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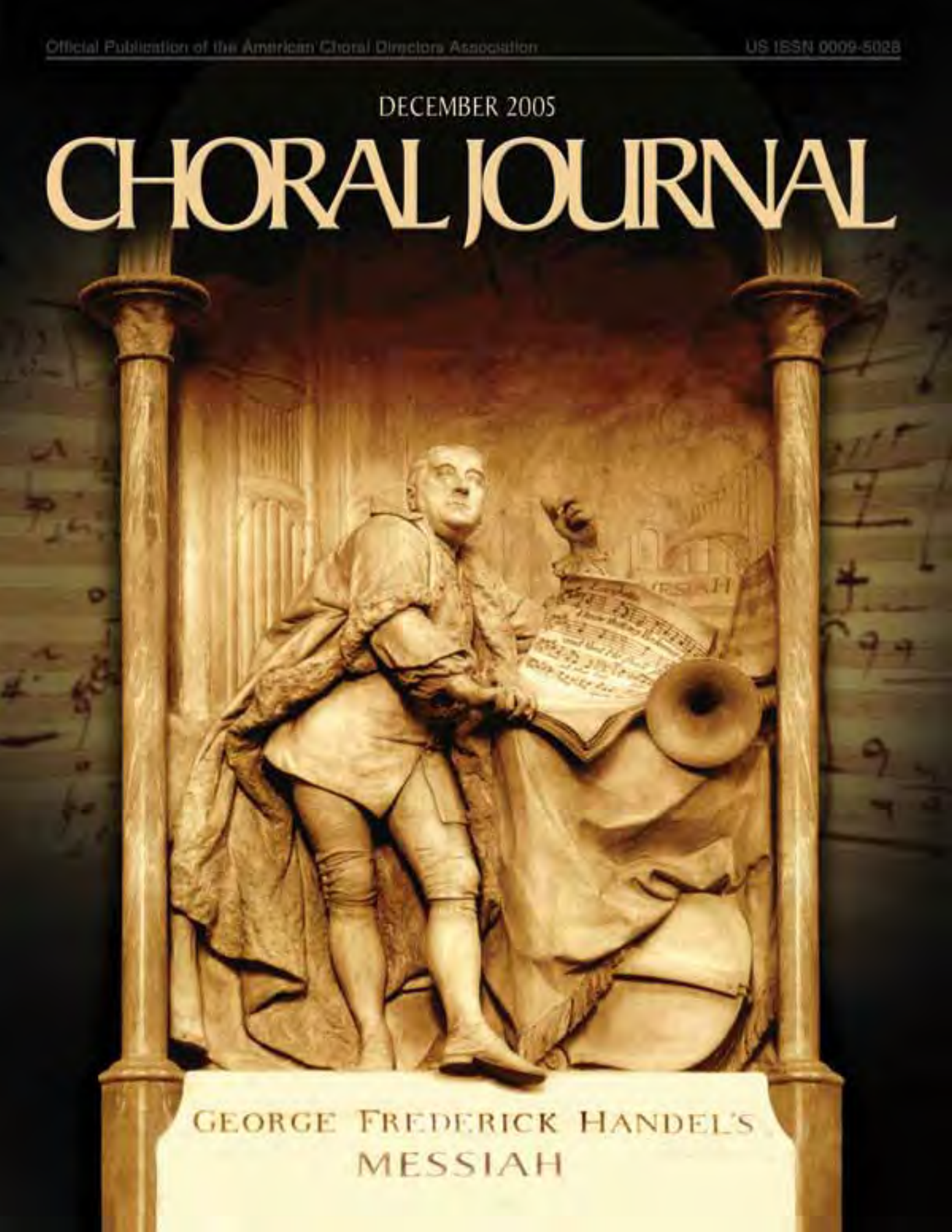

GEORGE FREDERICK HANDEL'S
MESSIAH

CHANGING BODIES CHANGING VOICES

A Brief Survey of the Literature and Methods of Working with Adolescent Changing Voices

by David Friddle

Preface

There is a large body of research and writing about working with children and adolescents. In addition to the psychological literature, which is vast, there is also much written about how to train young singers. For vocal pedagogues, music educators and choral directors, this research and literature is a considerable resource; the volume of materials, however, makes it difficult to assimilate.

In any endeavor that is at least in part subjective and based on empirical evidence, as is the teaching of singing, various researchers and writers often reach conflicting conclusions. It is difficult to reach consensus in any area that can not be measured scientifically and is not quantified based on controlled laboratory experiments that can be repeated verbatim, in order to verify original findings. Some scientific study has been made of the physiological implications of puberty and its affects on the musculature and cartilage of the laryngeal mechanism. Teachers of singing can educate themselves as to what transformations occur, why they take place, and how these mutations affect the speaking and singing ability of young people. Teachers also may learn when these changes commence, and in what stages they could possibly progress.

Still, what most educators, voice professionals, and choral directors need more is a proven, successful and—above all—workable approach to addressing the particular needs of young males and females. Indeed, so pervasive are the physical transformations that young bodies endure that even their method of communicating—the laryngeal tract—is for a time as unpredictable and mysterious as they appear to be. The aim of this article is to address some of the materials available for use by teachers of singing, identify the schools of thought regarding various approaches to dealing with adolescent changing voices, consider the psychological and emotional variables of the pubescent student, and present a few examples of testing methods and suggestions of experienced pedagogues about how best to safeguard the vulnerable psyches and tender voices of children and teenagers.

For purposes of this article the term "prepubescent" will be defined as any child, male or female, who has not begun the process of physiological maturation, and who sings in the range commonly known as 'soprano.' "Pubescent females" or "changing female voices" will refer to girls in the throes of bodily and vocal mutation. "Pubescent males" or "changing male voices" identifies boys whose bodies and vocal mechanism are undergoing the most radical physical alterations of all, and whose tessitura is variable and dependent on individual particulars. The term "changed voice" connotes male and female voices that have, for the most part, completed morphing and are in the process of settling; unless otherwise noted, the terms "tenor," "baritone," and "bass" refers to the voice part as identified in musical scores. These terms as applied to adolescents can not properly be equated with their adult male counterparts.

