A SELF-INSTRUCTIONAL MODULE

ON THE

ADOLESCENT CHANGING VOICE

BY

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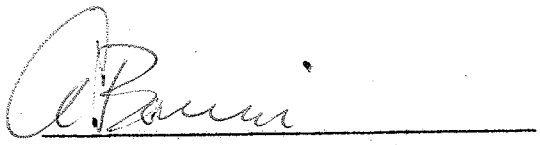

Signed

August 1980

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CHAPTER I

Introduction

The majority of male and female students participating in a junior high school chorus are between the ages of eleven and fourteen. Although many of these students may be similarly dressed, wearing jeans, T-shirts, and tennis shoes, their psychological and physiological characteristics are quite individual.

Pyschologically, these students are searching for their own identity and trying to find their role in society. Their behavior and attitudes, which are highly influenced by their peers, vary with each daily situation. The "everyone else does it" syndrome becomes an axiom of adolescent life.

One can easily see the physical changes of adolescence. Students begin to mature in weight, height, bodily contour and proportions. However, these changes do not occur simultaneously within the group. Instead, each individual matures at his own growth rate.

Vocal mutation, although included in physiological changes of adolescence, is not as easily detected. Unlike physical changes, which are visible, vocal changes must be heard. Often the changing voice is first detected when the singer is experiencing the highest mutational (voice change) stage. By this time, the adolescent singer has been trying to cope with the preliminary stages of voice change while trying to

rationalize the social and physical problems of adolescence. These transitional years may prove to be a difficult adjustment period for the adolescent.

A knowledge of the adolescent voice is essential in the development of teaching methods for this age group. This understanding is necessary in order to create a program adapted to the unique needs of the adolescent. Moreover, this program should provide a smooth transition from the childhood to the adult voice while allowing for the physical and emotional changes which occur during adolescence. Teachers should be able to recognize and understand students' individual needs, backgrounds, motivations, and goals as well as their frustrations and fears. In addition, a learning environment grounded in basic understanding and regard for individual differences should be established to allow for personal growth and achievement. All of these program components are necessary to provide opportunities for successful musical experiences at the adolescent level. Furthermore, these successful experiences may lead to continued musical participation through adulthood.

Numerous authorities agree that knowledge of the adolescent voice is important when teaching the adolescent. Irvin Cooper, a noted authority on junior high school music teaching stated that, "one of the prime requisites for a music teacher starting work in Grade 7 is a thorough understanding of the ranges, scope and limitations of voices with which he will work."[1] Frances Andrews, a noted music educator, agreed with Cooper when

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[1] Irvin Cooper and Karl O. Kuersteiner, Teaching Junior High School Music, 2nd ed. (Boston: Allyn & Bacon, Inc., 1970), p. 16.

she stated that "music teachers in the junior high school need to understand the changing voices (mutation) of their pupils..."[1]

Andrews also acknowledged the physiological and psychological differences which occur between sexes and believed that teachers need to develop various teaching methods to accomodate both male and female singers.
A more recent authority, John Cooksey, developed an eclectic theory of male adolescent voice change which focused on "range, tessitura, register delineation and voice quality as primary factors in voice development."[2]

Through personal interviews with numerous teachers, this researcher discovered a seeming uneasiness about effective teaching of the adolescent voice. Teacher comments revealed that they are frequently mystified, confused, and/or puzzled when teaching the adolescent. Particular areas of teacher concern are the pyschological and physiological changes of the adolescent, the determinants of proper range and tessitura for these voices, criterion for the selection of vocal repetoire, and effective methodologies for individual voice instruction. Further discussion with teachers revealed that they felt that much of their uneasiness was attributed to little or no training about the adolescent voice during their undergraduate degree program in music education. In fact, many of these teachers had developed their own techniques for teaching the adolescent voice through school-based experiences.

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[1]Frances M. Andrews and Joseph A. Leeder, Guiding Junior-High-School Pupils in Music Experiences (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1953), p. 175.

[2]John Cooksey, "Developing an Integrated Approach to the Care and Training of the Junior High School Male Changing Voice," Choral Journal 18 (December 1977): 5.

Traditionally, information about the adolescent changing voice has been discussed in a secondary choral or vocal methods class. Since the emphasis of this course is the secondary level, little time is allocated to the adolescent changing voice. The teaching of this subject matter has been accomplished through lecture, textbook readings and observation. Often the lectures emphasized the ranges of adolescent voices and offered a brief explanation of male voice change.

Textbooks used in the secondary methods class generally emphasized the high school singing voice. Little information was given in these books about the adolescent voice. For example, Neal Glenn, William McBride and George Wilson in Secondary School Music--Philosophy, Theory and Practice gave a two page description of the adolescent voice in the General Music chapter. Ira Singleton and Simon Anderson in Music in Secondary Schools alloted two pages of their textbook to adolescent behavior and vocal ranges. Because the junior high school choir qualifies as a choral ensemble, this researcher also investigated several texts concerned with choral conducting. These books generally discussed the vocal qualities of adult singers and appropriate performance practices of choral music. Two such books, Conducting Choral Music by Robert Garretson and Choral Director's Complete Handbook by Lewis Gordon adequately described adult vocal quality and performance practices but but made no reference to the adolescent changing voice.

The third method of obtaining knowledge about the adolescent changing voice occurred through observation. These observations were usually scheduled during the junior high choral rehearsal at which time college students would hear the entire group rehearse. Little time was allotted to

hearing individual voices.

To formulate definite teaching methodologies for the adolescent singer proved to be difficult for the undergraduate student because of the limited written material presented and time lapse between college classroom instruction and observation. Furthermore, the lack of specificity in the observation made it difficult for the college student to develop an aural awareness of the unique qualities of the adolescent voice.

In order to improve teacher awareness about the adolescent voice, this researcher developed an alternate method of instruction specifically directed to teachers' concerns, namely, the psychological and physiological needs of the adolescent, the determinants of proper range and tessitura, criterion for music selection, and effective methodologies for individual voice instruction. This method, intended for use by prospective teachers, utilized programmed instruction booklets and videotape observations. The booklets, cast in a self-instructional design, allowed the student to learn the presented material at his/her own pace, receive immediate results, and become actively involved in the learning process. In addition, each booklet was accompanied by a corresponding videotape which focused on adolescent voices, both male and female, experiencing vocal change. These observations were made with students in individual and group settings. The viewing of the videotapes were incorporated into a programmed instructional module thus providing reinforcement of the adolescent voice through two perceptual modes--aural and visual.

Purpose

The purpose of this study is to compare the effectiveness of traditional classroom methods with general observations and programmed instructional methods with focused observations in the teaching of the adolescent changing voice to undergraduate music education students. An experimental design was developed where two groups of undergraduate students were taught material on the adolescent changing voice by traditional and programmed instruction methods, respectively. Results of a standardized final exam were used to statistically test the traditional null hypothesis that there is no significant difference between the effectiveness of the traditional and the programmed instructional methods.

CHAPTER II

Review of the Literature

The purpose of this chapter will be to review five areas of literature which were instrumental in the development of an appropriate experimental design. The literature was reviewed 1) to demonstrate how the adolescent behaves in the real world 2) to illustrate the physiological changes occurring during adolescence and the relationship of these changes to the adolescent personality 3) to discover how the adolescent voice change phenomena were handled in the past and how present theories of voice change evolved 4) to describe an alternate method to classroom instruction and 5) to recognize various levels of classroom questioning.

These rationale enabled the researcher to divide the literature into five areas of concern, namely, 1) adolescent psychology 2) physiological changes occurring during adolescence 3) adolescent voice change theories 4) programmed instruction and 5) a taxomony of questioning.

Adolescent Psychology

The scope of material in the area of adolescent psychology has lead this researcher to choose four major domains of adolescent social-emotional development for review--self concept, sex-role identification, peer acceptance, and emotional turmoil.

Adolescence, from the Latin verb adolescere means to grow in maturity. Adolescence evolves as young people encounter fresh dimensions of the past, make new assessments of the present, and acquire their own view of destiny.[1] In order to establish a framework for reference, Elizabeth Hurlock in her book, Child Development, divides adolescence into three growth periods--preadolescence (ages 10 through 12), early adolescence (ages 13 through 16), and late adolescence (ages 17 through 21).[2]

One focus of adolescent psychological research is the examination of self-concept--a person's perception of himself. In the process of seeking to satisfy needs, each individual finds certain forms of behavior more effective than others. These forms of behavior develop into organized patterns of personality traits. L.L. Thurstone, an authority on adolescent psychology, lists seven traits which are often used for analysis in self-inventory testing. These traits are reflectiveness, friendliness, emotional stability, masculinity, ascendancy, activeness, and impulsiveness.[3] These individual traits which interact and modify each other form sets of socially accepted behavior patterns or societal roles. The self-concept is the developing attitude of societal role playing which is highly influenced by peer attitudes,

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[1]Robert Grinder, Adolescence 2nd ed. (New York: John Wiley & Sons, 1973), p. 5.

[2]Elizabeth Hurlock, Child Development 3rd ed. (New York: McGraw-Hill, 1956), pp. 27-28.

[3]L.L. Thurstone, The Dimensions of Temperament (Chicago: University of Chicago Press, 1947), p. 8.

sex-role expectations, and chronological age. The adolescent's self-concept affects his capacity to cope with his personal and nonpersonal environment.[1] If he thinks of himself as competent and successful, he is more likely to persevere in difficult situations than if he sees himself as average in ability and attainments.[2] Self-concept is significant during adolescence because the self image is being crystallized and revised simultaneously.[3] Paul Mussen and John Conger, child psychologists, view the adolescent as the "marginal man."[4] Partially accepted and rejected by adult society, the adolescent faces an "ego-identity" crisis. Unable to find his place in society, he becomes vitally concerned with assessing his abilities and assets and assumes various societal roles in order to discover his self identity.

Sex-Role Identification

The adolescent's self-concept is strongly affected by his changing sexual role. As he physically matures, he is often forced to assume heterosexually prescribed behavior patterns or face ostracism from his peer group.[5] Socially, rapport with the opposite sex becomes

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[1]Dorothy Rogers, The Psychology of Adolescence (New York: Appleton-Century-Crofts, 1972), p. 41.

[2]Ibid., p. 46.

[3]Ibid., p. 47.

[4]Paul Henry Mussen and John Janeway Conger, Child Development and Personality (New York: Harper & Brothers, 1956), p. 456.

[5]Rogers, The Psychology of Adolescence, p. 380.

an extremely important criterion for establishing prestige among his peers.

Psychologist D.B. Lynn states that four major assumptions affect traditional sex-role learning. These assumptions are:

1) both boys and girls initially identify with the mothers, but the boy must shift later to a masculine mold.
2) the young girl interacts more frequently than the boy with an appropriate sex-role model.
3) despite the shortage of male models, the young boy usually learns some stereotype of a masculine sex-role.
4) American society is still male-dominated and allocates more privileges to the male than the female, especially during adolescence and adulthood.[1]

The shift of the young boy from mother identification to masculine sex-role identification may be viewed as a period of crisis. Girls do not experience this crisis as dramatically because of the changing sexual roles in our society which allow women to display what were formerly considered masculine traits (assertiveness, aggressiveness, authoritativeness).

Peer Influence

The peer group allows the adolescent the opportunity to assume a variety of societal roles helping him to more readily make the transition

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[1] D.B. Lynn, Parential and Sex-Role Identification: a Theoretical Formulation (Berkeley: McCutchan, 1969), p. 466.

from childhood to adulthood. The adolescent learns many attitudes, beliefs, and techniques of social interaction from his peers. Sex roles become further clarified as competitive and cooperative responses and social skills are developed. The peer group provides support against parental authority, provides a source of status and prestige, replaces the father "head of the family" figure, and develops independence from the family unit. Mussen and Conger reinforce these ideas when they state, "the standards of the child's parents and those of his peers may be in conflict."[1]

Peer orientation generally increases with adolescence. Frank Musgrove in his article, "Inter-Generation Attitudes," reports that young people prefer their peers to their parents as leisure companions.[2] An early investigator of peer orientation, Clay V. Brittain, agrees with Musgrove when he reports that adolescents are more strongly orientated toward peer conformity in areas where social values are changing rapidly and where choices hold immediate responses. Curiously enough, boys and girls from nine to fifteen years of age prefer their parents to their peers when the situation requires coping with difficult tasks.[3] Though the young adult learns many responses from his peer

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[1]Mussen and Conger, Child Development and Personality, p. 498.

[2]Frank Musgrove, "Inter-Generation Attitudes," British Journal of Social and Clinical Psychology 2 (1963): 209-223.

[3]Clay V. Brittain, "Adolescent Choices and Parent-Peer Cross-Pressures," American Sociological Review 28 (1961): 385-390.

group which are useful in his future contact, parents are still influential in the development of the adolescent.

Emotional Turmoil

J.C. Gustin, in his article, "The Revolt of Youth," graphically describes the psyche of the adolescent:

> Picture an adolescent now poised at the brink of adulthood. Racked by sexual desire, frustrated by outer prohibitions and inner inhibitions; desperately longing for independence yet fearful of isolation; eager for responsibilities yet fraught with anxieties about inferiority; flooded by irrational impulses yet committed to propriety, he is hopelessly and helplessly confused and an enigma to everyone and himself.[1]

This graphic explanation supports Sigmund Freud's theory of "storm and stress." Freud held that the hormonal and psychic changes which initiate the reproductive period of life create an imbalance in the personality structure leading inevitably to storm and stress during adolescence.[2] Critics of the storm and stress theory believe that assuming all adolescents experience a similar degree of stress is a gross generalization.

Dorothy Rogers asserts that by adolescence, emotions have been generally defined but that they appear in patterns, the predominant ones varying with the situation.[3] Love, compassion, inferiority,

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[1]J.C. Gustin, "The Revolt of Youth," Psychoanalysis and the Psychoanalytical Review 98 (Summer, 1961):83.

[2]Grinder, Adolescence, p. 41.

[3]Rogers, The Psychology of Adolescence, p. 110.

shyness, guilt, fears and phobias, worry, anxiety, jealousy, depression, and hostility are emotions which vary with the adolescent societal role.

Psychologists Robert Havighurst and Hilda Taba, suggested that personality characteristics could be formed into a typology of personality types which included:

1) the <u>self-directed</u> person who is-
   a) conscientious.
   b) orderly, yet seldom satisfied with his performance.
   c) socially backward from ages 13 through 15.
   d) slow in establishing interpersonal relationships with the opposite sex.
2) the <u>adaptive</u> person who is-
   a) sociable, friendly, vivacious, and outgoing.
   b) easily adaptive to any social situation.
   c) conforms to expectations of his associates.
   d) develops good character easily and naturally.
3) the <u>submissive</u> person who-
   a) will not initiate action.
   b) never shows signs of overt aggressiveness.
   c) rarely shows signs of covert aggressiveness.
   d) lives by authority.
4) the <u>defiant</u> person who-
   a) shows open hostility.
   b) performs poorly in school.
   c) refuses to conform to social expectations.
   d) bears a continual grudge.

4) the defiant person who-

e) can't adjust to his peers, family, school or job.

f) experiences continued neglect and frustration from an early age.

5) the unadjusted person who is-

a) discontented, insecure and frustrated.

b) not openly hostile to society.

c) actively trying to establish a satisfactory relationship with his environment but is presently experiencing little success.[1]

All of these personality types are influenced by the socio-economic level of the adolescent. Critics of this method of classification of personality traits believe that overgeneralization can be dangerous and does not take into account the day-to-day variance in adolescent personality.[2]

Physiological Changes During Adolescence

Authorities agree that during adolescence there is a pronounced and accelerated period of physical growth. Moreover, growth rates vary immensely between individuals and even within the individual. Asynchrony, or "split growth", is evident when the body's various organs and subsystems grow at different rates and times, thus sprouting individually

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[1] R.J. Havighurst and Hilda Taba, Adolescent Character and Personality (New York: Wiley and Sons, 1949), pp. 124-175.

[2] Rogers, The Psychology of Adolescence, p. 59.

with no regard for overall proportions.[1] The extremities and neck grow faster than the head and trunk, giving the long-legged, "gawky" look of adolescence. The adolescent growth spurt is generally evidenced by increase in height and weight, maturation of the reproductive organs, muscular and bodily contour development, and vocal mutation.

