not familiar with the thick and somewhat chromatic harmonic texture of Brahms’ writing. At the return of the opening music at measure 29, many singers were not expecting the change in melodic content at measure 33. However, the choir read the ending section with confidence and musicality, allowing the lullaby theme to sway slightly.

Rehearsal #6 (Friday, March 7, 12-12:50pm)

1. Before the choir arrived, the risers, piano, podium, and recording equipment were placed in the same orientation as the previous recording sessions.

2. A short review of the exercises to be tested acted as the choir’s vocal preparation.

3. Before recording each ‘after’ excerpt, the choir reviewed each exercise and then applied the technique to the excerpt of music being recorded. For example, the choir practiced Five-Note Circles mastering the consistent air flow and vowel production needed for the melismas. Then, the choir sang the excerpt of “Quicksand Years” with the same vocal technique and mental idea as the exercise. Table 4.2 illustrates the issue, the corresponding tested exercise, and excerpt of music. For the full tested excerpt of each piece, see Appendix E.

Table 4.2. Issue, Tested Exercises, and Music Excerpts

Issue	Tested Exercise	Music Excerpt
Intonation	Tapping the Vowel	The Lamb, mm.11-18
Diction	IPA	La Biche, mm. 1-8
Flexibility	Five-Note Circles	Quicksand Years, mm. 36-end
Vowel Modulation	Vowel Gradation	Take, o take, mm. 1-18
Legato	[ni ne na no nu]	Sicut cervus, Phrase 3
Resonance	Nose Syringe	Sicut locutus, mm. 1-29
Color Voices	Father Arpeggio	Abendlied, mm. 1-13

Each excerpt was recorded only once, with the exception of “La Biche” which was recorded twice for balance reasons, and “Take, o take those lips away” which was recorded twice for tempo fluctuations. “Abendlied” was not recorded because of time constraints.

4. Following the recording of six of the seven ‘after’ excerpts, the Singer Questionnaire packet was distributed to each choir member. They were asked to fill in all sections except for the questions on the Father Arpeggio exercise as applied to “Abendlied.”

Rehearsal #7 (Monday, March 10, 12-12:50pm)

1. Before the choir arrived, the risers, piano, podium, and recording equipment were placed in the same orientation as the previous recording sessions.

2. A short warm-up using the Additional Exercises began the rehearsal.

3. The Father Arpeggio exercise was reviewed and applied to the “Abendlied” excerpt. The section was then recorded twice because of incorrect notes in the men’s sections.

4. The students then received two questionnaires, one for the application of Father Arpeggio to “Abendlied,” and the Singer Questionnaire for the Additional Exercises not tested on any choral literature.

5. Announcements followed in regards to the *viva-voce* Lecture Recital presentation. The concert order was given, along with a review of exercises and excerpts the choir would demonstrate.

6. The choir was then asked to sing the concert portion of the Lecture Recital in order without stopping any of the pieces for rehearsal.

Lecture Recital Presentation (Wednesday, March 12, 12-1:00 pm)

The *viva-voce* presentation was given to an audience of approximately forty people using a Power Point™ demonstration to elaborate on the printed outline distributed to the audience. In addition, all audience members received the exact handouts that each choir member had received, including all exercises and the IPA sheet. The Lecture portion elaborated on preliminary results of the Singer Pretest, each tested exercise, and the preliminary results of the Singer and Conductor Questionnaires. The Recital portion included performances of the tested choral literature in its entirety.

Conductor Evaluation Process

1. After all 'before' and 'after' excerpts were recorded onto mini-disc in an uninterrupted stream of sound during the rehearsals, tracks were inserted via the "track" button on the mini-disc player/recorder. This division of data on the disc allowed for the specific recording to be differentiated from others on the disc.

2. Each track was then played back on the mini-disc player with the volume set at level 22 into the audio input of a Dell Computer Corporation Inspiron 4100 laptop computer. The audio input was captured via the computer's audio recording feature. The feature would only record one minute's worth of sound input. Each excerpted recording happened to be between forty and sixty seconds long. As the audio file was captured onto the computer in digital form, it was given a label of the title of the piece followed by a "B" for 'before' or an "A" for 'after.' In addition, all of the 'before' excerpts were recorded on one mini-disc, and all of the 'after' excerpts were recorded on another to keep them separated.

3. The tested issues and corresponding choral selection were randomly ordered on the Conductor Questionnaire. Then, a Compact Disc was compiled with the 'before' and 'after' recordings corresponding to the order of tested issues on the questionnaire. Whether the issue's 'before' or 'after' recording was first on the Compact Disc was also randomly ordered. Six identical copies of the CD were burned on the Dell laptop and were labeled only with "Lamartine Lecture Recital Conductor Evaluation CD." An archive of the CD order and contents was placed on the computer.

4. The Evaluation CD, Conductor Questionnaire, and an instruction sheet with definitions of all tested issues was distributed to each of six graduate Choral Conducting

students at the University of Arizona on Monday, March 10: four Doctoral candidates (two male and two female) and two Masters candidates (one male and one female). None of the conductors had been allowed to listen to or be present at any portion of the University Singers rehearsals. The conductors were given up to an hour to evaluate the CD on the Technic SLPG440 stereo equipment in the listening lab of the University of Arizona Music Library. The researcher was available to answer any questions.

5. After evaluation, the conductors returned the completed questionnaires and CDs to the researcher.

OVERVIEW OF QUESTIONNAIRES

The Singer Pretest gathered basic demographic information such as gender, age, major in college, and previous choral or private voice lesson experience. In addition, the test gathered information using a Likert-type scale on whether the students felt that at least one approach to Intonation, Diction, Flexibility, Vowel Modulation, Legato, Resonance, and Color Voices had been taught in their previous choral experience.

The Singer Questionnaire for Tested Exercises evaluated:

1. How well the singer understood the purpose of the exercise
2. How well the singer understood the process or execution of the exercise
3. If the student felt the exercise allowed him to execute the demands of the music in the tested passages of choral literature
4. How well the student understood the voice function while doing the exercise
5. If the student felt that she will use these exercises in future vocal study

Statements 1,2,4, and 5 tested for general student understanding of the given exercise. Statement 3 determined the success of the exercise as applied to the given piece of choral music. For each piece of literature, an excerpt was chosen on which the choir could test a given vocal exercise. After the choir had learned all of the tested exercises, the excerpt of literature was sung. The choir would then vocalize on the specified exercise for that piece of music, reminding themselves of the vocal goal. Then the choir sang the excerpt again, with each individual noticing if the exercise helped the individual singer to accomplish the demands inherent in the choral literature.

The Singer Questionnaire for Additional Exercises tested the same items as above, with the exception of application to the choral literature. Instead, statement 3 evaluated how the exercise helped a singer's individual singing technique to improve.

The Conductor Questionnaire was distributed to a total of six graduate choral conducting students at the University of Arizona: four Doctoral students (2 male, 2 female) and two Masters level students (1 male, 1 female). The conductors evaluated a 'before' and an 'after' excerpt for each piece on which the choir was applying each exercise. The pieces on the recordings were randomly ordered and the correspondence of A or B as the 'before' or 'after' excerpt was randomly assigned. Conductors evaluated each recording for which one of the 'before' and 'after' pair had the better Intonation, Diction, Flexibility, Vowel Modulation, Legato, consistent Resonance, and blend of Color Voices in the texture. In this way, the researcher was able to determine if an exercise was allowing the individual students to execute successfully the demands of the music within the entire ensemble, and if a tested exercise was affecting other factors of the singers' technique than simply the element being tested.

Conductors were coached with an instructional handout before they evaluated the recordings. It included a set of definitions for Intonation, Diction, Flexibility, Vowel Modulation, Legato, Resonance, and Color Voices on which to base their evaluations in addition to detailed instructions on how to fill in the questionnaire. The conductors listened to each pair of recordings once for each comparison question within the tested element.

Questionnaire Wording and Organization

To simplify the questionnaire process for the students and to avoid confusion while reading the questionnaire, all questions were worded as positive statements, rather than the more accepted research process of alternating positive and negative statements on a Likert-type questionnaire. Question one on the Singer Questionnaire for Tested Exercises measured the student's understanding of purpose for the exercise, question two measured the student's understanding of how to accomplish the exercise, question four measured the student's understanding of the pedagogy behind the exercise, and question five measured the student's interest in further use of the exercise. Embedded in the general student understanding questions was the third statement that measured the student's perception of whether or not the specific exercise helped the student to accomplish the demands of the choral literature. In this way, the questions were randomly ordered. In the case of the Additional Exercises Singer Questionnaire, the third question was phrased to reflect effect on the individual. For example, "I feel that Encouraging Vibrato has helped me to find vibrato in my voice."

For ease of researcher compilation of results, the question order and phrasing remained consistent across the seven questionnaires for the Tested Exercises and the three

questionnaires for the Additional Exercises. A space for comments followed the questions.

Figure 4.1 illustrates a sample of the Singer Questionnaire for “Tapping the Vowel.”

Figure 4.1. Singer Questionnaire

INTONATION
MUSIC TESTED: MM. 11-18, THE LAMB (JOHN TAVENER)
EXERCISE TESTED: TAPPING THE VOWEL

Strongly Agree Agree Undecided Disagree Strongly Disagree

1. I understand the purpose of “Tapping the Vowel”.
2. I understand how to “Tap the Vowel.”
3. I feel that “Tapping the Vowel” has helped me to make a better tuned sound on “The Lamb.”
4. I understand how my voice works when singing the “Tapping the Vowel” exercise.
5. I will use the “Tapping the Vowel” exercise in my further vocal study, including choir and voice lessons.

Comments:

Similar to the Singer Questionnaires, all items on the Conductor Questionnaire were worded as positive statements. The conductors were given three options: recording A (abbreviated “A” on the questionnaire), recording B (abbreviated “B” on the questionnaire), and Neither. The reader will recall that the actual recording order was randomized. To ensure the anonymity of the actual issue being tested, the question order and phrasing remained identical across the seven questionnaires. A space for comments followed the

questions. Figure 4.2 illustrates a sample of the Conductor Questionnaire for “Quicksand Years.”

Figure 4.2. Conductor Questionnaire

Pair 1: Quicksand Years (René Clausen), mm. 36 - end

	A	B	Neither
1. Which recording contains the more accurate melismatic passages?			
2. Which recording contains the emergence of fewer color voices?			
3. Which recording contains the better legato?			
4. Which recording contains better freedom of sound and consistency within the vowels?			
5. Which recording contains better diction of language?			
6. Which recording contains better intonation?			
7. Which recording contains better overall vocal resonance?			

Comments:

Tabulation

Each response was recorded on a Microsoft Excel spreadsheet with each column heading representing a question and all response possibilities and each row containing the subject’s responses. In this way, subject numbers could be sorted and subjects who did not fill out all questionnaires due to absence or otherwise were discarded from the study (n=77). A ‘1’ was placed in a column that corresponded to the respondent’s answer. Each column’s responses were added and subsequent percentages of the entire subject pool were calculated. All percentages were rounded to the nearest whole percentage point for subject responses.

As five degrees of opinion were used on the Singer Questionnaires, the researcher used the common practice of adding together the percentage values for “strongly agree” and “agree” into one value, “agree,” and the percentage values for “disagree” and “strongly disagree” into another, “disagree,” for a total of three response categories. For example, if the response values were 42% for “strongly agree” and 45% for “agree,” the resultant “agree” value became 87%. Furthermore, an exercise was considered successful if a respondent marked either “agree” or “strongly agree,” and unsuccessful if the student marked “undecided,” “disagree,” or “strongly disagree.” So, the same example above would yield the success rate of 87%.

Due to the small sample size of the choir ($n=77$), each student’s responses counted for more than one percent of the total sample size. The rounding of percentage points to the nearest whole percent when calculating the percent response in some cases caused the total percentage points to add up to only 99%. For example, if only one student responded with “disagree,” the Excel spreadsheet would calculate the one response as 1%, whereas in actuality, the single response was more than one percent. Using this system, the researcher has labeled the margin of error as $\pm 1\%$.

To ascertain the average success of an exercise from a singer’s point of view, not including application to the choral literature, the researcher employed a simple averaging of success (combined “strongly agree” and “agree” responses) percentages for each question. For example, 100% of students understood the purpose of the exercise, 97% understood how to do the exercise, 93% understood the pedagogy behind the exercise, and 88% responded that they would use the exercise again. Adding the percentages and dividing by

four yields the average success value of 94.5%. Values for these calculations were rounded to the nearest tenth of a percent to differentiate between close success rates.

In the case of the Conductor Questionnaires, the researcher refers to the number of responses out of a total of six. In some cases, percentages were calculated for added clarity using the number of responses divided by the number six.

V. RESULTS

SINGER QUESTIONNAIRES

Singer Pretest

A Singer Pretest was distributed to determine the general experience level and make-up of University Singers. Forty-eight percent of the members of the ensemble were between the ages of eighteen and nineteen, most likely Freshmen. Females comprised 81% of the choir. Thirty percent of the singers had never sung in high school choir, whereas 44% had sung for three to four years of high school. Thirty-seven percent had taken a private voice lesson before attending college at the University of Arizona and 32% were taking private voice lessons either through the university for credit or privately in the community. Only 34% of the students in the choir were music majors, including Performance (B.M.), Music Education (B.MusEd.), and Bachelor of Arts majors with a voice or instrumental focus. In addition, 67% stated that they played an instrument either for leisure or for their major.

In gathering information from the singers, it was clear that many had been taught at least one approach to the tested issues of Color Voices, Intonation, Vowel Modulation, Flexibility, Legato, Resonance, and Diction. The terms listed on the questionnaire were purposefully not defined and were listed in random order. Those students who had never sung in a high school choir may have sung in a church or recreational choir in which some of the given concepts were taught. The Singer Pretest did not ask whether or not the singers thought these previous concepts or approaches were successful.