I will use the following system to identify musical pitches in prose language (Figure 1).

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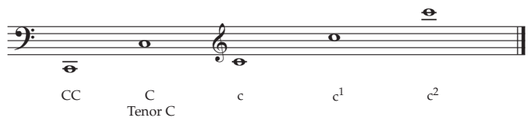

Figure 1. Pitch Identification System

Finally, because I myself have had extensive experience working with both prepubescent males and females as well as changing male voices, I will at times include my own personal, empirical observations. These interjections are neither scientific nor objective; I do not represent them as such and will either include them as footnotes or identify them, accordingly, in the text.

Working with Adolescent Voices: An Overview of Thoughts and Methods

For centuries, boys have been trained to sing. From the Medieval period onward, trebles have been an integral part of sacred and secular music-making. Because women were not allowed to participate in Roman Catholic liturgies, a long and well-documented history of methods of training prepubescent voices exists in Europe and the United States. As musical instruction entered into academia and the education of children, the vast majority of whom were males, the methods applied to the training of prepubescent and pubescent singers came mostly from religious institutions, where a distinguished choral tradition developed. Although prepubescent trebles were undoubtedly used in sacred settings on the Continent, the British, and in particular the Church of England, developed the most elaborate, thorough, and far-reaching program of training boys to sing.


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All-male choirs were prominent and generally well-funded in cathedral churches and at the university level. Each major city served as the seat of a diocese and the home of the local bishop; hence, cathedral churches maintained choirs and choir schools to provide music for Sundays, major feast days in the Church calendar, and, primarily, for the daily office. Cambridge and Oxford Universities had colleges whose chapels housed choirs of high quality. Boys were educated gratis in return for singing in services that could easily exceed 400 per year. Just as young men of today dream of making a mark in the world (while simultaneously earning their fortunes) through the pursuit of athletic endeavors, so did families, particularly impoverished ones, hope to secure a more prosperous future for their sons through admittance to either a cathedral choir school or a collegiate chapel choir.

Thus, when the Protestants landed at Plymouth, they brought with them the musical traditions associated with their particular denominations in the Old World. When music and choral singing were introduced into the nascent educational system, it was natural to incorporate these tried and true techniques of voice training into the curriculum.

Until the middle of the twentieth century one method was favored in the United States: the teachings and methods of the Church of England and its American cousin, the Episcopal Church. Since mid-century, however, a number of new techniques about how best to train both prepubescent and pubescent males have emerged.

Contemporary Ideas About the Male Voice

A synopsis of the six methods follows so that we can understand the diversity of opinion and variety of techniques posited by these differing schools.

A. Royal School of Church Music [Church of England] Prepubescent boys (trebles) are assigned soprano parts in all male choirs; they are trained to sing the professional soprano range in the upper adjustment only. Sound is pure in quality, with little or no vibrato. Boys are not permitted to incorporate chest voice into their mix; thus, pitches below e are virtually unusable. During voice change, trebles sing in pure voice only. After vocal mutation is more or less complete and the boys are no longer able to sustain soprano range, the voice is quieted for a period of adjustment until the lower voice settles.[1]

B. Alto-Tenor Approach [Duncan McKenzie] This plan suggests that voice change is a gradual process in which boys lose their upper register as they add notes in their lower register. Term "alto-tenor" describes the boy's voice after vocal mutation has commenced. Approximate range is G to g, is distinct (neither boy nor man) and light. Speaking voice is gauged a most reliable indicator of mutational stage. The longer the boy's voice remains in the "alto-tenor" range the more likely he will become a tenor. [2]

C. Cambiata Approach [Irvin Cooper and Don Collins] This highly popular method developed in the 1960s, espouses four types of boys voices existing in grades 4–12:

1. boys unchanged [treble];
2. boys in first stage of mutation [cambiata];
3. boys in second mutational stage [baritone];
4. boys with completed vocal mutation [basses].

Tenors do not exist in these years, since mature tenor voices do not emerge until the mid to late twenties. This approach prescribes that ninety percent of all boys' voices mutate and lower according to a common pattern: first stage in seventh grade; second change to baritone in eighth grade.[3]

D. Contemporary Eclectic Approach [John Cooksey] Although a student of Irvin Cooper, Cooksey concluded that Cooper's classifications were too narrow in scope to be useful pedagogically. Expanded categories to six:

0. Unchanged [Pre-mutational];
1. Midvoice I [Early Mutation];
2. Midvoice II [High Mutation];
3. Midvoice IIA [Climax of Mutation and key transitional period];
4. New Voice [Stabilizing Period]
5. Emerging Adult Voice [Post-mutational development and re-expansion]

Cooksey asserts that maturation proceeds at various rates through a predictable, sequential pattern of stages.[4]

E. Baritone-Bass Approach [Frederick Swanson] This approach states that mutation may be very rapid—that voice can mutate during one summer or even within a few weeks. Swanson believes that the voice drops at least one octave at onset of mutation for 30–40 percent

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of eighth and ninth grade boys and states that basses are quite common in junior high, albeit with limited range of AA to G. Some boys can become contrabasses if encouraged. Seventh grade boys are usually still trebles; eighth grade is when first mutation occurs. True tenors are rare, but not unknown.[5]

F. Voice Pivoting Approach [Sally Herman] This method keeps boys with mutating voices within their most comfortable range by pivoting them to other voice parts. It advocates using quality, multivoiced literature in which the boy sings a combination of voice parts according to his current vocal range and classifies young adolescent boys into four voice parts: first tenor, second tenor, baritone, and bass—not to be confused with adult or post-mutational counterparts. It relates that adolescents who have most difficulty matching pitch are those whose voices changed at an early age or at an advanced rate.[6]

Contemporary Ideas About the Female Voice

Because the vocal mutation of pubescent females appears less dramatic than pubescent males, perhaps researchers have followed these girls' vocal development less thoroughly; consequently, only one published systematic classification of pubescent females exists at this time.