Girls experience the growth spurt before boys on nearly all bodily measurements.[2] From about 10.5 to 13 years of age, girls are generally larger than boys. Males usually lag two years behind the females in reaching puberty. Although the male growth spurt occurs later, it persists for a longer period of time. At the peak of adolescent growth, girls grow about 3.5 inches a year in height and gain about 11 pounds in weight while boys often grow 4 to 5 inches per year and add 12 to 14 pounds to their weight.[3] It is important to note that in both sexes there are early and late "bloomers" leading to a vast number of individual growth differences.

Puberty is that time in the life cycle when the reproductive organs attain functional maturity. This maturation is a result of complex physical and hormonal changes occurring within the body.

The beginning of breast growth is usually the first external sign of impending puberty in the adolescent female. Internally, the female's

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[1] L. Joseph Stone and Joseph Church, Childhood and Adolescence (New York: Random House, 1973), pp. 424-425.

[2] Grinder, Adolescence, pp. 56-57.

[3] Stone and Church, Childhood and Adolescence, p. 423.

pelvic area grows rapidly in width and depth and the primary sex organs become functional resulting in menarche--the first occurrence of menstruation. The development of the reproductive organs in boys begins before the height spurt.[1] Growth of the primary sex organs is paralleled with the growth of the secondary sex characteristics which include the growth of the pubic, axillary (armpit), and facial hairs. Girls, more than boys, develop a layer of subcutaneous fat that rounds and softens the contour of the face and body whereas boys develop a leaner, more angular, muscular appearance than girls.[2]

These physical characteristics of adolescence heavily affect the adolescent's view of himself in the world as graphically stated by M.S.Faust. "The early-ripening girl probably feels out of place among her unripe classmates, and the late maturing girl is a lost soul among the hips and bosoms that surround her."[3] In 1964, Weatherley expressed the feeling of the adolescent male when he stated, "the late-maturing boy is likely to be made a butt of jokes, scapegoat, and an object of scorn and ridicule."[4]

The beginning of vocal change is characterized by a loss of vocal power, slight lowering of pitch, and frequent unmanageability of the voice. Generally these changes can occur as early as 9 years of age for girls and 10 years for boys.

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[1]Grinder, Adolescence, p. 63.

[2]Stone and Church, Childhood and Adolescence, p. 422.

[3]Grinder, Adolescence, p. 425.

[4]Ibid., p. 425.

Because the determination of these vocal changes are difficult to detect, many authorities have suggested other ways to determine vocal change. Frederick Swanson believes that there is a high correlation between the development of secondary sex characteristics and the singing voice change.[1] His Ph.D. dissertation is a well documented experimental study which supports this hypothesis. Deso Weiss, M.D., strongly suggests that the growth of the body's bone structure corresponds to vocal mutation rather than chronological or mental age.[2] Warren Joseph, music education researcher, supports Weiss's observation through his own research study where children's voices were classified by factors of biotype (skeletal development, weight, and shoulder breadth).[3]

Duncan McKenzie, an English boys' choir director, believed that the speaking voice was the most reliable indicator of the singing voice change because the speaking voice change precedes the lowering of the singing voice.[4] In the majority of cases, the pubertal change of the voice starts with unsteadiness and huskiness of the speaking voice. This huskiness, which may be the only mutational symptom which occurs, as in girls' voices, may be changeable in character, even during

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[1]Frederick John Swanson, "Voice Mutation in the Adolescent Male," (Ph.D. dissertation, University of Wisconsin-Madison, 1959), p. 216.

[2]Deso A. Weiss, "The Pubertal Change of the Human Voice," Folia Phoniatrica 2 (1950): 140.

[3]Warren Joseph, "Vocal Growth in the Human Adolescent and the Total Growth Process," Journal of Research in Music Education XIV (Summer 1966): 135-141.

[4]Duncan McKenzie, Training the Boy's Changing Voice (New Brunswick: Rutgers University Press, 1956), p. 5.

the same day or be the result of shouting or loud singing. During the mutational period, the vocal mechanism is highly vulnerable to inflammation, dryness, colds, and infections because of the rapidly growing size of the vocal organs and the corresponding change in function. Weiss agreed that the speaking voice is an indication of the singing voice change. However, he suggested that these two voices should be studied separately since the speaking voice precedes and changes faster than the singing voice. The average mutation of the speaking voice is three to six months, while the singing voice change may extend over a one to two year period.[1]

Garrison, noted adolescent psychologist, maintains that the pitch of the speaking voice cannot be used as an accurate index of the vocal change in developmental research studies. He states, "It (the speaking voice) could be studied if a recording device were used for comparing the depth and other qualities of the voice at various stages of development. In this connection, it should be pointed out that it is the progressive deepening of the speaking voice rather than the absolute pitch that is significant as an indication of progress toward maturity since the voices of young men at maturity will vary widely in pitch and other qualities."[2]

Herein lies the main difference between the speaking and singing voice change. The mean pitch of the speaking voice may fluctuate from

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[1]Weiss, "The Pubertal Change of the Human Voice," pp. 133-140.

[2]Karl C. Garrison, Psychology of Adolescence (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1965), pp. 70-71.

a higher to a lower pitch on a daily basis, but the mean pitch of the singing voice will continually lower without daily fluctuation.[1] It is generally agreed that boys' speaking voices lower an octave and girls' voices lower one or two tones.

Laryngologists and speech pathologists generally agree that the lower limit of girls' singing voices descend one to two tones and the upper limits may simultaneously gain one or two tones. The lower limit of boys' voices descends an octave and their upper limit descends only a sixth. Again, these are general statements based on statistics that may not accomodate each individual voice growth rate.

Many research studies have been conducted regarding the adolescent male voice change. Generally, authorities agree (Hollien, McKenzie) that the first noticeable changes in range and quality of the male singing voice begin at age 12, reach a climax at ages 13 to 14 and continue to develop less dramatic changes in timbre and range for at least two to three more years.[2]

The girls' singing voice changes during puberty due to the lengthening of the larynx and slight growth (3-4 mm) of the vocal cords. These changes occur especially in quality and are not as dramatic as the boys' change. The range of the voice continues to remain fairly constant, developing a fuller, rich quality.

Weiss believes that the transformation of the boys' singing voice during mutation seems to take the following direction;

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[1]John Cooksey, "Scientific and Empirical Findings: Some Tentative Solutions," Choral Journal 18 (November 1977): 7.

[2]Harry Hollien and E. Malcik, "Evaluation of Cross-sectional Studies of Adolescent Voice Change in Males," Speech Monographs 34 (March 1967): 80-84.

> "First, a gradual lowering of the lower limit, with steadiness of the higher notes (mostly premutational); then the high notes become unsteady and gradually get lost while the low notes slowly become steady (main phase); after the stabilization of the low notes, the high notes of the new range become steady. This later circumstance marks the end of the mutational period."[1]

In summation, the changes occurring in the organs of phonation are intricately related to the physiological changes of the adolescent. Extreme growth of the male larynx and vocal cords (about 1 cm) results in a more dramatic vocal change than in the female. However, the male voice change proceeds in a predictable downward pattern during adolescence. The lowered speaking voice, often used as an indication of the singing voice change, precedes the lowering singing voice. Thus, the lowered speaking voice may only be used as an indication of pre-mutational vocal changes.

Adolescent Voice Theories

Vocal mutation has been a phenomenon which has spanned many centuries. The problem of vocal mutation was first documented in the 3rd century B.C. where castration was used to conserve the boyish singing quality.[2] This practice was continued even through the 17th and 19th centuries where 4000 Italian children were annually "prepared" for their singing careers.[3] In ancient times, the boy's voice was important for solo singing accompanied by flute or the kithara.

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[1] Weiss, "The Pubertal Change of the Human Voice," p. 140.

[2] Ibid., p. 126.

[3] Ibid., p. 127.

With the development of polyphony in music and the extended use of boys' voices in church, the choir boy became quite valuable both physically and monetarily. Kidnapping of choir boys was a common practice even in the late 19th century.[1]

With the development of the secular solo song and the opera, male voices became more important and emphasis shifted to the development of the well trained adult male voice. This successful evolution lead to the methodology controversy with regards to the instruction of the adolescent male voice. Manuel Garcia, renowned singing teacher in the 1800's and Sir Morell Mackenzie, English laryngologist and voice physiologist, held opposing viewpoints. Garcia recommended the cessation of singing for one year at the time of pubertal voice change while Mackenzie advocated the continuation of singing through mutation by employing mild exercises.[2] In 1885, Emil Behnke and Lennox Browne questioned over 200 choirmasters and singing teachers about the question of exercising the voice during mutation. The conclusions of Behnke and Brown were that "the bulk of the evidence most strikingly proves the injurious and even ruinous consequences arising from the exercising of the voice by singing during the period of change." They admitted, however, that the boys' voice may change gradually in which case singing "may possibly be continued under the guidance of a competent teacher without detriment."[3] John Dawson in his book, The Voice of the Boy,

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[1]Ibid., p. 127.

[2]Ibid., p. 128.

[3]Emil Behnke and Lennox Browne, The Child's Voice: It's Treatment with Regards to After-Development (London: Sampson Low, 1885), p. 52.

supported systematic training during mutation which was enthusiastically supported by many followers in Germany.[1] During the childhood years (5-10 years) the boy would sing soprano, during boyhood years (10-15 years) the boy would sing alto, and through adolescence (15years---) the boy would sing tenor or bass. The use of vocal hygiene was strongly suggested during the entire training period.

In 1932, Dr. C.H.Moody, organist of Ripon Cathedral, advocated that boys remain silent for a three year period after the initial vocal break.[2] However, G. Edward Stubbs, a well-known New York organist and contributor to musical magazines in the 1930's wrote,

> "The average boy's voice, if properly handled, will gradually lower without any break whatever. The exceptions to the rule are too few to be taken into account . . . there is nothing new in the no-break theory. What is needed is more scientific recognition of a fact of importance (mutation) and more widespread knowledge concerning it."[3]

Scientific research on mutation was aided in 1854 by Garcia's invention of the laryngoscope.[4] Research included individual case studies (Schilling), longitudinal studies of school children (Paulsen) and studies on the physiology of mutation (Fournier).[5] Early physiological research, however, dealt primarily with the falsetto voice and perverse mutation (female tenor or baritone) with little research

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[1]John Dawson, The Voice of the Boy (Chicago: Laidlaw, 1919), pp. 28-31.

[2]McKenzie, Training the Boy's Changing Voice, p. 5.

[3]Ibid., p. 4.

[4]Weiss, "The Pubertal Change of the Human Voice," p. 127.

[5]Ibid., p. 128.

being conducted on the "normal" adolescent voice experiencing mutation.

With the birth of the junior high school in the United States (early 1900's), the boy's voice question had to be faced since music was part of the curriculum. The Laurel Music Reader edited by W.L. Tomlins in 1907 and Junior Songs revealed the American philosophy that the book was "designed for use in schools where changing voices introduce peculiar problems."[1] The Laurel Music Reader provided a predominance of unison songs in order that

> "All the grades will be enabled to express themselves with a generous degree of musical completeness; also the weak tones of the changing voice will in these unison songs be frequently called to use, and so be greatly strengthened and improved provided that such tones be rightly produced."[2]

In the 1930's and 1940's well known music educators recognized the problem of vocal mutation yet little effort was made to study the problem from a scientific point of view. In the 1950's and 1960's, three distinct adolescent voice theories emerged causing confusion and frustration among choral music educators. Irvin Cooper, Professor of Music Education at Florida State University-Talahassee, proposed the "cambiata" plan. Duncan McKenzie, former H.M. Staff Inspector of Music, Ministry of Education, England, espoused the "alto-tenor" approach. Frederick Swanson, director of the Moline, Illinois Boy's Choir, supported the "adolescent bass" theory. In 1977, John Cooksey, Professor of Music Education at California State University-Fullerton incorporated many

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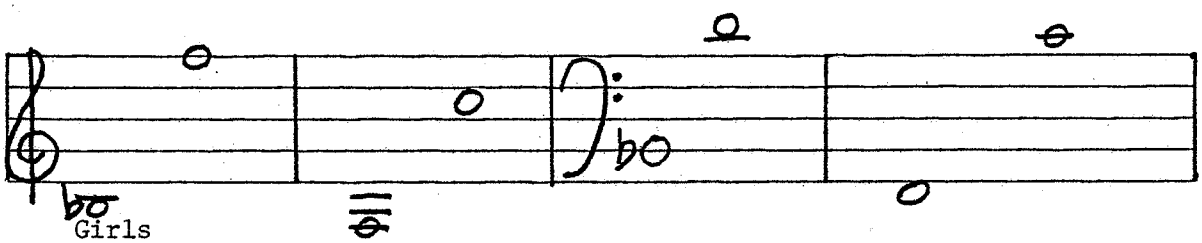
[1]Hollis Dann, ed., Junior Songs (New York: American Book Co., 1918), p. 5.

[2]W.L. Tomlins, ed., The Laurel Music Reader (Boston: C.C. Birchard & Co., 1918), p. 5.

ideas of these men in the development of an eclectic theory for the adolescent male voice.

The Irvin Cooper Theory

Irvin Cooper was primarily concerned with describing various aspects of vocal mutation, developing pedagogical materials for the training of these voices, and noting its corresponding effects on the quality, range, tessitura, and agility of the young adolescent male voice during puberty. Cooper designated junior high voices into five vocal ranges:[1]



Cooper believed that 90% of all junior high singers could work within these ranges. The majority of girls' voices seem to fall within a common range during this period with their vocal quality being described as "thin," "colorless," and "shrill."[2]

Boys' voices move steadily downward in the three defined ranges. The first change (cambiata) generally begins in the 7th grade and can last from a few months to two years. Consequently, cambiata voices dominate the

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[1]Cooper and Kuersteiner, Teaching Junior High School Music, p. 18.

[2]Ibid., p. 21.

male choral section in grades 7 and 8 and baritones become prevalent in the 9th grade. The quality of the cambiata voice is described by Cooper as being "rich and wooly."[1] He also considers its quality to be quite beautiful if it is controlled in volume and not permitted to become strident from sheer vocal enthusiasm. Boys in the second change (baritone) have obvious tenor or bass quality in their vocal tone but this quality is still not completely settled. Little volume or body is evident in this voice except in the upper registers. The baritone voice has problems with rapid articulations of the vocal line especially lines containing wide intervallic leaps.

Tessitura, that area of the vocal range where the voice functions with the most physical ease and beauty was considered by Cooper to be an important criterion for the selection of choral literature for the adolescent choir.[2] Unison singing, therefore, becomes a fruitless enterprise because songs must be restricted to the range of a major ninth in order to accomodate all of the Cooper vocal ranges and remain within the tessituras for each vocal part. Therefore, if a song moves up into the best part of the soprano range it eliminates the cambiata; conversely, a melody favoring the best register of the cambiata voice employs the weaker registers of sopranos and baritones.[3] Cooper considered range to be the primary criterion for music selection but he

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[1]Ibid., p. 22.

[2]William Vennard, Singing: The Mechanism and the Technic (Los Angeles: Carl Fischer, Inc., 1967), p. 79.

[3]Cooper and Kuersteiner, Teaching Junior High School Music, p. 46.

also included four additional ideas to be used in the selection process:[1]

1) There should be interesting supporting parts, particularly for the boys.
2) The articulation speed of the written part must be appropriate for all cambiate and baritones.
3) Childish texts should be avoided.
4) The quality of the music itself should be considered.

Cooper also advocated the use of group voice classification in order to avoid the "octave illusion" problem.[2] The cambiata voice presents the aural illusion of sounding an octave lower than is actually the case. Therefore, this voice can only be classified correctly by comparison with a known bass or baritone singing at the octave.

In summation, Irvin Cooper advocated a cambiata plan which takes into account the range, tessitura, and shifting quality of the adolescent male changing voice. His methods of voice classification and selection of appropriate choral literature emphasized the vocal problems of junior high male singers and showed suitable ways to work with these problems.

