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VOCAL PEDAGOGY IN THE CHORAL REHEARSAL: THE INFLUENCE OF SELECTED CONCEPTS ON CHORAL TONE QUALITY, STUDENT UNDERSTANDING OF THE SINGING PROCESS, AND STUDENT ATTITUDES TOWARD CHOIR PARTICIPATION

The Ohio State University

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DISSERTATION
Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By
Lynn Ann Corbin, B.M.E., M.A.

* * * * *
The Ohio State University
1982

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ACKNOWLEDGEMENTS

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Appreciation must be extended to my husband, Peter, for his never-ending support and encouragement throughout my entire graduate program.
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CHAPTER I
INTRODUCTION

There can be little doubt that choral directors are concerned about the final product created by their choirs: a quality performance. It is also evident from numerous articles in publications such as the Choral Journal, the Music Educators Journal, and the Journal of Research in Music Education that some choral directors are committed to good tone quality, careful and precise diction, and correct breathing technique. These articles and studies present teaching techniques and methodologies for meeting the vocal development needs of young singers, as well as warnings against mistreating young voices. As Lee (1977, p. 5) said:

Choral directors should know as much as possible about the human voice. They have a responsibility to give young singers sound vocal advice to prevent damage to the vocal instrument. There are directors who are hurting voices.

It might be expected that the long-range goals and objectives of a choral program do indeed include vocal development. Weiss (1978, p. 32) stated that "the most important goal of the choral director in the schools is to help the student to discover and develop his or her vocal instrument." However, a lack of emphasis placed on voice development techniques has been observed in numerous choral settings by the Investigator. Whether this is a result of a lack of substantiated,
quantified procedures and research for the teaching of voice concepts is a matter of conjecture.

Directors who choose to ignore vocal development for their choirs are committing a disservice to the choristers' musical education. The choral teacher has an obligation to truly educate the choir in the areas of music reading, interpretation, and singing, but until the educational value of vocal development for choirs is firmly established, directors will continue to doubt its importance and effectiveness. Since the primary function of a choir is to sing, it seems reasonable to expect that the singers would receive instruction in proper singing technique.

A school's choral program is often evaluated in an external fashion with contest ratings or the number of community performances as primary criteria for success. In these instances, little concern is shown for what the students are learning beyond the actual songs that are performed. While high contest ratings may indicate good teaching, ratings should not be the sole evaluative criterion for determining quality singing instruction. Evaluations of the choral teacher and the choral program should be made on the basis of how the singers develop, learn, and improve as a result of their involvement in the choir. If they as individuals and the choir as a unit are not gaining in skill, the program is weak.

Poor rehearsal technique may also result in a weak choral program. Many choral directors lack organization and direction within each rehearsal, preventing students from learning. In such situations, the
conductor may be involving the students in activities throughout the class period, but may not be dealing with anything beyond music reading and interpretation. Often, little or no attention is paid to vocal development (Major, 1978).

Information pertaining to vocal development is readily available in voice method books (Trusler, 1972; Stanton, 1978; Van Christy, 1980) and choral conducting books (Garretson, 1965; Cleall, 1955; Ehmann, 1968). These texts provide a variety of approaches to choral/voice pedagogy in discussions of breathing, diction, and resonance. Choral directors can avail themselves of this information in order to be aware of alternative methods of solving choral problems.

Need for the Study

Despite the availability of this information, however, it is apparent in practice that many choral directors either are not informed or skilled in the area of vocal development, or are uncommitted to the development and training of the singers in their care. These conductors tend to concentrate on the product at the expense of the learning process. The pressure of an approaching concert often overrides the long-range goals of the overall choral program, thus making the performance, rather than the individual development of the singers, the goal.

A contributory problem for choral directors in the matter of voice instruction for their choirs may be the focus of solo voice research in general. Research in voice production has dealt primarily with isolated resonance or physiological factors and very little with the broad area of evaluating teaching methodology (Goodwin, 1977; Nelson,
For example, voice experts disagree among themselves as to the best way to teach singers, and no solid proof has been offered that one method is better than another. The criticism of present voice research, supported by Fields (1972), is that objective voice research in the laboratory has reported many interesting facts about how the voice works, but that the observations are generally meaningless to the teacher because they do not relate to improved teaching.

In addition to the lack of research in the teaching of voice, the discrepancies found among the variety of "ideal" methods of teaching voice further cloud the issue. Vennard (1958) presented no fewer than seven different, acceptable methods of voice study that are currently in use, none of which has been objectively tested for effectiveness. Evaluations of effectiveness of method have traditionally been made on the basis of the teachers' or their students' performance successes as measured in reviews of recitals and operatic roles, rather than on the students' progress and development. The vast amount of literature that has been written on the subject of voice teaching for individuals, as well as choirs, has been long on support, but short on evidence.

**Purpose of the Study**

The purpose of the present study was to investigate the influence of selected vocal pedagogy concepts on high school choral tone quality. Vocal pedagogy represents a relatively well-defined conceptual strategy that appeared to serve the needs of the present study by providing basic tenets that are critical to both voice production and choral
singing. Vocal pedagogical practices as identified in choral and voice method books were used in an experimental research design in which a choir that was rehearsed with developmental voice technique incorporated was compared with one that did not receive such training. The study attempted to provide quantification of the effect that selected vocal pedagogy concepts have on choral tone quality and related aspects of choral performance.

It would seem that the teaching of vocal pedagogy concepts would provide information for the singers as to the singing process, thus allowing them to understand and more effectively apply the concepts in their own singing. Therefore, the study included an investigation of student awareness of voice production principles.

Since many choral programs reportedly suffer from negative student attitudes that can result in mediocrity and discipline problems, the study also included an investigation of the relationship of voice training in choral rehearsals to student attitudes. The theory here is that as students learn how to control their voices and improve their singing, they may become more interested, and eventually more able and willing singers.

**Hypotheses**

The hypotheses under investigation are:

1. The learning and application of selected vocal pedagogical concepts in choral rehearsals will improve the overall tone quality of choirs.

2. The learning and application of selected vocal pedagogical concepts will improve the choral performance aspects of precision and diction.
3. The learning and application of selected vocal pedagogical concepts will increase student understanding of the singing process.

4. The learning and application of selected vocal pedagogical concepts will improve student individual vocal performance.

5. The learning and application of selected vocal pedagogical concepts will positively affect student attitudes toward singing and choir participation.

Definitions

The concepts discussed below represent those that will be taught and tested in the course of the study. They have been identified as basic to sound vocal production by choral and voice experts, and also have been recognized by those experts as important to quality choral singing.

**Vocal pedagogy** refers to the art, science, and/or profession of teaching vocal development. It includes the principles and methods considered essential to quality, responsible, effective vocal teaching.

Key experimental concepts for this study include posture, proper breathing, diction, resonance, and relaxation.

**Posture** is the proper alignment of the human body to promote maximum breathing efficiency and muscular relaxation essential to good vocal technique (Decker, 1977, p. 15).

**Breathing** is the process by which air is inhaled into and exhaled from the lungs. For singing it is the basis for developing vocal sound, maintaining pitch and musical line, and establishing vocal freedom (Decker, 1977, p. 16).
Diction is the clear accurate delivery of words and the processes by which words are created. These include pronunciation, enunciation, and articulation as separate elements that must function as a whole. Pronunciation is concerned with the correct sound and syllabic stress of a word. Enunciation involves the clarity with which the word is pronounced. Articulation designates the physical movements required to shape vowels and consonants, and also the precision with which the consonants are produced (Decker, 1977, p. 5).

Resonance is the enriching of a musical tone by supplementary vibration. In singing, it refers to the quality imparted to vocal sounds by the resonance chamber effect of mouth and pharynx configurations (Decker, 1977, p. 5).

Relaxation is a condition of physical coordination and a freedom from muscular tension. This condition is critical for singing and does not refer to lazy or sluggish notions of relaxation (Decker, 1977, p. 25).

These vocal concepts do not begin to include all those that are possible, but they do represent the primary basic principles of voice teaching, which were used in this study. They are the beginning foundation for vocal development, and they must be understood before improvement will occur.

Limitations of the Study

The treatment period of seven weeks was due to constrictions of school year and the impossibility of long-term involvement with a
public school choral program that was not fully controlled by the Investigator. There were twenty-one treatment sessions over the period of the seven weeks.

The influence exerted on the choirs by the Investigator was limited to the actual contact during rehearsals. The regular directors of the two choirs conducted the remainder of their rehearsals as usual. The Investigator rehearsed no other pieces from the choirs' repertoires, and the regular director did not rehearse those involved in the study.

The study will concentrate on the vocal development principles outlined above, and not specifically on the development and testing of measurement instruments.

The experimental and control groups consisted of students from previously existing intact high school choirs. Randomization was determined to be logistically unfeasible. Forty subjects from each group were matched on the basis of pre-test scores, and only those subjects were tested following the treatment.

Assumptions Pertinent to the Study

The experimental and control groups were of similar ability and displayed similar attitudes toward choral music.

The physical presence of the Investigator would not inadvertently instill student learning of vocal pedagogical concepts in the control situation.

During rehearsals with the control group, the Investigator could avoid using vocal pedagogical concepts in solving choral problems such
as intonation, blend, and balance.

The potential influence of the Investigator's teaching style, personality, or personal opinions will not jeopardize the outcome of the study.

Summary

Vocal pedagogy has been identified as an important aspect of choral teaching by experts in the field of choral music, as well as voice. The limited utilization of vocal pedagogy activities in the choral rehearsal is possibly due to deficient backgrounds of the directors and/or to a lack of evidence as to the effectiveness of voice teaching in choral settings. As educators, choral directors are obligated to fully educate their students in the art of choral singing, which includes vocal development through voice training. Therefore, it was the purpose of this study to evaluate the application of commonly accepted vocal teaching techniques often used in studio and class voice situations in the choral rehearsal medium. The study was designed to investigate the influence of the aforementioned vocal concepts on the tone quality of high school choirs, student knowledge of voice production, and influence on student attitudes toward singing and choir participation.
CHAPTER II
REVIEW OF RELATED LITERATURE

The controversy surrounding the incorporation of vocal development techniques into choral situations is related more to actual practice than to philosophy. The vast majority of choral and vocal experts agree that vocal development should be an integral part of every choral rehearsal, but in practice it is often neglected. Much has been written in support of this ideal; however, the paucity of research in this area has forced choral directors to depend on method books and articles that are not research-based. The research that does exist is limited in the area of voice production, and even more so in the area of vocal development for choirs. The following review of literature will present information in four general categories: 1) vocal/choral pedagogy, 2) research in vocal pedagogy, 3) research in vocal/choral pedagogy, and 4) summary and discussion. Such a delineation in the discussion will provide an orderly flow of content relating to the topic of this project.

Vocal/Choral Pedagogy

The various methods and concepts presented in this section are descriptive in nature, with the authors offering diverse opinions and strategies of vocal/choral pedagogy. This overview provides background
and support for the vocal development principles used in the present study. The many voice production texts that exist are not discussed.

**Developing Young Voices**

There is little argument concerning the importance of vocal development to quality choral singing. Since the choir director is usually the only source of voice teaching in most schools, it is therefore critical that he/she has a strong background in vocal development techniques and is able to demonstrate them well (Anderson, 1979). In fact, Gilliland (1969) and others (Major, 1978; Peterson, 1971) believed that the teaching of proper voice production is the obligation of choral directors. Draper (1972), Diercks (1955), and White (1975) stressed the importance of conductor knowledge of voice production not only to prevent damage to the voices, as Lee (1977) and Weiss (1978) also suggested, but to improve general tone quality.

Casselman (1952) and Bellows (1979) stated that the director who gives no thought to the care of young voices produces a choir that sings with strain and tension, which can result in range and intensity deficiencies. Sunderman (1951), Casselman (1952), Brown (1958), and Shewan (1966) identified appropriate range as a primary consideration in choosing literature for high school choirs as a means to prevent vocal damage. Bellows (1960) discouraged overuse of literature that has a high tessitura, which can result in permanent vocal dysfunction. Experts agreed that voice ranges can be increased during adolescence (Mack, 1964), but that great care must be taken to avoid overextending young voices. Moderate range and tessitura were recommended.
**Functional Voice Disorders**

Functional voice disorders are usually a direct result of abuse or misuse of the vocal mechanism (Bradley, 1980) and are often a result of a combination of causes (Brown, 1958). Among the most prevalent, as reported by Brown (1958), are overuse, improper intensity (loudness), faulty attack, faulty register adjustment (carrying heavy adjustment too high), forced range, improper tessitura, and general vocal tension.