"While little research or writing exists concerning the voice change of the adolescent female, the pubertal girl does experience a voice change."[7] Following the basic system outlined by Cooksey, Lynne Gackle has set forth a system of classifying "the characteristic stages of development in the adolescent female voice."[8]

I. **Stage I: Prepubertal:** Ages 8–10[9]

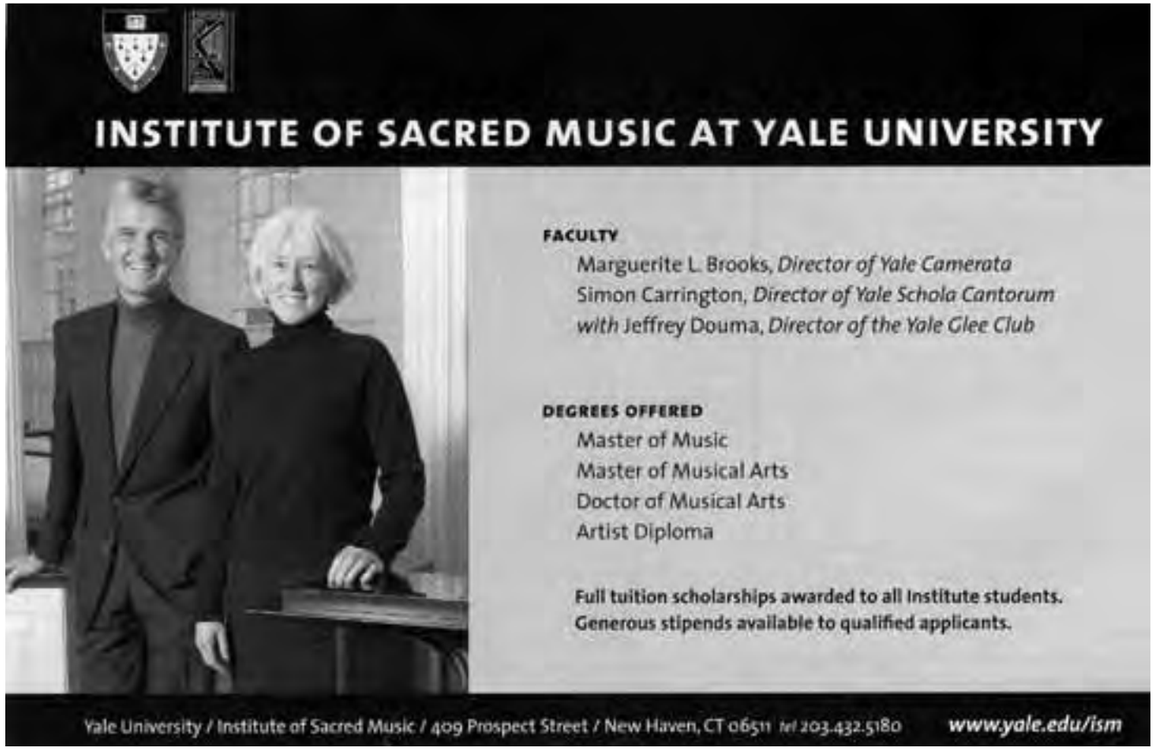
The singing voice is light and flutelike with no discernible register breaks; the voice is flexible and can easily manage intervallic leaps; quite similar to male voice of the same age with the exception that the female voice is lighter in "weight" because the volume potential is generally not as great.

II. **Stage IIA: Pubescence/Pre-Menarcheal:** Ages 11–12

Due to the mutational chink—an inadequate closure of the vocalis muscle as growth occurs in the laryngeal area—that develops in pubescent females, there is a marked breathiness in the tone; register breaks appear between g and b; some girls relate difficulty in producing chest voice and may even experience discomfort while singing.

Stage IIB: Puberty/Post-Menarcheal: Ages 13–14

This stage is critical in the development of pubescent females since tessitura may move up or down, or may narrow at either end, which yields only a five to six note range of comfortable singing; as with Stage IIA, register breaks still appear between g and b; lower notes are more easily produce



however, causing some teachers to misapprehend the transitional stage and label these girls altos; singing only in the lower range for an indefinite period can be injurious. Like pubescent males, their voices may crack; and there may be a pronounced hoarseness in the tone.

III. **Young Adult Female/Post-Menarcheal:** Ages 14–15

Overall range capabilities increase while greater consistency appears between registers; voice break is more apparent at passagio d1 to f-sharp1; Breathiness may decrease as tone becomes deeper and richer; ease returns to phonation and vibrato appears; volume, resonance and vocal agility increase.

Each of these schools of thought has proved successful; each has flourished in different parts of the country at different times. My purpose is not to espouse one method at the expense of another; neither is it to judge the relative strengths or weaknesses of each approach. Nevertheless, for the sake of clarity, when identifying vocal registers herein, I will follow the Eclectic Approach favored by John Cooksey, and is counterpart for the female voice outlined by Lynne Gackle.

Social and Peer Pressures Facing Adolescent Singers

What exactly is adolescence? When does it commence? What happens to young people and their ability to speak and sing during the mutation? Why are its effects so marked in some and barely visible in others? These are questions that every vocal professional is bound to consider; finding answers that are appropriate to a particular situation and particular individuals is part of our task. Simply put,

> Adolescence is defined as that period of time in an individual's life when he/she leaves childhood and enters maturity. Psychologically and emotionally for some individuals that is a period of several years. Adolescence is also defined as the time of pubescence. For some individuals this is indeed less than a year…Therefore, adolescence must be defined as the changing years and it must encompass those grades as early as the fifth and as late as the twelfth.[10]

Since every adult has personally experienced the travails of puberty, our students are better served when we are patient with their awkwardness, supportive of their sensitive natures, and empathic with the myriad ups and downs that are an inevitable part of emotional and physiological maturation. Vocal pedagogues, music educators and choral directors who work with adolescents face multitudinous challenges. Singing is generally not perceived to be an acceptable activity in modern American culture; indeed, among teenage males singing is viewed as effeminate and unmanly. In an age when sports figures are deified by the media and compensated with salaries that often exceed many millions of dollars, enticing adolescent males to participate in vocal ensembles can be daunting. Indeed, "Boys have to be convinced that singing is a worthwhile activity."[11]

Since adolescents are in a continual state of transition—both physiologically and psychologically—their amorphous physical and emotional states often contribute to behavioral problems. Certainly pubescent boys and girls experience mood swings that are unpredictable and disorienting; the rush of hormones that disrupt both their bodies and their psyches cause them to act in equally strange and mysterious ways.