The Duncan McKenzie Theory

Boy's voices pass through the Soprano to Soprano II to Alto range. Alto-tenor describes the boy's voice after it has lowered to the stage when the changed voice begins to develop.[3] This change is proceeded by

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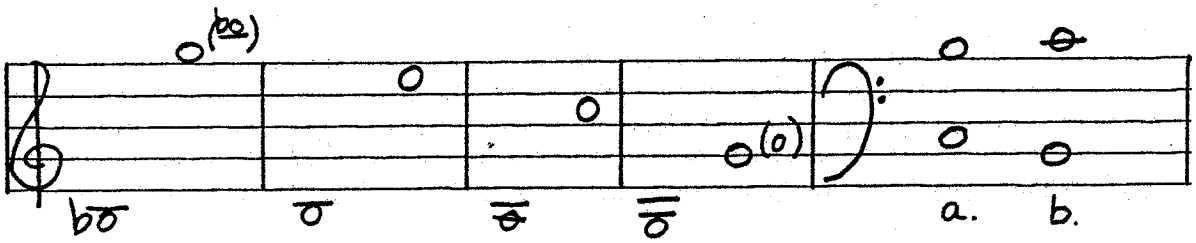
[1]Cooper and Kuersteiner, Teaching Junior High School Music, p. 47.

[2]Ibid., p. 22.

[3]McKenzie, Training the Boy's Changing Voice, p. 19.

the lowering of the speaking voice which McKenzie considers the primary indicator of voice change. The alto-tenor stage develops when the boy is able to sing F below middle C and possesses a vocal quality characteristic of a changing voice. McKenzie believes that the boy's voice generally follows a gradual lowering process into the bass clef while the quality of the voice is correspondingly changing. There are many variations in the length of time a boy may remain in the alto-tenor classification because of the various rates of individual physical growth. McKenzie believes that the boy who becomes an adult bass will generally be an alto-tenor for only a few months to a year. In the case of the future tenor, the change from alto-tenor to tenor may take from one year to eighteen months and even longer.[1] The vocal ranges for the McKenzie theory of vocal classification are:[2]



Soprano I Soprano II Alto Alto-tenor Junior High Baritone

In summation, Duncan McKenzie advocates a "middle of the road" position regarding adolescent male voice change. He agrees with Cooper that the change is a gradual lowering process but tries to classify future adult voices by the length of each singers' stay in the alto-tenor

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[1] Ibid., p. 31.

[2] Ibid., p. 21.

classification. He also believes that singers should be placed in a singing part which is within their comfortable singing range thus allowing the voice to physically develop at its own growth rate.

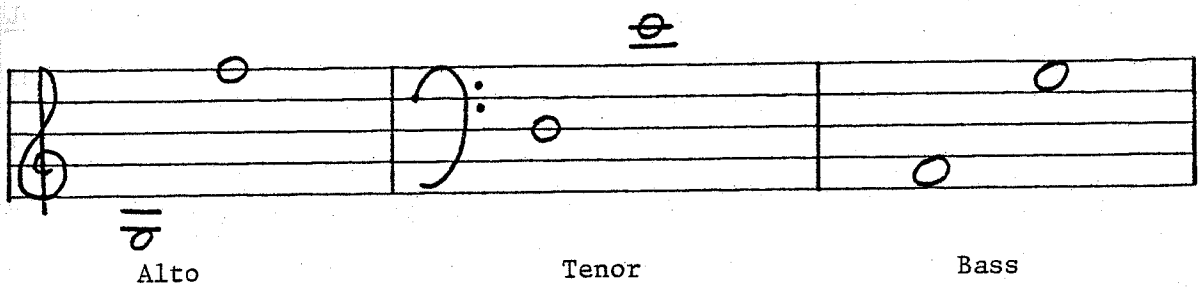
The Frederick Swanson Theory

In 1959, Frederick Swanson completed a one year study which demonstrated the high correlation between voice change and secondary sex characteristics (growth of the pubic hair). His conclusions were:

1) The rate of the voice change is very rapid, not gradual.
2) The male voice does not change gradually but drops at least one octave at the onset of mutation. Swanson's study showed that 30-40% of 8th and 9th grade boys tested followed this pattern.
3) The new bass still has the treble range intact with a blank spot or area around middle C where no notes can be produced. When the boy trys to sing in the blank area, the voice squeaks, breaks, and extreme strain occurs. Bridging of the treble and bass ranges is achieved through the use of falsetto technique, vocalizing downward from the treble to the bass voice.
4) Boys voices should be segregated from the girls' in order for the boy's voice to reach its full potential. This way the teacher is able to give full attention to the boy's voice and the boy need not feel any social embarassment when his voice becomes unmanageable because all the male voices will have the same types of vocal problems.
5) The tenor voice is rare in the Swanson theory because the voice change is not gradual. In order to achieve the tenor quality,

5) Swanson recommends the use of the falsetto and full voice to produce a unique tenor-like quality.[1]

Vocal ranges for the Swanson theory are:[2]



Because of the limited bass range, F. Swanson recommends that choral directors arrange their own music to accomodate these ranges. Like Cooper, Swanson advocates interesting vocal parts and also believes that the lower two parts should be arranged in interval separations of 3rds and 6ths so that these voices can develop a good harmonic sense.

In summation, Frederick Swanson believes that during mutation the boy's voice quickly drops to the range of an adolescent bass while maintaining a treble voice and a blank spot around middle C. Vocal materials and methodologies should be geared toward homogenous groupings and, therefore, materials should accomodate the individual singing parts. The tenor voice is rare in the Swanson theory and singers can only achieve a "tenor" sound by combining their falsetto and full voice qualities.

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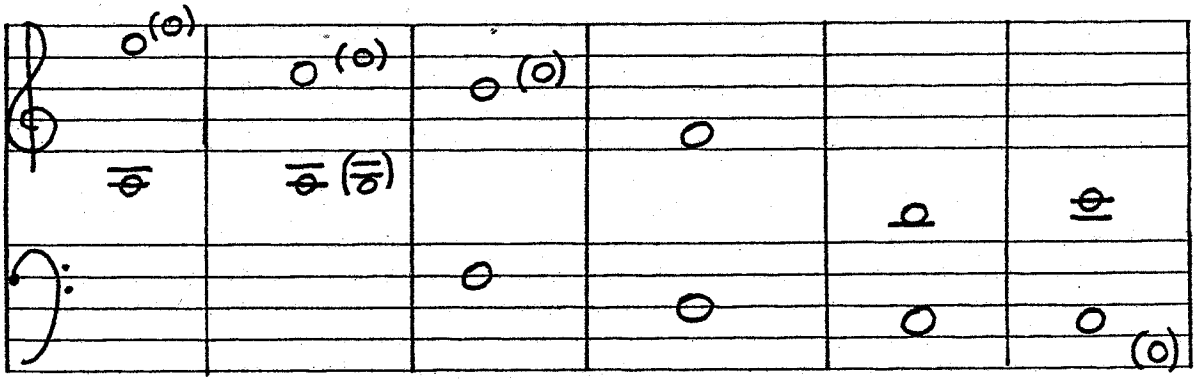
[1]Frederick J. Swanson, "The Vanishing Basso Profundo Fry Tones" Choral Journal 17, no. 5 (January 1977): 5-10.

[2]Frederick J. Swanson, "The Proper Care and Feeding of Changing Voices" Music Educator's Journal 48 (November-December 1961):63.

A Current Voice Theory

In 1977, John Cooksey, Professor of Music Education at California State University-Fullerton, wrote a series of articles for the Choral Journal entitled "The Development of a Contemporary Eclectic Theory for the Training and Cultivation of the Junior High School Male Changing Voice." These articles, written in four sections, summarized the existing theories of adolescent voice change, explained scientific and empirical findings concerning the changing voice, discussed basic principles of good vocal production, and provided criterion for the selection of choral music literature. Therefore, the tenets developed in his theory of male voice change concentrated not only on range, tessitura, register delineation, and voice quality but also on the various physiological complexities associated with pubertal vocal mutation. The vocal ranges employed in the Cooksey theory are:[1]



Stage 1	Stage 2	Stage 3	Stage 3A	Stage 4	Stage 5
Boy Soprano	Boy Alto	"Cambiata"	Transition	New Baritone	Settled Baritone

[1]John Cooksey, "Developing an Integrated Approach to the Care and Training of the Junior High School Male Changing Voice" Choral Journal 18, no. 4 (December 1977): 5.

These ranges were determined through Cooksey's personal experience and a longitudinal study on adolescent voice mutation conducted by Czechoslovakian Doctors Naidr, Zboril, and Sevcik during the early 1960's.[1] While some voices may not fit these categories, the majority should approximate the various stages presented. Cooksey further summarized the criterion for voice classification in Table 1 of his article "Scientific and Empirical Findings: Some Tentative Solutions."

TABLE 1

Cooksey Summary of the Five Stages of Voice Development in the Adolescent Male

Stage 1, Premutation: Boy Soprano Classification

a. Pre-pubertal period. May extend into 7th grade.
b. Mean average pitch frequency of speaking voice about middle c or b.
c. Singing voice: Full, rich sound. Soprano-like quality. Voice reaches pinnacle of development for childhood.
   Range and Tessitura: See range chart.
   Register: Only modal sound of soprano-like quality throughout the range. No lift points apparent yet.
d. Usually sings Soprano part, but may also manage some harmony parts, Soprano II or Alto.
e. Very flexible, agile, with good capability for dynamic variation.

Stage 2, Early Mutation: Midvoice I (Boy Alto)

a. Initial pubertal period. Grade 7 or early 8th grade. For the majority, occurs between ages 12 and 13.
b. Speaking voice begins to lower. Mean average pitch: a or b. Speaking voice timbre becomes a little rougher, darker . . . but still light.

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[1]John Cooksey, "Scientific and Empirical Findings: Some Tentative Solutions" Choral Journal 18, no. 3 (November 1977): 8.

TABLE 1 (Cont'd)

Stage 2, Early Mutation: Midvoice I (Boy Alto)

c. Singing voice: Variable loss of high tones in the range and increasing breathiness and strain, especially above c^1 (3rd space, treble clef). There is a little body or resonance in the extreme lower part of the range.
   Register: Only the modal still apparent, but some points of quality change become evident, around b flat to c^1 (3rd line, 3rd space, respectively, treble clef).
d. Usually sings the alto part, but still has most color and power in the mid-range area, d (just above middle c) to b or c^1 just above.
e. Volume capabilities begin to diminish.

Stage 3, 3A High Mutation: Midvoice II (Cambiata and Transition)

a. Height of pubertal period. The majority of boys in this stage are found in the eighth grade. Age span: 13-14.
b. Speaking voice becomes noticeably huskier and lower in pitch. Mean frequency pitch: a or g just below middle c.
c. Singing voice: Extremely crucial period for careful voice training. The voice loses agility and becomes harder to manage. There are coordination problems related to the external and internal growth of the laryngeal muscles. The quality of the sound becomes "unique" and stabilizes for a time. It can have a harsh edge if too much exuberance is allowed, be exceptionally breathy and weak if not encouraged, or be quite startling in its beauty and richness if cultivated properly; that is, if the voice is encouraged to develop within its own natural pitch tessitura.
   Register differentiation becomes apparent as the falsetto register emerges (around b, c^1, d^1 area in the treble clef).
d. Crucial period for part assignment. Standard alto parts sometimes too high; tenor parts too low.
e. Surprising volume capabilities, if cultivated properly. Maximum power of sound produced between A (below middle c) and g (2nd line treble clef).

TABLE 1 (Cont'd)

Stage 4, Postmutational Period: New Baritone

a. A "settling" period. Often begins near the end of the 8th grade or beginning of the 9th grade, and can extend to the 10th or 11th grade. Age: late 14th or early 15th year, extending to 16 or 17.
b. Speaking voice has lowered to approximately E or D (bass clef). Adult sound still not fully apparent.
c. Singing voice: See range chart.
The quality is difficult to describe since resonation capabilities in the lower register extremes are not yet fully developed. The voice remains light, but approximates the mid-baritone sound. It is huskier than the Midvoice II sound (Stage 3,3A), has a definite register lift point (middle c or d), and typically can not sing without strain in or above that area. The passagio region extends from middle c to possibly e or f above. While this transition area may be difficult for the young voice to negotiate, register breaks can possibly be avoided with proper vocal training. Some voices can sing from the modal (full) to head (middle) . . .from middle c to f or g . . . to falsetto without undue strain.
d. Vocal agility is usually limited. These recently changed voices may have difficulty in negotiating fast moving parts containing intervallic leaps of more than a perfect 4th or 5th.
e. Assigned to the baritone part. Sometimes (and often!) SATB bass parts are too low.
f. Volume capabilities are somewhat limited at first since the voice is light; however, the dynamic compass increases dramatically if proper training is applied.

Stage 5, Early Adult Phase: Adult Tenor, Baritone-Bass Qualities

a. May occur in the latter part of the 9th grade, but most often occurs after the male reaches 17 or 18 years of age.
b. Speaking voice approximates the adult sound.
c. Singing voice: Body and resonance of the tone increases, and characteristic adult qualities emerge. Vocal agility, resonance, and power increases significantly.
d. Must be assigned to tenor, baritone, or bass parts, depending upon voice classification.[1]

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[1]Ibid., pp. 12-14.

Cooksey further believes that individual voice classification is necessary to classify the male voice according to the stages of mutation. His individual testing method, completed in 10 to 15 minutes, includes matching tones and melodic phrases, flexibility exercises, tonal memory, rhythmic memory, and sight singing thus giving the instructor a knowledgable grasp of each singer's capabilities.[1]

Cooksey stresses the importance of having a good knowledge of the physiological mechanisms which affect the singing process. He believes that students should be taught the principles of good breathing, good posture, and breath support through simple explanation, minimal teacher demonstration, and student participation in easy exercises.

One aspect exclusive to the Cooksey theory is the discussion of register delineation. This delineation is characterized by a "lift point", or exact place in the range where change in vocal quality is noticeable. Basses are found to have a lower lift point (middle c) than baritones (d-e) and tenors (e-f). However, lift points do not become evident until the falsetto register emerges (Stage 3).[2]

In summation, John Cooksey's theory incorporates many of the ideas of Cooper and McKenzie. He advocates a gradual lowering process (Cooper, McKenzie) which corresponds to the lowering of the speaking voice (McKenzie). His voice classifications more specifically identify the various changes occurring during pubertal mutation. One aspect of his theory, a new idea, is the discussion of register lift points. Careful instruction which

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[1]Cooksey, "Developing an Integrated Approach to the Care and Training of the Junior High School Male Changing Voice," pp. 7-8.

[2]Ibid., p. 6.

includes many of the Cooksey principles will allow the junior high male singer to participate in a vocal music program. Now let us examine a method of educational program development which has been used as an alternative teaching method.

Programmed Instruction

Self-instructional programs are educational materials from which students learn independent of a teacher. The teaching technique based on self-instructional programs is called programmed instruction which may be presented in book form, tapes, records, television, teaching machines, and films. Regardless of the medium, the material presented makes use of what is called the learning cycle.

> First, they require the student to focus his attention on a limited amount of material at one time. Second, they require him to respond (or answer) in some way to each segment of material. Third, they give him immediate knowledge of results after each response.[1]

Within every program, the learning cycle is repeated for every segment of instruction.

Possible advantages of programmed instruction are that this technique typically teaches at least as much material as other methods but, often, in less time. This has implications for curriculum scheduling. The time allotted for completion of a portion of the scheduled curriculum may vary, thus allowing extra time for other topics to be covered within the course. Secondly, while the material is being learned individually, the teacher may be available to hold class discussions, help

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[1]Paul Jacobs, Milton Maier and Lawrence Stolorow, A Guide to Evaluating Self-Instructional Programs (New York: Holt, Rinehart and Winston, Inc., 1966), p. 1.

students organize their information, hold individual conferences, and develop the students' skills in applying what they have learned. Thus the teacher can more effectively organize the learning environment around the needs and interests of each student. Finally, students become responsible for their own learning. The student receives an immediate response to his answer, whether right or wrong, and then moves ahead to new knowledge or returns to the old material for review. Each learner is encouraged to work at his own pace while being the "judge" in determining if the presented material has been learned. Every attempt is made by programmers to provide the student with a successful experience. The programs, generally segmented, are designed to positively reinforce the learner and assist him by providing clues and prompts within the written text. All of these efforts are made to reinforce a good attidue toward learning, which is necessary for every student's intellectual development.