An aspect of overuse that is often found in high school choirs is the directors' attempts to develop an overly mature sound, regardless of the cost to the voices (Shewan, 1966). Bellows (1960) warned against insisting on the same quality for all voices as an important consideration for the varying maturation levels found in a high school chorus. Directors must guard against asking for what the singers are unable to give. Frustration and vocal damage will be the result (Sunderman, 1951).

Unnatural tension in the vocal mechanism can also cause damage to voices. Prolonged tense or forced singing, or an overbalanced attack results in nodules, or nodes, on the vocal chords (Sunderman, 1951) from which the singer may never recover. Voice experts believe that more injury to young voices is caused during the adolescent period than at any other time by forcing and straining to sing beyond individual abilities (Shewan, 1966).

Stoer and Swank (1978) identified hoarseness as the most important symptom to notice in a suspected voice disorder. Chronic laryngitis, voice breaks, vocal fatigue, and frequent throat clearing are among the
additional signs indicating that therapy is needed. Causes of hoarseness include oversinging, tension, and harsh glottal attacks. Among the techniques presented to alleviate this dysfunction are humming, the "yawn-sigh," and the relaxation and lowering of the jaw.

Another form of improper attack presented by Sunderman (1951) is the underbalanced attack. This type of attack in singing is breathy and weak, and results in a debilitated, ineffective voice. As a remedy for this condition, Vennard (1967, p. 211) recommended a strong "yawn-sigh," calling it a "shout" rather than a sigh, and encouraging energy and even more breath to be put into the initial tone.

**Physical Preparation**

**Posture/Breathing**

Good voice production for both choirs and soloists includes a number of basic aspects that must be addressed. Perhaps the most basic of these is the relationship between posture and breathing. Most experts, including Diercks (1955), Casselman (1952), Westerman (1959), Veld (1956), Colness (1968), and Gilliland (1969), support posture as being important to good singing since correct posture is of great importance to proper breathing. If the body is out of position, the diaphragm and intercostal muscles are restricted from working properly (Vennard, 1967, p. 29). Stout (1955), Diercks (1955), Gilliland (1969), and Casselman (1952) all support the importance of proper breathing to good choral/vocal tone production, and without training in proper breathing technique, Sunderman (1951) maintains, proper voice production is impossible.
Posture for singing was described by Decker (1977) as a state of balance with the weight evenly distributed between the feet, with a slight forward lean, pelvis and shoulders aligned, spine straight, shoulders back and relaxed down, arms relaxed down at the sides, and head erect and on top of the spine with the crown slightly higher than the forehead. These body positions were said to be desirable not only for the support of the vocal mechanism, but also to provide the opportunity for good breathing (Kindig, 1962).

The diaphragm is one of the most powerful muscles in the body (Vennard, 1967) and the most important to breath management for singing. Wehr (1961) described the diaphragm as the only active muscle in respiration, with its action being involuntary. Vennard (1967) disputed this contention by emphasizing that in singing, breathing technique can be improved, and it includes the action of the costal, or rib, muscles. The function of the diaphragm in singing is to meter the breath out slowly so as to avoid the sudden collapse of the chest and lungs (Stout, 1955) and thus to provide the support needed for efficient, free tone. Most voice experts support this concept of breathing as important to vocal development.

Several other styles of breathing have been presented over the years. Keller (1957) and Wehr (1961) advocated a normal, quiet breathing technique as being sufficient for the demands of singing. Perhaps the most interesting breathing style was that of Williamson (1937, 1967) in which establishing the proper "mood" of the song automatically changes the size of the cavity (lungs) to the necessary

Another important aspect of breathing is that of phrasing. A lack of breath support can result in phrasing problems (Keller, 1957) such as broken or uneven phrases. Williamson (1937, 1967), on the other hand, felt that good phrasing caused good breath control. Lyall (1970) stated that good breathing is necessary for good phrasing as well as for good tone.

An imbalance between breath and musculature (also known as the muscle system of the vocal mechanism) causes a number of problems, including attack; it also causes a faulty vibrato. According to Lukken (1956), a wobble is the result of forcing the breath pressure beyond normal conditions. His cure for a faulty vibrato calls for a complete release of the breath, which should result in a more gentle breath support as opposed to a "ramrod column of air" (1956, p. 56). Both Lukken and Vennard (1967, p. 194) support the concept of a natural vibrato in which the proper conditions in turn create the desirable vibrato.

Relaxation

Relaxation as a general concept refers to a lack of undue tension in the supporting musculature of the vocal mechanism (Decker, 1977). Applied to actual voice production, it refers to a variety of specific areas that, according to the following authors, should be taught in the choral setting. Diercks (1955), York (1970), and Gilliland (1969) feel
that a relaxed jaw is important for producing good tone. Tension in this area restricts freedom of movement and thus often causes a harsh, strident tone. Casselman (1952) and Colness (1968) applied relaxation to the throat with the result being a free, open throat. Marshall (1956) and Lee (1977) related the concept of relaxation to the condition of the mouth, with Marshall stressing the proper position of the lips and Lee advocating that the mouth must maintain a natural shape, primarily in relation to vowel formations. According to Veld (1956), relaxation of the body in this sense results in a free tone. When relaxation is incorporated carefully into choral rehearsals, the desired tension-free tone is the result.

**Tone Quality**

**Developing Choral Tone Quality**

Tone quality must be considered as one of the primary objectives for which a choir strives. Exclusive concentration on notes, rhythm, and interpretation results in a colorless, poorly produced tone (Sunderman, 1951).

To improve the tone quality of the choir, J. W. Jones (1957), Keller (1957), Wilson (1953), Lyall (1970), and others supported improving and refining the vowel production of the singers. Marshall suggested that the skillful use of consonants also improved tone. Williamson (1937, 1967), Rodda (1960), and Stout (1955) were in agreement, believing that correct enunciation contributes to a better tone. Phonetics was offered by Conley (1954) as a means to correct and
understand speech processes by providing the basic knowledge of how sounds are made and subsequently "tied together." Stoer and Swank (1978) stressed proper tongue position as being critical to good diction, which in turn contributes to good vocal tone.

Vocalises are valuable in developing tone as they isolate specific aspects of voice production and allow singers to concentrate on only a few aspects at a time. Rodda (1960) suggested that vocalises should be reinforced as similar conditions or patterns are encountered in the literature. A. Jones (1977) and almost all other authors of vocal development books and articles included a combination of breathing exercises, nonsense-syllable patterns, humming, and flexibility exercises that are intended to strengthen the voice and improve tone quality.

One of the most well-known "tone builders" is soft singing. The concept of soft singing was prevalent during the "a capella" movement of the 1930's. It was both praised as being blended and criticized as anemic. The controversy raged for a number of years between the choral experts who supported the practice as safe and healthy for young singers, and those who denounced soft singing as merely devitalized, undeveloped tone. Current philosophy concerning dynamics holds that variation is desirable and necessary. While sustained loud singing can indeed cause damage, singing softly exclusively is unnatural and detrimental to vocal development as well. The generally accepted practice today is to rehearse at the mezzo forte level and incorporate the indicated dynamic changes as called for in the music as the learning
process progresses (Darrow, 1975). Soft singing is still valued as a helpful technique for allowing overly tense tone to become more relaxed and balanced with the breath (Swank, 1978).

Vowels

Improving tone quality takes many forms, from soft singing to vocalises, but perhaps the most critical aspect of good tone quality is careful diction, with vowels being of primary importance.

The processes by which vowels are formed are intricate and specialized, but correct vowels are paramount to good tone and resonance since the vowel carries the "quality" of the voice. The pure sustained vowel represents the primary element of the voice (Vennard, 1967) and in the choral setting, directors must develop their ears in order to be able to shape vowels properly and detect deviations (Diercks, 1955). Bellows (1960) encouraged awareness of lip and tongue positions as being crucial to vowel formations.

Waring is regarded as the pioneer of choral diction and his concept known as "tone syllables" (1951) was one of the first attempts to systematize choral diction. Waring stressed an awareness of pitched consonants to avoid "scooping" as well as to give enough strength to the consonants so as not to lose the integrity of the word; continuity of tone by careful attention to how to get from one syllable to the next; attention to rhythmic placement of vowels and consonants; and exaggerated, distinct vowel sounds.

Veld (1956), Diercks (1955), and numerous others stressed the value of pure vowels to good tone and resonance. Diercks went on to
say that unified vowels are no substitute for pure vowels and that the
director must demand purity from the choristers. Keller (1957)
approached this concept from a different angle by unifying the vowel
sounds and then altering the "color" of the tone.

Blend

The discussion of pure versus unified becomes critical in the
discussions of choral blend. While most experts talked about unified
vowels, they were usually referring to unified pure vowels. Most
agreed that there was no substitute for the ideal of "pure" vowels
(Darrow, 1975).

There was almost complete agreement among vocal and choral experts
that vowels determine the resonance quality of the voice, as well as
being important to good blend. Hammar (1965) stated that clearly
pronounced vowels produce brilliance and contribute to the overall
resonance and sonority of a choir's sound. Darrow (1975) found that
many authors of voice pedagogy texts include the vowel as a facet of
resonation. Vennard (1967) identified the shape of the resonance
cavities as being partially determined by vowel production. When the
vowels are properly produced, and all other factors are normal and
correct, the optimum resonance will be achieved. Resonance also has an
effect on intonation and blend, both of which are influenced by vowel
production.

Wyatt (1967) compiled the opinions of a number of outstanding
choral directors on the matter of blend. He found two general defini-
tions, the first of which was preferred by 67 percent of those
contacted. The second definition was preferred by 22 percent, and the remaining 11 percent believed that both are correct. The definitions presented by Wyatt (1967, p. 15) are:

1. The perfect fusion of the tone of a number of voices whose various characteristics mix so as to result in one beautiful sound.

2. The uniformity of the quality of tone within and between sections.

Good choral blend combines all aspects of proper vocal production by striving to achieve consistent tone from all sections (Stout, 1953).

**Resonance**

Resonance is also identified as a key factor in singing, specifically for producing a free tone. Westerman (1959), Mack (1964), and Ehmann (1968) believed that this concept is important in developing young voices in choirs, and therefore should be taught. Stout (1955) also supported the teaching of resonance to choristers but advocated the use of vowels as the main thrust in the endeavor. Keller (1957) stressed the concept of oral space along with "rounding" the tone as the means to generate resonance in young singers.

**Intonation**

Probably the most common problem found in the high school choir is intonation. Diercks (1955) believed that all intonation problems are the result of faulty vocal production. Good intonation, therefore, must be the result of free tone and proper breathing (Lyall, 1970) and pure vowels (Keller, 1957) in addition to the other aspects needed for correct voice production.
Flatting is caused by a variety of factors. Vennard (1956) presented emotional depression and/or spread vowels as contributory to this problem. Lee (1977) cited heavy adjustment at inappropriate levels, also known as registration problems, as another cause of flatting. Wilson (1953) discussed the relationship between poor vowels and the resulting lack of resonance as an additional consideration. Inefficient or improper breath support is often considered to be a key element in flatting (Swank, 1980).

Sharping is generally caused by oversinging or pushing, according to Vennard (1956), who with Lee (1977) identified anxiety or excitement as contributory to raising the pitch of a song unintentionally.

Diercks (1955) provided a number of points to check when intonation becomes inaccurate. These included posture, breathing, and tension in the face or jaw. If any of these is not correct, the intonation may suffer. Tone production and all related aspects were identified as being critical to maintaining intonation (Darrow, 1975).

Choral Methods

Beyond the general category of vocal pedagogy for choirs lies the variety of specifically "choral" approaches that have been developed to improve singing. Ehmann (1968, p. 81) offered the "unison" as "providing the optimum opportunity for looseness and relaxation while forcing all singers to participate, think, and learn" vocal/choral production. In addition to vocalises, Gerry (1949) advocated using choral literature to teach vocal technique to the choir. O'Neal (1961, p. 78) asked students to "sing to" him, not "at" him and called this
the musicianship approach to choral music. He believed that it encouraged students to "let their voices go," resulting in a relaxed, free tone. York (1963) and Shewan (1974) supported the use of imagery in combination with specific literal instructions as being an effective approach to vocal development for choirs. All of the aforementioned techniques have the same goal: to foster the vocal development of choristers.

Research in Voice Pedagogy

Research in voice production has dealt with the influence of many aspects of teaching, breathing, diction, and resonance. Through a variety of procedures, much information has been gathered on the technical and physical aspects of voice production. Descriptive projects surveying voice teachers have identified areas of agreement among techniques of vocal development, while a number of experimental studies have found effective means of improving isolated factors of vocal production. The investigations of resonance, vowel articulation, and diction provide some of the most powerful information in the area of voice production and support aspects of the techniques employed in the present study. These include accurate vowel discrimination, pharyngeal resonance, and relaxation along the vocal tract. Along with the concept of support, this information can be considered the key to quality tone production.