Hence, an adult in a musical leadership position assumes the additional roles of erstwhile counselor, coach, cheerleader, and, occasionally even referee. Offering support to young singers who are experiencing pressure from their peers to participate in other activities—especially prevalent among boys—is necessary in order to ensure a successful ensemble. Once a young male has decided to participate in a vocal ensemble—either in a school, community-based organization or religious institution—the first hurdle for both the boy and the teacher/director is the audition. So heavily laden with misconceptions and anxiety is the word "audition" that perhaps substituting a more neutral phrase, such as "voice check," is one way that a boy's nervousness can be alleviated.

To Segregate or Not to Segregate: Finding a Solution to the Age-old Boy/Girl Dilemma

In his survey of more than forty music educators and choral directors, titled *Strategies for Teaching Junior High & Middle School Male Singers,* Terry J. Barham notes the consistency with which music directors conclude that the best environment for welcoming boys into a singing environment is one that does not include females:

> Boys are masses of paranoid hormones that can be totally intimidated by females … The nature of the young adolescent boy is such that he's still deciding if singing is

> OK for boys. I want a boy's complete attention, and I won't have it with girls in the room…. There's the possibility of embarrassment with ones tone quality and the voice breaking … Boys are more relaxed, more willing to experiment with their voices when their social status isn't on the line….[12]

Even teachers whose schedules do not allow for male-only choirs or testing periods agree that "Testing without girls might be better, but it is not possible in my situation."[13]

Puberty wreaks havoc with both genders: witness the loss of coordination that besets adolescents in the teen years. Any parent will testify that growth occurs randomly, and often with great alacrity. Most of the clues that an adolescent is undergoing a physiological mutation are visual: increased height; long and gangly limbs; and the appearance of facial and bodily hair. With adolescent males, however, the first indicator that puberty has commenced is often aural: a noticeable drop in speaking pitch; a huskiness to the voice; and an inability to control the registers, resulting in what is commonly known as "cracking." Consequently, the prospect of an event wherein a pubescent male is required to publicly display vocal uncertainty is likely to cause vocal and emotional stress. It is therefore incumbent on vocal professionals to ensure that a boy's initial experience with singing is as positive as possible.[14]

Certainly, at some point, boys will be required to sing in front of girls. Helping each gender to appreciate the common problems the other faces during adolescence is an important step towards socialization. "Making girls as well as boys aware of what's happening with boy's changing voices is crucial…. Both sexes must come to realize that singing is a natural process."[15] And, "It is important to me to establish a classroom atmosphere in which everyone understands that boys who sing are an absolutely normal, every day thing."[16] Even so, erring on the side of caution initially and allowing the boys to become accustomed to not only the notion of singing but also to the unpredictability of their own voices may, in the long run, establish a more comfortable framework from which the teacher may lead his charges.

Physiological Effects of Puberty on the Vocal Mechanism

The profound physiological changes that are associated with adolescence are primarily external: teens experience growth in their bodies that is unpredictable, intense, emotionally affective, and, particularly in their extremities, unsettling. Balance becomes more problematic; there is a loss of coordination that affects large muscle movements and that contributes to the use of the adjective "gangly" in relation to pubescent males and females.

Although the outward bodily transformation might appear to be somewhat similar between boys and girls, the alterations occurring in the vocal tract are dissimilar and achieve markedly different results. Boys and girls both grow prodigiously during puberty; a male of sixty inches may reach a height of more than seventy-two inches; even more dramatic changes in height are not unknown. To a lesser extent, the same holds true for girls at this age.

When examining the percent of growth in the larynx, however, a much larger—proportionally speaking—mutation takes place. A study of twenty cadaveric larynges of both genders, ranging in age from nine to eighteen years was made by Joel C. Kahane and reported in the American Journal of Anatomy in 1978.[17] Not surprisingly, some findings supported empirical observation: "[O]verall pubertal dimensions were clearly larger than prepubertal counterparts in each sex, though within-sex differences were clearly greater in the male than in the female."[18]

As any vocal professional will attest, prepubescent boys and girls have similar vocal ranges and tessitura, share an approximate lung capacity, and endurance and can sing identical repertoire. Gackle remarked on one striking difference between prepubescent boys and girls: "[T]he female voice is lighter in "weight" (than the male) because the volume potential is not as great…."[19] Otherwise, in physical appearance and vocal ability, prepubescent boys and girls can be said to share virtually identical vocal mechanisms.

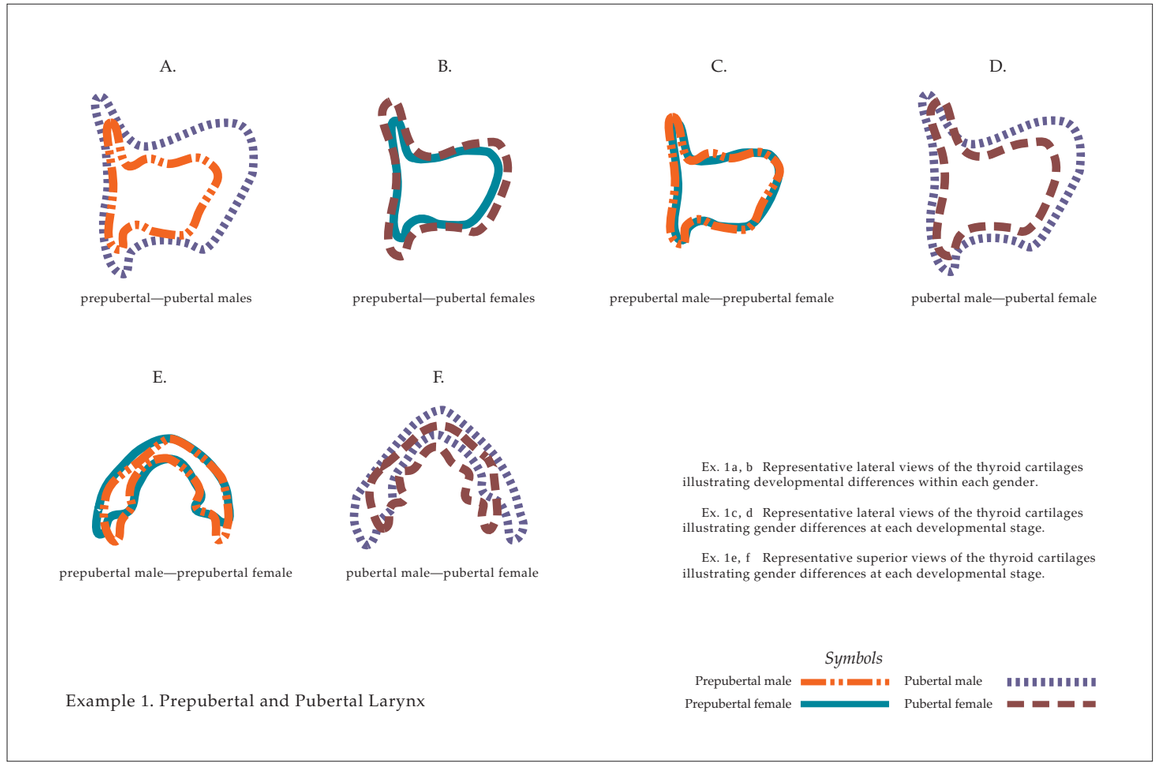
This finding is confirmed by Kahane:

> Prepubertal larynges shared a high degree of morphological congruence while pubertal larynges displayed clear sexual dimorphism, the male dimensions being significantly larger than prepubertal female counterparts. The marked differences in pubertal cartilage size result from dramatic growth of the larynx from prepuberty to puberty…."[20]

And: "[I]n either sex, no differences were seen in the length of the vocal folds before age 14…."[21] By age sixteen, however, the larynges of males "were larger than those of the female, which had attained adult size. The male vocal folds continued to grow in length to adulthood."[22] Kahane goes on to note, "The dimensions of the prepubertal female larynx were significantly closer to adult size and weight than prepubertal male counterparts. Thus, the prepubertal female larynx requires less growth per unit time to reach maturity."[23]

Kahane noted the particular growth relationship between the thyroid cartilages of prepubescent males v. pubescent males, and females; and differences between prepubescent males and females and pubescent males and females. "In the male thyroid cartilage significant regional growth appeared to take place in the anterior aspect of the thyroid cartilage. It was unparalleled in the other laryngeal cartilages or in the growth of the female larynx."[24] His drawings illustrate the distinct gender- and cross-gender nature of the mutation (Example 1).

Kahane's drawings[25] demonstrate succinctly the conclusions noted above: the larynges of prepubescent boys and girls are nearly identical in size; that prepubescent and pubescent girls undergo minimal growth; and, finally that the



Example 1. Prepubertal and Pubertal Larynx

most dramatic mutation occurs between prepubescent and pubescent males. "It is noteworthy, however, that though the male and female vocal folds reach essentially adult size by puberty, the absolute increase in the male amounted to 10.87 millimeters as compared to 4.16 millimeters in the female. The significantly greater growth of the male vocal folds compared with the female explains, in part, the structural bases for the dramatic drop in fundamental frequency in the male voice during puberty."[26]

Given the significant vocal mutation taking place in pubescent males, one has to wonder if it is advisable for boys to sing during this period. "In the 1940s, vocal teachers did not believe a male adolescent could sing during vocal mutation."[27] This view is not widely shared today. Indeed, Collins asserts that:

> boys can sing completely throughout vocal mutation without any detriment to the vocal instrument as long as they sing music written in accordance with the range and tessitura limitations of the adolescent voice. No attempt should be made 'to make the voice fit already existing music.' The music 'should be made to fit the voice'[28]

The difficulties appear in selecting appropriate literature, offering the boys emotional support and providing them with a safe space within which they can experiment with their new voices, and, perhaps most important, properly classifying them and working within their inherent registers—a critical step in properly assisting pubescent males to continue to sing healthfully during their teen years.

Vocal Registers in Prepubescent and Pubescent Singers

In his book *Teaching Kids to Sing*, Ken Phillips describes vocal registration in children at length, providing valuable insight into what is a challenge for every vocal professional:

> The trained adult voice is capable of producing an average vocal range of three octaves. This range is divided into areas called 'registers,' which may be defined as a 'group of like sounds or tone qualities whose origin can be traced to a special kind of mechanical (muscular) action … registers in fact result from the way the vocal folds vibrate in each mode and how the resulting sound couples with the vocal resonators.'"[29]

Phillips confirms that the "presence of registers in children's voices has historically been recognized by vocal authorities."[30] He goes on to discuss the traditional thinking regarding children's registers:

> [S]ome early pedagogues expressed their preference for the exclusive use of upper-register singing with children…[warning] against the use of the chest voice, noting the harshness of this register…. Complete dismissal of the lower register (chest voice) is not advocated…. What is taught is a three-register (upper, middle, and lower) approach…. Note that the pure lower voice (full length and width of vocal folds) is used only from middle C and lower."[31]

The RSCM approach to treble registration espouses a head-only vocal production. Phillips disagrees, noting that it "is not a healthy pedagogy and does not result in a sound that is equally balanced, especially in the middle voice."[32] Not all pedagogues subscribe to Phillips's three register approach, however. In *Teaching Choral Music*, Don L. Collins asserts,

> Basically, all singers (male, female, child, adolescent, or adult) have two useable registers. There is a third in the extremely high area of the child and female voice called the whistle register and another in the extremely low area of the adolescent changed and adult male voice referred to as fry tones…."[33]

Irvin Cooper, Collins' mentor and author of *Teaching Junior High School Music*, does not address registers; although Cooksey (*Working with Adolescent Voices*) comments at length on the stages of development, and gives examples of range/tessitura for each mutational stage, he does not specifically address register changes either. Barham, in his survey of master teachers, (*Strategies for Teaching Junior High and Middle School Male Singers*), subscribes to the three-register approach of Phillips.