Programmed instruction materials are usually constructed in a linear or branching format. B.F. Skinner, one of the strongest advocates of programmed learning, often used the linear format when programming instruction. The linear approach leads each student through the entire program in a step by step approach and all students follow the same sequence. Thus everyone is exposed to the same material.[1] The branching program may send or branch each student to different material depending upon the responses he makes.[2]

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[1]Ibid., p. 4.

[2]Ibid., p. 4.

The principal difference between branching and linear styles of programs is that in a branching program, the material to which the student is directed depends on the answer chosen by the student. But in the linear program, the material the student sees does not depend on his response to the material--he sees the entire program.

In order to be an effective teaching tool, each program should be developed following these basic stages:

1) Specify goals. The objectives of the program should be clearly specified. The objectives should become increasingly specific as the program is developed until they are stated as particular tasks that the student should master.

2) Write frames. The material should be segmented into logically ordered units or frames, each demanding a response from the student. Correct student response should occur only when understanding of that frame is achieved.

3) Try out and revise. This is the heart of program writing. The first version of the program is piloted through student usage resulting in revision based on students' comments and errors. Frequently the final program is considerably different from the original version.

4) Validate. The program should be validated, or tested, through the use of a standardized test used to assess the learning. Student reactions to the program should be reported, as well as the learning scores. The relationships among the learning scores, academic ability, learning times, and student attitudes are also determined.[1]

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[1]Ibid., pp. 10-11.

By following these stages of curriculum development, sound educational principles are established as the foundation for the program. Instruction becomes goal-oriented allowing students to acquire specific knowledge or skills. The steps of instruction are carefully organized and sequentially built upon previous knowledge. The student's attention is focused on a single point because the material is presented in short, concise learning units and he proceeds at his own pace through the program taking one step at a time. Each student becomes an active learner because he is asked to respond to the material in every frame. Immediate feedback gives the student the responsibility for his own learning and allows him opportunity for remediation.

Many educators have questioned the effectiveness of programmed learning. They argue that the use of short steps, immediate feedback, ordered sequence, and self-pacing does not accomodate the learning styles of the individual student but rather groups them into a block of learners all responding in a like manner. W. Schramm reviewed 165 research reports on programmed learning and summarized that of 36 reports comparing programs with conventional classroom instruction, 17 showed superiority for programmed instruction over conventional instruction, 18 showed no significant difference, and only 1 showed a final superiority for the conventional classroom method.[1] It seems then that programmed instruction can be as effective as conventional classroom instruction.

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[1]Ernest R. Hilgard and Gordon H. Bower, Theories of Learning 3rd ed. (New York: Appleton-Century-Crofts, 1966), p. 558.

Programmed learning is not limited to a particular kind of subject matter. Initially, programmed instruction was used to teach cognitive or psychomotor skills in mechanical training, math and language. Very few, if any, dealt with the affective domain. However, programmed learning now includes effective programs in many affective subject areas including teaching the appreciation of poetry, training creativity and problem-solving, and learning music appreciation.[1]

Anthony Barresi and Robert Diamond, educators at the State University College of Fredonia, New York, incorporated programmed instruction into various segments of a music appreciation course. Student tests revealed a high degree of success in learning the cognitive materials. Student questionnaires also revealed enthusiasm and interest for the learning modules.[2]

In summation, programmed instruction may be as effective as conventional teaching methods. It has been effectively used to teach cognitive and psychomotor skills in language, math, and mechanical training as well as poetry, creativity, and music.

Programmed materials are designed in two formats--linear or branching. Each format makes the student responsible for his own learning by providing self-pacing, immediate feedback, and remediation either in every step of the program (linear) or through students' individual responses (branching). Furthermore, the programs are constructed to

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[1]Ibid., p. 560.

[2]Anthony Barresi and Robert Diamond, A Modular Approach to Music Appreciation with Emphasis on Independent Study (Fredonia, N.Y.: SUC Fredonia Instructional Resource Center, 1970), pp. 4-5.

offer the student positive reinforcement throughout the learning sequence thus generating a good attitude toward learning.

Programmed instruction does not replace the teacher. Rather, it frees the instructor to prepare enrichment activities that would normally not be included in the course curriculum. Because programmed learning often concentrates on repetitive skills and cognitive information, the teacher is relieved of this teaching responsibility and is able to concentrate on individual students questions and concerns. In order to produce challenging instructional programs, the written text and intermittent questioning within the program must lead the student to higher cognitive levels. Therefore, an effective classification of classroom questioning has been reviewed.

A Taxonomy of Questioning

Questions and problems have long been used in the classroom to motivate interest, instruct, and evaluate instruction. Traditionally, questions have been used to determine what has been learned--too often as isolated bits of knowledge which are of little value. The quality of a question can lead students into various levels of learning and evaluative thinking. A good question is precise, clear and closely connected to the matters on which the question is based.[1]

The Taxonomy of Educational Objectives, edited by B.S. Bloom, presents an ingenious plan for classifying educational objectives.

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[1]Norris M. Sanders, Classroom Questions: What Kinds? (New York: Harper & Row, 1966), p. ix.

This book was an attempt by a committee of college and university professors to provide classification of the goals of education. This group had been troubled by the difficulty of composing tests that truly evaluated the success in attaining objectives set forth for various college subjects. The first book concentrated only on the intellectual aspects of education leaving the emotional and physical aspects for later study. Within this cognitive domain, they defined six sequential levels of thinking that encompassed all intellectual objectives in education. Bloom's categories of thinking were knowledge, comprehension, application, analysis, synthesis, and evaluation.[1] In 1966, Norris M. Sanders, adapted Bloom's ideas into a taxonomy of classroom questioning. His questioning levels were:

1) Memory: The student recalls or recognizes information.

2) Translation: The student changes information into a different symbolic form or language.

3) Interpretation: The student discovers relationships among facts, generalizations, definitions, values, and skills.

4) Application: The student solves a lifelike problem that requires the identification of the issue and the selection and use of appropriate generalizations and skills.

5) Analysis: The student solves a problem in the light of conscious knowledge of the parts and forms of thinking.

6) Synthesis: The student solves a problem that requires original, creative thinking.

7) Evaluation: The student makes a judgement of good or bad, right or wrong according to standards that he designates.[2]

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[1]Benjamin Bloom, ed., Taxonomy of Educational Objectives (New York: David McKay, 1956), pp. 4-9.

[2]Sanders, Classroom Questions: What Kinds?, p. 18.

The taxonomy for classroom questioning helps the teacher to evaluate instructional materials, develop good classroom and test questions, and foster critical thinking in students.

There are three factors that determine the level of the question. First, the nature of the question itself must be considered in terms of its classification in the taxonomy. A certain kind of question leads to a certain level of thinking. Second, the level of the question will be influenced by the student's knowledge of the subject. The question might be on the analysis level for one student and just a matter of recall for another. The third factor that enters into the classification of a question concerns the instruction that proceeds the asking of the question.[1] For example, if the answer had previously been mentioned in an explanation by the teacher, then the question is only on a memory or recall level.

Many educators advocate less emphasis on "what", "where", and "when" questions and more emphasis on "why" and "how" questions. However, instructional procedure enters into the kind of thinking required by a question so that a "why" question may revert to a level of recall.

There are both simple and complex questions in each level of thinking. All teachers from the primary grades through graduate school can use every level of the taxonomy of questioning because the differences in questions offered at various grade levels should be in the <u>complexity</u> of the thinking, not the question.[2]

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[1]Ibid., p. 8.

[2]Ibid., p. 10.

Short answer questions can be used to instruct, evaluate diverse subject matter and skills, and are easy to correct. When composing short answer questions the following suggestions are given:

1) Don't write questions on trivial ideas.

2) Do not use vague language.

3) Make certain the questions call for a single, correct answer.

4) Do not overuse superlatives as they usually indicate the answer is false.

5) Include at least four options, but do not use obviously phony ones.

6) Use "None of the above" or "All of the above".

7) Keep all the options grammatically consistent.[1]

Short-answer questions can lead to thinking in all categories except synthesis and analysis.

Effective questioning will help students develop more diversified and critical thinking which should prove valuable not only in their student days but throughout their lives. Therefore, it is very important for the instructor to create questions that will "stretch" the minds of their students.

Knowledge of the literature reviewed in this chapter was essential in the formulation of an appropriate experimental design. The areas of concern included adolescent psychology, physiological changes occurring during adolescence, adolescent voice theories, programmed instruction, and a taxonomy of questioning. These elements provided the basis of the design of the study to be discussed.

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[1]Ibid., pp. 164-165.

CHAPTER III

The Design

This researcher has developed an appropriate experimental design to compare the relative effectiveness of traditional classroom instructional methods with a self-instructional module. A group of approximately fifty students enrolled in the University of Wisconsin-Madison vocal methods classes were divided into two groups--control group A and experimental group B. Group A was exposed to material concerning the adolescent changing voice through traditional methods of classroom lecture, handouts, and discussion. Observations were made through general visits to junior high choral rehearsals within the Madison area. Group B was taught the same material through a self-instructional module utilizing programmed instruction booklets and videotapes of adolescent voices in singular and group settings. The videotapes focused upon the material presented within the programmed instruction booklets.

Upon completion of the curriculum sequence, each group was given the same final exam which required students to:

1) identify the characteristics of the adolescent changing voice.

2) identify the "typical" changing voice ranges.

3) select suitable musical material for the changing voice.

4) suggest pedagogical solutions for common voice change problems.

Bloom's Taxonomy of Educational Objectives provided background on human reasoning levels.[1] Sanders' levels of classroom questioning, namely, recall, translation, interpretation, application, and analysis were influential in the formulation of the final exam questioning.[2] Suitable statistical tests were applied to the raw scores to determine if there was a significant difference between instructional methods.

The Traditional Method

The traditional method used for control group A included four fifty minute lectures covering 1) the physiological and psychological changes during adolescence 2) ranges and tessituras of the adolescent changing voice 3) criteria for suitable choral literature and 4) general vocal problems of the adolescent. Observations of junior high singers were arranged in local junior high schools. These visits allowed the college student to hear junior high voices in a group setting. The college classroom instruction, given by this researcher, was accompanied by written literature highlighting characteristic behaviors of the adolescent, adolescent voice ranges and tessituras from John Cooksey's eclectic theory of male voice change, a list of publishers and composers who accomodate the adolescent voice, and criteria for selection of suitable choral literature for this age group. The instruction was also accompanied by classroom discussion and actual practice in selecting suitable literature for adolescent choirs. (See Appendix 1--Student Handouts).

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[1]Bloom, Taxonomy of Educational Objectives, pp. 4-9.

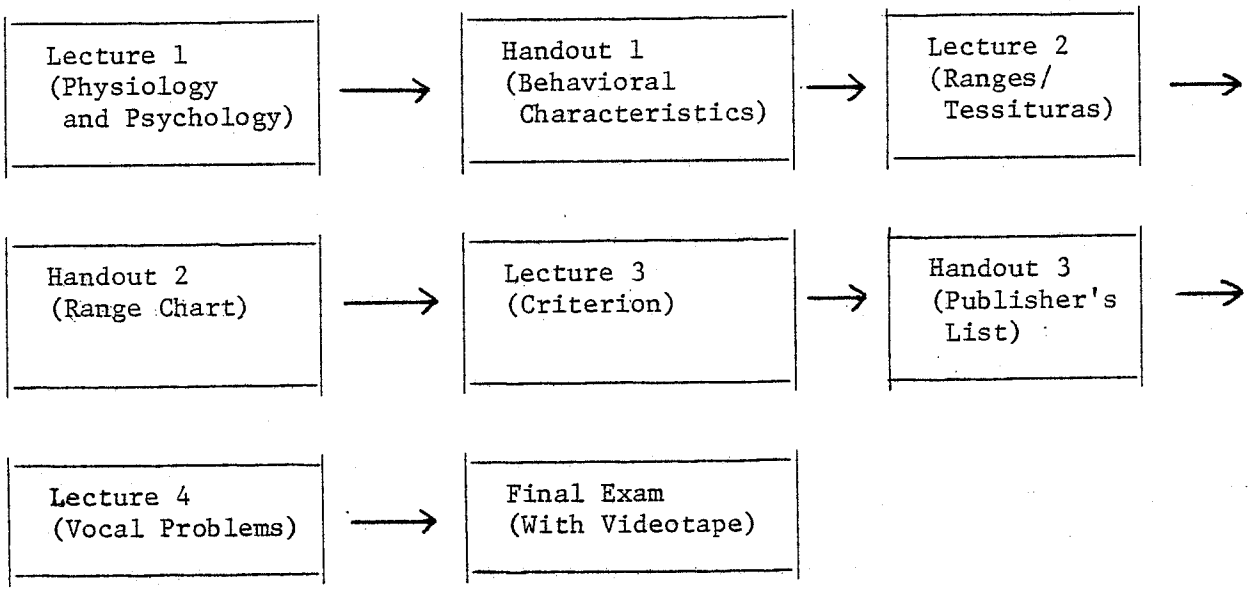
[2]Sanders, Classroom Questions: What Kinds?, p. 10.

The instructional flow chart for this method is given in Table 2.

TABLE 2

Instructional Flow Chart

Traditional Method



The classroom instruction was supplemented by group discussion and observations of junior high school choral rehearsals. The entire instructional sequence spanned a three week period.

An alternative method of instruction was devised to teach the same curriculum material on the adolescent changing voice. This method was utilized by the experimental group B in a three week learning sequence at the Instructional Materials Center of the University of Wisconsin-Madison. At the completion of the alternative method, group B students were given the same final exam as group A which included videotape observations of adolescent singers.

The Self-Instructional Method

The formulation of a self-instructional module on the adolescent changing voice was made possible through a grant by the Undergraduate Committee for Instructional Improvement, University of Wisconsin-Madison. This module, devised by Dr. Anthony Barresi, UW-Madison, and M. Goetsch incorporated features of a successful music appreciation programmed instructional module utilized at the State University College, Fredonia, New York.[1] These features, namely, programmed instructional booklets in a branching format and videotape, were incorporated into a self-instructional module on the adolescent changing voice. Its components included an introductory videotaped lecture on adolescent psychology, four programmed instruction booklets (PI), and four accompanying videotaped observations (VTO). These components were entitled:

Introductory Lecture--A Profile of the Adolescent.

PI 1--Characteristics of the Adolescent Changing Voice.

PI 2--Ranges of the Adolescent Changing Voice.

PI 3--Methods for Selection of Suitable Literature.

PI 4--Methods for Adolescent Voice Instruction.

VTO 1--Qualities of Adolescent Voices.
(qualities illustrated by young singers.)

VTO 2--Ranges of Adolescent Voices.
(ranges illustrated by young singers.)

VTO 3--Junior High School Choral Rehearsal.
(demonstration of suitable music being rehearsed.)

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[1] Barresi and Diamond, A Modular Approach to Music Appreciation with Emphasis on Independent Study, p. 8.

VTO 4--Adolescent Voice Lessons.
(demonstration of appropriate teaching techniques for young singers.)