Twenty-nine percent of students were undecided or disagreed that they had been taught a vocal approach for Flexibility. On the other hand, 89% surveyed said they had been taught about Vowel Modulations, possibly misinterpreting the term to mean vowel

“modification,” a different concept. Similarly, most singers had been taught at least one approach to blend of Color Voices (85%), Legato (82%), Intonation (83%), Diction (86%), and Resonance (82%).

Tested Exercises

Each exercise was graded according to the results of the responses on the Likert-type questionnaire. Table 5.1 illustrates the relationship between the exercise, the tested issue, and the objective for the singer and the ensemble as a whole. Note that only one exercise for each issue was chosen to be tested.

Table 5.1. Tested Exercises

Exercise	Issue	Goal
Tapping the Vowel	Intonation	Re-iteration of vowels
IPA	Diction	Fluency with symbols
Five-Note Circles	Flexibility	Consistent air flow and vowel placement
Vowel Relation	Vowel Modulation	Relating resonant vowels
[ni ne na no nu]	Legato	Consistent phonation between notes
Nose Syringe	Resonance	Cultivate sinusital resonance
Father Arpeggio	Color Voices	Blend

Understanding of Purpose

The purpose or goal for Tapping the Vowel, Five Note Circles, and [ni ne na no nu] was understood by every student in University Singers. The other exercises also proved to have high levels of understanding: Father Arpeggio (99%), Vowel Relation (97%), IPA (97%), and Nose Syringe (94%). See table 5.2 below.

Table 5.2. Understanding of Purpose (In Percents)

Exercise	SA	A	U	D	SD
Tapping the Vowel	71	29	0	0	0
IPA	66	31	1	1	0
Five-Note Circles	62	38	0	0	0
Vowel Relations	57	40	3	0	0
[ni ne na no nu]	74	26	0	0	0
Nose Syringe	51	43	4	1	1
Father Arpeggio	56	43	1	0	0

Notes: The margin of error for the statistics is $\pm 1\%$. Please note that the results tables employ the use of abbreviations for the Likert scale responses on the Singer Questionnaires: Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), and Strongly Disagree (SD).

Understanding of How to Accomplish the Exercise

One hundred percent of students understood how to sing the Five Note Circles, [ni ne na no nu], and the Father Arpeggio. Understanding varied from 93% to 97% for Nose Syringe, Vowel Relation, and Tapping the Vowel. Only 9% of students did not understand how to apply IPA to the foreign language selections, which is significant because a large portion of the IPA system was presented in rehearsal. See table 5.3 below.

Table 5.3. Understanding of How to Accomplish the Exercise (In Percents)

Exercise	SA	A	U	D	SD
Tapping the Vowel	66	31	3	0	0
IPA	47	44	8	1	0
Five-Note Circles	65	35	0	0	0
Vowel Relations	56	40	4	0	0
[ni ne na no nu]	73	27	0	0	0
Nose Syringe	57	36	5	1	0
Father Arpeggio	54	46	0	0	0

Understanding of Pedagogical Function

An explanation of the voice's function while doing the exercise accompanied the presentation and demonstration of each exercise. The only exercise that scored 100% understanding of pedagogical function was [ni ne na no nu]. The other exercises scored

between 88 and 96 percent: Five Note Circles (96%), Vowel Relations (95%), Tapping the Vowel and Father Arpeggio (93%), and IPA (88%). See table 5.4. The lower score for IPA may be attributed to the fact that information was not to be applied to the voice, but rather as a written tool for pronunciation.

Table 5.4. Understanding of Pedagogical Function (In Percents)

Exercise	SA	A	U	D	SD
Tapping the Vowel	51	42	8	0	0
IPA	49	39	10	1	0
Five-Note Circles	49	47	4	0	0
Vowel Relations	52	43	5	0	0
[ni ne na no nu]	64	36	0	0	0
Nose Syringe	48	43	6	3	0
Father Arpeggio	40	53	6	1	0

Further Use of Exercises in Future Vocal Study

The average percentage of students who agreed that they would use the exercises in future vocal study was 86%. Five-Note Circles and [ni ne na no nu] scored the highest, with 92 and 91 percent, respectively. See table 5.5.

Table 5.5. Further Use of Exercises in Future Vocal Study (In Percents)

Exercise	SA	A	U	D	SD
Tapping the Vowel	48	40	10	0	1
IPA	51	34	13	1	1
Five-Note Circles	49	43	6	0	1
Vowel Relations	52	32	12	1	1
[ni ne na no nu]	60	31	6	1	1
Nose Syringe	44	36	14	3	3
Father Arpeggio	43	34	19	4	0

Additional Exercises

Table 5.6 illustrates the relationship of the chosen exercise, the tested issue, and the objective for the exercise. Note that the additional exercises tested were chosen from many presented to the students.

Table 5.6. Additional Exercises

Exercise	Issue	Goal
Encouraging Vibrato	Vibrato	Release laryngeal tension to allow vibrato
Slide of a Fifth on [u]	Passaggio	Smooth transition in and out of <i>passaggio</i>
Five-Note [ui] Scale	Range Extremes	Cultivate rich head tone in lower extremes

Understanding of Purpose

All three additional exercises scored high for the students' understanding of why the exercise was being done. Slides of a Fifth scored 100% understanding, Five Note [ui] scored 99% and Encouraging Vibrato scored 97%. Table 5.7 shows the entire breakdown.

Table 5.7. Understanding of Purpose (In Percents)

Exercise	SA	A	U	D	SD
Encouraging Vibrato	67	30	3	0	0
Five-Note [ui] Scale	66	33	1	0	0
Slides of a Fifth on [u]	63	37	0	0	0

Understanding of How to Accomplish the Exercise

Students understood well how to sing the exercises. Five Note [ui] and Slides of a Fifth scored 100% and 99%, respectively. However, there was a 4% lack of understanding in how to sing in the Encouraging Vibrato exercise (see table 5.8). The lack of comprehension could be based in two things: many students in the choir may already have vibratos or that singing a shake made the students focus on the change of pitch as opposed to the relaxation of the their vocal tracts.

Table 5.8. Understanding of How to Accomplish the Exercise (In Percents)

Exercise	SA	A	U	D	SD
Encouraging Vibrato	62	34	4	0	0
Five-Note [ui] Scale	68	32	0	0	0
Slides of a Fifth on [u]	61	39	0	0	0

Understanding of Pedagogical Function

Ninety-seven percent of the University Singers understood how the voice was functioning while singing Five Note [ui] and Slides of a Fifth. Seven percent of students did not understand how the Encouraging Vibrato exercise allowed the voice to function (see table 5.9).

Table 5.9. Understanding of Pedagogical Function (In Percents)

Exercise	SA	A	U	D	SD
Encouraging Vibrato	50	43	7	0	0
Five-Note [ui] Scale	58	39	3	0	0
Slides of a Fifth on [u]	51	46	3	0	0

Further Use of Exercises in Future Vocal Study

The average percent of students who would use these additional exercises in their further vocal study was 87%. As table 5.10 shows, even with a slight non-understanding of the exercise, Encouraging Vibrato scored the highest with 90% of students in favor of using the exercise again.

Table 5.10. Further Use of Exercises in Future Vocal Study (In Percents)

Exercise	SA	A	U	D	SD
Encouraging Vibrato	41	39	14	5	0
Five-Note [ui] Scale	47	38	12	1	1
Slides of a Fifth on [u]	49	39	9	1	0

SUMMARY OF FINDINGS

Student Understanding of Tested Exercises

The exercises listed in order of overall average success as judged by the singers in relation to their own understanding of the goal, how to sing the exercise, voice function, and if the exercise will be used in further voice study are as follows:

1. [ni ne na no nu] (97.8%)
2. Five-Note Circles (97%)
3. Tapping the Vowel (94.5%)
4. Father Arpeggio (93.5%)
5. Vowel Relation (93%)
6. IPA (90.3%)
7. Nose Syringe (89.5%)

The two exercises that scored the highest across all questions pertaining to understanding and usage were Five Note Circles to cultivate flexibility and [ni ne na no nu] to encourage a legato sound. One reason for the high evaluations may be in part due to the fact that the pitch content is exactly the same for both exercises, only the Five Note Circles includes three repetitions of the pitch pattern. Since students sang these patterns many times in the course of learning the two exercises, they may have simply felt more comfortable with the exercise melody. Secondly, the basic concept behind each exercise is fairly simple and easy to comprehend, especially by the untrained singer. Both exercises work from the basic concept of sliding, or consistent phonation from pitch to pitch, even if the vowel changes.

It seems that the students may have been confused by both the application of IPA and the Nose Syringe exercise. As stated before, the IPA was not presented as a vocal concept, but rather on a printed sheet. If a student did not focus attention to the handout,

he or she may have lost the information. As for the Nose Syringe exercise, students may not have understood it completely because it is a three-step exercise that requires mastering one part before understanding the next. In addition, the title and graphic explanation of “two syringes up the nose blowing air into the sinus cavities” was surprising and possibly unsettling to some students.

Although all exercises were generally successful, one must remember that students may have been overwhelmed with the amount of information. The vocal pedagogy lesson and explanation in addition to the presentation of the tested exercises all took place in one fifty-minute period. Students may have not had the time to digest the information or apply the techniques to the voice before having to evaluate them. Students may not have taken the time to think about each question for each exercise, as several questionnaires had the same Likert scale degree marked for every question on every exercise. Were they out of time? Did they not understand? Or did they just give high ratings to the exercises because they liked the instructor (instructor affect) or because they marked the rating that they thought they should? ³²

Questions aside, comments included statements such as “very effective,” or “very helpful,” indicating that some students did actually take the time to think about the understanding and application of each exercise. One student wrote in reference to the Father Arpeggio, “Explanation that time and energy be spent on [f] alone before singing needed to be earlier.”

³² John Best states in his book, *Research in Education*, “...there is a possibility that people may answer according to what they think they *should* feel rather than how they *do* feel.” John W. Best and James V. Kahn, *Research in Music Education*, 6th ed. (Englewood Cliffs, NJ: Prentice Hall, Inc., 1989), 198.