Simply put, according to the three-register model, a prepubescent male or female has a lower (G-c), middle (c-c1), and upper (c1-g1—or perhaps c2). Figure 3 shows the registers on a musical staff.[34]

Phillips speaks at length about registration in prepubescent singers:

> It is commonly known that children lacking vocal instruction mostly gravitate to the chest voice for singing … [which] is the speaking-voice register, with which they are most comfortable…. Middle C is the pitch where children will traditionally shift into chest voice, if permitted. The pure upper voice (inner edges of the vocal folds) begins an octave above middle C (c1) and extends upward. Between these two pure registers is the middle voice … or shared adjustment, bridges the transition from pure lower to pure upper voice … [and] uses less vocal width as the pitch ascends and more as it descends…. Because this lower register in the child's voice is quite elastic, it can be used to sing far above middle C, resulting in a harsh sound and strained technique, which is potentially damaging to the vocal folds.[35]

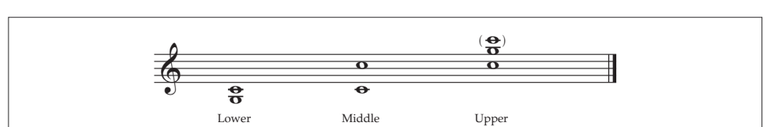


Figure 2. Three-voice model

As a boy enters adolescence, he begins to lose the ability to sing in his pure upper register, c1 to c2, as his range in the lower register begins to expand downward. However, boys should continue to exercise the head voice daily through sirens and downward scalar patterns with active breath support and good posture."[36] And, Until his voice is more settled (in high school), a boy whose voice is changing should use only pure upper voice from e to c1.[37] (Figure 3).

He also notes that "boys can continue

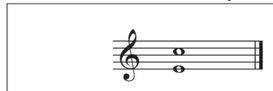


Figure 3

to sing in the upper voice throughout the voice change … [indeed] vocalising adolescent boys in the upper register is the secret for developing the high school tenor."[38] Phillips takes pains, however, to note the distinction between a prepubescent boy's pure head and falsetto voices:

> The *falsetto* voice is a 'false' voice, in that it is a product of strained vocal technique in which the larynx rises and cuts out the laryngeal resonator, resulting in a weak and unsupported sound….The pure upper voice in the male changing and changed voice will sound much like the prepubertal boy's voice in the octave c1 to c2 … fuller and freer than the falsetto sound."[39] Indeed, Phillips suggests, "Males with changing voices should be taught to find the pure lower register and to use it for the lower two-thirds of the male vocal range (tenor C to middle C).[40]

Phillips and Barham recommend that "From middle C downward, boys with changing voices should use the pure chest register … [and] that these boys use a two-register production for singing. The upper register begins at e and moves upward to c2. The lower register begins at d and moves downward [41] (Figure 4). Moving between the newly formed registers can present a problem for pubescent males.

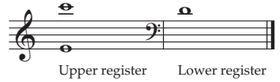
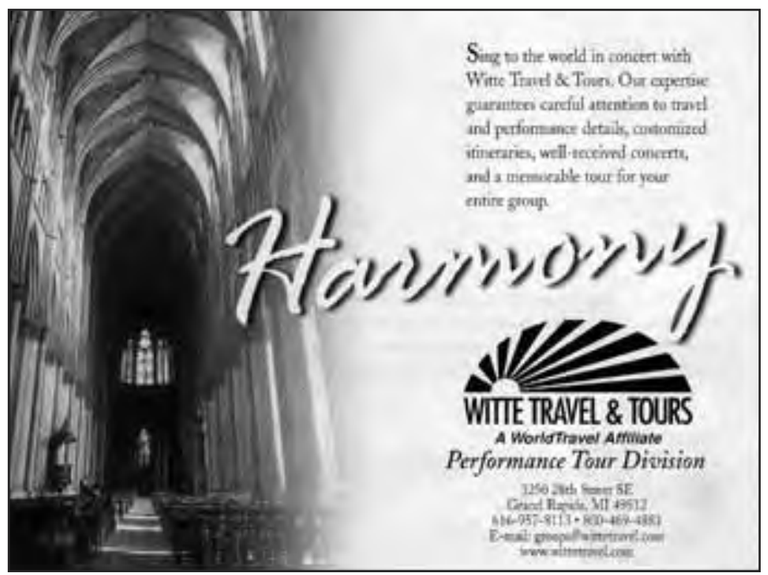


Figure 4. Three-voice model

The adolescent male can no longer sing in what was his middle voice in childhood (c to c1) with the same balance of upper and lower registers. The length and thickness of the growing vocal folds disturbs this coordination, and a new passagio or covered technique must be eventually learned for this new top register (c1 to c2). However, until such a time as the voice is settled and a certain stability is evident (senior high years), this new passagio register and technique must be avoided in favor of a modified approach using only the pure upper voice from approximately pitches e to c1. Continued use of the upper register through this part of the range will maintain its strength, so that later it can again be coordinated with the chest voice for a new passagio register.[42]

Since [D]ifferent sets of muscles located in the larynx control these two registers, jarring register shifts occur for most boys when one set of muscles is unable to make a smooth transition to the other set of muscles."[43] The area of transition, the passagio, differs between prepubescent and pubescent males. "One passagio (transition area) occurs around the pitches e, f, f-sharp, and g. The other is found in the vicinity of middle C (b, c, c-sharp, and d) (Figure 5). In any of the octaves above middle C, these pitches continue to be physiological points at which voices change to another register.[44]

"For junior high/middle school boys, teachers can listen for register changes in the vicinity of middle C for baritones…. For those boys whose lowest sung note occurs in the vicinity of F, a register shift can be expected in the vicinity of f."[45] Put



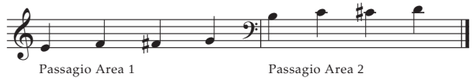


Figure 5. Differing transition (passagio) areas during voice change

another way, a boy whose lowest sung pitch is approximately tenor C will most likely become a baritone (or perhaps bass) and will have a register shift at middle c; boys whose lowest sung pitch is approximately tenor F will most likely become tenors and will experience a register shift around f (Figure 6).