The self-instructional module, which included programmed booklets interspersed with videotapes, provided immediate reinforcement of the cognitive material presented through visual and aural observation. Questioning in the booklets utilized the branching programming format approach which sent each student to different material depending upon the responses he made. The instructional flow chart for this method is as follows:

Table 3

Instructional Flow Chart

Self-Instructional Method

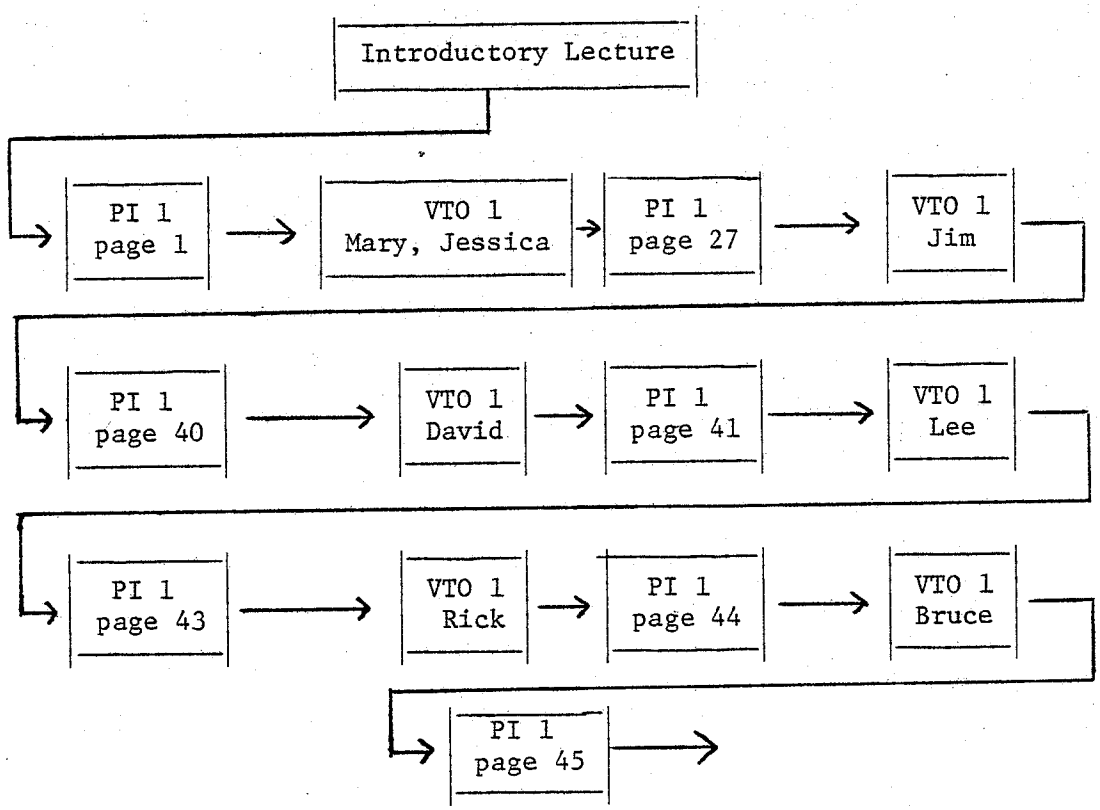
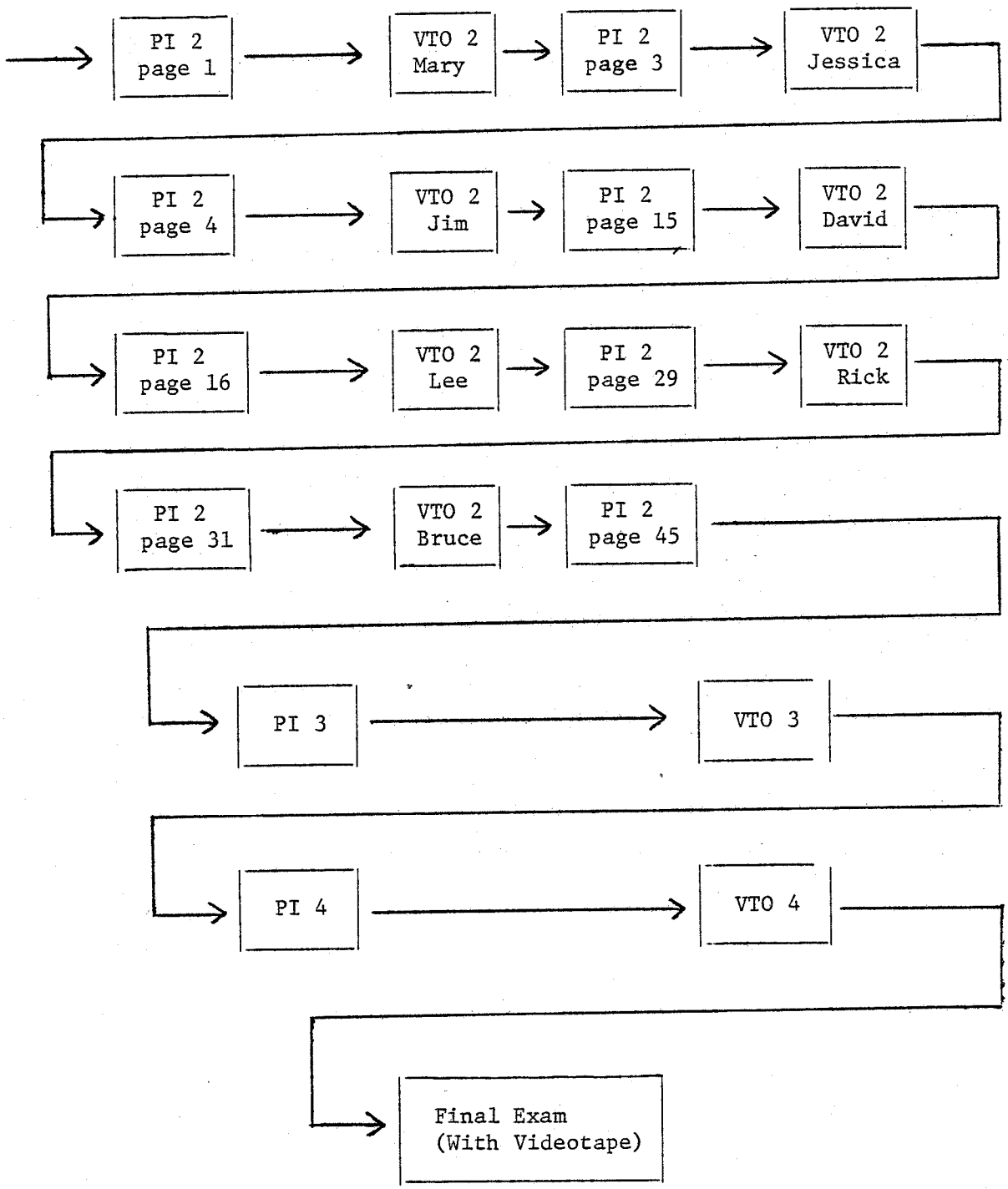


Table 3 (Cont'd)



The introductory lecture, given by Barresi and Goetsch, described the adolescent changing voice physiology and its accompanying psychological implications. These topics were reinforced through discussion within the vocal methods class.

The booklet entitled Characteristics of the Adolescent Changing Voice (PI 1) explained the physical changes of adolescence and how they affect voice quality. Stages of adolescent voice mutation were introduced and qualities of the speaking and singing voice were discussed for each mutational stage. Since there is little change in the vocal quality of the adolescent female voice, the author chose to label the female voice "treble" instead of the traditional "soprano" and "alto" classification. This philosophy allows the voice to develop its natural vocal quality without being restricted by early classification. Treble 1 and Treble 2 were utilized for separation of voices into two singing parts. However, singers should occasionally switch vocal parts in order to experience singing harmony. (See Appendix 2--Programmed Instructional Booklet 1).

Instructional Booklet 2, Ranges of the Adolescent Changing Voice (PI 2), gave the range and tessitura guidelines for adolescent male and female voices. These guidelines, adapted from John Cooksey's "Eclectic Theory for the Training and Cultivation of the Junior High School Male Changing Voice", and the Naidr, Zboril and Sevcik longitudinal study reinforced the concept of sequential downward movement from the pre-mutational stage to the newly changed baritone.[1] Ranges and

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[1]Cooksey, "Scientific and Empirical Findings: Some Tentative Solutions", pp. 5-10.

tessituras for the female voices were taken from the Irvin Cooper theory on adolescent voices.[1] (See Appendix 2--Programmed Instruction Booklet 2).

Programmed Instruction Booklet 3--Methods for Selection of Suitable Literature--established criteria for the selection of appropriate literature for the adolescent choir, discussed problems with published literature, and suggested a junior high choral seating arrangement which adapted to changing voices. These selection methods incorporated knowledge of adolescent psychology and vocal maturation patterns of adolescence. (See Appendix 2--Programmed Instruction Booklet 3).

Methods for Adolescent Voice Instruction (PI 4) proposed suitable techniques and methodologies to train the adolescent voice through each mutational stage. These approaches were based upon knowledge of the physiological changes which affect vocal mutation, psychological characteristics of the adolescent, and correct breathing and accurate vowel formation. (See Appendix 2--Programmed Instruction Booklet 4).

Videotape observation 1 (VTO 1)--Qualities of Adolescent Voices illustrated the speaking and singing vocal qualities of each adolescent mutational stage. Subjects selected for VTO 1, 2, and 4 were students from Kromrey Middle School, Middleton, Wisconsin. Two girls and five boys were chosen to represent the stages of adolescent vocal mutation. Each student was individually tested for vocal quality, range, and tessitura that would approximate the Cooksey guidelines for voice classification. However, an

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[1]Cooper and Kuersteiner, Teaching Junior High School Music, p. 18.

illustration of variability in the adolescent male voice range became evident from the original testing (October, 1979) to the studio taping (November, 17, 1979). The boy selected to represent the pre-mutational (unchanged) stage in October began to experience early voice change signs. By November 17, his range and voice quality had changed to that of a boy alto. The vocal stages illustrated on VTO 1 are:

Female		Male
Treble 1	Treble 2	Pre-Mutational, Stage 1
		Early Mutation, Stage 2
		High Mutation, Stage 3
		Transitional Mutation, Stage 3A
		Newly Changed Baritone, Stage 4

Videotape observation 2 (VTO 2)--Ranges of the Adolescent Changing Voice demonstrated the two female ranges and tessituras and the five stages of male voice mutation. Detection of tessitura differentiation was particularly difficult in the female voices, while lift points, or changes in vocal quality, became evident in the lower mutational stages. Further research on adolescent tessitura might be helpful in the determination of individual voice placement within the mutational stages.

Junior High School Choral Rehearsal, VTO 3, was a demonstration of a junior high chorus rehearsing suitable literature. This choir was composed of approximately sixty young adults, ages 12-14, from Kromrey Middle School. The music rehearsed, chosen in cooperation with Mr. James Hofsteen, the director, showed the capabilities of adolescent voices

and the problems encountered because of vocal immaturity.

Finally, VTO 4, Adolescent Voice Lessons, was a series of three voice lessons illustrated by a female treble voice, a boy experiencing the crux of mutation, and a newly changed baritone. These lessons were formulated to illustrate many of the methodologies and vocal exercises suggested within Programmed Instruction Booklet 4.

The formulation of the self-instructional module was based on research concerning adolescent psychology and physiology, adolescent voice theories, vocal pedogogy, programmed instruction, and a taxonomy of questioning. All of the booklets were constructed in a programmed instructional format where material was taught by frames, or short instructional units, followed by questions concerning those frames. Correct response moved the student on to new material, while incorrect response returned the student to the previously presented material for review. Questions interspersed throughout each booklet were constructed employing various levels of questioning so that each student was challenged not only at the completion of the module but also within the learning sequence. Graphics and musical examples also helped to accentuate the programmed learning.

The videotapes provided focused observations of adolescent voices in an individual and group setting. They also reinforced the written material of the programmed booklets through other perceptual modes (aural, visual). The videotape sessions were conducted at Kromrey Middle School and the studio of the Instructional Media Distribution Center, UW-Madison.

Final Exam Questioning

Effective programs specify goals, are logically sequenced, piloted, revised, and validated. The specific goals of the program on the adolescent voice were to identify the unique characteristics of the adolescent voice, provide knowledge of the psychological aspects which affect adolescent singing, and suggest suitable methodologies for teaching this singing voice. The sequencing of this program followed a logical order namely, 1) how the adolescent operates in the real world 2) how adolescent psychology affects the singing voice 3) the qualities of the singing voice 4) suitable choral literature for the adolescent and 5) how to teach the adolescent voice. This program was piloted in the vocal methods class, Spring, 1980. Student questionnaires have been used to recognize strengths and weaknessess in the program which will lead to revision. Validation of the program was achieved through the use of an exam given at the completion of the self-instructional module.

The final exam contained various levels of test questioning. Questions 1A and 1B were based on a short videotape observation of two boys. Students were asked to describe the visible signs of physical maturity (translation), estimate the stage of vocal mutation (application), and suggest possible vocal ranges and tessituras (translation). Question 2 presented an anecdote in which the teacher was required to motivate junior high students to learn a contemporary composition. Test respondents were asked to select five psychological and personality characteristics of the adolescent and to suggest a motivational strategy based upon these characteristics (synthesis).

Question 3 asked that the student write the voice ranges and tessituras for each adolescent voice stage (recall). Although this question was based on the lowest level of knowledge (recall), this information was essential in order to answer question 4.

Question 4 suggested a hypothetical distribution of 7th and 8th grade students in a junior high choir. Three sections of choral compositions were given within the test. From this information, the test respondent was asked to choose the most appropriate choral section and defend their choice through voice placement, articulation, text, and any of their own ideas (analysis).

The final question, Question 5, was derived from a videotape observation of a young female singer performing a solo. Students identified four vocal problems and briefly suggested suitable remediation (application).**

The majority of test questions required the student to apply their knowledge of the adolescent changing voice to higher levels of reasoning thus demanding more than recall from students. Videotape observations were used in the final test to illustrate realistic examples of adolescent voices thereby forcing the college student to identify qualities of adolescent vocal mutation stages and devise appropriate instructional techniques for these voices. (See Appendix 3--Final Exam).

**The reader may wish to review the taxonomy of questioning on pp. 40-43.

Student Questionnaire

A student questionnaire was administered to experimental group B after the completion of the self-instructional module on the adolescent changing voice. This questionnaire provided student feedback concerning the effectiveness of the instruction and student interest in all portions of the module. Constructed in a similiar fashion to that used in the Barresi and Diamond study, students were asked to circle an appropriate response to express their interest and knowledge learned. Space was also provided for student written comments. (See Appendix 4--Student Questionnaire).

The students reactions were tabulated and will be used for purposes of revision. (See Chapter IV, page 67). Briefly, of the sixteen student responses, eleven students felt they had learned a great deal and thirteen believed the module to be either interesting or extremely interesting. General comments about the module were:

"The module as a whole was put together extremely well."

"The knowledge gained from these booklets and tapes is very important."

"I liked the module format and I felt it was conducive to learning the material with all its reinforcement."

"Being able to see and hear the students in a controlled and convenient environment (the videotape format) was very helpful."

"Generally, I feel the booklets were more helpful than the videotapes. The tapes move too slow and get a little boring."

"Previously knowing NOTHING about the changing voice, the module taught me much."

Evaluation

To evaluate the effectiveness of the instructional methods utilized within the experimental design, this researcher has chosen to analyze the final exam scores of each student through a t-test between two independent means and an item-by-item analysis. The t-test was used to determine whether the performance difference between the control group A taught by traditional methods and the experimental group B taught by self-instruction was significant. In order to analyze the scores, a null hypothesis stating that there is no significant difference between instructional methods will be tested. An item-by-item analysis comparing individual question responses was used to determine which questions were more easily answered by the control group and the experimental group.

In summation, two student groups were taught the same curriculum material on the adolescent changing voice through two different instructional methods. Group A was taught by the traditional method using lecture, student handouts, discussion, and observation. Group B was self-instructed utilizing an instructional module which incorporated videotapes into a programmed instructional booklet format. Upon completion of instruction, the same final exam was administered to both groups. Analysis of test results was used to determine if there was any significant difference in results due to the instructional method.

CHAPTER IV

Results

Analysis of the test results of control group A and experimental group B was used to determine if there was a significant difference in results due to the instructional method. Students in both groups were music education majors who had met a 2.75 GPA in their music courses to enter the department of music education. The groups were composed of male and female vocalists, pianists, and instrumentalists who had chosen to take the vocal methods course as part of their curriculum. Therefore, these groups provided random samples of the UW-Madison's music education students. In Spring, 1979, control group A was taught material on the adolescent changing voice through the traditional method of classroom lecture, handouts, and general observations of junior high vocal students in a choir setting. In Spring, 1980, group B was given the same material but through a self-instructional method which utilized programmed instruction booklets, and videotapes of adolescent singers in a singular and in choral settings. A test was administered at the end of the curriculum sequence which used videotapes and examples from musical literature as well as traditional test questioning. Tests were graded by the following standard:

Question 1A-Observation---10 points

3 points---description of the physical maturational stages

3 points---estimate of the vocal mutational stage

3 points---vocal range

2 points---tessitura

Question 1B-Observation---10 points

3 points---description of the physical maturational stage

3 points---estimate of the vocal mutational stage

2 points---vocal range

2 points---tessitura

Question 2-Anecdote---10 points

1 point for each personality characteristic (total of 5 points)

1 point for each motivational strategy (total of 5 points)

Question 3-Ranges/Tessitura---10 points

1 point for each characteristic range (total of 5 points)

1 point for each characteristic tessitura (total of 5 points)

Question 4-Literature Selection---30 points

10 points---choosing the correct composition

5 points---voice placement

5 points---articulation

5 points---text

5 points---other

Question 5-Voice Lesson---30 points

3 points for each vocal problem identified (total of 12 points)

4 points for each remediation (total of 16 points)

2 points for further explanation

TOTAL POSSIBLE POINTS = 100**

**A copy of the complete test may be found in Appendix 3

Statistical Measures

The scores for each group were tabulated by individual question and by total test results (Tables 4,5). In total scores, twelve of seventeen subjects from group B scored 80 points or above while only one subject from group A scored above 80 points.