Diction

Belisle (1965) found subjects exhibited superior diction when they sang with greater vitality, more accurate vowel discrimination,
clarity, and more carefully formed glides. Using a variety of measurement techniques, including a panel of judges and individual testing, Schmalsteig (1973) reported that training using programmed instruction in vowel problems improved subjects' abilities to perform uniform vowels. Anderson (1971) found quick and significant improvement in subjects' vowel formations as a result of video-tape feedback of the subjects' mouths.

Using X-rays and sonograms, Delattre (1958) determined that the best conditions for a spoken vowel required the presence of certain constrictions along the vocal tract. For singing these conditions needed to be absent in order to promote the high-frequency overtones required for good resonance.

A study by Johnson (1966) indicated that spoken vowels did not present a good model for sung vowels. Subjects who used spoken vowels as examples had difficulty reproducing the correct vowel for singing. In comparing differences between spoken and sung vowels, Sundberg (1970) attributed the observed formant frequency differences to articulatory variations related to intensity.

Resonance

Incorporating information gathered from both scientific equipment and a panel of listeners, Woolridge (1954) determined that the nasal cavity does not act as a resonance cavity for sung vowel tones. In measuring the physiology of resonation, the most significant differences found by Perkins (1958) were in the length of the pharyngeal cavity. A long pharynx with a low larynx was found to produce the most vibrant tones. These conditions may also have affected resonance.
Breathing

Sharnova (1949) found that "there was no substitute for breath support/control" (p. 41). When singers who were uninformed about breathing technique were asked to "sing on the diaphragm," their voices were lacking in both focus and carrying power (p. 36). Also, singing "in the mask" without breath support produced small, tight vocal tones (p. 36). The "spinge avanti" (push it forward) technique produced light, white, unpredictable tone (p. 41). All of these word images were found to be acceptable when breath support was introduced as a companion concept. Correct, erect posture in conjunction with deep expansive breathing resulted in a free tone that was resonated correctly, and a tone that had vibrancy and focus (p. 42).

Bouhuys, Proctor, and Mead (1966) stated that the use of several "inspiratory rib muscles" (costal) produced a more carefully controlled exhalation during singing than did the diaphragm.

One of the few voice research studies that mentioned practical applications was completed by Rubin, LeCover, and Vennard (1967). They found that glottal resistance is more important in supporting a vocal tone of increasing loudness than is the amount of air flow. They also found that inadequate breath support impairs vocal quality by causing secondary "interfering glottal tensions":

As long as expiration was easy and not forced (during sustained full voice phonation), glottal tension, as measured by subglottic pressure, remained essentially unchanged. However, as the air reserve decreased and extra-laryngeal muscular effort to maintain the flow of air necessary to support the tone increased, optimal flow-pressure relationships were disturbed, and glottal resistance as measured by
subglottal pressure also increased. Acoustically, these interfering compensatory tensions were invariably accompanied by the form of vocal inefficiency noted above as throatiness or constriction (Large, 1980, p. 96).

A physical examination and documentation of the breathing process by Jones (1971) determined that coordination of the abdominal and thoracic muscles was necessary for good phonation. These muscles affected the condition of the musculature surrounding the larynx and also the larynx itself. Without relaxation of this area through proper breathing, the singers did not have the necessary freedom for agility and control essential for good phonation.

Teaching (Experimental)

Several studies that dealt with aspects of solo voice teaching used various approaches that included video tape, programmed instruction, and behavior observation. Elrod (1972) and Isquick (1977) found significant improvement in singing achievement when using video-tape feedback rather than traditional teaching methods. Elrod investigated general physical aspects such as posture and breathing, while Isquick concentrated on the mouth formations of subjects.

Warmink (1975) developed a programmed text for the teaching of voice production fundamentals. Through the use of multiple programming formats, the text was shown to be an effective teaching tool. Diagrams were used to clarify muscle, bone, and cartilage positions, with a great deal of attention given to physiological terminology and to the function of each portion of anatomy involved in the singing process.
Froelich (1977) developed and tested an observational instrument for the purpose of identifying a number of variables that might contribute to the effective teaching of singing to elementary school-age children. The interaction-style analysis indicated that student activities such as playing instrumental accompaniments and rhythmic reading were highly effective in improving singing ability. The activity identified as the most influential to singing was work on phrasing.

In comparing group versus private study, Sims (1961) found no significant differences in student achievement. Based on her results, Sims recommended that studio and public school music teachers should be teaching more vocal technique in groups, as this has been shown to be an effective teaching method.

**Teaching (Descriptive)**

Although not experimental in nature, the results of the following surveys provide important information concerning studio teaching practices. Herrick (1977) analyzed thirteen well-documented teaching practices to lend support to the contention that sensation of tone and cognition are both involved in learning to sing. Jorgenson (1980) dealt with various methods of studio voice instruction and found two basic areas of agreement: 1) there should be an "ease" in the musculature involved in singing—no stretching, pushing, or forcing; and 2) the optimum resonance or ring is achieved as a result of an elongated "vocal tract" that comes from a low-lying larynx in combination with a "vaulted velum." Concerning vocal registers, Warren (1977) found a
Research in Choral Pedagogy

Research in choral music education dealing with vocal development is not plentiful. A great deal of the literature on this subject consists of subjective opinions on why and what to teach in the choral rehearsal. Gonzo (1973), in a review of choral research, found four general categories: historical accounts of public school music, physiological aspects of choral singing, choral rehearsal techniques and the conductor, and error detection skills of choral directors and music students. The following discussion is organized around three of these categories. Historical accounts are not related to the present study and will not be included. Error detection will be combined with choral rehearsal techniques as it is an aspect of daily rehearsals. The discussion will begin with the physiology of choral singing.

Physiological Aspects of Choral Singing

In solo singing, correct vowels are generally regarded as the most important aspect of diction in that they carry the tone and control the shape of the resonance cavities. Uniform vowel concepts were identified by Wyatt (1967) as one of the most important factors in achieving choral blend. Drawing information from published choral material, scientific sources, and the opinions of noted choral experts, Wyatt found that soft singing and vowel homogeneity were critical to improving blend. It was also determined by Hunt (1970), through the...
use of spectographic analysis of selected vowels in choral tone, that unified vowel sound is essential in achieving good choral/vocal blend. This good blend requires that a "common natural harmonic series must be achieved through an alignment of the acoustical factors present" (p. 23). Vowel unity was also found to be directly related to vowel formant intonation problems.

Solo voice characteristics as found in choral settings have been investigated primarily in terms of blend. Trevor (1977) found that better blend was achieved when the vibrato rate and the extent of the vibrato of paired singers became closer. In another study dealing with solo characteristics in choral situations, Goodwin (1977) found clear patterns of difference existed between vocal sounds produced in solo performance and those produced in choral performance. Subjects sang excerpts of songs while hearing a pre-recorded tape of a choral group and then while hearing only themselves. The task for the taped performance was to blend with the group at various dynamic levels. Blended or choral tones tended to be reduced in overall intensity from solo levels for corresponding dynamic indications. Spectral differences were found suggesting that blended tones have fewer and weaker partials on frequencies above the first formant, but have slightly stronger fundamental frequencies. Goodwin (1980) claimed that the results may partly explain how certain "common choral" practices, such as not permitting voices to "stick out" and vowel unification, take advantage of these traits of aural perception in producing choral
blend. As the modifications may be intuitive, each singer will do whatever is necessary to match group blend.

**Choral Rehearsal Techniques**

Several methods of choral teaching using experimental designs were investigated. While individual musical development was included in several of them, no concentrated vocal pedagogy approach was included in any of the studies discussed below.

In an experiment comparing three methodologies of choral teaching, Ball (1953) found little difference in the effectiveness of the methods. Using the traditional approach (learn the notes, no discussions), the rhythmic approach (phrase by phrase speaking in rhythm), and the mood approach (meaning, emotional content), Ball taught nine pieces to a large choir over a three-week period. Easy, moderate, and difficult pieces were divided equally among the categories. Recordings were made weekly and evaluated by a panel of judges. Ball attributed the lack of significant findings as partially due to the short treatment period.

Using Biolinguistics, a procedure incorporating phonetics and biological measurements, Nelson (1955) instructed a volunteer choir in breathing, posture, phonation, resonance, and articulation. Results, reported in case study form, indicated improved tone quality and higher scores on the Seashore Measures of Musical Talent for all subjects.

An experiment to measure pitch accuracy while singing scales by Madsen, Wolfe, and Madsen (1969) incorporated several general references to posture, breathing, and relaxing the jaw during the course of
the trials. These activities improved sixth graders' abilities to sing the scales with better intonation.

Latherow (1962) presented a collection of objectives and procedures for successful choral teaching based on his own observations and a survey of successful choral programs. The results indicated that success would be achieved through knowing the principles of singing, and developing the ability to teach voice to large groups. Hansler (1965) disputed many of Latherow's contentions as being based on opinion.

Diagnosing vocal problems in the choral setting is not an easy task for directors, especially those without an extensive background in voice development. Wyatt (1974) developed a self-instructional program for choral conducting students designed to enhance their skills at diagnosing and correcting vocal production problems in choral groups. Using a programmed text on vocal structure and function in conjunction with taped examples of solo and choral ensemble performances, students studied the acoustical properties of vocal problems based on this knowledge and prescribed appropriate solutions to the problems encountered. The self-instructional program was shown to be effective for teaching concepts of breathing, resonance, and phonation, and in developing awareness of vocal problems and solutions.

A choral performance rating scale, developed by Cooksey (1977), used a facet-factorial approach for evaluation of high school choral events. Through reconstruction of a large number of descriptions of choral performances into items, or statements, a number of categories
emerged as crucial. These categories were diction, precision, dynamics, tone control, tempo, balance/blend, and interpretation/musical effect. Thirty-nine descriptions were selected to measure these seven factors. The items were put into positive or negative form and paired with a Likert-scale of 1 to 5, with 5 indicating strong agreement. The scale achieved high inter-judge reliability and high criterion validity.

Summary and Discussion

The function of research is to provide new information or to verify existing thought. Ideally, this research should be disseminated and interpreted for practical use. The collective research areas of voice pedagogy and choral pedagogy have dealt with many of the same topics as have non-research choral and vocal material. However, there appears to be a lack of concerted effort among these experts to inter-relate their findings, generating research-based methodologies.

The primary areas of interest to both vocal/choral research and teaching are posture, breathing, diction, and resonance. These represent a large percentage of the research being conducted as well as a smaller percentage of the non-research activity.

Criticism of voice research in these areas tends to focus on the lack of teacher-oriented application, which is not usually found in this type of research (Nelson and Tiffany, 1968; Fields, 1972). While choral pedagogy has been more practical in orientation, a very limited number of concerns have been investigated. Studies that combine voice pedagogy with choral pedagogy in an experimental mode are almost
non-existent. Investigations of choral blend have concentrated on vowel unification, but the processes needed for obtaining the desired vowels have not been presented in conjunction with the results. Research in choral music education is "fragmented and narrow in its scope, and is more descriptive than experimental" (Gonzo, 1973, p. 29).

The non-research vocal/choral literature provides the basis for most pedagogical tenets in use today. While this information is valuable, and often effective, a strong foundation of supportive research would assist in establishing the need for a solid vocal background for choral conductors and would also encourage them to use such knowledge in their teaching.

Gilliland (1969, pp. 12-13) provided an outline of fundamentals that presents a summary of the desired objectives of a high school choir.

1. Intonation - the state of being in tune
2. Quality - normal for the individual and capable of varied expressive colors
3. Diction - intelligible without sacrificing quality
4. Agility - ability to sing all intervals, melismatic melody and embellishments as well as legato
5. Range - adequate to encompass a broad variety of literature for a particular voice
6. Dynamic control - adequate to meet the needs of the music

The above outline does not include the basic vocal concepts discussed earlier in this chapter, but Gilliland did emphasize that those concepts must be the means to achieve these objectives. The
The notion that good vocal/choral technique equals good choral tone is supported by Crawford (1967), Draper (1972), White (1975), and many others. To further underscore the importance of vocal development in choirs, the American Choral Directors Association (A.C.D.A.) and the National Association for the Teaching of Singing (NATS) jointly released a position paper that stated: "The solo voice and the choral voice are one and the same. Properly trained soloists blend with properly trained choristers. [We] support the proper, basic fundamental techniques of singing" (Peterson, 1971, pp. 11-12). On the basis of the information presented in this chapter, and the Investigator's belief in the importance of vocal development for choristers, this study will attempt to discover the effects of an extensive vocal pedagogy approach on high school vocal tone quality and other related aspects of student knowledge.
CHAPTER III
MATERIALS AND PROCEDURES

The content of this chapter will deal with the design of the study, the process by which the choirs were selected and assigned to treatment groups, the development of the instruments of evaluation, a description of the two treatments, and a description of the post-treatment evaluation processes.