Figure 5.1. Understanding of Purpose, Tested Exercises

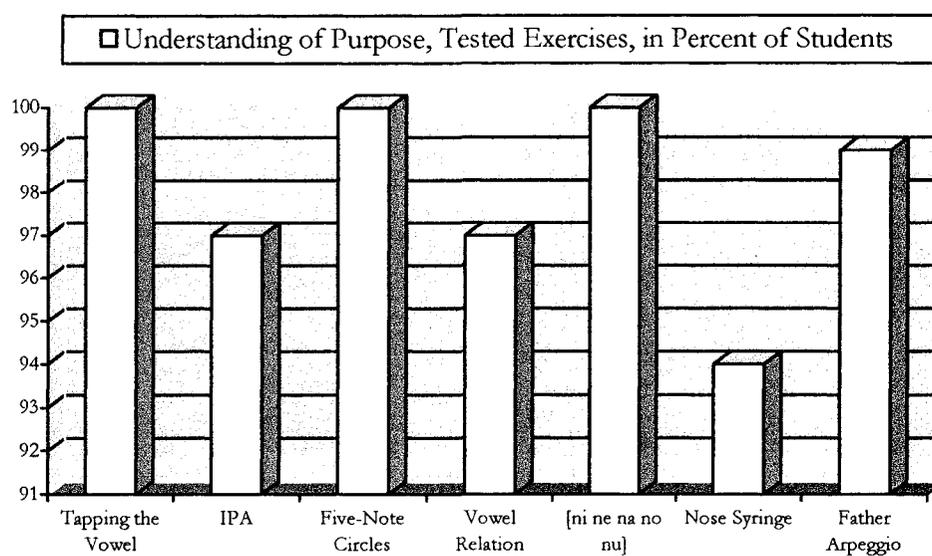


Figure 5.2. Understanding of Execution, Tested Exercises

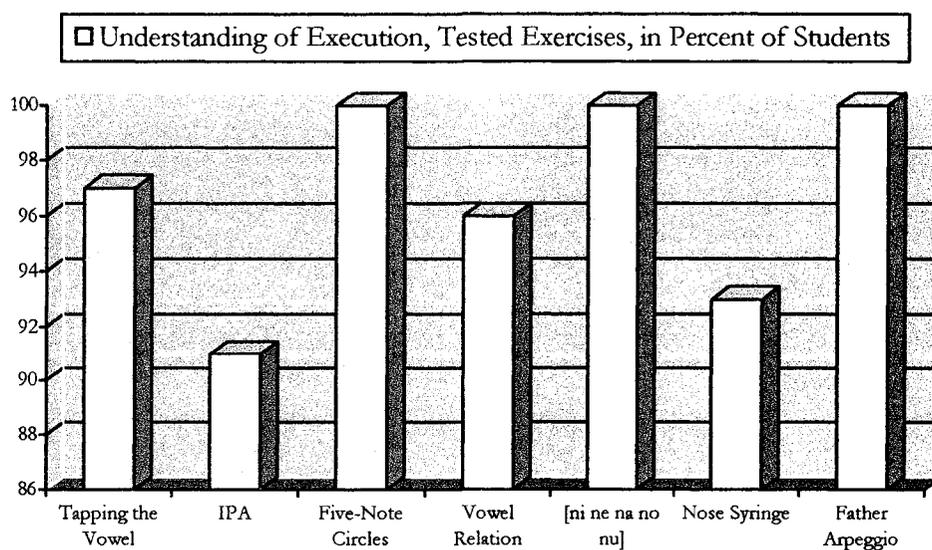


Figure 5.3. Understanding of Pedagogy, Tested Exercises

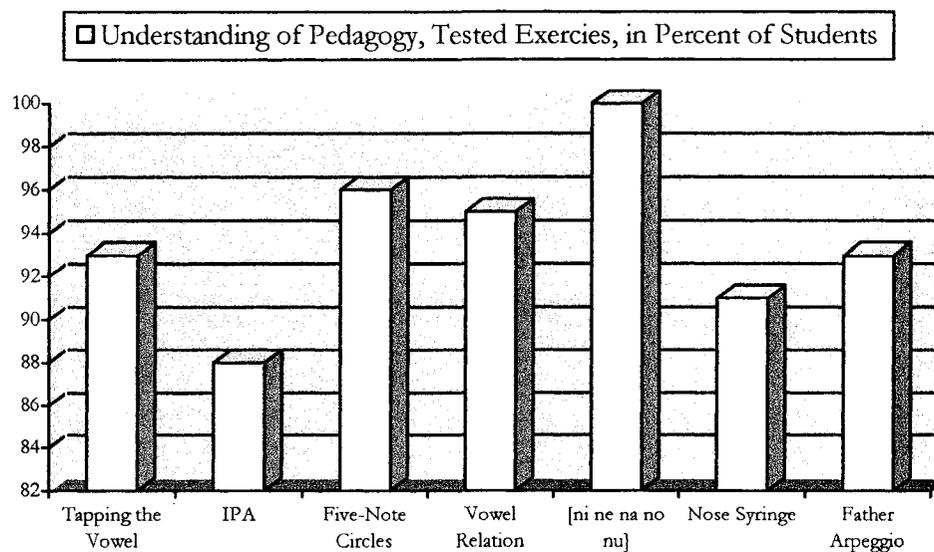


Figure 5.4. Further Use of Exercises, Tested Exercises

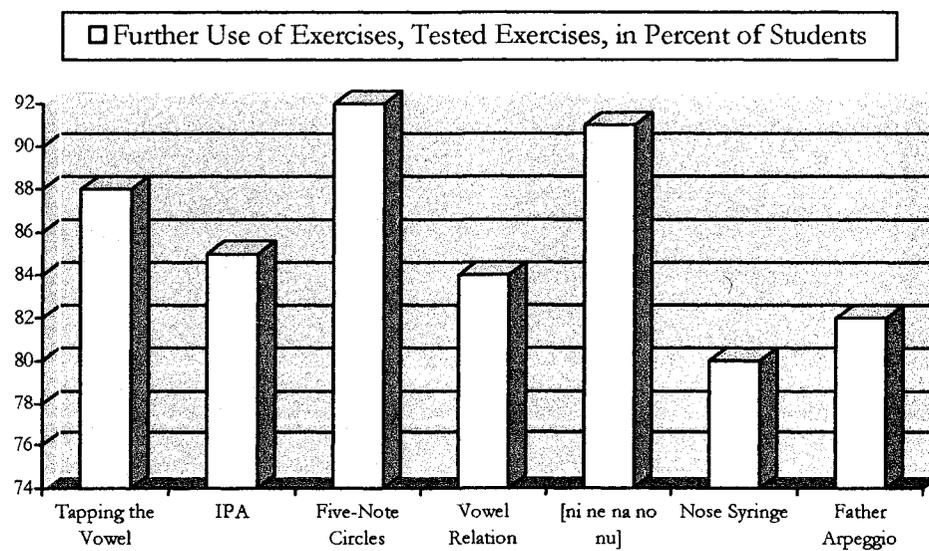
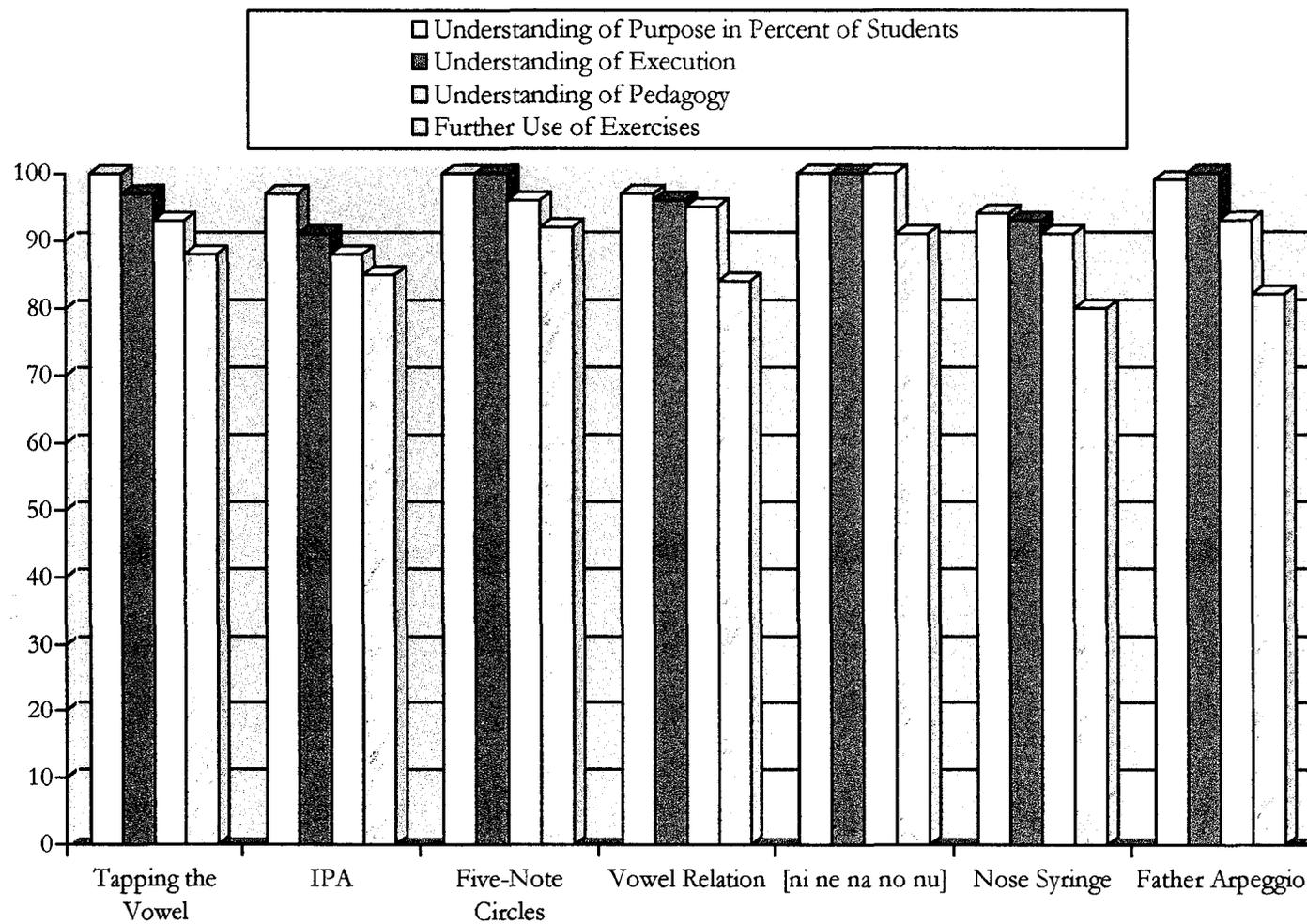


Figure 5.5. Compilation Chart of Student Understanding, Tested Exercises



Student Understanding of Additional Exercises

Although there were only three exercises tested in this group, results tended to be lower as compared to those results of the exercises tested on the choral literature. Even though Encouraging Vibrato scored the lowest for student understanding of purpose, execution, and voice function of the exercise, it was the one that the highest number of students were likely to use again in the future. This result could be because many vocal students want to have a vibrato, which traditionally has been a mark of beauty in the voice.

It must be noted that the Additional Exercises tested were a sampling of the many exercises presented to the students. The chosen exercises exemplified an ease of testing for success, whereas the other vocalizes contained multi-step goals and differing vowels or notes for the two genders.

In teaching and explaining the exercises, the students were able to experiment with them during one of the rehearsals for a twenty-minute period. Without the time that would allow for individual feedback, a student will never know for sure if he or she is accomplishing the goals of these more technical exercises. Between 82% and 89% stated that the individual exercise helped the problem area of that student's voice. These percentages, though lower than others, still deem these additional exercises as successful from the individual singers' point of view.