In order to determine the performance difference between the two groups, it was necessary to calculate a t-test on the total scores. The basic computational formula [1] for the t-test of a difference between two independent means is:

$$t = \sqrt{\frac{\bar{X}_1 - \bar{X}_2}{\dfrac{\Sigma X_1^2 - \dfrac{(\Sigma X_1)^2}{N_1} + \Sigma(X_2^2) - \dfrac{(\Sigma X_2)^2}{N_2}}{(N_1 + N_2) - 2} \times \left[\frac{1}{N_1} + \frac{1}{N_2}\right]}}$$

where $\bar{X}_1$ = the mean of the first group of scores

$\bar{X}_2$ = the mean of the second group of scores

ΣX_1^2 = the sum of the squared score values of the first group

ΣX_2^2 = the sum of the squared score values of the second group

$(\Sigma X_1)^2$ = the square of the sum of the scores in the first group

$(\Sigma X_2)^2$ = the square of the sum of the scores in the second group

N_1 = the number of scores in the first group

N_2 = the number of scores in the second group

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[1] James L. Bruning and B.L. Kintz, Computational Handbook of Statistics (Glenview, IL: Scott, Foresman and Company, 1968), p. 10.

TABLE 4

Traditional Instructional Method

Subject	Question 1A (10)	Question 1B (10)	Question 2 (10)	Question 3 (10)	Question 4 (30)	Question 5 (30)	Total Score (100)
1	2	2	10	10	29	30	83
2	3	3	5	7	28	30	76
3	3	2	10	10	23	26	74
4	3	3	6	10	25	23	70
5	5	2	8	8	20	20	63
6	3	3	0	8	27	22	60
7	0	0	4	1	24	30	59
8	3	3	7	7	15	17	52
9	2	3	5	2	30	8	49
10	0	1	8	6	22	12	49
11	0	3	7	8	1	28	46
12	3	10	6	9	0	17	45
13	3	3	4	4	17	14	45
14	0	1	8	0	10	22	41
15	0	1	8	0	10	22	41

TABLE 5

Self-Instructional Module

Subject	Question 1A (10)	Question 1B (10)	Question 2 (10)	Question 3 (10)	Question 4 (30)	Question 5 (30)	Total Score (100)
1	10	10	10	10	30	27	97
2	10	10	10	10	25	30	95
3	10	10	10	10	23	30	93
4	10	10	9	10	27	27	93
5	8	6	7	10	30	30	91
6	9	3	10	10	27	30	89
7	10	9	5	10	22	28	84
8	8	6	8	7	30	24	83
9	6	3	10	10	25	27	81
10	8	7	10	5	27	24	81
11	2	10	9	10	28	22	81
12	6	10	9	10	21	25	81
13	5	4	7	7	25	30	78
14	8	5	6	10	21	28	78
15	2	2	10	10	25	20	77
16	8	8	6	10	25	20	77
17	0	2	5	5	20	26	58

The t-values calculated for questions 1A and 1B showed a highly significant difference at the .001 level between the results of groups A and B. The t-values of questions 2,3, and 4 were significant at the .02 level, thus showing that the results were significantly different but not as significant as the results of question 1. Question 5's t-values showed a significant difference that was higher than questions 2,3 and 4 but less than questions 1A and 1B. In summary, the most significant difference between groups occurred in questions 1A and 1B, then question 5, followed by questions 2,3 and 4. (See Table 6, p. 64).

An item by item analysis was also conducted by calculating the dispersal of scores on each question. This was done by calculating the mean:

$$\mu = \frac{\Sigma_i X_i}{N}$$

where $\Sigma_i X_i$ = the sum of the scores

N = the total number of scores used in the computation[1]

and the standard deviation:

$$\sigma = \sqrt{\frac{\Sigma X^2 - \frac{(\Sigma X)^2}{N}}{N - 1}}$$

where ΣX^2 = the sum of the squared score values

$(\Sigma X)^2$ = the square of the sum of all the scores

N = the total number of scores used in the computation.[2]

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[1] Ibid., p. 3.

[2] Ibid., p. 5.

TABLE 6

t-values calculated for Individual Items

Question	t-value	Significance
1A	5.59	.001
1B	4.22	.001
2	2.50	.02
3	2.73	.02
4	2.56	.02
5	2.93	.01
Total Test	6.41	.001

Note: Questions 1A and 1B were highly significant, as was the total test.

Because test questions were assigned differing numbers of total points possible, (e.g., question 1A was worth 10 points; question 4 was worth 30 points), the standard deviation was normalized. Often called the percent standard deviation, use of this measure allowed for direct comparison of the results of any of the questions. The formula for percent standard deviation is:

$$\% \text{ s.d.} = \frac{\text{standard deviation}}{\text{mean}} \times 100$$ [1]

The mean, standard deviation and percent standard deviation were calculated for each question for control group A and experimental group B. Tables 7 and 8 summarize the results.

TABLE 7

Control Group A--15 subjects

Question	Total Possible Points	Mean (μ)	Standard Deviation (σ)	% S.D.
1A	10	2.0	1.6	80
1B	10	3.06	2.76	90
2	10	6.33	2.55	40
3	10	6.53	3.29	50
4	30	18.0	10.76	60
5	30	21.46	6.84	32
Mean	--	----	----	58

[1] Ibid., p. 5.

TABLE 8

Experimental Group B--17 subjects

Question	Total Possible Points	Mean (μ)	Standard Deviation (σ)	% S.D.
1A	10	7.05	3.15	45
1B	10	6.76	3.31	46
2	10	8.29	1.89	23
3	10	9.05	1.82	20
4	30	25.35	3.20	13
5	30	26.82	3.0	11
Mean	--	----	----	58%

Note: Results of individual test questions are plotted in Graphs 1-5.

For every question, the average scores were higher for group B than for group A. On question 1A, for example, the displacement of means between groups is so large that the mean plus one standard deviation for group A (2.00 + 1.60), is lower than the mean minus one standard deviation for group B (7.05 - 3.15). This result is clearly illustrated in Graph 1, p.75, in which the scores are seen to barely overlap. This result is also evident in the other questions although not as decisively.

A second result becomes apparent by studying Tables 7 and 8, and is most clearly illustrated in question 4. Not only is the mean score of group B significantly higher than that of group A, but the standard deviation of the mean of group B (3.2) is much less than the standard deviation of the

mean of group A (10.76). This illustrates the result that the scores of group B were more consistent than the scores of group A. This result is also apparent in the other questions, though not as dramatically.

The standard deviation of the mean for each question was generally lower for group B than for group A, signifying that group B's scores were clustered around the mean while scores for group A were more widely dispersed. Furthermore, the % standard deviation for each question was much lower for group B than for group A. In fact, the mean % standard deviation for all questions was 26% for group B compared to 58% for group A.

Student Responses

Group B's reaction to the self-instructional module was generally positive. However, the reaction was more positive to the program booklets than to the videotapes. Tables 9 and 10 tally student responses for each portion of the module. Some examples of written comments were:

"Program Booklet 1 was a well-explained introduction to understanding the adolescent voice change, something which I am out-of-tune with, and need to learn about."

"It was good to be able to see these ranges and get a general idea of what one can expect from different voices."

"VTO 1 was an integral learning experience because the changing voice was heard and the boy seen."

"My initial reaction is it isn't necessary and a drudge to watch, but I think the example helped settle in my mind more securely what to do and how to do it than if I just read notes and tried to teach."

TABLE 9

Student Questionnaire Responses

Self-Instructional Module	Extremely Interesting	Interesting	Some Interest	Little	Boring	No Response
Overall	3	10	2	--	--	1
VTO-Lecture	--	7	6	--	--	-
Program Booklet 1	5	10	1	--	--	-
Program Booklet 2	3	12	1	--	--	-
Program Booklet 3	5	7	4	--	--	-
Program Booklet 4	5	11	--	--	--	-
VTO 1	4	7	4	--	--	1
VTO 2	2	6	7	--	--	1
VTO 3	3	4	8	1	--	-
VTO 4	3	11	2	--	--	-

TABLE 10

Student Questionnaire Response

Self-Instructional Module	Learned A Great Deal	Learned Some	Learned Little	Learned Very Little	No Response
Overall	11	4	--	--	1
VTO-Lecture	4	10	2	--	--
Program Booklet 1	6	9	1	--	--
Program Booklet 2	11	3	1	--	--
Program Booklet 3	8	8	--	--	--
Program Booklet 4	9	7	--	--	--
VTO 1	9	4	1	--	--
VTO 2	5	6	5	--	--
VTO 3	4	7	4	1	--
VTO 4	4	10	1	--	--

"I could hear the differences in stages of development fairly well. This was the first time I'd had a chance to listen like this!"

"Again I would say the booklet was superior and the videotape OK (PB 1/VTO 1). Some of the material was reinforced by the tape but most of the tape was just something to watch."

Discussion of Results

Control group A and experimental group B represented a random population of undergraduate music education majors. Both groups were presented the same material but the method of instruction differed. Group A was taught in the traditional manner while group B was taught through a self-instructional module. Results of the post-test showed that group B performed significantly better than group A. These results lead one to reject the null hypothesis which stated that there was no significant difference between instructional methods. Therefore, it is concluded that the self-instructional module was more effective in teaching the material on the changing voice.

The t-values computed for individual questions were significant. Questions 2,3, and 4, which were all significant at the .02 level, required the student to use his knowledge of adolescent psychology, ranges and appropriate choral music for the adolescent. In question 5, where the difference in test results became more significant (.01), the student was asked to demonstrate knowledge of adolescent vocal problems, and to aurally analyze and provide appropriate remediation for the vocal problems of an adolescent shown on videotape.

In questions 1A and 1B, which showed the highest significant difference in test results (.001), students viewed a videotape observation of two adolescent male singers and were asked to answer all parts of the question through visual and aural analysis. More specifically, they were asked to identify the physical and vocal maturation stages of development and the ranges and tessituras of both voices. In reviewing the results of questions 1A and 1B (Graph 1, page 75), the means of the traditional group A were lower than the means of the self-instructional group B. In fact, the curve of the traditional group was almost separate from the curve of the self-instructional group. It is possible that this result occurred because the self-instructional group had previously studied individual adolescent voices while participating in the self-instructional module. Therefore, this added exposure to the unique sound of the adolescent changing voice resulted in transferring their aural/visual knowledge to the response for questions 1A and 1B.

Question 2 presented an anecdote in which the teacher was required to motivate junior high students to learn a contemporary composition. Test respondents were asked to select five psychological and personality characteristics of the adolescent and to suggest a motivational strategy based upon these characteristics. The results of question 2, as shown in Graph 2 (page 76) again reveal a higher mean for the self-instructional group. The % standard deviation was significantly higher for the traditional group thus showing that group A's scores were more widely dispersed than those of group B. Students in group B consistently scored higher than the group A students. Nine of seventeen students in group B scored 9 or 10 points (out of a possible

score of 10 points), while only two of fifteen students in group A received a similar score (Graph 2, p. 76). This result may be explained because knowledge in group B was reinforced through the remedial steps of programmed instruction. If the student chose the wrong answer he was instructed to review the material until success was attained, thus reinforcing knowledge throughout the learning sequence.

Question three required the student to write the vocal ranges and tessituras for each adolescent male voice stage. The % standard deviation was significantly higher for the traditional group. Again this result showed that students in group B did consistently better in remembering the ranges and tessituras (Graph 3, page 77). Memorization of the adolescent vocal ranges was reinforced by the questioning found in Program Instruction Booklet II-Ranges of the Adolescent Changing Voice and the videotape of the adolescent voice ranges. The questioning within Program Booklet II forced the student to not only memorize the ranges and tessituras but apply them to musical examples. Students had to decide which voice range could sing a particular music line (PB II, p. 9, 17). Again, failure returned the student to the original material for review. Videotape II-Ranges of the Adolescent Voice reinforced the aural perception of the changing voice thus helping the student to internalize the adolescent vocal ranges and tessituras.

Question four suggested a hypothetical distribution of 7th and 8th grade students in a junior high choir. Three sections of choral compositions were given within the test. From this information, the test respondent was asked to choose the most appropriate choral section and defend their choice through voice placement, articulation, text, and any of their own ideas.

The % standard deviation was significantly different (group A-60; group B-13). This large difference implied that group B's results were more consistent (i.e., the scores were clustered), more learning occurred (as shown by the consistently high scores), and more learners learned the material in the same way. These results are illustrated in Graph 4 (p.78). The results of group A showed a random method of learning, inconsistency in that learning, and that less material was learned. The wide dispersal of scores for question 4 is clearly evident in Graph 4. Even though both groups studied choral compositions in class or within the self-instructional module, students within the experimental group had their criteria for selection of suitable literature reinforced by a videotape of a junior high choir (VTO III). This choir demonstrated many of the criteria used in selecting a choral composition for an adolescent choir.

Finally, question five was derived from a videotape observation of a young female singer performing a solo. Students identified four vocal problems and briefly suggested suitable remediation. Although the mean values for group A and group B were relatively close, the standard deviation clearly illustrated the wide dispersal of scores for question 5 (Tables 7 & 8, pp. 65-66). The standard deviation for group A (6.84) was twice as large as group B's (3.0). Furthermore, Graph 5 (page79) illustrates that all students in group B scored at least 20 out of 30 possible points, while in group A, scores ranged from 8 to 30 points. This wide dispersal of scores again demonstrated that more group B students learned the material and learned it in the same manner. The accuracy of these results are plausible because group B studied Program Instruction Booklet IV-Methods for Adolescent Voice Instruction.

This portion of the self-instructional module provided general remediation procedures used in training adolescent changing voices and exercises for specific vocal problems. These methodologies were illustrated in VTO IV where three adolescents were given brief voice lessons which incorporated many vocal exercises from Program Booklet IV. Group A studied adolescent voice instruction through classroom lecture, discussion and general observations of junior high choirs.

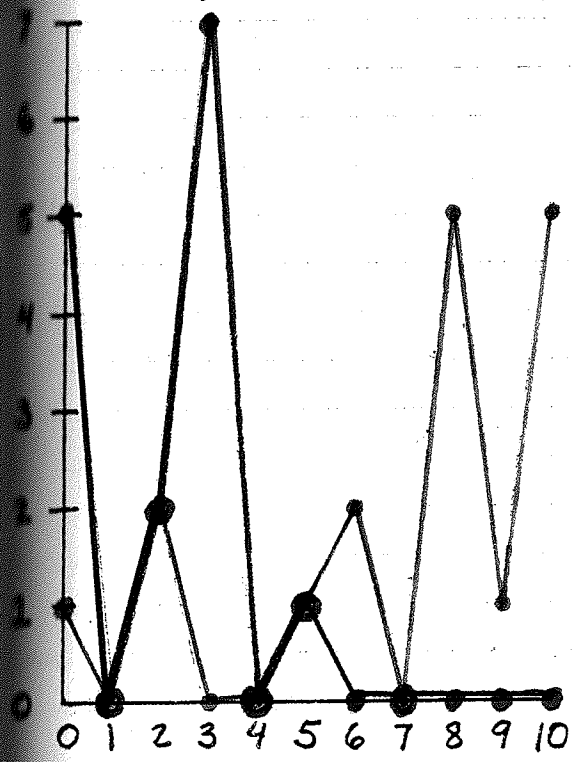
In summation, the self-instructional module proved to be a more effective teaching tool than the traditional method of instruction. Students in the experimental group were reinforced visually in the programmed booklets and visually and aurally by the videotapes. Although student response was less favorable to the videotapes than to the programmed booklets, test scores showed that the addition of another perceptual mode clearly increased the amount of learning (Questions 1 and 5).