Phillips believes that:

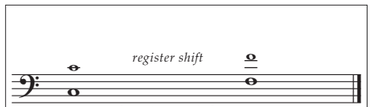


Figure 6. Range of register shift

> the "vocal registers of adolescent girls remain basically the same as for prepubertal children"[46] and that females "with limited ranges, who can sing neither first soprano nor second alto, are the norm.... Adolescent girls seem to sing in one register—mixed or middle … failing to make the necessary adjustments of removing all of the lower vibratory pattern from the voice. This added weight of the lower voice prohibits the ease of production in the upper voice … [which] is compounded by an elevated larynx, which interferes with the lengthening and thinning of the vocal folds. All females (including altos) should be vocalised in a light manner from c1 to c1 … [which] will help them to learn the feeling of moving to an inner-edge-only vibratory pattern....[47]

Phillips warns that the "chest voice does present a problem in female singing when its use is permitted in its pure form above middle C. The higher this chest quality is carried, the more difficult and obvious the transition becomes and the more strident the voice sounds … exclusive use of the chest register above middle C is potentially damaging to the vocal folds. Increased contact of the membranes at higher rates of vibration causes friction and a wearing that may result in damage to the structure of the folds...."[48] In short, even though there are significant physiological and acoustical differences between the vocal mechanisms of pubescent

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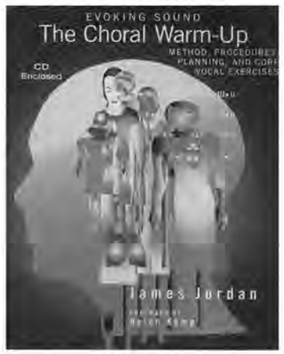

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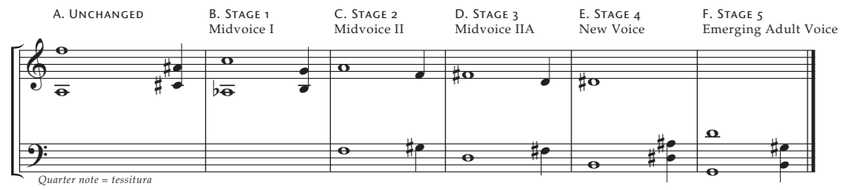

Figure 7. Mean Ranges and *Tessituras* for the Voice Change Series

singers and those of mature adults, some basic, healthful principles—such as mixing the head register downward and discouraging the upward use of the chest register—apply to both. Instilling good singing habits early in life can produce a lifetime of healthy vocal production.

Identifying Ranges and *Tessitura* in Young Singers

Identifying the vocal registers simultaneously points out a workable range and *tessitura* while enabling vocal professionals to proceed with proper voice categorization for pubescent singers. Cooksey's Eclectic Model identifies six stages of development; he assigns the following ranges and *tessitura* to each (Figure 7): [49]

Although these ranges and *tessitura* are generally similar to those of the vocal professionals surveyed in Barham[50], prepubescent boys with proper training can easily sing to c2 and above. The abundance of both sacred and secular repertoire bears out this fact. In settings where singers are not rehearsed frequently, or one in which boys singing above the staff is novel[51], a teacher may encounter some initial resistance to the idea that boys can reach and sustain high pitches; indeed, they can do so quite comfortably—much more so than adult female singers.

Gackle and Cooksey have taken the "eclectic" approach devised for males and applied it to female voices. Unlike males, for whom six categories are necessary, they have identified four stages for the pubescent female voice[52] (Figure 8).

It is important to remember that these ranges and *tessitura* are merely suggestions of what may be possible with prepubescent and pubescent male and female voices. Obviously, the final results will vary according to the needs of the ensemble, the skill of the instructor, and the repertoire chosen. Phillips believes that

> Adolescent singers are capable of a far greater richness of sound than is commonly heard.... [I]mproper vocal technique results in an elevated larynx and a lack of pharyngeal resonance.[53]

He emphasizes, however, that

> Loud singing still must be avoided in the junior high years; vocal technique is too immature to prevent voice abuse, and the resultant quality of loud singing is often forced and harsh.[54]

When selecting repertoire for these vocally vulnerable young people, it is advisable to avoid choral works (or staged musicals) that require a forced singing production or the use of "belting." Otherwise, lifelong vocal damage may be incurred. Phillips believes that one indicator of healthful singing is the appearance of vibrato: "Vibrato in high school students is the norm when good vocal technique is taught."[55] Methods of voice classification vary among the sources. However, two common elements emerged: allowing the boys to pitch the testing example, i.e., *My Country 'tis of Thee*, in a range that feels comfortable for them. Listening to the opening pitch is telling for purposes of voice classification in that the astute teacher can immediately discern whether the boy is most comfortable above or below middle C; it also clarifies the extent to which the boy's voice has mutated.

The other common element was to test males as a group. This method enables a teacher to create a safe space in which novices can be tested; it also reinforces the weaker singers by pairing them with stronger, more experienced males. Irvin Cooper suggests having the boys stand together and sing (in his case) *Jingle Bells*. He advises telling the boys beforehand that the teacher will walk among the singers and tap some boys on the shoulder; the boys thus indicated should then be seated. "Determine which boys are definitely singing in the lower octave, tapping … each boy who will be a baritone. Any voice about which you are uncertain leave alone for further checking later."[56]

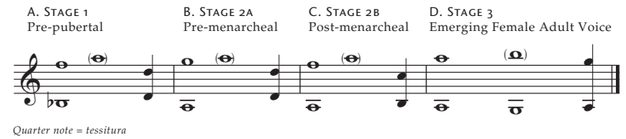

Figure 8. Mean Ranges and *Tessituras* for the Female Voice Change Series

Cooksey's approach is similar: "Ask the boys to sing *America* as a group in the key of C (or B-flat or B). Listen for voices singing in the octave BELOW [middle C] … listen for boys singing in the falsetto register during this process. Some Midvoice IIs and New Baritones/New Voices may do this. When in doubt, check their ranges!"[57] Phillips notes that "Boys with a strong [tenor C] (and lower) will most likely become basses; baritones should be able to sing down to D, and tenors will not have much range below F."[58] After segregating the baritones from the unchanged voices, Cooksey recommends having the remaining boys sing *America* again, this time pitched in F or G.