Figure 5.6. Understanding of Purpose, Additional Exercises

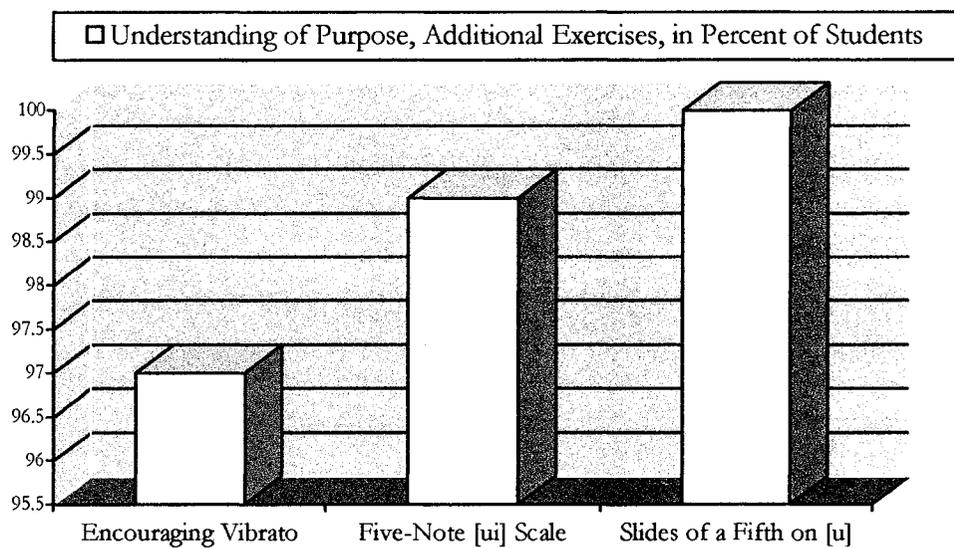


Figure 5.7. Understanding of Execution, Additional Exercises

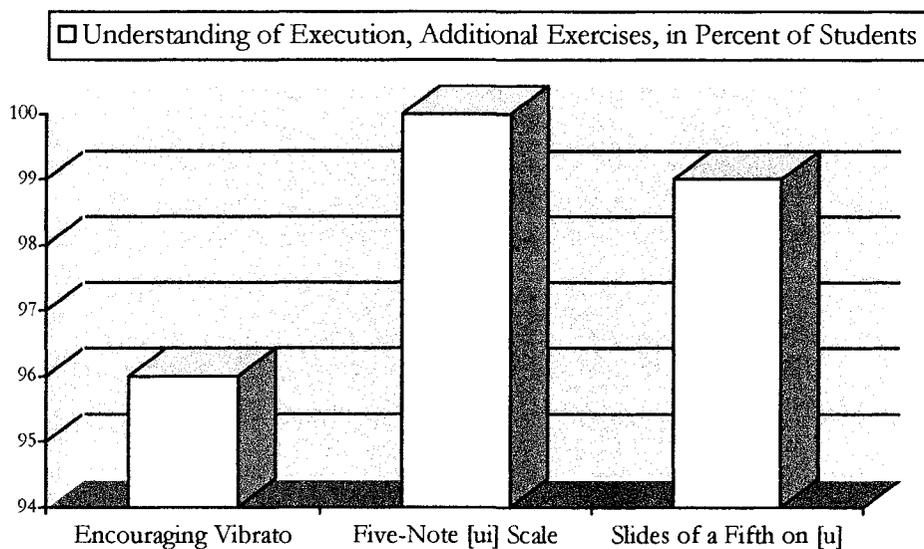


Figure 5.8. Understanding of Pedagogy, Additional Exercises

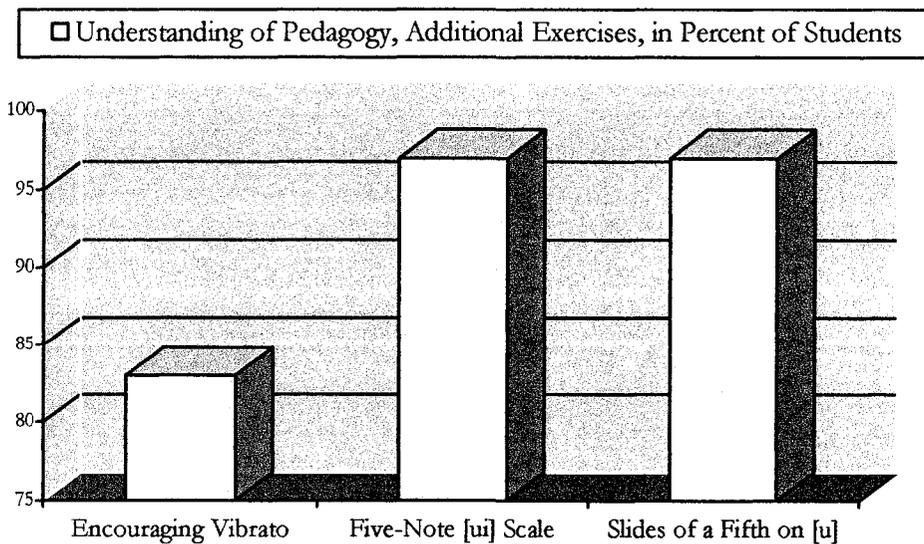


Figure 5.9. Further Use of Exercises, Additional Exercises

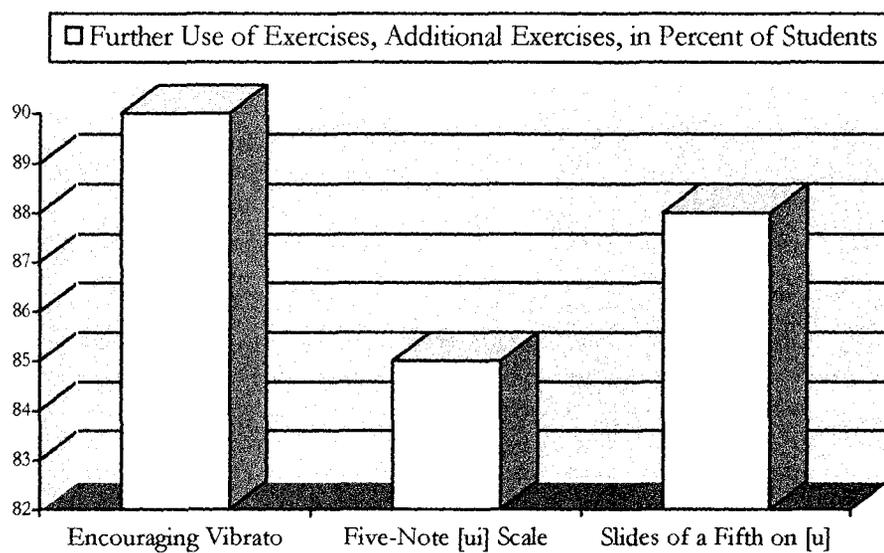


Figure 5.10. Positive Effect on Individual Voices, Additional Exercises

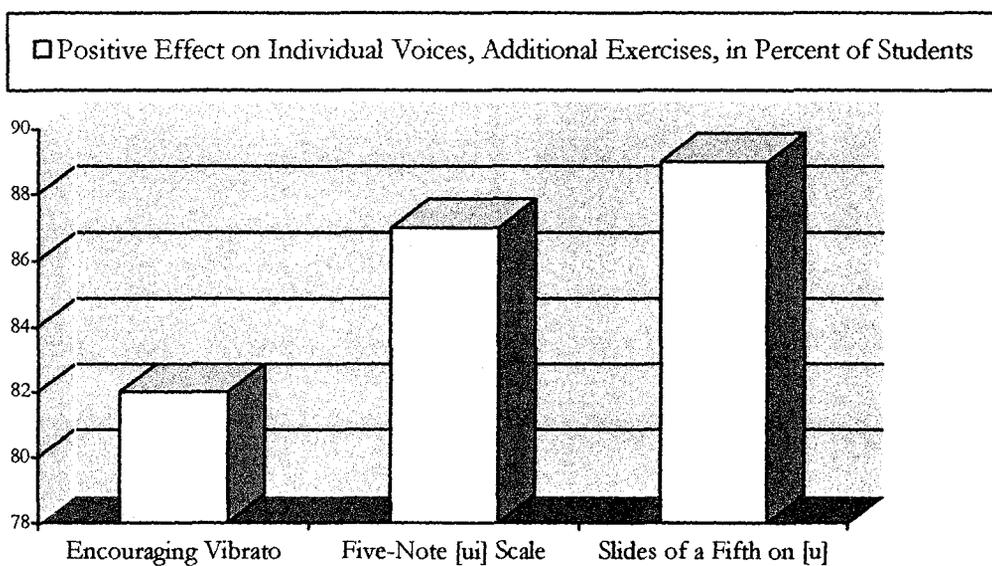
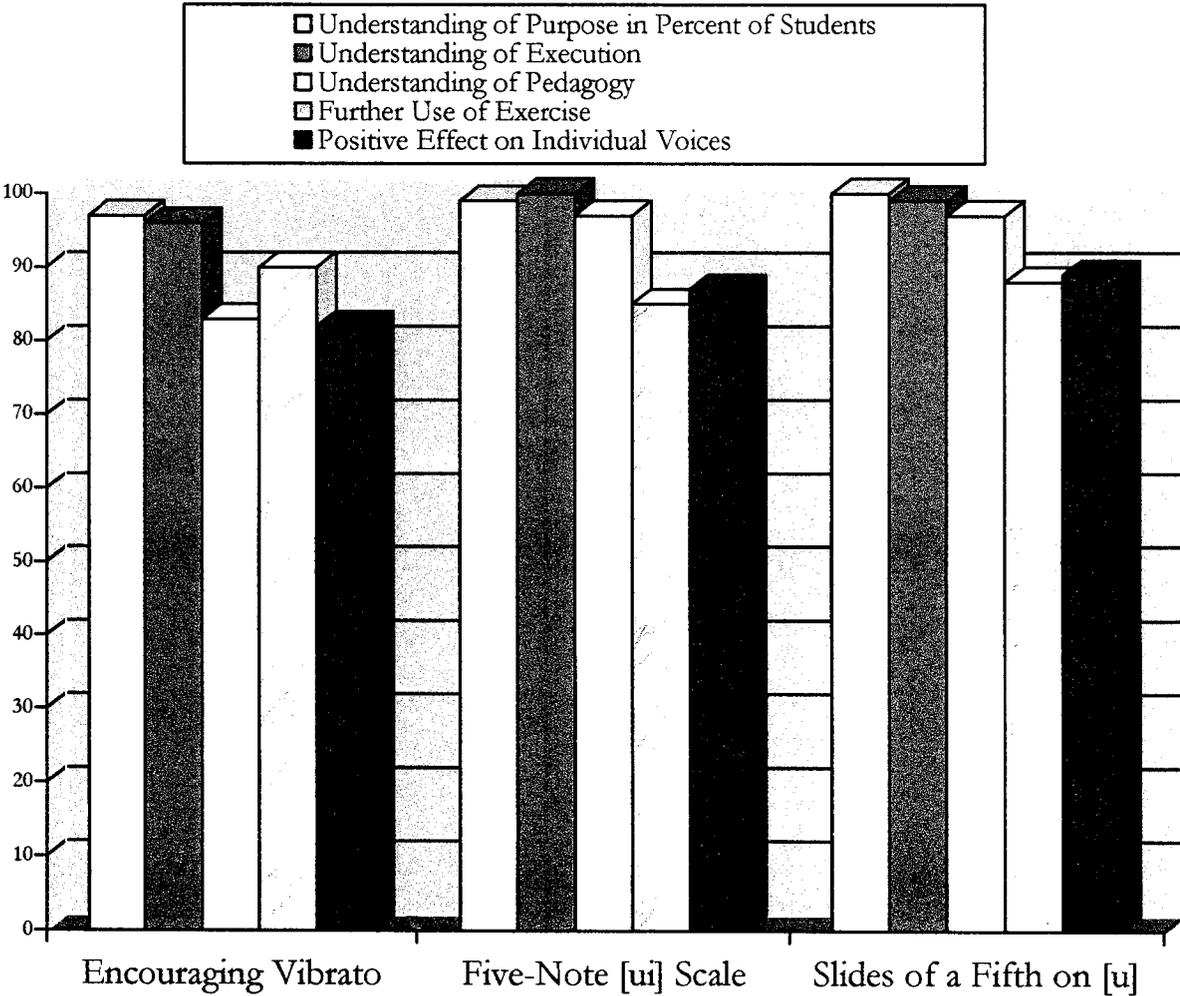


Figure 5.11. Compilation Chart, Additional Exercises



EXERCISES TESTED ON CHORAL LITERATURE

Table 5.11 shows the correlation of Choral Tone and Singer Technique issues, exercises, and tested literature excerpts:

Table 5.11. Testing Literature and Excerpts

Issue	Exercise	Literature	Excerpt
Intonation	Tapping the Vowel	The Lamb	mm. 11-18
Diction	IPA	La Biche	mm. 1-8
Flexibility	Five-Note Circles	Quicksand Years	mm. 36-end
Vowel Modulation	Vowel Relation	Take, o take those lips away	mm. 1-18
Legato	[ni ne na no nu]	Sicut cervus	Phrase 3
Resonance	Nose Syringe	Sicut locutus est	mm. 1-29
Color Voices	Father Arpeggio	Abendlied	mm. 1-13

Note that the choral tone and singer technique issues are randomly ordered. Table 5.12 demonstrates the raw percentage results of the singers' opinion of whether the exercise was thought to be successful as applied to the choral literature.

Table 5.12. Number of Students who thought the Exercise was Helpful as Applied to the Choral Literature (In Percents)

Exercise	SA	A	U	D	SD
Tapping the Vowel	43	48	8	1	0
IPA	53	34	10	1	1
Five-Note Circles	58	35	5	1	0
Vowel Relations	52	44	3	1	0
[ni ne na no nu]	65	31	3	1	0
Nose Syringe	42	43	13	1	1
Father Arpeggio	41	47	9	3	0

Summary of Findings for Exercises Tested on the Choral Literature

The average success percentage from the individual singer's perspective was 91%, which means that on average 70 out of 77 students tested deemed that each exercise helped him or her to accomplish the musical demands in the literature. This is significant in that the singers thought they were successfully taught an approach to singing the literature that helped them to grow as individual singers who contribute to the ensemble in a more informed manner.

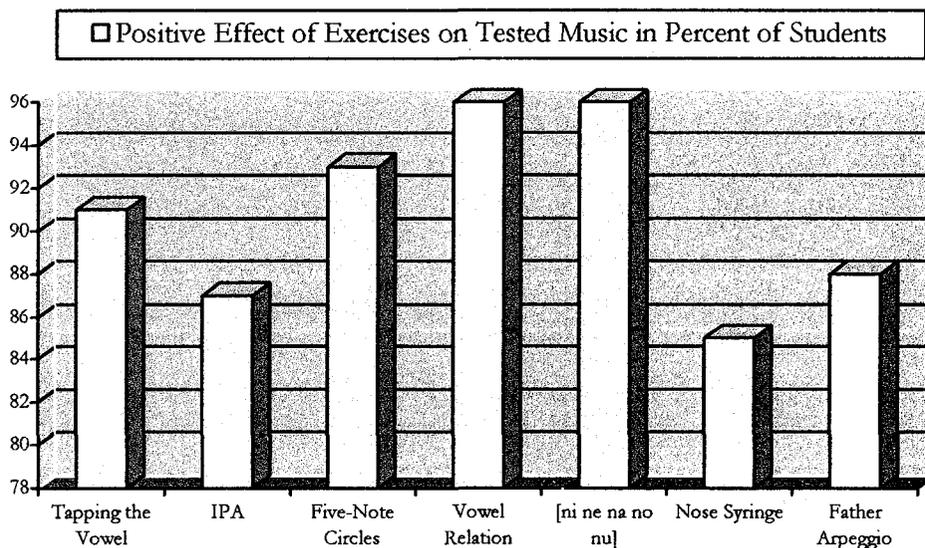
More specifically, the exercises that had the highest success rating as applied to the music were Vowel Relation for Vowel Modulation and [ni ne na no nu] for Legato at 96%. Five Note Circles (93%) and Tapping the Vowel (91%) were also successful from the singers' point of view. The Nose Syringe, IPA, and Father Arpeggio exercises ranged in

success from 85% to 88% (see figure 5.12). The exercises listed in order of success as judged by the singers in relation to accomplishing the goals of the music are as follows:

1. Vowel Relation for Vowel Modulation (96%)
[ni ne na no nu] for Legato (96%)
2. Five Note Circles for Flexibility (93%)
3. Tapping the Vowel for Intonation (91%)
4. Father Arpeggio for Color Voices (88%)
5. IPA for Diction (87%)
6. Nose Syringe for Resonance (85%)

Recalling that Five Note Circles and [ni ne na no nu] were the most successful exercises from the standpoint of singer understanding, it can be concluded that the most successful exercise overall from the singers' perspective, including application to the music was the [ni ne na no nu] exercise. This exercise scored an average of 97.4% success on all of the questions on the Singer Questionnaire.

Figure 5.12. Positive Effect of Exercises on Tested Music, Singers



CONDUCTOR QUESTIONNAIRE

Intonation

Table 5.13 shows that every conductor chose the 'after' recording of "The Lamb" as having the better Intonation. In addition, every other issue was voted by at least five conductors as being improved after the application of Tapping the Vowel, with the exception of Flexibility. As one astute conductor said, "There aren't any melismatic passages."

Table 5.13. Conductor Votes after Application of Tapping the Vowel for Intonation

Issues	Before	After	Neither
Intonation	0	6	0
Diction	1	5	0
Flexibility	0	2	4
Vowel Modulation	0	6	0
Legato	0	5	1
Resonance	0	6	0
Color Voices	1	5	0

Diction

Five conductors chose the 'before' excerpt of "La Biche" as having the better Diction, as well as Legato, Vowel Modulation, Intonation and Resonance. The only aspect that was chosen as being improved after the application of IPA was the non-emergence of Color Voices. See table 5.14.

Table 5.14. Conductor Votes after Application of IPA for Diction

Issues	Before	After	Neither
Intonation	5	1	0
Diction	5	1	0
Flexibility	1	0	5
Vowel Modulation	6	0	0
Legato	5	1	0
Resonance	5	1	0
Color Voices	2	4	0

Flexibility

Table 5.15 demonstrates that only two conductors thought that the melismatic passages in “Quicksand Years” were executed more clearly after the application of the Five-Note Circles. However, four conductors voted the ‘after’ excerpt as containing better Diction, and three voted that it contained better ensemble of Color Voices. Legato, Vowel Modulation, and Resonance were better in the ‘before’ recording from the conductors’ standpoint.

Table 5.15. Conductor Votes after Application of Five-Note Circles for Flexibility

Issues	Before	After	Neither
Intonation	2	3	1
Diction	2	4	0
Flexibility	3	2	1
Vowel Modulation	4	1	1
Legato	3	2	1
Resonance	4	2	0
Color Voices	2	3	1

Vowel Modulation

Four out of the six conductors deemed the consistency of vowel resonance, or Vowel Modulation, as better before the application of the Vowel Relation exercise on “Take, o take those lips away.” Five conductors thought the Diction improved in the ‘after’ recording. Intonation and Resonance were split equally between the ‘before’ and ‘after’ excerpts. See table 5.16.

Table 5.16. Conductor Votes after Application of Vowel Relations for Vowel Modulation

Issues	Before	After	Neither
Intonation	3	3	0
Diction	1	5	0
Flexibility	0	1	5
Vowel Modulation	4	2	0
Legato	4	2	0
Resonance	3	3	0
Color Voices	4	1	1

Legato

Table 5.17 shows that 100% of the conductors voted that the ensemble's legato was better after the application of the [ni ne na no nu] exercise on "Sicut cervus." In addition, every other tested aspect improved in the 'after' excerpt from the conductors' point of view.