**Design of the Study**

In order to assess the impact of vocal pedagogy activities on choirs, an experimental design was employed involving experimental/control treatment groups. The control treatment was based on the primary rehearsal concepts of correct notes, accurate interpretation of dynamics and rhythm, intonation, blend, and balance. The experimental group, rehearsing the same music as the control group, received instruction in the basic vocal pedagogy concepts of posture, breathing, diction, resonance, and relaxation in addition to information concerning notes, phrasing, and dynamics.

The Investigator rehearsed the same two pieces of music with both groups. The Investigator had complete authority on the two pieces considered to be a part of the treatment for this study, but not on the entire repertoires of the treatment groups rehearsed by the regular director for the duration of the treatment period. Both treatment
groups were rehearsed for three 25-minute sessions per week over a period of seven weeks (21 sessions).

To evaluate the product of the treatment a panel of experts analyzed a series of audio and video tapes of the final performances of the treatment groups following the treatments. Pre-treatment measures were administered to all choir members for the purpose of matching pairs of subjects. Post-treatment measures were administered to the eighty matched subjects for eventual assessment of individuals in terms of attitude, and singing skill and knowledge.

Selecting Treatment Choirs and Directors

University supervisors who work with choral student teachers in Franklin County (Ohio) were contacted as to which choral programs might fit the needs of the present study. These experts presented their opinions as to the general size of a number of choirs, whether or not vocal pedagogy was taught, their impressions of the groups' abilities, the equivalency of the choirs, and whether the current director had been there long enough to have made an impact. The Investigator contacted four of these directors and interviewed them, using the Director Survey. (See Appendix A.) Using the information from the Director Survey and the related interview that discussed the availability of the choirs, as well as the comments from the university supervisors, two directors and their choirs were asked to participate in the study.

In order to ascertain equivalency for post-treatment testing purposes, pre-treatment measures were administered to every member of
each choir. Based on the scores obtained from the Singing Knowledge Test, the Interview/Audition Inventory, and the Musical Background Inventory, forty subjects from within each choir were matched. (These pre-treatment measures are presented in Appendix B.)

The Student Attitude Survey was also administered to all of the choir members as a pre-treatment measure, essentially to reassure the investigator that the two treatment groups were indeed similar in terms of attitude. These data were not used for any additional purposes. Comparisons were made by rank ordering each group separately, using the means derived from the responses to each item. Six of the twenty items were in identical order, with five more being $\pm 1$, and eight within $\pm 2$.

**Selection of Choral Music**

The choral literature used in this study was selected by the investigator with the approval of her advisor and both directors. "Adoramus te" by Palestrina (two similar editions: SATB, Belwin Mills 769; SATB, G. Schirmer 6091) was chosen as a piece that would lend itself to a vocal pedagogy approach because of the pure vowels of the Latin text. All part ranges were found to be moderate and since the piece is primarily homophonic, it provided a good vehicle for working on intonation, blend, balance, and vowel unification. A contrasting piece, "How Lovely Is Thy Dwelling Place" from the Brahms Requiem (two similar editions: SATB, Carl Fischer CM 632; SATB, G. Schirmer 5124) offered a definite challenge. It is a difficult piece with regard to range, stamina, and breath control. Vowel formation and production is
extremely important as the extreme range of this piece requires great attention to the relaxation of the jaw and tongue, which is critical for the production of good vowels and freedom of tone. Even though the piece is demanding, it is within the capabilities of most high school choirs.

It would have been desirable to have had totally common literature for both treatment groups' current repertoires, and not just for the literature considered to be a part of the treatment. However, the "unique" nature of each control situation made two selections the maximum.

**Instruments of Evaluation**

**Director Survey**

In order to assist in the selection of the treatment choirs, a survey for directors was developed by the Investigator. The Director Survey dealt with assessing teaching philosophies and the specific vocal production techniques used within their rehearsals. The focus of the survey was not what the directors knew, but rather what the directors said that their students were informed about the specific vocal techniques identified in the survey. The information assisted in the director/choir selection process, as well as in determining what the students should already know. The instrument was piloted before it was administered. (The Director Survey is presented in Appendix A.)

**Student Attitude Survey**

Choirs at the high school level are made up of students who initially joined the group for a variety of reasons; the most obvious
might be because they like to sing. To discover what the other reasons might be, and to eventually assess their reactions to the treatment, an attitude survey was developed. Statements concerning "reasons" for joining choir, as well as statements concerning the appropriateness of incorporating vocal development techniques into rehearsals were included. A Likert-type scale of 1 to 5, with 5 indicating strong agreement, was the method of response. Several of the twenty statements were reworded within the survey to help establish response reliability. Statements were presented in either positive or negative format.

The Student Attitude Survey was pilot tested in a senior high school choir situation. The students were asked to respond anonymously to the S.A.S. and to write in any additional reasons as to why they had joined choir at their school or any additional reactions to vocal development activities during rehearsals. They appeared to enjoy taking the S.A.S., as numerous chuckles were heard. Only two reasons for choir participation were offered in addition to those on the Survey, and since they were extremely personal, they were not considered strong enough to be included in a revised survey. (The pre-treatment version of the Student Attitude Survey is presented in Appendix B.)

Revisions in the S.A.S. included adding three statements dealing directly with the influence of the research project, and deleting two repetitive statements and one statement concerning parental pressure. (The revised version of the Student Attitude Survey is presented in Appendix E.)
Singing Knowledge Test

The Singing Knowledge Test required subjects to describe ten aspects of voice production. These aspects reflect many of the specific vocal pedagogy concepts considered critical to quality choral singing; they were drawn from the programmed text of Warmink (1975) as well as from other writings on this subject. Students in a local high school choir, not members of the control or experimental choirs, assisted in the pilot testing of this instrument. Most of the students were able to answer the items fairly accurately. Following the pilot testing of the S.K.T., a revision was made in that the final question was found to be too ambiguous and was changed to an objective multiple choice format before the instrument was administered to the actual treatment groups. (This form of the Singing Knowledge Test is presented in Appendix B.)

Validity of the S.K.T. was determined by correlating the students' individual test scores and the director's rankings of choir members' value to the choral program. The validity was determined to be .77, which is sufficiently high for continued use of an instrument.

In order to incorporate specific aspects of the experimental treatment into the post-treatment version of the S.K.T., several of the descriptive questions were reworked into multiple choice format, and several specified more exactly what was expected in the response by providing definite terms to be discussed. (The revised Singing Knowledge Test is presented in Appendix E.)
**Musical Background Inventory**

A brief musical background inventory was also developed and administered to each choir member, with the results being used exclusively for subject matching purposes. (The Musical Background Inventory is presented in Appendix B.) Items of interest were choral and/or instrumental ensemble participation, private music lessons, live concert attendance, record purchases, and parental casual musical involvement.

**Interview/Audition Inventory**

To assess the individual vocal abilities of the choir members, an interview/audition form was developed that obtained a quick but diversified rating of each chorister. Students were asked to demonstrate correct posture and breathing, sing four short vocalises, and sing the first line of "My Country 'Tis of Thee." Ratings were based on a Likert scale of 1 to 5, with 5 being the highest. The Investigator conducted these interviews prior to designating control or experimental group status for the choirs. (The Interview/Audition Inventory is presented in Appendix B.) The same form of the Interview/Audition Inventory was used for both pre-treatment and post-treatment evaluations, with the results of the pre-treatment instrument being used for subject matching purposes.

**Pre-Treatment Measures**

The pre-treatment measures (Singing Knowledge Test, Musical Background Inventory, Student Attitude Survey, and Interview/Audition
Inventory) were administered to all members of both choirs. The scores obtained from these instruments were used to match subjects and to ascertain attitudinal equivalency.

Scoring for the S.K.T. was done on the basis of giving single points per the number of acceptable responses made to each question. The possible number of points varied, reflecting the detail requested. An outstanding or very complete answer was awarded two points. For example:

**Question:** How do the vocal cords work when we sing or speak?

**Response 1:** "They tighten and relax while air is forced through causing them to vibrate. The more [they are] tightened, the higher the pitch. The more relaxed, the lower."

**Response 2:** "They vibrate."

The former response received two points, and the latter response received one point.

The Musical Background Inventory was scored by halving the number of years of ensemble participation and private lessons, with the exception of private voice lessons, which received their full value. For example, a total of six years of ensemble participation was scored as three. Other items on the inventory received one point for a response of "yes."

Forty pairs of subjects were matched for post-treatment testing purposes using the results of the pre-treatment measures. (The scores of the matched subjects appear in Appendix C.) To further establish
equivalency between the control and experimental groups, the means of
the test scores were computed. These are presented in Table 1.

Table 1. Means for Matched Subjects on Pre-Treatment Measures

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Control</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview/Audition</td>
<td>34.60</td>
<td>33.81</td>
</tr>
<tr>
<td>S.K.T.</td>
<td>12.20</td>
<td>12.37</td>
</tr>
<tr>
<td>M.B.I.</td>
<td>8.81</td>
<td>8.78</td>
</tr>
</tbody>
</table>

Based on the fact that the means for the "matched" subjects are
extremely close in all instances, the subject populations of the
experimental and control groups were considered to be equivalent.

The designation of control or experimental status for the choirs
was the result of a coin toss. Since the results of the pre-treatment
measures indicated such strong similarities between the choirs, there
was no reason to believe that one group would be more receptive to a
particular treatment.

Treatments

Control Group

The treatment for this group did not involve vocal pedagogy
activities: warm-ups or other voice building techniques were not
employed. As performance problems arose in the two selections under
study, the problems were identified for the choir but were not solved
using vocal pedagogy content. Intonation, blend, and diction were
consistent problems identified by the Investigator for the students, but no attempts were made to alter their vocal production to remedy the problems. The method used was limited to repeated labeling of the identified problems as they occurred. The Investigator concentrated on dynamics and phrasing as primary objectives after the notes were learned.

All treatment sessions were tape recorded for the purpose of monitoring treatment content. These tapes provided a means to check for any lapses by the Investigator into vocal production language, and to identify additional problems not dealt with during the rehearsal session. These problems were then dealt with in subsequent rehearsals.

**Experimental Group**

The content of all of the rehearsals with the experimental group consisted of vocal development activities centered around the two common choral selections. Each rehearsal included five minutes of warm-ups and brief, periodic lectures that explained in more detail the concepts the students were becoming increasingly aware of as the project progressed. Problems of intonation, blend, and diction were addressed through improving posture, breathing technique, relaxation of jaw and tongue, and vowel modification. Phrasing and dynamics were also emphasized, with information as to the "how" and "why" being included in these discussions.

Rehearsals with the experimental group were also monitored through the use of audio tapes. These tapes were evaluated regularly to diagnose any additional problems not identified in the rehearsal and to
prescribe solutions that would be applied in subsequent rehearsals. (Complete daily lesson plans for both groups are presented in Appendix D.)

**Post-Treatment Evaluation Procedures**

**Evaluation of Individual Subjects**

The revised Singing Knowledge Test and Student Attitude Survey were administered to all of the matched subjects in addition to another Interview/Audition Inventory that was identical to the initial one used as a part of the pre-treatment measures. The Investigator conducted these audio-taped interviews but evaluated only that portion that dealt with posture, breathing, and mouth opening, all of which could be visually assessed. Since a panel evaluation of eighty subjects' interviews was viewed to be impossible, a local vocal/choral expert who has studied voice extensively and is knowledgeable in the area of young voices evaluated the singing portion of the Interview/Audition Inventory by listening to and evaluating the tapes made of the interviews.

The scores achieved on the S.K.T. and the Interview/Audition Inventory were submitted separately for statistical analysis. Only twelve of twenty items from the Student Attitude Survey (items 3, 6, 7, 10, 12, 13, 14, 16, 17, 18, 19, and 20), which dealt with the influence of the research project and vocal development, were subjected to statistical analysis.
Evaluation of Treatment Choirs

In order to assess the tone quality and other performance aspects of the choir as a whole, both treatment choirs were video and audio taped in their respective auditoriums performing the two selections rehearsed by the Investigator during the seven-week treatment period. The purpose of the video tape was to provide a means for visually assessing posture, breathing, and relaxation of the mouth and jaw. As a quality audio tape was needed to evaluate choral tone quality, the video equipment was not considered for this purpose. A cassette tape recorder, an external microphone, and tape cassettes of high quality provided the audio source for the tone quality ratings.