Believing that the groups used in this study were representative of undergraduates in music education, it may be assumed that the same technique administered in this study could be favorably used with a larger population.

Graph 1

Individual Question Results
for
Students in Groups A and B

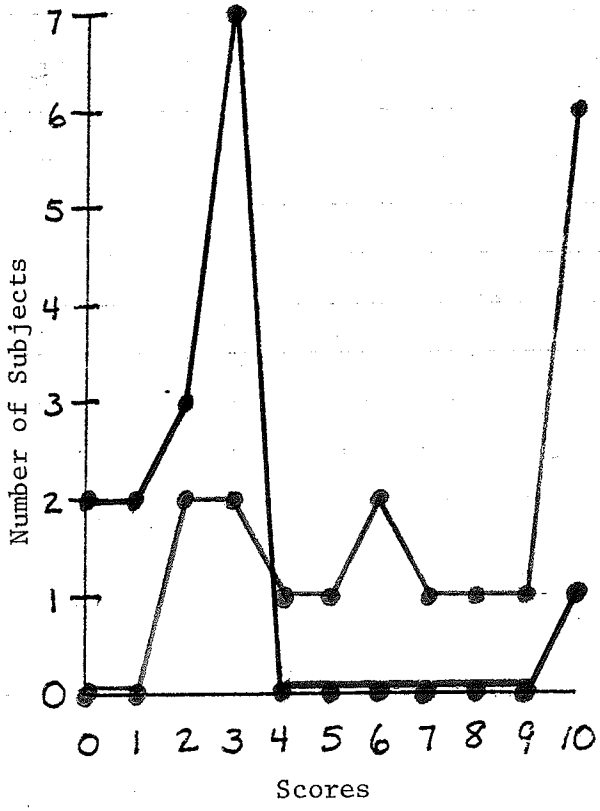
Question 1A



Traditional-Group A
(15 Subjects; mean = 2.0)

Self-Instruction-Group B
(17 Subjects; mean = 7.05)

Question 1B



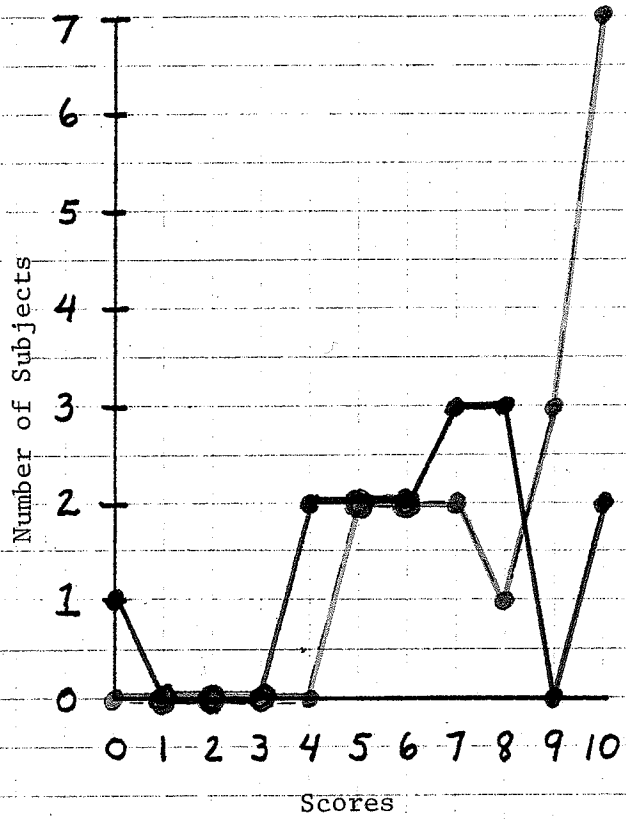
Traditional-Group A
(15 Subjects; mean = 3.06)

Self-Instruction-Group B
(17 Subjects; mean = 6.76)

Graph 2

Individual Question Results
for
Students in Groups A and B

Question 2



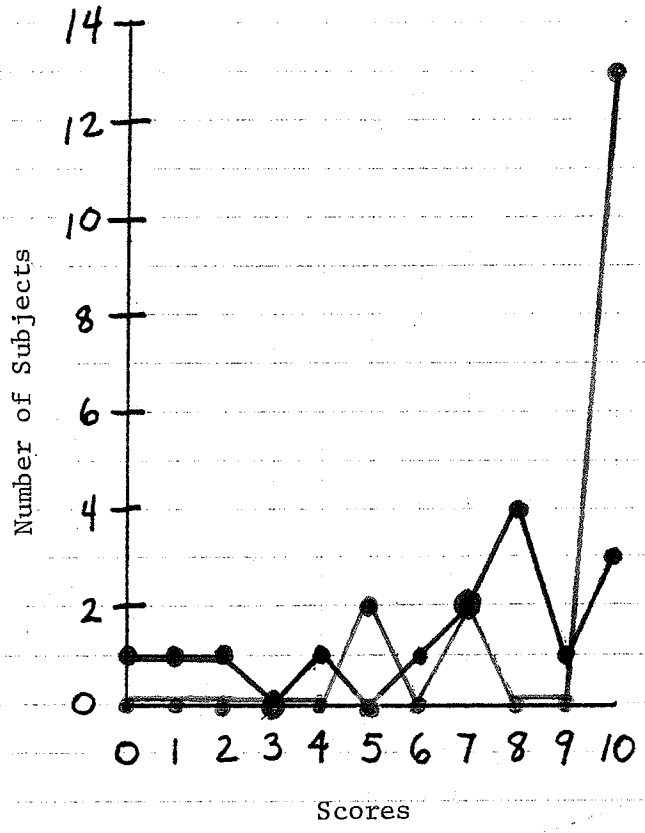
——Traditional-Group A
(15 Subjects; mean = 6.33)

——Self-Instruction-Group B
(17 Subjects, mean = 8.29)

Graph 3

Individual Question Results
for
Students in Groups A and B

Question 3



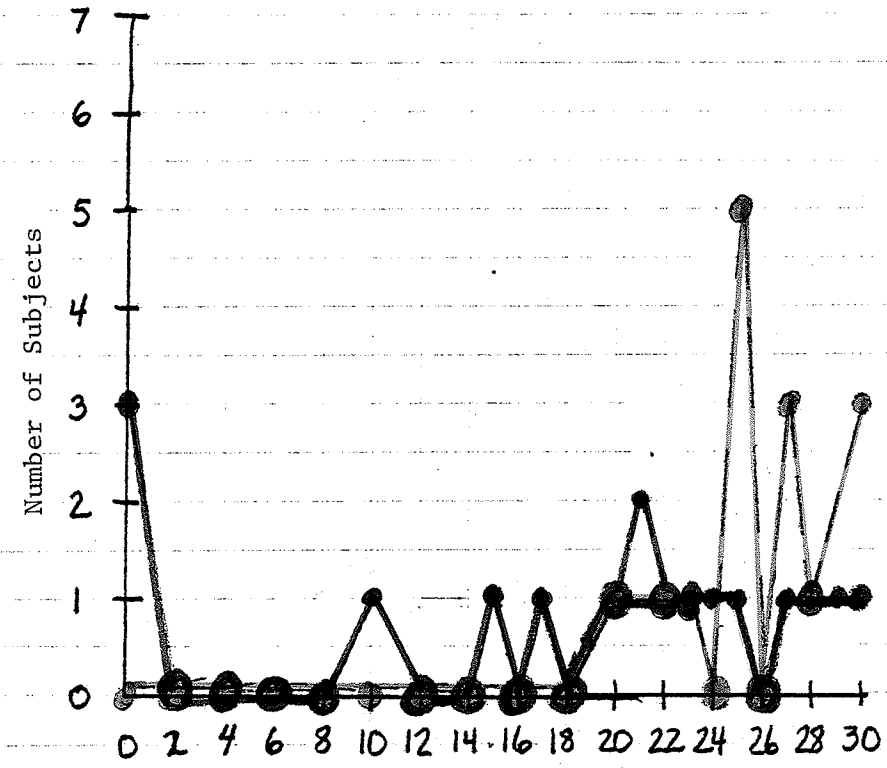
Traditional-Group A
(15 Subjects; mean = 6.53)

Self-Instruction-Group B
(17 Subjects, mean = 9.0)

Graph 4

Individual Question Results
for
Students in Groups A and B

Question 4



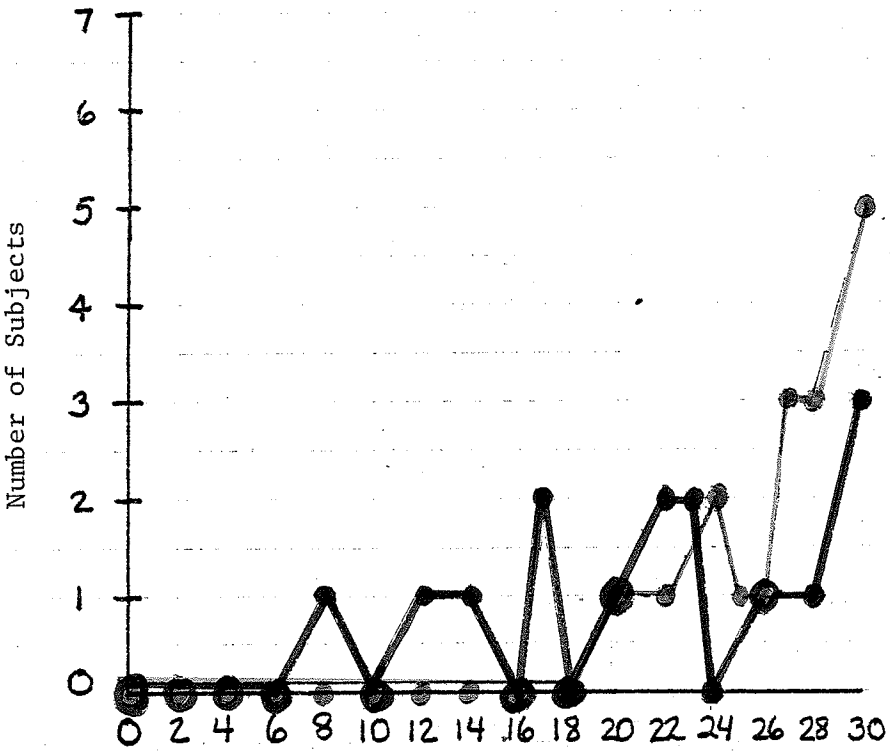
Traditional-Group A
(15 Subjects; mean = 18)

Self-Instruction-Group B
(17 Subjects; mean = 25.35)

Graph 5

Individual Question Results
for
Students in Groups A and B

Question 5



—Traditional-Group A
(15 Subjects; mean = 21.46)

——Self-Instruction-Group B
(17 Subjects; mean = 26.82)

Conclusion

The self-instructional module on the adolescent changing voice has been shown to be an effective teaching tool which benefits both teacher and student. The teacher becomes available for class discussion and individual conferences while helping students develop methods which are applicable to the adolescent voice. Moreover, each student becomes responsible for his own learning, acquires knowledge at his own pace, and is reinforced by intermittent questioning during the learning sequence. In addition, he is able to view focused observation on videotape of the various stages of vocal mutation thus giving him the option of hearing these voices as often as he wishes.

Furthermore, this module freed the teacher to develop enrichment topics for the class period since students are working on the module during their own time. Thus students were exposed to more material within the semester curriculum sequence.

Because the self-instructional module is a portable unit composed of programmed booklets and videotapes, it has the potential of not only being used as a teaching tool for the undergraduate but also for the music teacher in the field. The use of this module for in-service training may help to alleviate teachers' frustration and uncertainty about the singing voice of the adolescent.

It is the hope of this researcher that the Self-Instructional Module on the Adolescent Changing Voice will help teachers, both young and old, to better understand the unique quality of the adolescent changing voice.

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A P P E N D I X 1

Student Handouts for the Traditional Method

THE EMERGING ADOLESCENT

Physical Growth Characteristics

interest patterns follow physical changes
lack of coordination due to irregular bone/muscular growth
poor body mechanics, awkwardness
extreme restlessness needing daily release
unlimited energy and resistance presented but realistically tire easily and are unwilling to admit it
sensitive to changing body contours
anxiety about normality of physical growth
wide range of individual physical differences

Mental and Intellectual Growth Characteristics

can carry out formal as well as concrete operations (dealing with real, possible and abstract)
intellectual curiosity
active involvement over passive recipiency
variable cognitive maturation providing for individualized instruction
immediate goals or purposes
likes to discuss some experiences with adults
intellectually uninhibited
tremendous potential range of creative expression
appreciation of arts and humanities
can evaluate rather critically
desires better understanding of their individual abilities
strong desire for approval
easily discouraged if they don't achieve
awareness of interrelationship of elements in the environment
can make inferences
increase in personal responsibility for learning changing the role of the teacher

Personality Characteristics

conflict between dependence and independence in the family structure
conformity
peer acceptance
fluctuates between interests
personal appearance
sex role identification
self concept
emotional turmoil

Sources:

Gatewood, Thomas E., Dilg, Charles A. The Middle School We Need: A Report from the ASCD Working Group on the Emerging Adolescent Learner., Washington, D.C., 1975.

Cooper, Irvin, Kuersteiner, Karl O. Teaching Junior High School Music. Allyn and Bacon, Inc., 1970.

Handout 1A

Physiological Changes in boys and girls during Adolescence

1. Growth in height and weight.

2. Skeletal development.

3. Strength/Muscular Development.

4. Growth of vital organs--lungs, heart.

5. Skin Glands activate.

6. Fat thickens.

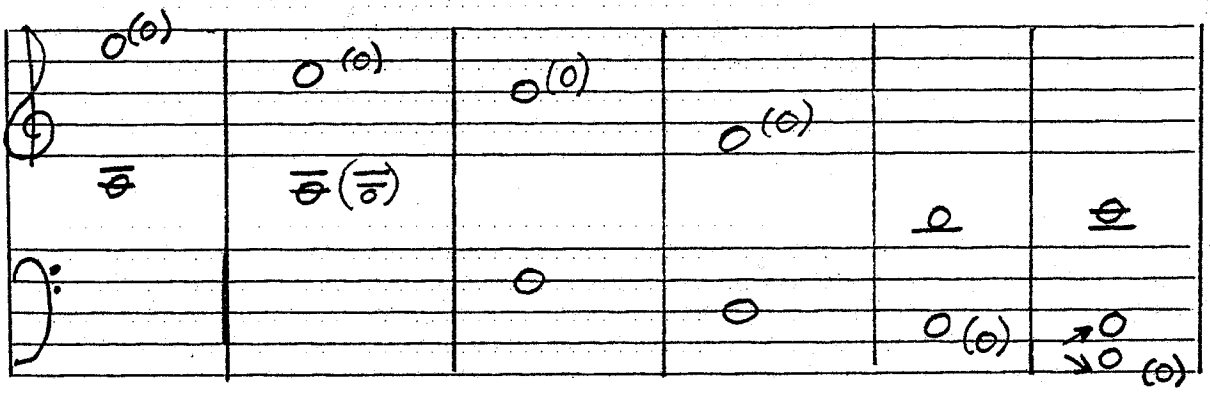
7. Sexual Development.
   a) growth of the sexual organs.
   b) pigmental hair; moustache.