Walk through the section and tap the shoulders of the boys who are obviously singing in the upper octave with ease. Also note the lightness of the vocal quality. These should be Midvoices Is and Unchanged voices. Ideally, Unchanged voices will be more successful vocally if they sing the soprano part, and Midvoice Is should be assigned to the alto part in a mixed SATB chorus. Midvoice Is can be assigned to a tenor part that does not go below G or A.[59] Once the students, particularly males, have been tested for voice classification[60], there is the delicate matter of what exactly to label their voice parts. Teenage boys have fragile egos; their masculine identities are only beginning to formulate; thus, it is important to find names that will allow them to feel comfortable in their newly assigned section.

"Some teachers promote 'male-ness' by avoiding names often associated with girls, i.e., soprano and alto…. Utilize the term unchanged voice instead of treble, soprano, or alto and you may help create a 'comfort zone' for your boys."[61] Phillips notes this important distinction: "These labels [tenor, baritone and bass] should not be confused with the terms used for mature male voices, but adolescent boys do like to be labeled with the terms used for their older male counterparts."[62] Most sources agreed that unchanged boys are better served by being assigned to a 'treble' section, as opposed to soprano, with its distinctly female connotations:

One will find the nomenclature "treble" much more satisfactory than soprano or alto with these young men because those terms carry a female connotation and stigma. Also, when the treble moves into the first phase of change he will be happier with the term "cambiata" as opposed to alto or alto/tenor because of the female connotation. Using the term "tenor" with the cambiata is inappropriate primarily because it is not indicative of the type voice he currently has.[63] Barham ultimately believes that what "boys are labeled, musically, is not as important as your continually nurturing their self-esteem and helping them recognize their overall growth…."[64] Almost every vocal professional who has worked with pubescent males and females will acknowledge that providing emotional support to pubescent males and females is crucial to helping these vulnerable young people succeed in their efforts to become accustomed to their new, erratic vocal mechanisms.[65]

NOTES

[1] Kenneth H. Phillips, *Teaching Kids to Sing* (New York: Schirmer Books, 1992), 78.
[2] Ibid.
[3] Ibid., 79.
[4] Ibid., 79–80.
[5] Ibid., 80–1.
[6] Ibid., 81–2.
[7] Ibid., 82.
[8] Ibid., 83.
[9] M. Lynne Gackle, "The adolescent female voice: Characteristics of change and stages of development." *The Choral Journal*, 31(8), 17–25.
[10] Don L. Collins, *The Cambiata Concept* (Conway, AK: Cambiata Press, 1981), 4.
[11] Terry J. Barham, *Strategies for Teaching Junior High & Middle School Male Singers* (Santa Barbara: Santa Barbara Music Publishing, 2001), 19.
[12] Ibid., 13.
[13] Ibid., 14.
[14] I have worked with boys in both community-based programs with high expectations, such as the Texas Boys Choir, the American Boy Choir or any number of other excellent training programs for trebles; I have also led children's choirs in summer music camps and religious institutions where boys and girls sang together. My own experience confirms the belief that boys will respond more positively and with less stress when segregated from their female peers.
[15] Collins (1981), 15.
[16] Barham, 15.
[17] Joel C. Kahane, "A Morphological Study of the Human Prepubertal and Pubertal Larynx," *American Journal of Anatomy*, 151 (1978), 11–19.
[18] Ibid., 16.
[19] Phillips, 84.
[20] Kahane, 18.
[21] Ibid.
[22] Ibid.
[23] Ibid.
[24] Ibid., 17.
[25] Ibid., 13.
[26] Ibid., 18.
[27] Collins (1981), 2.
[28] Ibid., 3.
[29] Phillips, 41.
[30] Ibid., 43.
[31] Ibid.
[32] Ibid., 45.
[33] Don L. Collins, *Teaching Choral Music*. (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1993.)
[34] Barham, 10.
[35] Phillips, 43–44.
[36] Barham, 10.
[37] Phillips, 49.
[38] Ibid.
[39] Ibid., 50.
[40] Ibid., 51.
[41] Barham, 10.
[42] Phillips, 49.
[43] Barham, 11.
[44] Ibid.
[45] Ibid.
[46] Phillips, 47.
[47] Ibid.
[48] Ibid., 48.
[49] Cooksey, 13.
[50] Barham, 23. Of twelve teachers surveyed who use five categories for classifying boys, only one listed high c2 as an option in range; three listed a1 at the uppermost more in their boys range.
[51] Barham compiled his survey data based on the number of developmental categories the participating teachers identified—from six to two. Excepting a few anomalies among individual teachers, the ranges correspond more or less to those of Cooksey. See Barham, pp. 23–25 for complete results of his work.
[52] Cooksey, 19.
[53] Phillips, 54.
[54] Ibid., 55.
[55] Ibid.
[56] Irvin Cooper and Karl O. Kuersteiner, *Teaching Junior High School Music* (Conway, AK: Cambiata Press, 1973, 34.)
[57] Cooksey, 25.
[58] Phillips, 51.
[59] Cooksey, 25.
[60] Barham, 8–9. The survey asked respondents how often they tested their pubescent males. The answers ranged from testing once every six weeks to once per year; the vast majority of those polled (48%) favored one voice test per semester. Some teachers, however, noted different testing strategies: "I test monthly … constantly … as often as I feel is necessary … I informally test a boy almost every day … I listen to boys every week and make changes as needed … I encourage students to ask me to listen to them whenever they feel anything uncomfortable or unusual is happening vocally."
[61] Ibid., 19.
[62] Phillips, 51.
[63] Collins (1981), 14.
[64] Barham, 19.
[65] All of the consulted sources discussed concepts of healthy vocal production, offered examples of vocalises, body movement and breathing exercises. Phillips is far and away the most thorough; indeed his important work was most often quoted by other authors. Cooksey and Barham also provide numerous musical examples, as well as possible seating arrangements, audition forms, appropriate repertoire, etc. Space limitations do not provide for quotations of these various appendices. The reader is encouraged to consult these excellent materials directly.

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