All tapes were submitted for evaluation to a panel of local choral experts, all of whom had at least eighteen years of successful public school teaching experience. Each has developed an excellent choral program and is recognized statewide as a leader in the field of choral music education. All three judges have earned Master's Degrees and are active as judges for the Ohio Music Education Association large group contests.

The panel of experts evaluated the tapes using a modification of the format developed by Cooksey (1977). The modification incorporated a number of items from this format with those developed by the Investigator. The rating forms used both positive and negative statements relating to the choral performance, which the judges rated by agreeing or disagreeing using a Likert scale of 1 to 5, with 5 indicating strong agreement.
The Aural Rating Form included statements on diction, correctness of vowels, precision, and tone quality. The Video Rating Form was mainly concerned with posture, breathing, and mouth opening as they contributed to or detracted from the choir's performance. Musical interpretation was not important to the investigation and was not included. (Both forms are presented in Appendix F.)

Before submitting any tapes to the panel of experts, the Aural Rating Form was read by the judges and discussed by them with the Investigator. Several points of clarification were requested concerning specific terminology. After these were explained, the first trial/training tape was played and evaluated by the panel using the Aural Rating Form. Results were discussed with further clarifications being made. For example, in item 4 of the tone quality section, the word "harsh" was changed to "forced," and in item 11 of the same section, the words "overly breathy" were deleted.

As there was much disagreement among the judges in several areas, a second trial tape was played, evaluated, and discussed in the same manner. The judges were more familiar with the items on the Aural Rating Form and appeared to be more comfortable using it. Since there was much better agreement among the scores, it was decided to proceed with the evaluation process. The audio tapes were played in the following order:

1. Experimental: Palestrina
2. Control: Brahms
3. Experimental: pre-treatment tape
4. Control: pre-treatment tape
5. Control: Palestrina
6. Experimental: Brahms

A break between tapes was taken in order to allow the judges to complete the Rating Form. No consultations between judges and/or the Investigator occurred once the actual evaluation of the tapes had begun.

As with the procedures used for evaluating the audio tapes, the Video Rating Form was perused and discussed in order to establish an understanding of the terminology. No questions were raised; therefore, the first trial/training tape was shown. Following this trial, clarification was sought by the judges as to whether to evaluate the group as a whole or to focus on individuals. It was decided that evaluations should be made of the entire group. It was also noted that the items dealing with breathing were difficult to evaluate because these processes were not easy to visually discern from the tape. In addition, in item 15, the word "good" was inserted before the word "quality."

In order to generate familiarity with the Video Rating Form, a second trial tape was shown, evaluated, and discussed. As the judges found themselves more comfortable with the Rating Form and raised no additional questions, the evaluation of the post-treatment video tapes proceeded in the following order:

1. Experimental: Palestrina
2. Control: pre-treatment tape
3. Experimental: pre-treatment tape
4. Control: Palestrina
5. Experimental: Brahms
6. Control: Brahms

A short break occurred between evaluations in order to prepare the next tape and to allow completion of the Rating Form. All tapes, both audio and video, were played only once. While six audio and six video tapes were evaluated by the judges, only those that were performed by the experimental or control treatment choirs for the actual post-test were submitted for statistical analysis. The extra tapes served to provide variety during the evaluation session, hopefully allowing for a fair, non-biased evaluation of the experimental and control treatment groups' performances. (The judges ratings appear in Appendix G.)

After all of the tapes had been evaluated and the forms collected, the Investigator and the judges discussed the project in relation to what was heard and seen. They reported being impressed with the results and commended the Investigator for her efforts and the fortitude to listen to the less than exquisite sounds that had been produced by some of the choirs.

The judges were able to identify the choirs from the video tape because of facilities and wording on shirts, but this was not determined during the evaluations and not all three of the judges recognized both schools.
Equipment

The rehearsal tapes were made on a Marantz "Superscope" cassette tape recorder using a separate external SONY microphone (model F-27) and TDK SAC90 cassette tape. This same equipment was also used for the final taping sessions.

The video tapes were made on a JVC portable video cassette recorder (model VCR CR-4400U) and Scotch UCA 20s Color Plus video tape cassettes using a Panasonic color television camera (model WV-3300). These were played on a SONY Trinitron color television (model KV-1711D) and a SONY video cassette recorder (model V0-2600).

The audio tapes were played for the panel on a JVC stereo cassette tape deck (model KD-A33) with power from a JVC stereo receiver (model IR-S61H) through Interaudio speakers (model 1 by Bose).
CHAPTER IV
PRESENTATION AND ANALYSIS OF DATA

Following the completion of all evaluation and testing procedures, the scores obtained were subjected to statistical analysis. The data concerning the dependent variables of choral tone quality, choral diction/precision, student knowledge of the singing process, student individual vocal performance, and student attitudes were analyzed in the computer facilities of The Ohio State University using the SAS statistical package, which computed a series of t tests to determine if significant differences existed between the treatment groups. The organization of this chapter will be to present the hypotheses, the results of the statistical analysis, and a discussion. "Song 1" refers to "Adoramus te" by Palestrina, and "Song 2" refers to "How Lovely Is Thy Dwelling Place" from the Brahms Requiem. In Tables 2 through 10, "Exp." refers to the experimental group and "Con." refers to the control group.

**Tone Quality**

**Hypothesis 1**

The learning and application of selected vocal pedagogy concepts in choral rehearsals will improve the overall tone quality of choirs.

In order to test this hypothesis, scores were derived from the ratings of the panel of experts (c.f. Chapter III, p. 45) and were
submitted for statistical analysis. The results of this procedure appear in Tables 2 and 3.

Table 2. Paired Observation t Test for Significance Between Means for the Dependent Variable Tone Quality for Song 1

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Mean Difference</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>2.86</td>
<td>.74</td>
<td>.76</td>
<td>2.8788</td>
<td>.007</td>
</tr>
<tr>
<td>Con.</td>
<td>2.13</td>
<td>.65</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Paired Observation t Test for Significance Between Means for the Dependent Variable Tone Quality for Song 2

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Mean Difference</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>3.89</td>
<td>.35</td>
<td>2.07</td>
<td>17.2314</td>
<td>.0001</td>
</tr>
<tr>
<td>Con.</td>
<td>1.82</td>
<td>.30</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As seen in Tables 2 and 3, the statistical analysis indicated significant differences between the means of the treatment groups in favor of the experimental treatment. The results for the homophonic Renaissance period piece were significant at the .007 level; for the Romantic era piece, at the .0001 level. Therefore, the hypothesis is accepted for both pieces.
Hypothesis 2

The learning and application of selected vocal pedagogy concepts in choral rehearsals will improve the performance aspects of diction and precision of choirs.

In order to test this hypothesis, scores were derived from the ratings of the panel of judges (c.f. Chapter III, p. 45) and were submitted for statistical analysis. The results of this procedure appear in Tables 4 and 5.

Table 4. Paired Observation t Test for Significance Between Means for the Dependent Variable Diction/Precision for Song 1

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Mean Difference</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>2.44</td>
<td>.59</td>
<td>.42</td>
<td>1.7798</td>
<td>.089</td>
</tr>
<tr>
<td>Con.</td>
<td>2.02</td>
<td>.56</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Paired Observation t Test for Significance Between Means for the Dependent Variable Diction/Precision for Song 2

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Mean Difference</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>3.69</td>
<td>.48</td>
<td>1.67</td>
<td>9.8592</td>
<td>.0001</td>
</tr>
<tr>
<td>Con.</td>
<td>2.02</td>
<td>.33</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen in Tables 4 and 5, the statistical analysis indicated no significant difference between the means of the treatment...
groups for audio diction/precision for Song 1. However, the statistical analysis does indicate a significant difference between the means of the treatment groups for Song 2 at the .0001 level. Therefore, the hypothesis is rejected for the Renaissance period piece and accepted for the Romantic era selection.

**Student Knowledge of the Singing Process**

**Hypothesis 3**

The learning and application of selected vocal pedagogy concepts will increase student knowledge of the physical singing process.

In order to test this hypothesis, scores were derived from the results of the Singing Knowledge Test (c.f. Chapter III, p. 44) and were submitted to statistical analysis. The results of this procedure appear in Table 6.

**Table 6. Paired Observation t Test for Significance Between Means for the Dependent Variable Student Knowledge of the Singing Process**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Mean Difference</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>16.15</td>
<td>3.36</td>
<td>4.02</td>
<td>5.3394</td>
<td>.0001</td>
</tr>
<tr>
<td>Con.</td>
<td>12.13</td>
<td>3.07</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen in Table 6, the statistical analysis showed a high level of significance for the influence of the experimental treatment on verbal knowledge of the singing process. The difference between the means was significant at the .0001 level. Therefore, the hypothesis is accepted.
**Student Vocal Production**

**Hypothesis 4**

The learning and application of selected vocal pedagogy concepts in choral rehearsals will improve individual student vocal performance ability.

In order to test this hypothesis, scores were derived from the Interview/Audition Inventory (c.f. Chapter III, p. 44) and were submitted to statistical analysis. The results of this procedure appear in Table 7.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Mean Difference</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>35.46</td>
<td>4.23</td>
<td>4.20</td>
<td>3.7475</td>
<td>.0004</td>
</tr>
<tr>
<td>Con.</td>
<td>31.26</td>
<td>5.16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen in Table 7, the statistical analysis revealed a significant difference between the means in favor of the experimental treatment for student individual performance ability. The difference between the means was significant at the .0004 level. Therefore, the hypothesis is accepted.
While the video ratings were intended to measure large group performance (c.f. Chapter III, p. 45) the results are more pertinent to improved individual performance. The results of the Video Rating Form are presented in Table 8.

**Table 8. Paired Observation t Test for Significance Between Means for the Dependent Variables Posture, Breathing, and Relaxation, Video Rating for Song 1 and Song 2**

<table>
<thead>
<tr>
<th>Group</th>
<th>Song</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Mean Difference</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>1</td>
<td>2.797</td>
<td>.68</td>
<td>.757</td>
<td>3.7825</td>
<td>.0008</td>
</tr>
<tr>
<td>Con.</td>
<td>1</td>
<td>2.040</td>
<td>.37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp.</td>
<td>2</td>
<td>3.84</td>
<td>.48</td>
<td>1.53</td>
<td>9.7849</td>
<td>.0001</td>
</tr>
<tr>
<td>Con.</td>
<td>2</td>
<td>2.31</td>
<td>.36</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen in Table 8, the statistical analysis indicated significant differences between the means at the .0008 and .0001 levels in favor of the experimental treatment for both songs.

Based on the information from Tables 7 and 8, the hypothesis is accepted.
Student Attitudes

Hypothesis 5

The learning and application of selected vocal pedagogy concepts during choral rehearsals will positively affect student attitudes toward singing and choir participation.

In order to test this hypothesis, scores were derived from the Student Attitude Survey (c.f. Chapter III, p. 44) and were submitted to statistical analysis. The results of this procedure appear in Table 9.

Table 9. Paired Observation t Test for Significance Between Means for the Dependent Variable Individual Student Attitudes

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Mean Difference</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>3.20</td>
<td>1.46</td>
<td>.09</td>
<td>0.1853</td>
<td>.85</td>
</tr>
<tr>
<td>Con.</td>
<td>3.29</td>
<td>.79</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen in Table 9, the statistical analysis indicated no significant differences between the means of the treatment groups for attitude. Based on this analysis, the hypothesis is rejected, indicating that no attitudinal differences exist.

While no significant differences were found for the selected items on the Student Attitude Survey, a notable difference was seen between the means on two key items. (See Table 10.)
The contents of Items 3 and 13 were directly related to the activities of the research project.

**Table 10. Means of Two Key Items from the Student Attitude Survey**

Item 3. The activities during the research project helped me to make a better contribution to the choir.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>4.45</td>
</tr>
<tr>
<td>Con.</td>
<td>3.23</td>
</tr>
</tbody>
</table>

Item 13. The activities of the research project have helped me to appreciate choir more.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>4.12</td>
</tr>
<tr>
<td>Con.</td>
<td>3.10</td>
</tr>
</tbody>
</table>

The means found in Table 10 may be interpreted to indicate a favorable reaction to the experimental treatment. While not statistically significant, the results suggest that vocal development activities tend to influence student attitudes in a positive direction.
CHAPTER V
SUMMARY AND CONCLUSIONS

Purpose of the Study

The primary purpose of the present study was to investigate the influence of selected vocal pedagogy concepts on high school choral tone quality. Through the study, the Investigator attempted to provide quantification of the effect that these concepts have on choral tone quality and related aspects of choral performance.