Table 5.17. Conductor Votes after Application of [ni ne na no nu] for Legato

Issues	Before	After	Neither
Intonation	0	6	0
Diction	1	4	1
Flexibility	1	5	0
Vowel Modulation	0	6	0
Legato	0	6	0
Resonance	2	3	1
Color Voices	0	6	0

Resonance

Fifty percent of the conductors thought that the choir's Resonance improved in the 'after' recorded excerpt of "Sicut locutus est" with the application of the Nose Syringe exercise. The conductors were also split evenly on the issues of Flexibility and Diction. However, it was almost unanimous that non-emergence of Color Voices, Legato, and Vowel Modulation were all better in the 'before' recording. See table 5.18.

Table 5.18. Conductor Votes after Application of Nose Syringe for Resonance

Issues	Before	After	Neither
Intonation	4	2	0
Diction	3	3	0
Flexibility	3	3	0
Vowel Modulation	5	1	0
Legato	5	1	0
Resonance	3	3	0
Color Voices	6	0	0

Color Voices

Five out of six conductors voted that there were fewer Color Voices cutting through the choral texture in “Abendlied” after the application of the Father Arpeggio exercise. In addition, ensemble Legato and Vowel Modulations improved with the ‘after’ recording. However, it was clear that most conductors thought that the choir had better Diction, Intonation, and Resonance in the ‘before’ recording (see table 5.19).

Table 5.19. Conductor Votes after Application of Father Arpeggio for Color Voices

Issues	Before	After	Neither
Intonation	3	2	1
Diction	4	2	0
Flexibility	1	2	3
Vowel Modulation	3	3	0
Legato	1	4	1
Resonance	5	1	0
Color Voices	0	5	1

Summary of Findings for Exercises Tested on Choral Literature

At least three out of six conductors voted that the recorded excerpt containing music on which the exercises had been applied was improved for Intonation, Legato, Resonance, and blend of Color Voices. Fewer than three conductors heard a measurable improvement in the music after the application of exercises that affected Diction, Flexibility, and Vowel Modulation. The only element that had 100% conductor agreement in its positive affect on the tested music was Legato ([ni ne na no nu]).

There does not seem to be any apparent correlation between the success or failure of an exercise as applied to the music and its affect on the other issues. Diction seemed to have improved from the conductors' standpoint for five of the seven 'after' musical examples, but not the one on which it was tested. Resonance and Color Voices improved on four of the 'after' examples, including the excerpts on which they were tested. Intonation, Legato, and Vowel Modulation all were viewed as improving the ensemble sound on the 'after' recording, but Vowel Modulation improved on excerpts for which it was not being tested. Flexibility improved in only two 'after' recordings, both of which did not test for its success.

The 'after' recordings which yielded improvement of two or more tested elements may have been due to the fact that the choir knew the music more thoroughly for the second recording. However, recalling the possible singer confusion after application of IPA to "La Biche" may explain the better blend of Color Voices perceived by the conductor panel in that the singers were not singing to their full potential.

To recapitulate, table 5.20 lists the tested element, corresponding exercise, tested literature, and the conductor panel's rating of success of the exercise to change the overall

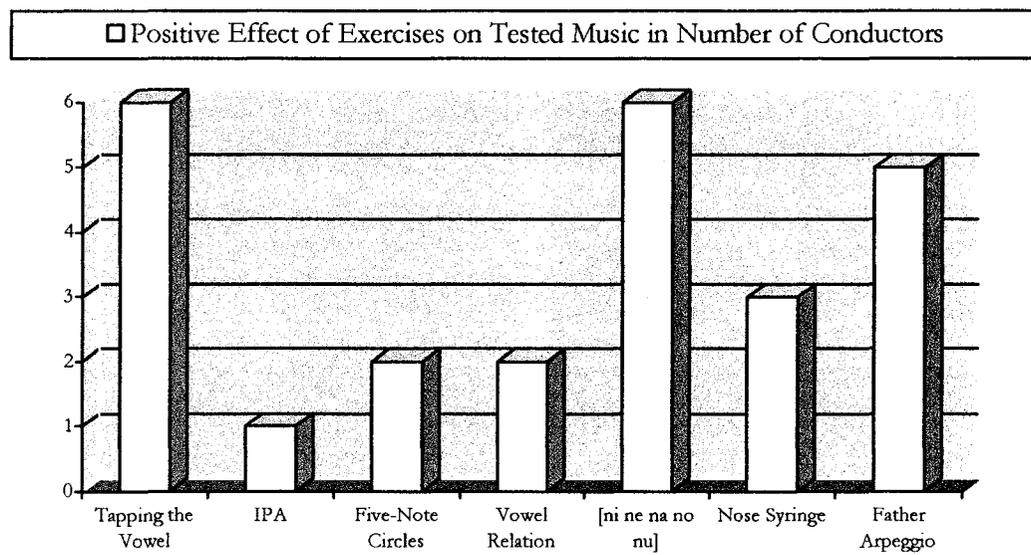
ensemble sound. Success is measured by three or more conductors out of six voting that the 'after' recording contained the better ensemble sound.

Table 5.20. Success of Tested Exercises as Voted by Conductors

Issue	Exercise	Literature	Success
Intonation	Tapping the Vowel	The Lamb	Successful
Diction	IPA	La Biche	Unsuccessful
Flexibility	Five-Note Circles	Quicksand Years	Unsuccessful
Vowel Modulation	Vowel Relations	Take, o take	Unsuccessful
Legato	[ni ne na no nu]	Sicut cervus	Successful
Resonance	Nose Syringe	Sicut locutus	Successful
Color Voices	Father Arpeggios	Abendlied	Successful

Possible skews to the conductor panel and the questionnaire process include a feeling that either recording A or recording B had to be voted as "better," as opposed to voting for "Neither." As one conductor stated, "Within each recording there are inconsistencies which for many made me think neither was the best answer, but I tried to find a 'better' performance." Another possible skew might have been that a conductor may not have actually listened to the examples, in that one questionnaire had the B excerpt marked as "better" for every element on every recorded pair of excerpts.

Figure 5.13. Positive Effect of Exercises on Tested Music, Conductors



DISCUSSION OF SINGER AND CONDUCTOR RELATIONSHIP OF RESULTS

As the reader may recall, the two exercises that were rated highest in relation to singers' understanding of the exercise goal, how to sing the exercise, voice function and if the exercise will be used in further voice study were [ni ne na no nu] (97.8%) for Legato and Five-Note Circles (97%) for Flexibility. The three top-rated exercises as judged by the singers in relation to accomplishing the goals of the choral literature were Vowel Relation (96%) for Vowel Modulation, [ni ne na no nu] (96%) for Legato, and Five Note Circles (93%) for Flexibility. In addition, the researcher concluded that the most successful exercise overall from the singers' perspective, including application to the music, was the [ni ne na no nu] exercise for Legato. Table 5.21 illustrates the ranking of exercises with their corresponding success values.

Table 5.21. Ranking of Exercises According to Singer Questionnaires

Ranking	Exercise	Average Success (In Percents)	Student Understanding (In Percents)	Success of Application to Music (In Percents)
1	[ni ne na no nu]	97.4	97.8	96
2	Five-Note Circles	96.2	97	93
3	Tapping the Vowel	93.8	94.5	91
4	Vowel Relations	93.6	93	96
5	Father Arpeggios	92.4	93.5	88
6	IPA	89.6	90.3	87
7	Nose Syringe	88.6	89.5	85

There are two items of interest in the table above. The first is that in six of the seven exercises tested, the success of application to the music was lower than the students' general understanding of the exercises. This may be due in part to a time gap: the students learned the exercises in Rehearsal #4, but were asked to evaluate their effectiveness as applied to the music in Rehearsal #6. Secondly, although Vowel Relations scored 93% for student understanding, it scored a 96% for application to the music. This data demonstrates that although students may not fully understand the concept or pedagogy of the exercise, they are still able to identify its positive effect on the music.

Table 5.22 is a summary of the results of the Conductor Questionnaire. The ranking was determined according to the number of conductors who voted a positive change in the ensemble's sound after application of the exercise. Included in the table is a listing of how many times the conductors voted that the issue was improved over all of the 'after' examples.

Table 5.22. Ranking of Exercises According to Conductor Questionnaires

Ranking	Issue and Exercise Tested	Improvement on Tested Issue and Music	Number of Times Issue Improved	Comments
1	Intonation (Tapping the Vowel)	6/6 Conductors	3	
2	Legato ([ni ne na no nu])	6/6 Conductors	3	
3	Color Voices (Father Arpeggio)	5/6 Conductors	4	
4	Resonance (Nose Syringe)	3/6 Conductors	4	
5	Flexibility (Five-Note Circles)	2/6 Conductors	2	Not voted as improved on the issue tested
6	Vowel Modulation (Vowel Relations)	2/6 Conductors	3	Not voted as improved on the issue tested
7	Diction (IPA)	1/6 Conductors	5	Not voted as improved on the issue tested

The most successful positive change in issues from the 'before' to the 'after' recordings of the musical excerpts as judged by the conductor panel were Intonation (100%, or six out of six conductors), Legato (100%), Color Voices (five out of six conductors, or 83%), and Resonance (50%). It is interesting to note how many times each issue was voted as having been improved for all of the examples. Diction improved on five out of the seven 'after' musical examples, even though it did not show improvement on "La Biche."

By correlating the success of exercises from the singers' individual experiential opinions and from the conductors' aural opinion of the ensemble, the most successful tested vocal exercise was [ni ne na no nu] for Legato. The second most successful exercise was Tapping the Vowel for Intonation.

The overall success of the [ni ne na no nu] exercise lies in its simplicity. The exercise encompasses only a five-note range, yet challenges the voice with skips of both major and minor thirds. Young singers are able to understand the purpose and goal of the exercise, while having almost immediate results through the easy sliding concept. Once a singer can identify the consistent phonation within the voice, he or she is able to contribute a more consistent and reliable tone to the ensemble. Conductors are able to hear a more refined and efficient sound from the ensemble as a whole, and subsequently hear immediate change in the ensemble's approach to the given choral literature (in this case, a Renaissance motet).

VI. CONCLUSIONS

CURRICULUM CONCLUSIONS

From the results and information gathered in this experiment, one can deduce that all exercises were successful in teaching entry-level collegiate singers usable vocal techniques and in extracting a more refined and accurate choral ensemble tone. Some exercises had a more apparent effect on the ensemble's sound, whereas some only benefited the singer as individual. Table 6.1 illustrates the results that a conductor can expect from singers and from the ensemble as a whole when using the selected exercises from the CVPCC. Only the tested exercises are included in the table, but one can expect similar results from other concepts and exercises in the Curriculum.

Table 6.1. Curriculum Results

Issue	Suggested Exercise	Results: Singers	Results: Ensemble
Intonation	Tapping the Vowel	Reiteration of pure vowels	Highly improved Intonation, Resonance, Diction, Vowel Modulation, Legato, and Color Voices
Diction	IPA	Comprehension, recognition, and application of IPA characters which represent sounds of the foreign language	Improved Color Voices
Flexibility	Five-Note Circles	Consistent air flow and vowel placement for melismatic or arpeggiated passages	Improved Color Voices, and Diction
Vowel Modulation	Vowel Relation	Relationship of resonant vowels acoustically appropriate for a given range	Highly improved Diction, improved Resonance and Intonation
Legato	[ni ne na no nu]	Consistent phonation between notes	Highly improved Legato, Flexibility, Color Voices, Vowel Modulation, and Intonation, Improved Diction and Resonance
Resonance	Nose Syringe	Cultivation of sinusital resonance	Improved Resonance, Diction, and Flexibility
Color Voices	Father Arpeggio	Energized and functional singing tone with reduced overtones	Highly improved Color Voices, improved Legato and Vowel Modulation
Vibrato	Encouraging Vibrato, Reducing Tremolo, Reducing Wobble	Efficient and tension-free phonation by all parts of the voice (actuator, vibrator, resonators, and articulators) to function together optimally	Probable improved Color Voices
Range Extremes	Five-Note [u] Scale, Zi lo mai	Cultivation of adduction and abduction control	Probable improved Intonation, Color Voices, Vowel Modulation and Resonance
Passaggio	Slides of Fifth on [u], gender specific exercises	Blended transitions into and out of phonation registers	Probable improved Resonance, Intonation, Color Voices, Vowel Modulation, and Legato

In addition, it must be reiterated that with the use of exercises in the CVPCC, results suggest that a conductor will hear an ensemble improvement in more than one area. For example, in five out of seven tests for other issues, Diction was improved after application of any exercise to bring the vocal placement into the resonance. Vowel Modulation, or consistency of vowel placement, improved Resonance. Flexibility, in turn, was improved by increased Resonance. Consequently, as singers concentrate, they tended to sing with a less resonant sound. Reduced Resonance caused improved Color Voices and Legato.

Two major conclusions can be drawn from the results of this experiment. It seems that as individual Intonation improves through the use of the Tapping the Vowel exercise, so does Resonance, Diction, Vowel Modulation, Legato, and Color Voices (see figure 6.1). More importantly, as Legato (or consistent phonation) improves through the use of the [ni ne na no nu] exercise, so will every other issue of Choral Tone and Singer Technique tested (see figure 6.2).

This study suggests that the most important issues to conquer in an ensemble setting are an individual's Intonation and consistent phonation, or Legato. Furthermore, as Resonance and consistent placement are cultivated within the individuals of the ensemble, Diction will vastly improve. In addition, this study suggests that the emergence Color Voices in an ensemble is due in large part to increased Resonance of a particular voice.