Procedures

Two high school choirs from the Columbus, Ohio, area were selected and tested for equivalency. Four separate measures were used to determine this condition and for the purpose of matching forty pairs of subjects. The control group was rehearsed by the Investigator concentrating on the rehearsal concepts of phrasing, intonation, dynamics, balance, and blend. The experimental group was also rehearsed by the Investigator, but vocal pedagogy was incorporated into the rehearsal technique. Two choral selections of differing styles were rehearsed by the Investigator in conjunction with the research study.

The experimental treatment was based on the development of the concepts of posture, breathing, diction, resonance, and relaxation. The treatment duration was seven weeks, three sessions per week. Each
rehearsal session of approximately 25 minutes was conducted by the Investigator and included techniques to develop one or more of these concepts. Vocalises were used in conjunction with directions to alter and improve aspects of voice production within the actual choral pieces being rehearsed as part of the study.

The control treatment, identical in duration, was based on the primary rehearsal concepts of correct notes, accurate interpretation of dynamics and rhythm, intonation, blend, and balance. Problems were identified and labeled for the choir members as necessary without any attempt to offer a vocal production solution.

To assess individual knowledge and vocal development following the treatment period, the revised Singing Knowledge Test and the Interview/Audition Inventory were administered to the matched subjects. The Student Attitude Survey was administered to the matched subjects to measure the effects of the research project on attitudes toward vocal development. To assess the performances of the treatment groups, audio and video tapes were made.

**Matériaux**

**Choral Music**

The two choral selections rehearsed as part of this study were of varying styles and historical periods. A homophonic Renaissance piece ("Adoramus te" by Palestrina) and a polyphonic Romantic piece ("How Lovely Is Thy Dwelling Place" from the Brahms *Requiem*) were used as the basis for training and subsequently evaluating the performances of the treatment choirs.
Instruments of Evaluation

Information as to the matched subjects' verbal knowledge of the singing process was assessed through a paper and pencil test (Singing Knowledge Test) on aspects of voice production and an individual session (Interview/Audition Inventory) wherein they were asked to demonstrate basic vocal production.

The attitudinal portion of the study was measured by means of a student survey (Student Attitude Survey) that dealt with reactions to the research project and vocal development, as well as reasons for being in choir.

For evaluation of the choirs' performances in terms of tone quality, diction, precision, posture, breathing, and relaxation, rating forms (Aural, Video Rating Forms) were developed to measure specifically these choral/vocal production principles. Using these rating forms, a panel of choral experts made the ratings.

Data Analysis

The scores derived from the various post-treatment measures were subjected to statistical analysis by performing t tests on the means obtained from each post treatment measure. There were a total of nine t tests.
Results

Hypothesis 1: The learning and application of vocal pedagogy concepts will improve the overall tone quality of choirs.

The hypothesis was accepted at the .007 and at the .0001 levels in favor of the experimental treatment.

Hypothesis 2: The learning and application of vocal pedagogy concepts will improve the choral performance aspects of precision and diction.

The hypothesis was rejected for Song 1 (Palestrina) and accepted for Song 2 (Brahms) at the .0001 level in favor of the experimental treatment.

Hypothesis 3: The learning and application of vocal pedagogy concepts will improve student understanding of the singing process.

The hypothesis was accepted at the .0001 level in favor of the experimental treatment.

Hypothesis 4: The learning and application of vocal pedagogy concepts will improve individual student vocal performance.

The hypothesis was accepted at the .0004 level in favor of the experimental treatment.

Hypothesis 5: The learning and application of vocal pedagogy concepts will positively affect student attitudes toward singing and choir participation.

The hypothesis was rejected because of a lack of significant differences between the means of the treatment groups.
Conclusions and Implications

The results presented in Chapter IV and a review of the purpose of the study suggest the following conclusions.

1. The use of vocal pedagogy in choral rehearsals improves the diction, precision, and tone quality of high school choirs, and thereby improves overall performance.

Voice and choral experts have long supported voice training for choristers as being important for their development as well as for an improved choral sound. Choral directors should incorporate training in posture, breathing, diction, relaxation, and resonance as part of every rehearsal. These concepts have been identified as critical to vocal development in both research and non-research literature pertaining to this subject. Vocalises designed to correct specific vocal problems can be used as warm-ups to further enhance vocal development. Choral literature should be selected partly on the basis of teaching potential in the area of vocal development concepts such as range, pure vowels (diction), breath control, and appropriate styles of vocal production to meet the needs of different styles of music. The results of this study showed a marked difference between groups in terms of student verbal knowledge of singing, student vocal performance, and choral performance. Based on these results, directors should be convinced of the value of vocal development for choirs and, therefore, should stress sound vocal production in every rehearsal.

2. The teaching of vocal pedagogy in the choral setting improves student understanding of the singing process, which thus encourages application of this knowledge for improved individual vocal performance.
The choral director is often the only voice teacher many students ever have. Therefore, it is imperative that the choral director provide quality vocal training as this training may represent how the student will sing for much of his/her life. Students who receive voice training in the choral setting will be aware of their limitations and be able to sing comfortably and properly in many styles. Their personal enjoyment and development will perhaps extend beyond the high school level to college or even to community activities. Producing lifelong music consumers is one of the goals of music education, and choristers who are not trained vocally will perhaps lose interest as their voices deteriorate or as they feel uncomfortable about singing. To ignore vocal development is to deny the essence of choral music.

3. As employed in this study, the concepts of posture, breathing, diction, resonance, and relaxation provide a foundation for vocal growth and development for high school choristers.

These key concepts have been identified as basic to good vocal production for both choristers and soloists. Natural, free singing is the result of responsible teaching of these concepts in the studio and in the choral rehearsal.

4. The results of this study should allow studio voice teachers to re-evaluate their opinions of choral music education to accept the possibility that responsible vocal teaching in choirs is indeed beneficial to the young singer.
The literature pertaining to the potentially detrimental aspects of choral singing has encouraged vocal development in the choral rehearsal, but the lack of communication between directors and teachers has generated distrust of one group for the other. This study has provided evidence as to the effectiveness of vocal pedagogy in the choral rehearsal. Given this information, the studio teachers and choral directors must collaborate in their efforts toward vocal development for young singers.

5. While the results of the Student Attitude Survey were not significantly different, they may indicate an inclination toward learning vocal development through special activities.

These "special activities" could represent concentrated instruction in vocal development over a short or long period of time and reinforce the director's attempts at vocal development, providing a new angle or approach, different terminology, or motivation. Activities such as choral and/or vocal camps or special "visiting teachers" are recommended as possibilities.

The lack of significance may be the result of an imprecise instrument of evaluation. The items may have been too long or too short, or may have been unclear to the students. The instructional concepts may not have been effectively reflected in enough of the items to produce more than general tendencies.

6. Training in the identification of vocal production problems in choirs and the prescribing of effective solutions is a necessity for the potential choir director.
Music education preparation for choral majors must include extensive training in vocal production and development techniques that would be directly applicable to choral situations. This training should include voice study in the form of group or private lessons, observations of vocally-oriented directors during actual rehearsals, and practice recognizing the difference between musical "mistakes" and vocal production problems. Choral directors must be trained in the care of young, developing voices in order to know their limitations and to prevent abuse.

**Recommendations for Further Research**

The following recommendations for further research are suggested from the findings and limitations of this study. Studies should be carried forth:

1. In which several different treatment groups would receive instruction in vocal pedagogy over varying periods of time with measurement of gain or improvement as a function of the length of treatment;

2. Of longer duration to allow for more detail in the areas of concept explanation and discussion;

3. In which vocal development concepts would be applied to all of the current repertoire of the choir;

4. In which the various voice sections of a choir would be isolated occasionally and rehearsed as a voice class in order to intercept and repair more individual vocal problems.
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APPENDIX A

Director Survey
Director Survey

1. What do you tell your students about posture for singing?

2. What do you tell your students about breathing technique for singing?

3. Please describe your method for encouraging "open mouths" for singing.

4. What vowel sounds do your choir members have the most trouble with? How do you correct them?

5. What do you tell your students about support?

6. Please describe your teaching philosophy as it relates to choral music education.

7. Do you ever use soft singing as a teaching technique? If so, under what circumstances?

8. What do you tell your students about initial attacks on vowels? Consonants?
APPENDIX B

Measurement Instruments Used for Matching Purposes
SINGING KNOWLEDGE TEST

Please answer the following questions as best you can. You will not receive a grade for your answers, but it is important that you try your best. If you do not know the answer to a question, leave it blank. If you know a little bit, but not the whole answer, put down what you do know.

1. What are five (5) important things to think about for good singing? Besides the notes and the words, what physical kinds of things should you think about?

2. How should singers stand when trying to sing their best? Describe in as much detail as possible.

3. How should you breathe for singing?

4. What does "support the tone" mean to you?

5. How do your vocal cords work when you sing or speak?
6. What is a diphthong? How do good singers sing them?

7. Why are consonants important to singing? How should they sound?

8. Why is it important to open your mouth to the correct shape when singing?

9. Where should your tongue be when singing a vowel?

10. Which of the following best describes the desired body conditions for singing?
    a. Relaxed, at ease
    b. Tense, tight
    c. Relaxed, with energy
    d. Erect, stiff
STUDENT ATTITUDE SURVEY

Please respond to the following statements as honestly as you can. Your responses will be anonymous and the more honest you can be, the more accurate a picture will be produced. To respond to each item, circle the number which best describes your reaction to the statement. The number scale works as follows:

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<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
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1. I like choir because we learn how to control our singing voices and produce a better vocal tone.
   SD  D  N  A  SA
   1  2  3  4  5

2. I joined choir because I like to sing.
   SD  D  N  A  SA
   1  2  3  4  5

3. I'm in choir because I wanted to learn how to control my singing voice better.
   SD  D  N  A  SA
   1  2  3  4  5

4. I joined choir because many of my friends are in it.
   SD  D  N  A  SA
   1  2  3  4  5

5. I joined choir because I knew it would be easy to get a good grade.
   SD  D  N  A  SA
   1  2  3  4  5

6. I joined choir because I wanted to make new friends.
   SD  D  N  A  SA
   1  2  3  4  5

7. I'm in choir because I think the group (choir) is good.
   SD  D  N  A  SA
   1  2  3  4  5
8. Choir at this school is "the place to be."
   SD  D  N  A  SA
   1  2  3  4  5

9. I signed up for choir because I heard that the director is a good teacher.
   SD  D  N  A  SA
   1  2  3  4  5

10. Learning **HOW** to sing is important to me.
    SD  D  N  A  SA
    1  2  3  4  5

11. Choir is a good time to learn how to improve my singing voice.
    SD  D  N  A  SA
    1  2  3  4  5

12. I would rather just sing and have fun in choir instead of working to improve.
    SD  D  N  A  SA
    1  2  3  4  5

13. I'm in choir because the director is a nice person.
    SD  D  N  A  SA
    1  2  3  4  5

14. I joined choir because all of the best kids are in it.
    SD  D  N  A  SA
    1  2  3  4  5

15. The main reason that I joined choir is that I enjoy singing.
    SD  D  N  A  SA
    1  2  3  4  5

16. If students want to develop their voices, they should take private voice lessons, not choir.
    SD  D  N  A  SA
    1  2  3  4  5
17. I joined choir because it is a good time without much responsibility on my part.

18. I'm in choir because my parents made me.

19. The reason that I joined choir was to improve my singing voice.

20. I like choir better now than at the beginning of the year.
MUSICAL BACKGROUND INVENTORY

1. How many years have you been in high school choir? ________
   junior high school choir? ________

2. How many years have you been in high school band? ________
   junior high school band? ________

3. How many years have you been in high school orchestra? ________
   junior high school orchestra? ________

4. Have you ever taken private lessons? Yes No
   If so, check any that apply.
   piano ________(years)
   voice ________(years)
   organ ________(years)
   band instrument ________(years)
   string instrument ________(years)

5. Do you attend live music concerts or shows? Yes No
   Check any that apply.
   Jazz ________
   Rock ________
   Choral (choirs) ________
   Musicals ________
   Columbus Symphony ________
   Pro Musica Chamber Orchestra ________
   Country & Western ________

6. What kind(s) of records or tapes do you buy? Check any that apply.
   Jazz ________
   Rock (all kinds) ________
   Country & Western ________
   Disco ________
   Classical ________

7. Do your parents attend concerts? Yes No

8. Do your parents listen to music at home? Yes No

9. About how many hours a day do you listen to the radio or to records
   at home? ________ (hours a day)
STUDENT INTERVIEW RECORD for __________________________

1. "Show me how you are supposed to stand for singing."
   
   head 1 2 3 4 5
   shoulders 1 2 3 4 5
   chest 1 2 3 4 5
   feet 1 2 3 4 5
   legs 1 2 3 4 5

2. "Breathe like you were going to start singing."
   
   low expansion 1 2 3 4 5
   heaving chest 1 2 3 4 5

3. "Sing the following exercises on the vowels I give you."
   
   ah 1 2 3 4 5 (ascending and descending do - sol - do)
   oh 1 2 3 4 5 Dialect Pure
   oo 1 2 3 4 5 1 2 3 4 5
   ee 1 2 3 4 5

4. "Sing 'My Country 'tis of Thee'. Sing it in your best singing voice."
   
   General Tone Tight Breathy Free (clear, even)
   1 2 3 4 5
   Jaw Action Closed Dropped
   1 2 3 4 5
APPENDIX C

Scores for Matched Subjects

(Pre-Treatment)
### Scores of Matched Subjects on Pre-Treatment Measures

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APPENDIX D

Daily Lesson Plans for Treatment Groups
Daily Lesson Plans

Control

Day 1  Introduction of self and purpose of project.
       2 choirs getting different treatments on the same music.
       Read through Brahms with piano on parts.
       Work through parts first phrase.

Day 2  Brahms: Review first phrase parts; add second phrase, piano on parts. Mark phrases so far. Sing from beginning, using their terminology: "Sit up straight and bring the music to your face."

Day 3  Brahms: Sing from beginning on neutral syllable "tah."
       Augment tenors with a few (3) altos for solo passage to build confidence. Work on getting precise entrances; give attention to phrase shaping; fix notes as necessary.

Day 4  Brahms: Work out notes for all parts p. 4-5. Emphasize dynamics. Mark phrases p. 4-5; check phrase markings from beginning.

Day 5  Brahms: Sing from beginning with text. Remember dynamics; bring out moving parts. Work parts p. 6-7. Discuss "shaping phrases": most in this piece start softer, grow in the middle and come back down or taper back down.

Day 6  Brahms: Work parts p. 7-8-9 top; isolate problem spots as they occur and fix. Sing from beginning; go on to the end.

Day 7  Brahms: Review parts p. 7-8-9, especially alto. Continue singing to end of piece. Sing all the way from beginning, back 2 rows standing. Emphasize dynamics and shaping phrases; start softer.
       Palestrina: Read through on neutral syllable "loo" twice, with piano on parts.

Day 8  Brahms: "Counted" through for energy and flow and connection.
       Palestrina: Work parts beginning phrase, counting first phrase. Change to "loo" at B; fix alto/tenor m. 2 before C, fix tenor at B.
       Speak through Latin text, sing with text.

Day 9  Palestrina: Check parts, mark dynamic changes that are different from those in the score. Mark phrases. Move to "scrambled" position, back 2 rows standing. Emphasize dynamics; bring out moving parts.
Day 10  Smaller group because of field trip.
Palestrina: Sing through; fix note problems as necessary; with piano, without piano. Listen and try to blend. Make the last cadence even; no accent on the last chord. Don't let it explode.

Day 11  Brahms: Check parts p. 8-9-10. Sing from beginning, back 2 rows standing. Go to scrambled position, back 2 rows standing. Sing from beginning; emphasize dynamics and correct phrasing.

Day 12  Palestrina: Sing through, fixing parts as necessary. Remind of dynamics, phrasing. Sing through on neutral syllable "doo"; sing with text.
Brahms: Check parts p. 6 to end, "counting" p. 8 especially for women rhythm. Sing from beginning with text, "leaning" on beat 1 side to side (for relaxing and energy, not discussed with students.)

Day 13  Palestrina: Avoid diphthong "ay-eee"; make them all "eh." Listen and blend; grow from one note to the next, making one big "hill" rather than a series of little ones between syllables. Do not let the note taper off. Sing from beginning.
Brahms: Sing through. Concentrate on dynamics and phrase shaping.
Formation: Scrambled.

Day 14  Palestrina: Make crescendos more gradual. Sing from beginning on neutral syllable "loo." Sing as if in a large stone cathedral (resonance and intonation). Sing from beginning.
Brahms: Work on balance--more alto/tenor, less soprano throughout. Clean up cutoffs--watch and think. Fix note problems as necessary.

Day 15  Brahms: (Regular director took choir through this today -- it was to be performed at a memorial service. He did nothing except sing through it while playing the piano.)
Palestrina: Sing with text, with and without piano. Build and shape phrases carefully. Concentrate on and remember dynamics.

Day 16  Brahms: (Sing through with regular director in charge. No instructions except cutoffs.)

Day 17  Palestrina: Remind of diphthong "ay-eee." Stagger breathing within phrases. Make every long note "do something"; don't let it stay the same. Stand; sing with and without piano.

Day 18  Palestrina:  "Make music out of this"; listen and balance. Circular formation around edge of room, me in the center.
Brahms:  Sing straight through.

Day 19  Make-up session from Day 16, longer than normal.
Brahms:  Check altos p. 9; work same section with sopranos for rhythm. Remember dynamics and phrasing. Scrambled formation.
Palestrina:  Form several compact circles progressively larger until all choir members are "used up." Balance each chord; blend by listening and adjusting.

Day 20  On stage with risers and acoustical shell (auditorium).
Palestrina:  Sing through twice. Work for more variation. Taper phrases back down.
Brahms:  Sing through. Do everything worked out previously: shaping, entrances, cutoffs, dynamics.

Day 21  Palestrina:  Be sure to grow from note to note—don't let notes sag and die, especially within words. (Demonstrate.) Keep volume relatively soft; clean up initial attacks.
Brahms:  Watch and react or respond with more variation. Sing straight through.

Day 22  Video and audio tape choir in auditorium on risers with acoustical shell. Run through both pieces before taping.
Daily Lesson Plans
Experimental

Day 1  Introduction of self and project.
Warm-ups: (standing)
1. Floppy jaw: ya ya ya, 5-1.
2. Chewing hum, 5-1.
Discuss with students the purpose of these exercises. (loosen jaw and/or relax jaw and mouth)
Explain POSTURE and discuss importance of correct posture to good singing.
   a) Feet apart comfortably about shoulder width. (good balance)
   b) Legs/knees flexible. What happens if locked? (creates tension, results in fainting)
   c) Shoulders back and relaxed down. What happens to your chest? (Raises, becomes higher, goes out)
   d) Arms relaxed down at side. (messes up posture if held in front or behind)
   e) Head level, sitting on top of spine. Why not stretched up with chin jutting out? (students do this and try to move jaw; should find it difficult)
      Tuck chin way in. Does this work? (no)
Sit and read through Brahms with piano playing parts. Work parts in opening phrase.

Day 2  Review Posture.
Warm-ups:
1. Chewing hum opening to ah on last note of exercise, 5-1. (relax jaw, resonance)
2. Pwee/pwee descending arpeggio, 8/5/3/1 + throwing a "fast ball." (energy, relax body)
3. Yawn-sigh, stress relaxation/dropping of jaw. (create oral space, relax jaw and throat)
Brahms: Sing first phrase. Review parts for tenor/bass on neutral syllable "bah." Fix vowel in "lovely" to "lahvely." Work through next phrase parts. Encourage tenors to use lots of breath in the tone and to keep the mouth open and drop the jaw. Ask altos to sing with "elegance"; lighter sound on the lower notes, no pushing.
Day 3  Warm-ups:
1. Chewing hum opening to ah.
2. Kah/kah descending arpeggio, 8/5/3/1.
   (minimize jaw action, use tongue, work for a round, full
   "ah" vowel)
Brahms: Sing from beginning on neutral syllable "tah" at A.
   Men work for breathy light sound with lots of oral space.
   All sing with text, trying to reproduce the open "ah"
   feeling from the vocalise throughout. Mark phrases.

Day 4  Warm-ups:
1. Pwee/pwee + throwing.
   Brahms: Stress relaxation of jaw. Work parts p. 5-6. Sing
   with accompaniment; check dynamics.

Day 5  Introduce breathing. Inhalation: Diaphragm pulls down, expanding
   lungs; air rushes into the vacuum. Exhalation: Diaphragm
   slowly and steadily metering out air by moving upward. Feel
   this around the waist as air comes in; diaphragm should
   move out.
   Warm-ups:
1. Blow out candles.
   (conservation of air, breath energy)
2. Breathe in deeply, exhale slowly with a soft hiss.
   (connection of diaphragm to exhalation process, metering
   of breath)
3. Short, crisp "hey!!" (each section demonstrate)
   (power of breath + relaxation)
4. Roll r's or b's, 1-5-1.
   (discuss purpose of having enough breath to maintain the
   vibration and relaxing of lips or tongue)
Brahms: Work parts p. 6-7 on neutral syllable "doo." Mark
   phrases. Sing from beginning with text and accompaniment.

Day 6  Review breathing. Students demonstrate and check selves.
Brahms: Work p. 6 parts in various combinations: solo,
   different 2 and 3 combinations. Encourage sopranos to be
   more energetic. Work parts p. 7-8-9. Sing with text from
   p. 6. Remind of "Laev; try for more open and relaxed
   "thee."

Day 7  Warm-ups:
1. Sniff.
   (feel diaphragm movement)
2. Sniff hum, 5-1.
   (breathing, using smooth exhalation)
Start Palestrina: Read through on neutral syllable "loo" or
   "doo" with piano playing parts. Work for a gentle round
   "oo" vowel; pull lips forward like a kiss.
Brahms: Work parts p. 9-10 top (sop/alto, tenor/bass), fixing
   individual parts as necessary.
Day 8 Warm-ups:
   (breath contact and energy)
2. Tah-tay-tee-toh-too, 1-5-1.
   (tongue relaxation, articulation)
Discuss tongue position.
   (relaxed down, gently touching front teeth).
   Try to sing with it pulled up. What happens?
   (tension, discomfort)
   Do it correctly and feel the difference.
   (comfortable, relaxed)

Day 9 Warm-ups:
1. Roll r's and b's 1, 2, and 3 times on one breath.
2. Sustain NG hum, open to ah, descend 5-1, being sure to drop the jaw for both NG and ah.
   (resonance, relaxation of tongue, oral space)
Palestrina: Sing through on neutral syllable "too." Fix parts p. 3 top. Work on "oo" vowel, demonstrating variations. Speak text for students. All sing ugly "oo" and modify continuously until correct.

Day 10 Warm-ups:
1. Roll r's and b's as before.
2. Doo, 1-5-1, getting softer as ascend in pitch. Work for round vowel.
   (light adjustment, use of breath for relaxation)
Explain breath support: Using enough breath to create a controlled, vibrant, un-tense tone. Tone needs a lot of breath—not like a baby, but with energy.
Brahms: Rework parts p. 7. Rework parts p. 9-10 for rhythm and entrances. Move sopranos around within section to encourage more effort. Stand and sing to the end.

Day 11 Warm-ups:
1. See-ah, 1-5-1-5-1-9-1.
   (one breath, conservation and energy, changing vowel, smooth connection of moving notes)
2. Yawn-sigh ah and oh.
   (relax jaw, open throat)
3. Pwee/pwee + throwing.
Review breath support.
Brahms: Work parts p. 10. Sing C to the end, fixing notes as necessary. Sing from beginning, sopranos working for more energy and vitality.
Day 12
Warm-ups:
1. Deep breath, exhale, breathe, exhale soft hiss.
   (forward feeling of vibration, tongue movement and relaxation)
3. Roll r's and b's.
Palestrina: Sing through on neutral syllable "doo." Check phrasing and dynamics. Sing with text.
Brahms: Sing through on text. Concentrate on dynamics and phrasing. Remember vowels worked on previously.

Day 13
Warm-ups:
1. Deep breath, yawn-sigh.
2. Bree-ah, 1-5-1.
   (focus, opening for ah)
Palestrina: Continue warming up on neutral syllable "loo." Work for round "beautiful" vowel. Fill the mouth with sound. Use lots of breath in the sound.
Brahms: Sopranos energize; altos soft and warm sounds; tenors relax, no pushing; basses don't oversing. Sing from beginning. Fix "the" to "thah."