Figure 6.1. Relationship of Intonation to Other Issues

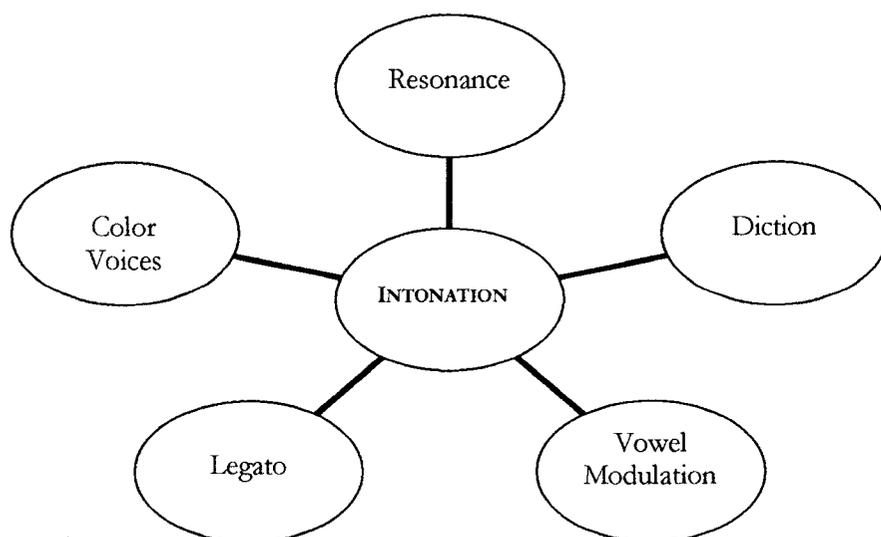
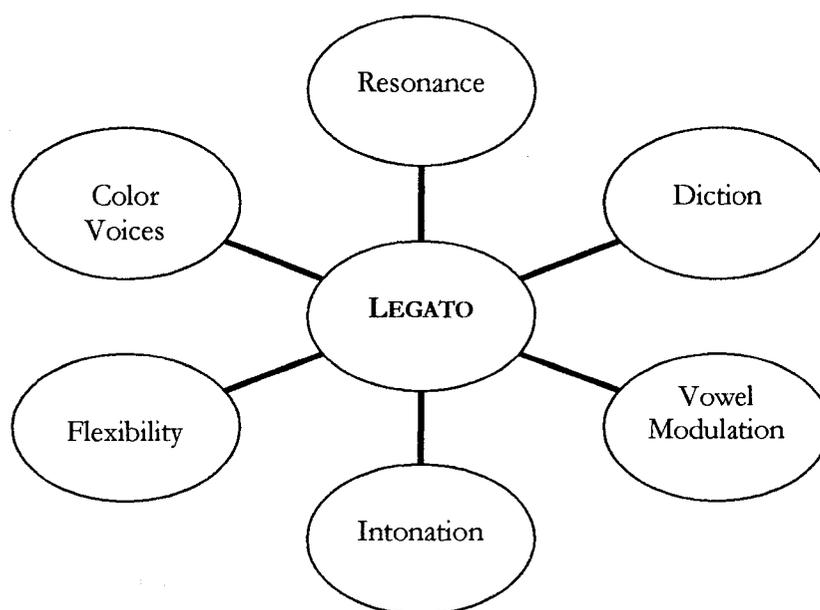


Figure 6.2. Relationship of Legato to Other Issues



ADDITIONAL CONCLUSIONS

Some additional conclusions can be made from the results of this experiment. First, the success of a given exercise does not always correlate between a singer's point of view and a conductor's opinion. For example, one of the most successful exercises from the singers' standpoint was the Five Note Circles for Flexibility. This particular exercise was deemed unsuccessful in the cultivation of ensemble Flexibility by the conductor panel. However, this result points to the notion that if singers feel confident that a particular exercise gave them more refined vocal technique, then an ensemble warm-up or exercise could be applied to cultivate the effect that a conductor may want. In addition, individual exercises are important to give singers vocal skills and confidence which will empower them with knowledge, but ensemble warm-ups and exercises are valid as dictated by conductor tone preference.

Secondly, singer technique is a building block that will allow conductors to have a wider palette of sounds with which to work. Individual singer and conductor dedication to learning efficient vocal technique will improve the ensemble sound. This corroborates the principle that an ensemble can never be any better than its weakest member, or any better than the skills of its conductor.

Lastly, specific vocal challenges present themselves in choral literature. It is imperative that singers and conductors alike have a multitude of techniques to serve the needs of the singer. In this way, the individual is empowered to make the most efficient contribution to the ensemble as a whole. In addition, with vocal knowledge and technique, singers will be able to contribute to the ensemble the sound that it needs for a specific style of choral literature.

Possible Skews

As with any study, unforeseen circumstances may have caused skews to the overall successful results of this experiment. Missing data as a result of absences in the choir made it such that the researcher could not include any information from that subject in the final tabulations. This resulted in a loss of 17% of the questionnaire data.

One large possible skew was that the researcher was able to present the material to the choir. The researcher employed the help of student demonstrations so that the singers could hear a non-trained voice sing the exercise. However, the researcher's feedback to the choir is particular to her experience with the material. One may wonder if a different conductor would have the same results in teaching the exercises to the same choir.

The largest possible influence on the results is that learning to sing is a time-consuming process. One cannot learn and apply exercises for vocal growth in a week's time period with accurate results.

In addition, the conductor panel may have been influenced in their opinions of the recorded excerpts. University Singers knew the music more thoroughly for the 'after' recordings, which may have padded the success of the application of exercises to the literature on the Conductor Questionnaire.

If this study were to be replicated in the future, certain controls would be necessary. A script of exact wording for other conductors to follow in the presentation of the concepts and exercises would reduce instructor affect. The instructions for and the reading of items on the Singer and Conductor Questionnaires could be recorded onto a CD with specified interlude timings to control the amount of time given to answer the questionnaires. For the Singer Questionnaires, a thorough explanation of the definitions for the terms would aid in

gathering more accurate data, especially in the Singer Pretest. Every questionnaire could be re-worded to control for possible subject leading, and a pre-test with a smaller sample group would intercept unclear statements and questions. Controls for the Conductor Questionnaire could include aurally training the conductor panel with unrelated examples of ensemble improvement.

Implications

The most significant implication of this study is that the CVPCC is a successful tool for the teaching of singing within an ensemble setting. It is a revolutionary approach to choral singing: the individual choral singer is empowered with knowledge to make the most effective vocal contribution to an ensemble. In addition, this study proved that for an entry-level collegiate choir, solo vocal techniques were successful in accomplishing the demands of the choral literature. With the success of this study, the researcher proposes that individual responsibility for one's own instrument can raise the standard in choral singing. Subsequently, choral conductor responsibility for the cultivation and care of developing voices can be taught through solo vocal techniques.

Further research could include this same experiment with a choir over the course of at least a semester to measure vocal growth more accurately within the exercises and techniques. In addition, conductors could replicate the study with the vocal issues in other, possibly more advanced, repertoire and with different vocal exercises. One could also study the Lombard effect on an individual's contributive singing technique to the choral ensemble.

In conclusion, the researcher would like to express that the exercises and techniques presented in the study are not meant to be the only answer to the issues explored, but rather

one more approach in the body of professional vocal and choral knowledge. If the information is helpful to one or more persons, it has been a success.

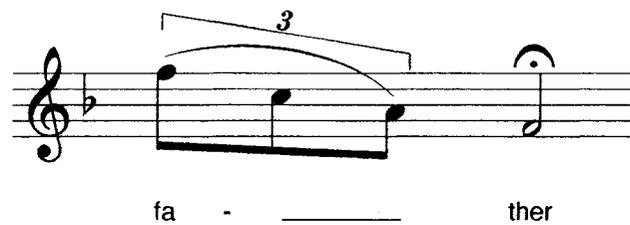
APPENDICES

APPENDIX A: TESTING EXERCISES¹

CHORAL TONE ISSUES

Color Voices

1. Sigh-singing



Objective: To allow for an energized and functional singing tone with reduced overtones

Process: -While singing, allow some of the buzzy resonance felt in the mask to relax, while keeping constant air flow
-“Sigh into the sound”

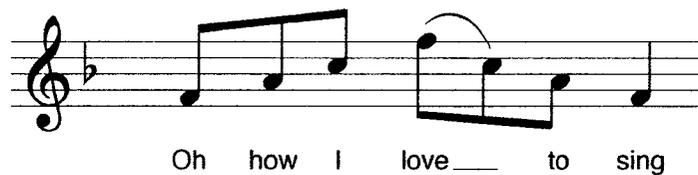
Derivation: common in reducing hyperfunction, Lamartine

Pedagogy: By allowing for a relaxed approach, the vocal folds will adduct slightly less to produce fewer overtones. Slightly less energized air will not allow all of sound waves to access the upper resonators.

¹Nicole C. Lamartine, Notes from voice teaching and conducting, 1997-2003, ADS, Personal collection; Nicole C. Lamartine, Notes from voice training, 1988-2003, ADS, Personal collection.

Intonation

1. "Tapping" the vowel



Objective: To iterate the pure vowel

Process:

- Anticipate articulation of consonant
- Sing consonant through vowel that follows it
- Sing vowels without consonants

Derivation: Prof. Faye Robinson, Lamartine

Pedagogy: Reiterating the vowel allows for vocal folds to adduct slightly for each vowel with a consistent air flow underlying phonation. Air flow remains consistent so that each time the folds approximate they are given an extra amount of air flow, creating a slight accent on each vowel.

2. Senza Vibrato

Objective: To sing with little or no vibrato

Process: “Straighten” air flow so that energized air does not resonate in the upper resonating chambers

Derivation: Lamartine

Pedagogy: The reduction of energized sound waves allows for a sound with fewer overtones. A choral sound can be better tuned at the ends of crucial phrases with fewer overtones.

Vowel Modulation

1. Vowel Relations



The image shows a musical staff in treble clef with a key signature of one flat (B-flat). The melody consists of a series of eighth notes: G4, A4, Bb4, C5, D5, E5, D5, C5, Bb4, A4, G4. There are two slurs, one over the first five notes and another over the last five notes. Below the staff, the vowels are listed: Women: i e a _____ and Men: u o a _____.

Objective: To allow for the most resonant vowels that are acoustically appropriate for range

Process: -For a given passage, find the vowel that “works” and is comfortable
 -Remember the feeling and sound of that vowel while singing the actual vowels of the passage or think the first vowel while singing the actual vowels

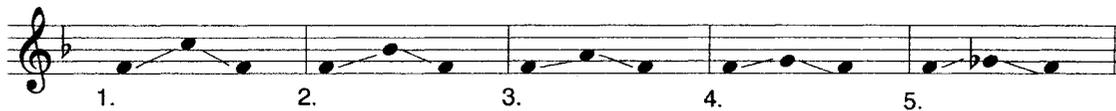
Derivation: Lamartine, common, Berton Coffin

Pedagogy: Muscle memory and auditory feedback act as monitors while singing the actual vowels of the passage. The vowel that works tends to be the most acoustically appropriate vowel for that singing range. (See Berton Coffin's vowel chart)²

SINGER TECHNIQUE ISSUES

Flexibility

1. Trill



Objective: To sing two neighboring notes in quick and clear succession

Process:

- On the vowel of your choice, sing an open fifth (like Tarzan)
- On the same vowel, a perfect fourth (collapsing the interval)
- On the same vowel, a major third
- On the same vowel, a minor third
- On the same vowel, a major second
- On the same vowel a minor second
- Work for lack of phonatory control and laryngeal freedom within a bright sound

Derivation: Lamartine, Jon Linford

² Berton Coffin mastered the acoustical appropriateness of vowels and their subsequent 'modification' along a given spectrum of pitches. Berton Coffin, *The sounds of singing: Vocal techniques with vowel-pitch charts* (Boulder, CO: Pruett Publishing Co., 1976).

Pedagogy: Non-control of sound encourages laryngeal holding patterns to diminish. Once free and loosely suspended, the larynx encourages other minute musculatures to negotiate rapid and clear pitch succession.

2. Scalar Melismas

Women: i or a _____ Men: u or o _____

Objective: To sing scalar melismatic passages with clarity

Process:

- Men: place a diaphragmatic pulse on each note (as if laughing from the belly)
- Women: place a glottic flutter on each note (as if giggling)
- Both: place a vowel on each note, keep an open pharyngeal tube that does not change, and keep the vowel consistent, allowing only oro-pharyngeal space to change when needed for range extremes

Derivation: Lamartine, Prof. Faye Robinson, common

Pedagogy: The pulse of each note, whether diaphragmatic or laryngeal, creates an audible, but free attack on each note. By keeping the pharynx open and free and the vowel steady, the singing placement stays consistent. The placement allows for consistent resonance which is perceived by the listener as each note having the same quality.

3. Five Note Circles



Objective: To cultivate a feeling of moving notes being in the same vocal place

Process: -132435421 three times, once each on [i, e, a]

-Sing in “circles” with the upper notes moving up and over

-Imagine the notes are not up and down, but moving out away from
the body in the same plane

Derivation: Prof. Faye Robinson, Lamartine

Pedagogy: The imagination of the notes being in one place allows for less laryngeal
adjustment during rapid passages, which in turn produces more
consistent resonance and phonation.

Legato

1. Legato

i
or o
or a

i e a o u
or ni ne na no nu

i
or u

i a i a
or u o u o

Objective: To allow for consistent vibration between notes

Process: On a five note scale or 132435421 or 1356531 slide ever so slightly
from one note to another, reducing the 'h' between notes

Derivation: Lamartine

Pedagogy: By sliding slightly between notes, the vocal folds never stop vibrating.

This creates consistent phonation which reduces breathiness and breath loss.

Resonance

1. Nose Syringe

1. n n n n n

2. n n ni _____

3. ni _____

Objective: To access upper sinusital resonating spaces

Process:

- Imagine two syringes filled with air are placed up the nose
- On 'n': Five note scale down allowing a puff of air to escape through the nose
- On 'n': 5554321 two staccato 'n' hums followed by the five note scale on [ni]
- On [ni]: 8531 each arpeggio begins with a slight 'n' hum
- Be sure that there is not tension in the back of the tongue

3. Speak-sing (“Julia Child,” “Pirate”)

Objective: To cultivate a consistent air flow, resonance, and palatal lift using speech as the vehicle

Process: Speak the words of the piece at the relative pitch level with an exaggeration of either air flow and resonance (Pirate) or air flow, low larynx, and palatal lift (Julia Child)

Derivation: Lamartine, common

Pedagogy: As speech is common to most singers, relating singing to elongated speaking often releases tension that may be present in the larynx and articulators.

4. Lower range ‘nyang’

nyang nyang nyang nyang nyang

nyang nyang nyang nyang nyang a _____

Objective: To cultivate sinusital resonance in lower range, to allow vocal folds to function with relaxed vibration, to allow for a mixed head/chest sound (women)

Process: -On the notes D,R, Me, R, D singing on a breathy 'nyang'

- Feel the buzziness in the upper mask
- After 'nyang,' add an [a] on the same notes
- Take the breathiness out of the [a], while still feeling the buzz
- Remove 'nyang' and sing only on [a], retaining the frontal placement
of the sound

Derivation: Lamartine

Pedagogy: As one descends into chest voice, the entire surface edge of the vocal fold vibrates. By encouraging a breathy sound with much frontal resonance, one can learn to sing with less forceful adduction and a shorter vibrating surface on the vocal folds, while keeping resonance with a frontally-placed tone.

Diction

1. International Phonetic Alphabet

Objective: To learn and recognize IPA characters which represent sounds and apply them to the text of the foreign language

Process: Learn pertinent vowel and consonant symbols

Derivation: Common

Pedagogy: By linking a symbol to a sound, singers have a visual, aural, and oral reference of how to produce that sound in the context of the music.

APPENDIX B: ADDITIONAL EXERCISES³

Vibrato

1. Encouraging Vibrato



Objective: To encourage all parts of the voice (actuator, vibrator, resonators, and articulators) to function together optimally

Process: -Five-note scale down on [i] or [u], ending in a shake at the bottom
 -Work for lack of laryngeal control while singing the shake

Derivation: Lamartine

Pedagogy: Vibrato is a natural occurrence that happens when energized air is sent through relaxed vocal folds to create sound waves which are accentuated by accessing the open spaces of the resonators. Other types of vibrato (diaphragmatic pulsations, bleat, tremolo) are manufactured alterations of tone and/or pitch caused by deliberate function or as a result of other tensions within the vocal mechanisms. In order for a natural vibrato to occur, laryngeal tension must not be present.

³ Lamartine, Voice teaching and conducting; Idem, Voice training.

2. Reducing Bleat or Tremolo



Objective: To reduce tremolo through relaxation of the articulators, creating a breath connection, and singing legato

Process:

- Slides of 5ths and octaves, paying special attention to consistency of breath flow
- Sing with “mush-mouth” (relaxed enunciation)
- Mirror work to recognize and identify facial and tongue tensions
- Sing on any scale or passage with skips of no more than a third, sliding gently from one note to another (legato)
- Speak-singing (Julia Child) applied immediately to the sung passage to reinforce relaxed muscle memory
- Quick vocal slides and sirens with a rush of air

Derivation: Lamartine

Pedagogy: A tremolo occurs when undue tension is present in the jaw or lips paired with lack of breath connection. With relaxation and non-control of the singing sound, air flow can be energized and increased, allowing for a natural, slower vibrato to be produced. In addition, singers with tremolo tend to have an extremely directed sound. With the cultivation of palatal lift and relaxation of facial tensions, the sound becomes warm within the focus.

3. Reducing Wobble



Objective: To reduce wobble through relaxation of articulators, energizing air flow, and re-directing placement

Process:

- Sing with a buoyant tone, without weight in the lower voice
- Sing in “circles” for the melisma, imagining the notes being sung in one vocal plane out away from the body
- Work for upper resonance to lift the placement from mouth to sinusital resonators
- Mirror work to relax the tongue into its most flat position (like raw oysters in the shell)

Derivation: Lamartine

Pedagogy: A wobble occurs when there is undue tension present in the back of the tongue, paired with lack of breath energy. The tongue tension often depresses the larynx and blocks the pharyngeal resonating space, which makes vowels unclear. Oftentimes, singers with wobble will also sing with exaggerated oro-pharyngeal opening, which causes the tone to be unfocused and noisy. When the mouth-placed sound is re-directed to sinusital placement, the tone becomes resonant with less effort on the singer’s part.

In addition, singers with wobble often manufacture vibrato from diaphragmatic pulses. As the singer learns to use a consistent stream of air, the energized air is more likely to reach the resonators and create a quicker, more natural vibrato.

Passaggio

1. Women's Upper Passaggio

The image contains two musical exercises on a treble clef staff. The first exercise is a melodic line with a wavy vibrato line, with the vowel 'u' written below. The second exercise is a chromatic exercise with the syllable 'wi' repeated under each note.

Objective: To blend the transition into and out of head voice (b^1 to $f\#^2$ for sopranos, a^1 to e^2 for mezzo-sopranos)

Process:

- Slides of a fifth working chromatically upward and downward
- On a chromatic major third, sing [wi wi wi wi wi wi wi wi wi]
- More air, less voice (less adductive pressure)
- Sighs from top down

Derivation: Lamartine, Dr. Martha Rowe

Pedagogy: Slides allow for consistent vocal vibration while the change from heavy to light mechanism occurs. The chromatic exercise allows for small intervals to

be sung in quick succession, not allowing the voice to make any detrimental adjustments. Any exercise from the top down will create muscle memory with a penchant for the lighter mechanism. Once the lighter mechanism is solid, cultivating resonance is almost automatic.

2. Men's Upper Passaggio

u _____ u _____

i _____ e _____
 e _____ i _____
 u _____ o _____
 o _____ u _____
 a _____ a _____

Objective: To blend the transition into and out of the lighter mechanism to create head voice (c^1 to g^1 for tenors and b to e^1 for baritones/basses)

Process: -Slides of a fifth up and down, keeping consistent air flow and low laryngeal positioning

-Five-note scales up and down with a light sound

-Vowel gradations: five note scale up and down on

[i] to [e]

[e] to [i]

[u] to [o]

[o] to [u]

[o]to [a]

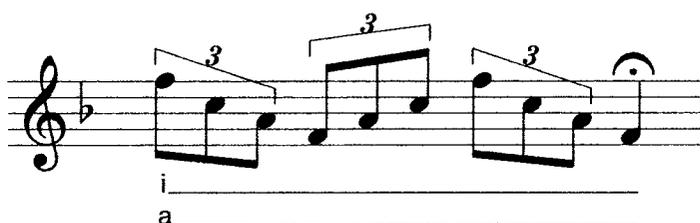
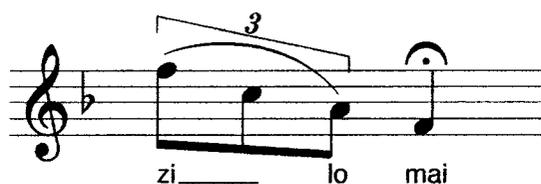
[a] to [o]

Derivation: Prof. Charles Roe, Lamartine, common

Pedagogy: The transition in men's voices into the upper passaggio is more dramatic than in women's voices. Therefore, as men learn how to approach the upper register, care must be taken to keep the larynx low and to keep the sound light. Young male singers have a tendency to lift the larynx and chin as the pitches ascend. A lighter production will produce less adductive pressure on the vocal folds, allowing for a more smooth transition between register productions. Vowel gradation is helpful in that the singer learns to transfer muscle memory of a low larynx to all vowels in the spectrum.

Range Extremes

1. Top Extremes



Objective: To cultivate an approach to singing in the upper registers with ease

Process: -Quick arpeggios down from top on a range of vowels with no time to re-set voice for register shifts

-Quick arpeggios down and then back up again

Derivation: Lamartine, common

Pedagogy: If a singer can touch one high note, that singer has the potential to be able to sustain that note with further practice. A light approach with a rush of air from breathing musculature contractions creates an open pharyngeal tube with little adductive pressure on the vocal folds.

2. Low Extremes



Objective: To cultivate an “off the cords” approach to the lower range extremes

Process: -Five note scale down on [uiuiuiui], allowing sinusital resonance to take over on the descent

-“Lower Range Nyang” exercise (see Testing Exercises, Resonance, #4)

-Men: practice on [o] with a slight protrusion of the lips

Derivation: Lamartine

Pedagogy: As singers descend into a comfortable lower range, they tend to relax the placement and allow the vocal folds to vibrate without any “lift” in the sound. This creates a “gravelly” sound, especially in men and altos. By cultivating palatal lift and ease going into the lower range, the transition of registers coming out of the lower range occurs with more ease. In addition, placement stays consistent, allowing for a connected sound throughout the range. For men, the protrusion of the lips creates a longer pharynx, allowing for more resonance with less effort.

APPENDIX C: BASIC VOICE PEDAGOGY

Teaching Strategies and Ideas⁴

Bernoulli Effect: Students can hold two pieces of paper loosely together close to their lips. As they blow, the papers are actually sucked together instead of blown apart, as one might expect. This is the cycle of motion that produces sound at the vocal folds.

Vibrator: The sound waves that are produced at the vocal cords housed in the larynx sound only like the “put-put” of an engine or the tapping of a lip buzz (without phonation). Students can demonstrate this with an unvoiced lip buzz or a vocal fry.

Hertz: The number of vibrations (or Bernoulli cycles) per second. For example, the pitch A at 440 Hz means that the vocal folds are opening and closing four hundred and forty times per second.

Resonators: A resonating space is any open space in the head (or body) with hard or taut surfaces in which a sound wave can be amplified (open spaces and hard places). Examples of resonating cavities include a piano, guitar, violin, megaphone, etc.

⁴ Ibid.

Articulators: The voice is the only instrument to have the honor of producing words with the music. Articulators include lips, teeth, and the tongue.

Vocal fold function: Use a rubber band or two index fingers side by side to demonstrate adduction and abduction (change of glottis opening). Use two index fingers in a wave-like motion to demonstrate the movement of vocal fold vibration. Show the shift of registers from the whole surface of the vocal fold vibrating to a smaller amount of surface with differing amounts of fingers touching for vibration.

Use the rubber band to demonstrate pitch change as a result of tension and stretch. Explain that the length of the rubber band's vibrating surface results in a change of pitch: the longer the rubber band is stretched (addition of tension), the higher the sounding pitch, and vice versa. However, if there is already tension on the vibrating surface, the length affects the pitch conversely. For example, the shortest strings on a piano sound the highest pitch. Thus, a pair of vocal folds works like both the rubber band and the piano string in that the vocal folds are stretched to a longer length to sing a higher pitch, but less of the vocal fold surface is actually vibrating.

Each singer can also do a lip buzz demonstration in which one actuates a non-phonated lip buzz while using the fingers at the corners of the mouth to pull the lips towards the ears. The pitch will rise as tension on the lips increases. In addition, most singers find that in doing this exercise, they must concentrate on using more air in the buzz as tension increases or it will stop. Thus, one learns the lesson that higher pitches usually need to be powered with more air flow.

Arytenoid cartilages: These small, triangle-like cartilages work much like two hands holding the reins of a horse in that they are at least partly responsible for moving the vocal folds together, apart, and up and down to increase or decrease surface tension. They can even work independently of one another.

Thyroid cartilage: This cartilage is the largest and most frontal cartilage of the larynx housing. It is usually apparent on post-pubescent males. Students can feel the thyroid cartilage on themselves or a neighbor. Have the students feel or watch a male's throat as he executes a vocal slide from low to high. Most likely, the entire larynx will raise with the pitch. Remind the singers that, ideally, the larynx should not ascend as the pitch ascends.

Soft Palate: The most significant purpose of raising the soft palate when singing is that it regulates the amount of air flow that can access the upper sinusital resonators. Many singers will tend to tense the back of the tongue when learning the 'lifted' sensation, so be aware of tension.

Vocal Fold Size: The length of mature male vocal folds is about equal in length to the diameter of a nickel or quarter. The length of mature female vocal folds is about equal in length to the diameter of a dime. This visual reference helps students to realize that the voice is a tiny instrument and that it can produce much sound, but that because of its size, one must be careful to keep it and the body healthy.

Ribs: Have the students bend over at the waist while they feel their lower ribs on their backs. As they breathe, most will feel an expansion which demonstrates that the ribs are actually flexible bones.

Intercostals: These two sets of rib muscles are responsible for expanding and contracting the rib cage, and subsequently for the amount of thoracic space available for lung expansion. Students are able to remember their name and function by reminding them of the labels: inter- means 'between,' -costal means 'rib,' externals are on the outside and they expand the rib cage, and internals are on the inside and they decrease the volume of the rib cage.

Registers: A student can feel the two main vocal registers with a simple demonstration: have the students place a hand on his or her sternum while speaking a short phrase. Most people feel the vibration of the sound. Then, have the student place a hand across the lower forehead, nose, and cheekbones while they speak the same phrase. Most will not feel a vibration, but they may feel a vibration if they speak the same phrase in a 'high' voice. Generally when speaking or singing in a lower register, the voice is in chest register, employing the full vibrating surface of the vocal folds, or the voice with which we use to speak. As the pitch ascends, the vocal folds use less vibrating surface to produce sound, and thus, we call this head register. Quick feedback on the use of head and chest voices for new singers is a check to feel where the singing voice is vibrating.

Vibrato: Most voice scholars agree that vibrato is produced when all parts of the voice (actuator, vibrator, resonators, and articulators) are functioning together optimally. It is a

natural occurrence that happens when energized air is sent through relaxed vocal folds to create sound waves which are accentuated by accessing the open spaces of the resonators.

Straight tone: The lack of vibrato signifies a straight tone. According to the above definition of vibrato, in order to produce a straight tone, one of the parts of the voice must not function optimally. There are two basic ways of producing a straight tone: 1) “straighten out” the air flow to remove some of the breath energy that causes resonant sound waves, 2) adduct, or bring together, the vocal cords with more pressure than is needed to make the sound. The first option is optimum because of the reduction of an element, rather than addition of tension. However, it must be said that conductors may need to ask for straight tone to accommodate a certain style (Renaissance, jazz) or for intonation purposes.