Day 14
Warm-ups:
1. Po/po descending arpeggio.
   (strong attack, rounded oh, drop jaw)
2. Thah-thay, etc.
Scrambled formation.
Brahms: Check parts at beginning, especially altos.
   Fix vowels: Lord, rounded, not lard
   hosts, round, not Ohio "oh"
   the, Thah drop jaw, not thuh
   love, Lahv, not Luv
Altos use plenty of air in the tone; keep the energy but use more breath (to relax the sound). Men be consistent with the tone; think about all that has been "fixed."
Sopranos ENERGIZE.
Sing from beginning with accompaniment.

Day 15
Warm-ups:
   (breath energy, "oh" vowel)
   (forceful breath attack, resonance sensation, relaxed jaw)
Palestrina: Sing through on neutral syllable "loo." Sing airy and full. Concentrate on dynamics; avoid diphthong ay-e-e-e-e-e.
   Listen to other parts while singing, and balance. Fix last phrase for balance and intonation.
Brahms: Sing through. Concentrate on correct vowels. Fix notes as necessary.
Day 16 Warm-ups:
1. Short, crisp "Hey!!"
2. Yawn-sigh and roll head.
   (relax neck and jaw)
   (forward placement, solid attack, good vowels)
Formation: Women mixed across front, men mixed across back.
It takes both the brain and the body to sing. You need energy and concentration for good singing.

Day 17 Warm-ups:
1. Breathe deeply, blow out multiple candles.
2. Yawn-sigh, pull on jaw with fingers to relax.
3. Sigh; descend 5-1 trying to retain the relaxed feeling, each section alone.
   (breath and energy)
Palestrina: Sing from beginning on text. Watch where to breathe--stagger during phrases. Remember dynamics (crescendo/decrescendo). With and without piano. Fix parts p. 2-3 top.
Brahms: "Praise" too closed; open and think preh. "Lovely" still too tight; relax and use more breath. Need more energy on "how" pick-ups. Fix tenor p. 6 last measure.
Formation: Men across front in sections, women in back scrambled.

Day 18 Warm-ups:
1. Thah-theh-thee, etc., 1-5-1.
2. Po/po, 8/5/3/1, + throwing.
   (energy, relaxation)
Explain importance of the shape of the mouth: for good vowels, resonance, projection; to let the sound out! Good vowels = good shape and vice versa.
Explain RESONANCE: Adds richness and fullness to tone, improves quality. Discuss pharynx and mouth vs. chest and nose.
Brahms: Tenor solo--relax and sing lightly. All--too much "r" in "courts" and "for." Sopranos shrill top of p. 8; get ready for it (breathe) and get under it (support). At C too much sound too soon. Bass/tenor "they praise" too heavy; lighten up. "Praise thee" too smiley and tight; open up and use more breath. Alto p. 10 under pitch; lighten and listen. Tenors last cadence, don't scream; softer and more breath.
Sing from beginning incorporating the above.
Day 18  Palestrina: Explain and demonstrate staggered breathing. 
(Cont)  Avoid breathing at bar lines and before syllable changes. 
Careful of diphthongs (ay-eee, spread oo). Shape phrases carefully. Fix notes as necessary.

Day 19  Warm-ups:
1. ming/mong, 1/3/5/3/1.
   (frontal resonance, ng resonance, tongue relaxation)
2. Flah-fleh-flee, etc., 1-5-1.
   (flexibility, resonance)
Brahms: Check alto notes in opening phrase. Fix notes p. 6.
   Not so much "r" in "Lord." Fix ladies' rhythm p. 10.
   Open and round "how" - hawh.
Sing from beginning incorporating the above.
Palestrina: Placement of the "s" with the following syllable rather than elongating it. Careful attacks. Breathe with me and watch carefully. Careful of ay-eeeee. Clean up parts final phrase.
Sing from beginning incorporating the above.

Day 20  Further explanation of resonance: Natural amplification system. May feel something in head, but really happens in mouth and throat. All vowel shaping and dropped jaw contributes; makes a full vibrant sound.
Discussion of consonants: Makes text understandable. Need to be clean and precise so as not to distort vowel sounds.
Warm-ups:
1. Roll r's, 1-5-1.
2. See-ah.
3. Pwee + throwing.
Brahms: Sing memorized. Watch for entrances, cutoffs, dynamics, and phrases. Try to respond to what I do.
Palestrina: Sing memorized with help on text. Concentrate on "beautiful" vowels.

Day 21  Rehearse in auditorium on risers with acoustical shell.
Warm-ups: (selected by the choir)
1. Pwee + throwing.
2. See-ah.
3. Yawn-sigh.
Sing both songs, fixing note problems as needed.

Day 22  Audio and video tape in auditorium, on risers with acoustical shell.
APPENDIX E

Revised Post Treatment Measures
SINGING KNOWLEDGE TEST
(Post Treatment)

1. What are five important things to think about for good singing? As you sing, what do you need to be thinking about?

2. How should singers stand when trying to sing their best?
   Describe each of the following.
   a. Head
   b. Chest
   c. Shoulders
   d. Legs
   e. Arms

3. How should you breathe for singing?

4. Why is it important to sing vowels correctly?

5. Why is it important to open your mouth to the correct shape when singing?
   a. To let the sound out
   b. For proper resonance
   c. For the proper vowel sound
   d. All of the above
   e. a and c only

6. What does "support the tone" mean to you?
7. How should each of these vowels be sung in order to be correct? Use sentences or diagrams to describe conditions or pronunciations.
a. i as in night
b. a as in place
c. o as in Lord
d. u as in adoramus
e. o as in lovely

8. Which of the following best describe the desired body conditions for singing?
a. Relaxed, at ease
b. Tense, tight
c. Vital, with energy
d. Erect, stiff

9. Where should your tongue be when singing a vowel?
a. High, pulled up and back
b. Relaxed, resting on the bottom of the mouth
c. Wherever it goes
d. In the middle of the mouth cavity

10. Why are consonants important to good singing?
STUDENT ATTITUDE SURVEY
(Post Treatment)

Please respond to each of the following statements as best you can. Circle the number which best reflects your reaction to each statement. The number scale works as follows:

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<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
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<td>4</td>
<td>5</td>
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</tbody>
</table>

1. I like choir because we learn how to control our singing voices and produce a better vocal tone.
   SD  D  N  A  SA
   1  2  3  4  5

2. I joined choir because I like to sing.
   SD  D  N  A  SA
   1  2  3  4  5

*3. The activities during the research project helped me to make a better contribution to the choir.
   SD  D  N  A  SA
   1  2  3  4  5

4. I joined choir because many of my friends are in it.
   SD  D  N  A  SA
   1  2  3  4  5

5. I'm in choir because I think the group (choir) is good.
   SD  D  N  A  SA
   1  2  3  4  5

*6. I'm in choir because I wanted to learn how to control my singing voice better.
   SD  D  N  A  SA
   1  2  3  4  5
7. I joined choir because I figured that it would be easy to get a good grade.

8. I joined choir because I wanted to make new friends.

9. I signed up for choir because I heard that the director is a good teacher.

10. Learning how to sing is important to me.

11. I joined choir because all of the best kids are in it.

12. I would rather just sing and have fun in choir instead of working to improve.

13. The activities in the research project have helped me to appreciate choir more.

14. Choir is a good time to improve my singing voice.

15. I'm in choir because the director is a nice person.
16. The main reason that I joined choir is that I enjoy singing.

17. If students want to develop their voices, they should take private voice lessons, not choir.

18. Choir is not the place to be learning about voice improvement.

19. I joined choir because it is a good time without much responsibility on my part.

20. I feel that I can produce a better vocal sound now than I could at the beginning of the semester.
APPENDIX F

Performance Evaluation Measures

(Aural and Video)
AURAL RATING FORM

Diction
1. The overall diction of this group is clear, understandable, and precise.
   \[ SD \quad D \quad N \quad A \quad SA \]
   \[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \]
2. The vowels are unified across the group.
   \[ SD \quad D \quad N \quad A \quad SA \]
   \[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \]
*3. The diction of this group is excellent.
   \[ SD \quad D \quad N \quad A \quad SA \]
   \[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \]
4. The vowels are modified appropriately.
   \[ SD \quad D \quad N \quad A \quad SA \]
   \[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \]
5. Final consonants need more crispness.
   \[ SD \quad D \quad N \quad A \quad SA \]
   \[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \]
6. The vowel sounds are approaching "pure" and are without regional accent.
   \[ SD \quad D \quad N \quad A \quad SA \]
   \[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \]
*7. Initial consonants need more emphasis.
   \[ SD \quad D \quad N \quad A \quad SA \]
   \[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \]

Precision
*1. All part entrances are precise.
   \[ SD \quad D \quad N \quad A \quad SA \]
   \[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \]
*2. Attacks and releases of many notes are imprecise.
   \[ SD \quad D \quad N \quad A \quad SA \]
   \[ 1 \quad 2 \quad 3 \quad 4 \quad 5 \]
*3. Attacks are consistently weak.
   SD D N A SA
   1 2 3 4 5

4. Entrances give evidence of good breathing technique.
   SD D N A SA
   1 2 3 4 5

5. Attacks and subsequent notes are evenly begun, showing evidence of efficient phonation in all ranges.
   SD D N A SA
   1 2 3 4 5

Tone Quality

*1. The tone quality is often forced in this choir.
   SD D N A SA
   1 2 3 4 5

*2. Excellent control of intonation at forte levels.
   SD D N A SA
   1 2 3 4 5

3. Blend is excellent.
   SD D N A SA
   1 2 3 4 5

*4. The tone quality is too harsh in forte passages.
   SD D N A SA
   1 2 3 4 5

*5. Soprano and tenor parts sound forced in upper pitch and dynamic ranges.
   SD D N A SA
   1 2 3 4 5

6. Balance is poor in forte sections.
   SD D N A SA
   1 2 3 4 5

*7. Intonation in all parts excellent throughout performance.
   SD D N A SA
   1 2 3 4 5
8. Balance is good in soft sections.
   SD  D  N  A  SA
   1  2  3  4  5

9. Tone is free and open, without breathiness or tension.
   SD  D  N  A  SA
   1  2  3  4  5

10. Intonation is maintained in soft sections.
    SD  D  N  A  SA
    1  2  3  4  5

11. Tone quality in the upper ranges is overly breathy and without depth.
    SD  D  N  A  SA
    1  2  3  4  5

12. Tenors have a pleasant open head voice in upper registers.
    SD  D  N  A  SA
    1  2  3  4  5

13. Sopranos tend to be shrill in upper registers.
    SD  D  N  A  SA
    1  2  3  4  5

14. Altos have a warm, rich tone quality.
    SD  D  N  A  SA
    1  2  3  4  5

15. Basses are producing a pushed, tense sound.
    SD  D  N  A  SA
    1  2  3  4  5

Additional Comments
VIDEO RATING FORM

1. The posture of this group is erect and correct for singing.
   SD  D  N  A  SA
   1  2  3  4  5

2. Weight appears to be balanced.
   SD  D  N  A  SA
   1  2  3  4  5

3. Head position is generally correct, with few jutting jaws or raised chins.
   SD  D  N  A  SA
   1  2  3  4  5

4. Chests are caved-in.
   SD  D  N  A  SA
   1  2  3  4  5

5. The group appears to be breathing correctly.
   SD  D  N  A  SA
   1  2  3  4  5

6. Breathing is low and deep in the lungs.
   SD  D  N  A  SA
   1  2  3  4  5

7. Shoulders are not raising during inhalation.
   SD  D  N  A  SA
   1  2  3  4  5

8. Chests are heaving during inhalation.
   SD  D  N  A  SA
   1  2  3  4  5

9. There is visual evidence of expansion just below the rib cage of low, deep breathing.
   SD  D  N  A  SA
   1  2  3  4  5
10. During singing, the mouths and jaws of most of the singers are open to an adequate degree.

SD D N A SA
1 2 3 4 5

11. The jaws appear to be flexible, opening fully and freely during singing.

SD D N A SA
1 2 3 4 5

12. The mouths and jaws of the singers appear to be free of unnecessary tension.

SD D N A SA
1 2 3 4 5

13. Facial expression and general demeanor reflect concentration.

SD D N A SA
1 2 3 4 5

14. Arms are relaxed down at the sides.

SD D N A SA
1 2 3 4 5

15. This group's posture is contributing to the quality of sound.

SD D N A SA
1 2 3 4 5

Additional Comments
APPENDIX G

Judges' Ratings of Performances
(Post Treatment)
### AURAL RATING: SONG 1

#### Control Group

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#### Diction

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#### Tone Quality

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### VIDEO RATING: SONG 2

**Experimental Group**

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