Passaggio: Students are able to identify the upper and sometimes the lower passaggios with a simple slide on [u] from the bottom of the range starting from a vocal fry to the top of the range and then back down. Students have found that either the slide up or down seems to make the register shift more apparent. Again, the index finger demonstration of register shift is a quick way to show how much the vocal folds must shift to negotiate dramatic change of pitch.

Volume and Resonance: Most students hold the misconception that either the amount of air flow or the amount of sheer vocal fold use (adduction) in a singing sound produces volume. A cultivation of resonance is the key for high-level volume. It is the upper overtones of the sound spectrum that carry through a large space, not the abundance of

fundamental pitch. Ideally, a combination of optimal air flow and resonance will create efficient singing volume. One can demonstrate this principle by singing a comfortably low pitch in a full chest voice, and then sing the same pitch with the same energy and an abundance of nasal resonance. The second pitch is usually louder in most voices because of the use of resonating cavities. Many young singers try to 'make' volume through over-adduction of the vocal folds, instead of 'allowing' the volume to occur through a resonant placement. Similarly, a non-resonant tone usually is perceived by the singer as being louder because the singer hears it through bone and tissue conduction. The resonant sound is perceived as being 'in front' of the face and oftentimes easier to sing, but harder for the singer to hear.

Vowels: Singers must remember that the vowels carry the sound and its overtones into the performance space. Oftentimes, singers put more energy into the percussive aspects of consonants instead of the legato flow of the vowels. A sound that is connected in vowels will often be perceived as louder by the listener on account of the uninterrupted flow of sounds with overtones.

APPENDIX D: COMMENTS

SINGER QUESTIONNAIRE: TESTED EXERCISES

General

“Nicole, you’re so cool!”

“I may seem to ‘Strongly Agree’ often, however I have been in choirs for 9 years and am very familiar w/ most of these exercises or ones much like them!”

Intonation

“Very effective.”

“Very helpful.”

Language

“I already knew IPA.”

Flexibility

“Not sure if I do it correctly.”

Resonance

“Don’t remember!!” (also marked Disagree for all responses)

“Hard to do constantly.”

Color Voices

“☺”

“Explanation that time and energy be spent on [f] alone before singing needed to be earlier.”

SINGER QUESTIONNAIRE: ADDITIONAL EXERCISES

Passaggio

“Helps a lot with feeling of resonance.”

Encouraging Vibrato

“Pretty cool incorporating it at this level.”

In response to using the exercise in future vocal study, “Yes, but not vocal; instrumental.”

CONDUCTOR QUESTIONNAIRE

General Comments

“Within each recording there are inconsistencies which for many made me think neither was the best answer, but I tried to find a ‘better’ performance.”

John Tavener, “The Lamb”

“There aren’t any melismatic passages.”

“B [‘after’] was more energized sounding again.”

René Clausen, “Quicksand Years”

“The weight in the second example [‘after’] confounds the melisma [*sic*] and hurts legato.”

“In general, I prefer the more energized sound of A [‘before’], but the melismas were not clear, surprisingly.”

Palestrina, “Sicut cervus desiderat”

“B [‘after’] is smoother, freer, more whole.”

In explanation as to why the respondent marked A [‘before’] for only better vocal resonance, “vocal resonance does not equal blend,” meaning B [‘after’] had better “blend.”

J.S. Bach, “Sicut locutus est”

“Melisma and blend categories especially evident here [meaning B, ‘before’].”

Johannes Brahms, “Abendlied”

In response to which example had better diction, “...A [‘before’] had better vowel shape (esp. *lösen*), but that B [‘after’] had better consonant releases.”

APPENDIX E: TESTED CHORAL LITERATURE EXCERPTS

Choral Tone Issues

Color Voices: Johannes Brahms, "Abendlied," mm. 1-13

Abendlied
#3 from "Vier Quartette, Op. 92" Johannes Brahms
(1833-1897)

SATB with piano

Andante *p dolce*

Soprano: Fried - lich be - käm - pfen

Alto: Fried - lich be - käm - pfen

Tenor: Fried - lich be - käm - pfen

Bass: Fried - lich be - käm - pfen

Piano: *Andante* *p dolce*

Nacht — sich und Tag; wie das zu däm - pfen,

Nacht — sich und Tag; wie das zu däm - pfen,

Nacht — sich und Tag; wie das zu däm - pfen,

Nacht — sich und Tag; wie das zu däm - pfen,

Color Voices, continued: Johannes Brahms, "Abendlied," mm. 1-13

Wie das zu lösen vermag, zu lösen ver-

The score consists of four vocal staves (Soprano, Alto, Tenor, Bass) and a piano accompaniment. The lyrics are: "wie das zu lösen vermag, zu lösen ver-". The piano part features a rhythmic accompaniment with chords and moving lines in both hands. Dynamics include *f* and *p*. There are also hairpins and accents in the vocal lines.

13 mag!

mag!

mag!

mag!

The score consists of four vocal staves and a piano accompaniment. The lyrics are: "mag!". The piano part continues with a rhythmic accompaniment. Dynamics include *f* and *p*. There are also hairpins and accents in the vocal lines.

Intonation: John Tavener, "The Lamb," mm. 11-18

A tempo — moving forward

S
Lit-tle Lamb, I'll tell thee, Lit-tle Lamb, I'll tell thee;

A
Lit-tle Lamb, I'll tell thee, Lit-tle Lamb, I'll tell thee;

T
Lit-tle Lamb, I'll tell thee, Lit-tle Lamb, I'll tell thee;

B
Lit-tle Lamb, I'll tell thee, Lit-tle Lamb, I'll tell thee;

Intonation, continued: John Tavener, "The Lamb," mm. 11-18

S
He is called — by thy name. For he calls him-self a Lamb.

A
He is called — by thy name. For he calls him-self a Lamb.

T
He is called — by thy name. For he calls him-self a Lamb.

B
He is called — by thy name, For he calls him-self a Lamb.

S *poco*
He is meek, and he is mild, He be-came a lit-tle child.

A
He is meek, and he is mild, He be-came a lit-tle child.

T
He is meek, and he is mild, He be-came a lit-tle child.

B
He is meek, and he is mild, He be-came a lit-tle child.

Intonation, continued: John Tavener, "The Lamb," mm. 11-18

Poco meno mosso

S *pp*
I am a child, and thou a lamb, We are called by his name.

A *pp*
I am a child, and thou a lamb, We are called by his name.

T *pp*
I am a child, and thou a lamb, We are called by his name.

B *pp*
I am a child, and thou a lamb, We are called by his name.

Vowel Modulation: Emma Lou Diemer, "Take, O take those lips away," mm. 1-18

II. "Take, O take those lips away"

Slow $\text{♩} = 80$ *p*

S
A
T
B

Take, O take those lips a-way That so sweet-ly were for-sworn;

p

Slow $\text{♩} = 80$ *pp*

pp

pp

And those eyes, the break of day, Lights that do mis-lead the morn:—

mp

mp

S
A
T
B

But my kiss-es bring a-gain, bring a-gain; Seals of love,

mp *p* *mf*

mp *p* *mf*

mp *p* *mf*

Vowel Modulation, continued: Emma Lou Diemer, "Take, O take those lips away,"
mm. 1-18

The musical score is arranged in three systems. The first system contains the vocal staves for Soprano (S), Alto (A), Tenor (T), and Bass (B). The lyrics are: "seals of love, but seal'd in vain, seal'd in vain." The tempo is marked "Very slow" and includes performance instructions: "rit." (ritardando), "dim." (diminuendo), and "p" (piano). The piano accompaniment is in the second system, with the right hand in treble clef and the left hand in bass clef. It features a complex rhythmic pattern with many beamed sixteenth notes. Performance instructions for the piano include "rit.", "dim.", and "p". Below the piano staff, there are five "Ped." (pedal) markings and an asterisk (*) at the end of the system.

Singer Technique Issues

Flexibility: René Clausen, "Quicksand Years," mm. 36-end

Tempo primo

mp
Out of pol-i-tics, tri-umphs, bat-tles, life, what at last *mp* fi-nal-ly re-

mp tutti
Out of
Quick-sand years, quick-sand years,

mains? Ah
pol-i-tics, tri-umphs, bat-tles, life, what at last fi-nal-ly re-mains? Ah
quick-sand years, Ah
mp
Quick-sand years,

Flexibility, continued: René Clausen, "Quicksand Years," mm. 36-end

mf sim.
 On - ly the theme I sing, on - ly the theme I
mf sim.
 On - ly the theme I sing,
mp
 Out of pol-i-tics, tri-umphs,
 Out of pol-i-tics, tri-umphs, battles, life, what at last fin-al-ly re-

sing, quick-sand years. *mf Ah*
 on - ly the theme I sing, quick-sand years. *mf Ah*
 bat-tles, life, what at last fin-al-ly re - mains? *mf Ah*
 mains? Quick-sand years. *mf Ah*

ff non rit. div. 2
 lines give way, quicksand years.
 your schemes, poli-tics, tri-umphs, bat-tles, quicksand, quicksand years.
mp cresc. poco a poco lines give way, quicksand, quicksand, quicksand, quicksand years.
ff
 quicksand, quicksand, quicksand, quicksand, quicksand, quicksand, quicksand, quicksand years.

Legato: Palestrina, "Sicut cervus desiderat," Phrase 3

a - ni - ma me - a
 a - ni - ma mu - a
 a - ni -

ad te, De - us,
 ad te, De - us. a - ni - ma me - a
 ma me a ad te, De
 a - ni - ma me - a ad te, De

a - ni - ma me - a ad te, De
 ad te, De - us. ad te, De -
 us, a - ni - ma me - a ad te, De -
 us, a - ni - ma me - a ad te, De

us.
 us, ad te, De us.
 us, ad te, De - us.
 us, ad te, De - us.

Resonance: J.S. Bach, "Sicut locutus est," mm. 1-29

11. Sicut locutus est

Soprano I

Soprano II

Alto

Tenore

Basso

Continuo

Si - cut lo - cu - tus, lo - cu - tus est ad Pa - tres no - stros, A - bra -

Resonance, continued: J.S. Bach, "Sicut locutus est," mm. 1-29

Si - cut lo - cu - tus, lo - cu - tus
 cu - tus, lo - cu - tus est ad Pa - tres no - - - stros, A - bra - ham et se - mi - ni
 ham et se - mi - ni e - jus in sae - cu - la, si - cut lo - cu - tus est

6

Si - cut lo - cu - tus, lo - cu - tus est ad Pa - tres
 est ad Pa - tres no - - - stros, A - bra - ham et se - mi - ni e - jus in
 e - jus in sae - cu - la, si - cut lo - cu - tus est in
 in sae - cu - la, si - cut lo - cu - tus est ad Pa - tres

11

Resonance, continued: J.S. Bach, "Sicut locutus est," mm. 1-29

no - - stros, A - bra - ham et se - mi - ni e - ius in sae - cu -
 sae - cu - la, in sae - cu - - la, in sae - - - cu -
 sae - cu - la, si - cut lo - cu - tus est ad Pa - tres no - - -
 no - - stros, si - cut lo - cu - tus est in sae - cu -

16

Si - cut lo - cu - tus, lo - cu - tus est ad Pa - tres no - - - stros, A - bra -
 la, A - bra - ham et se - mi - ni e - ius in sae - cu - la, si - cut lo -
 la, Si - cut lo -
 stros, si - cut lo - cu - tus est in sae - cu - la,
 la,

21

Resonance, continued: J.S. Bach, "Sicut locutus est," mm. 1-29

Nam et se-mi-ni e-ius in sae-cu-la,
cu-tus lo-cu-tus est ad Pa-tres no-stros
cu-tus lo-cu-tus est ad Pa-tres no-stros
si

26

Diction: Paul Hindemith, "La Biche," mm. 1-8

I. The Doe. La Biche

For Four-Part Chorus of Mixed Voices
Unaccompanied

Rainer Maria Rilke
English version by
Elaine de Sincay

Paul Hindemith

Moderato e dolce (♩ = 72-80)

SOPRANO *p* *pp*
O thou doe,— what vis-tas of sec-u-lar for-ests ap-pear in thine
O la bi-che; quel bel in-té-rieur d'an-ci-en-nes fo-rêts dans tes

ALTO *pp*
what vis-tas of sec-u-lar for-ests ap-pear in thine
quel bel in-té-rieur d'an-ci-en-nes fo-rêts dans tes

TENOR *p* *pp*
O thou doe,— what vis-tas of sec-u-lar for-ests ap-pear in thine
O la bi-che; quel bel in-té-rieur d'an-ci-en-nes fo-rêts dans tes

BASS *pp*
what vis-tas of sec-u-lar for-ests ap-pear in thine
quel bel in-té-rieur d'an-ci-en-nes fo-rêts dans tes

Moderato e dolce (♩ = 72-80)

For rehearsal only *p* *pp*

Diction, continued: Paul Hindemith, "La Biche," mm. 1-8

eyes re-lect-ed! What con-fi-dence se-rene — af-lect-ed by tran-si-ent
yeux a-bon-de; com-bien de con-fi-an-ce ron-de mê-lée à com-

eyes re-lect-ed! What con-fi-dence af-lect-ed by dim
yeux a-bon-de; com-bien de con-fi-an-ce mê-lée

eyes re-lect-ed! What con-fi-dence af-lect-ed by dim
yeux a-bon-de; com-bien de con-fi-an-ce mê-lée

eyes re-lect-ed! What con-fi-dence se-rene — af-lect-ed by tran-si-ent
yeux a-bon-de; com-bien de con-fi-an-ce ron-de mê-lée à com-

shades, by shades of fear.
bien, com-bien de peur.

shades of fear, by shades of fear.
à com-bien, com-bien de peur.

shades of fear, by shades of fear.
à com-bien, com-bien de peur.

shades, by shades of fear.
bien, com-bien de peur.

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