8. Growth of the larynx.
   length increases by 1 cm. in boys.
   length increases by 3-4 mm. in girls.

Handout 2

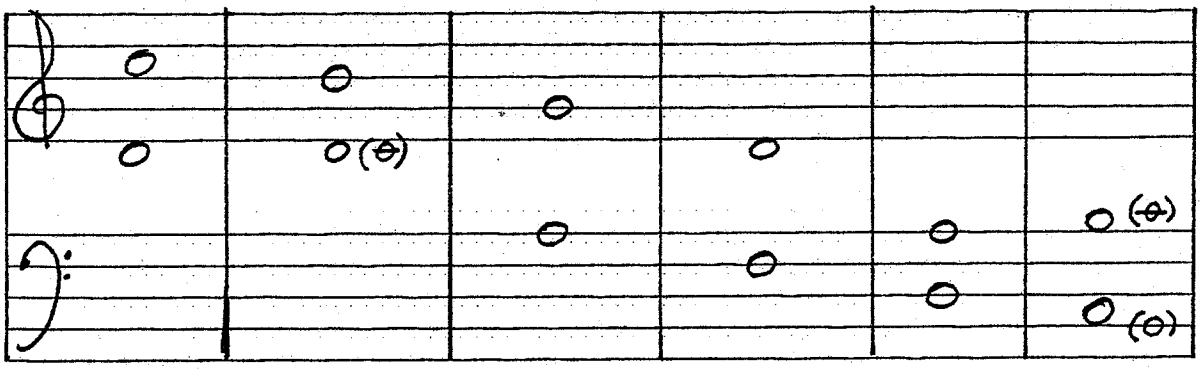
Cooksey Classification

Ranges:



Boy Soprano | Midvoice 1 (alto) | Midvoice 2 | Midvoice 2A | New Baritone | Settled Baritone

Tessituras:



Boy Soprano | Midvoice 1 (alto) | Midvoice 2 | Midvoice 2A | New Baritone | Settled Baritone

Handout 3

List of Publishers concerned with the adolescent changing voice:

1) General Words and Music Co., Neil A. Kjos, Jr. (GWM)

2) Studio Publications, Recording (Studio P/R)

3) Jenson Publications

4) Cambiata Press

5) Pro Art

6) Belwin

A P P E N D I X 2

Self-Instructional Programmed Booklets

A P P E N D I X 3

Final Exam

CHANGING VOICE TEST

NAME_____

1A. A short video taped observation of two boys has been prepared. Describe the visible stages of physical maturity achieved by each of the individuals. Where would you estimate them to be in the voice change process? What are the possible vocal ranges and tessituras of each person? (20)

Student A (10)

1B. Student B (10)

2. The following is an anecdote which might have occurred in any middle school setting.

   The general non-auditioned 8th grade chorus is beginning work on an SATB contemporary piece by Jean Berger. The work has some different harmonies, lively tempos, difficult rhythms, and unusual text. The vocal requirements are demanding but not beyond the capabilities of these singers. For the most part, the students were not impressed with the initial reading of the piece but you, as teacher, feel that work on it would be musically and educationally beneficial for the students.

   Psychological and personality characteristics of the adolescent can frequently be influential in the motivational process. Select five of those characteristics which could be applicable to the above anecdote and briefly suggest a motivational strategy based upon those characteristics. (10)

3. On a staff write the following voice ranges and the accompanying tessituras for each.

Boy soprano, mid-voice I, mid-voice II, mid-voice IIa, and new baritone (10)

4. Enclosed are three sections of choral compositions. From this material determine which selection would be best suited for the following choir.

   48 students in classes 7 and 8: 18 sopranos and 17 altos, 3 unchanged boys, 5 mid-voice I, 3 mid-voice II-IIa, and 2 new baritone.

   Defend your choice of piece through these criteria:

   a) Voice placement, b) articulation, c) text, and d) other. (30)

Musical Example 1

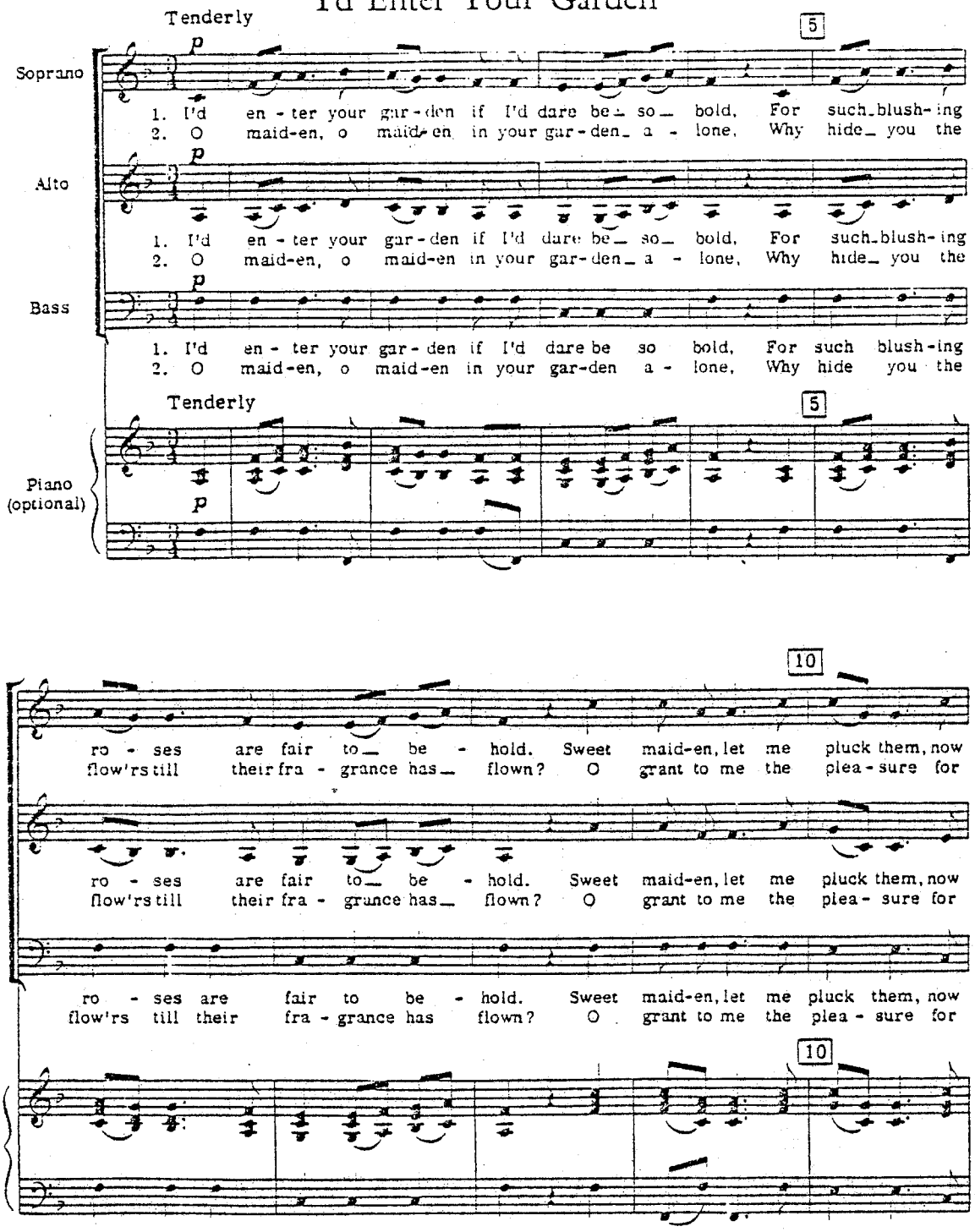
THREE FOLK SONGS

Three Part Mixed Chorus (SAB) and optional Piano

English Translation by
Harold Heiberg

JOHANNES BRAHMS
arr. by Walter Ehret

I'd Enter Your Garden



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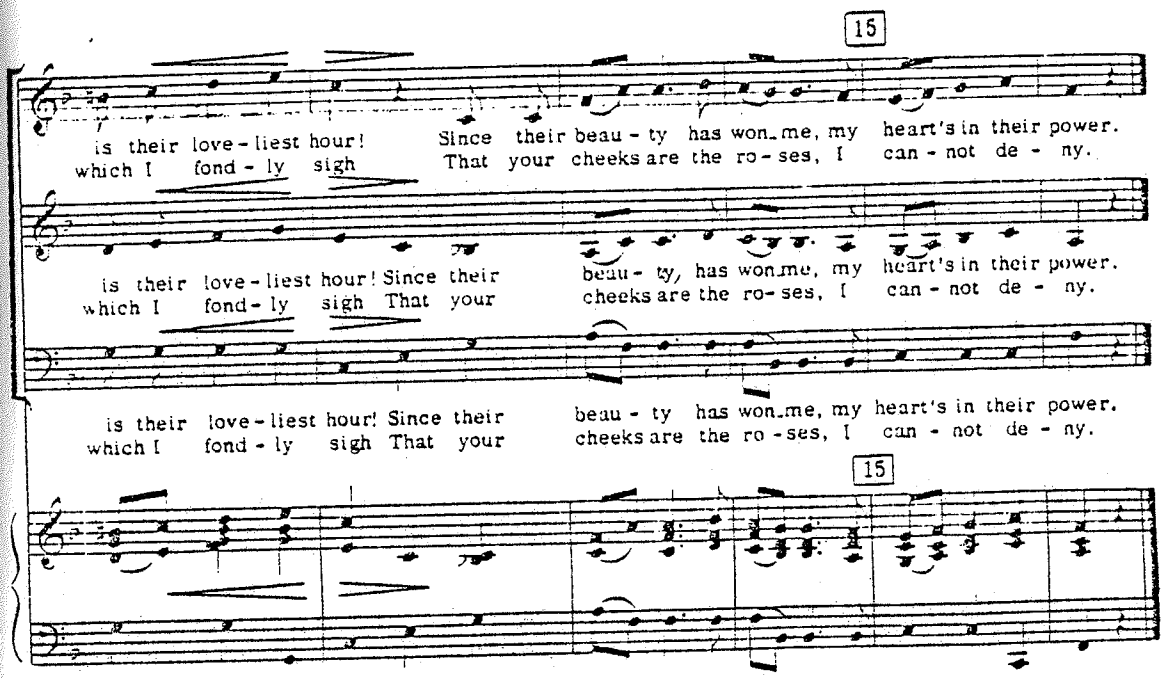
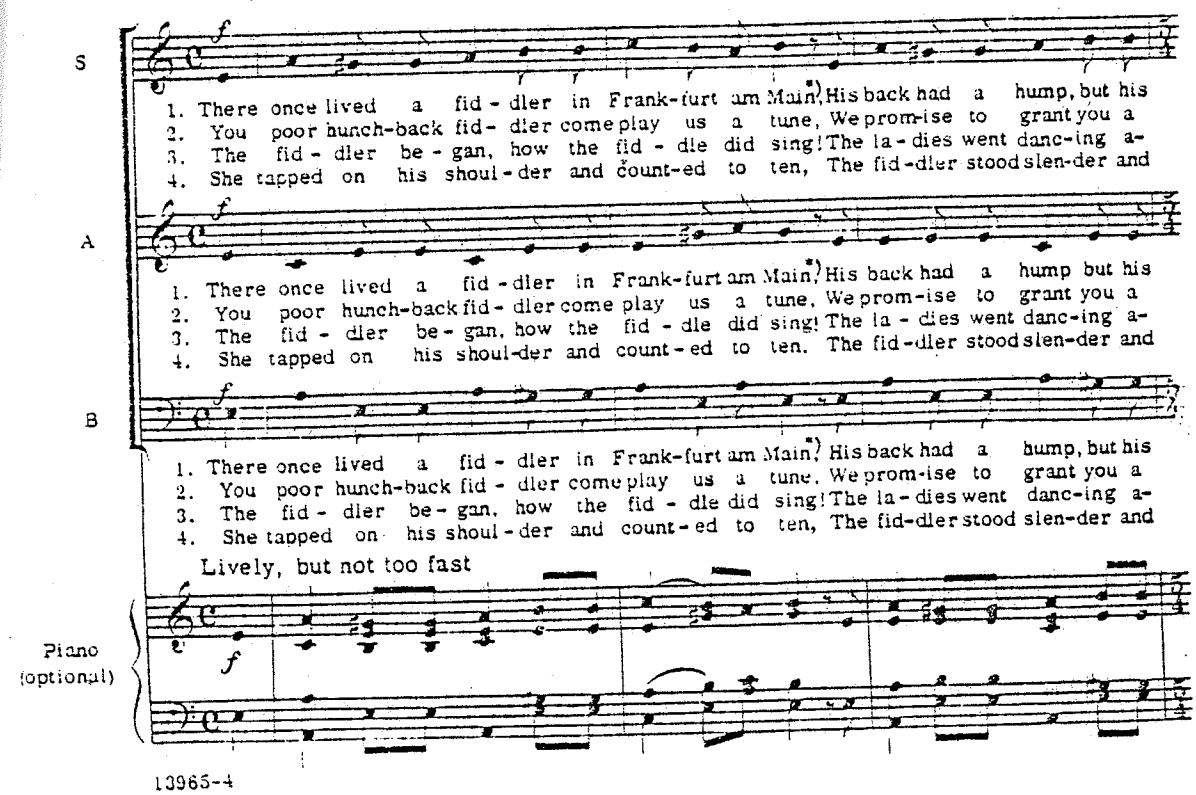


The Fiddler

Lively, but not too fast



13965-4

*) to be pronounced: mine

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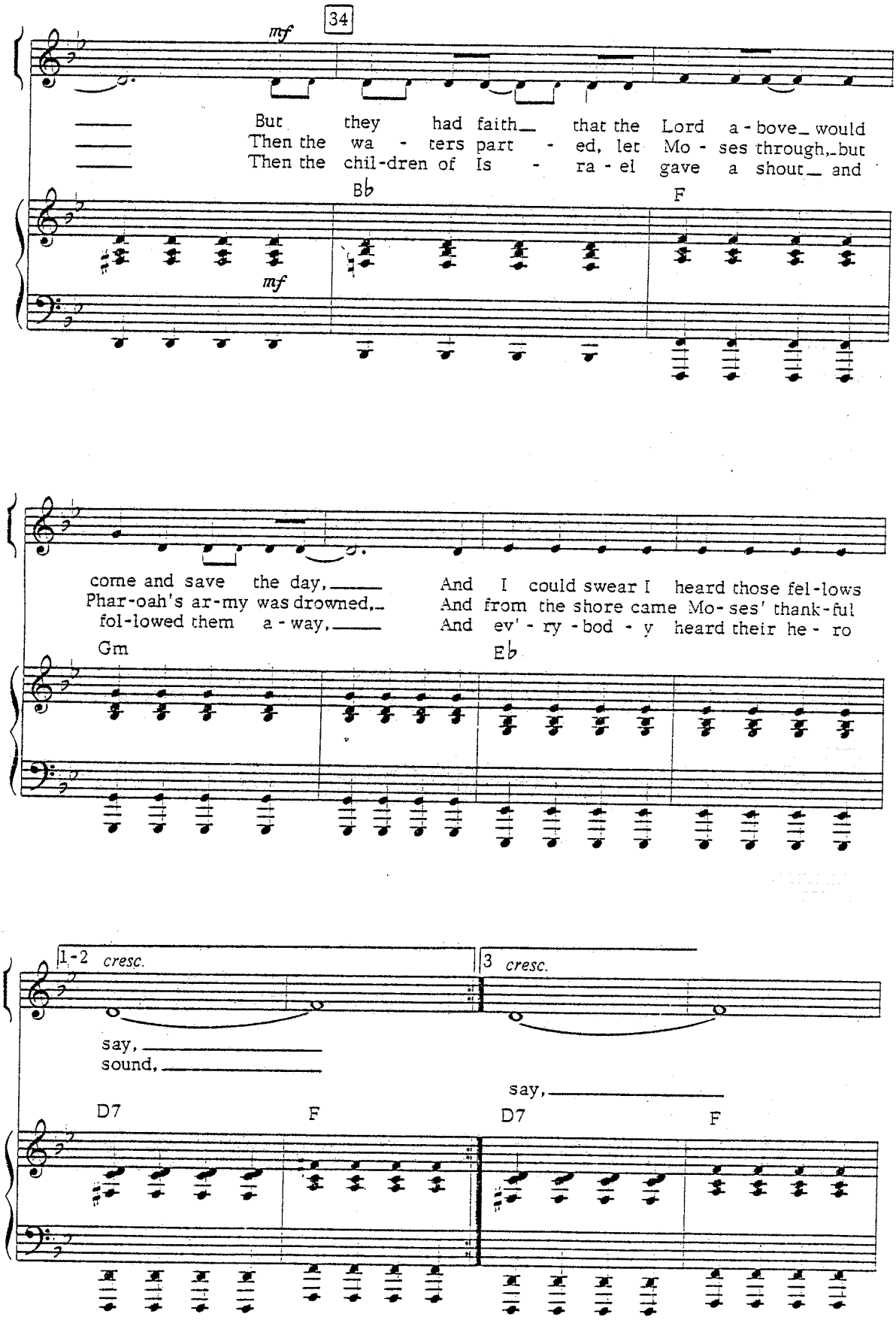
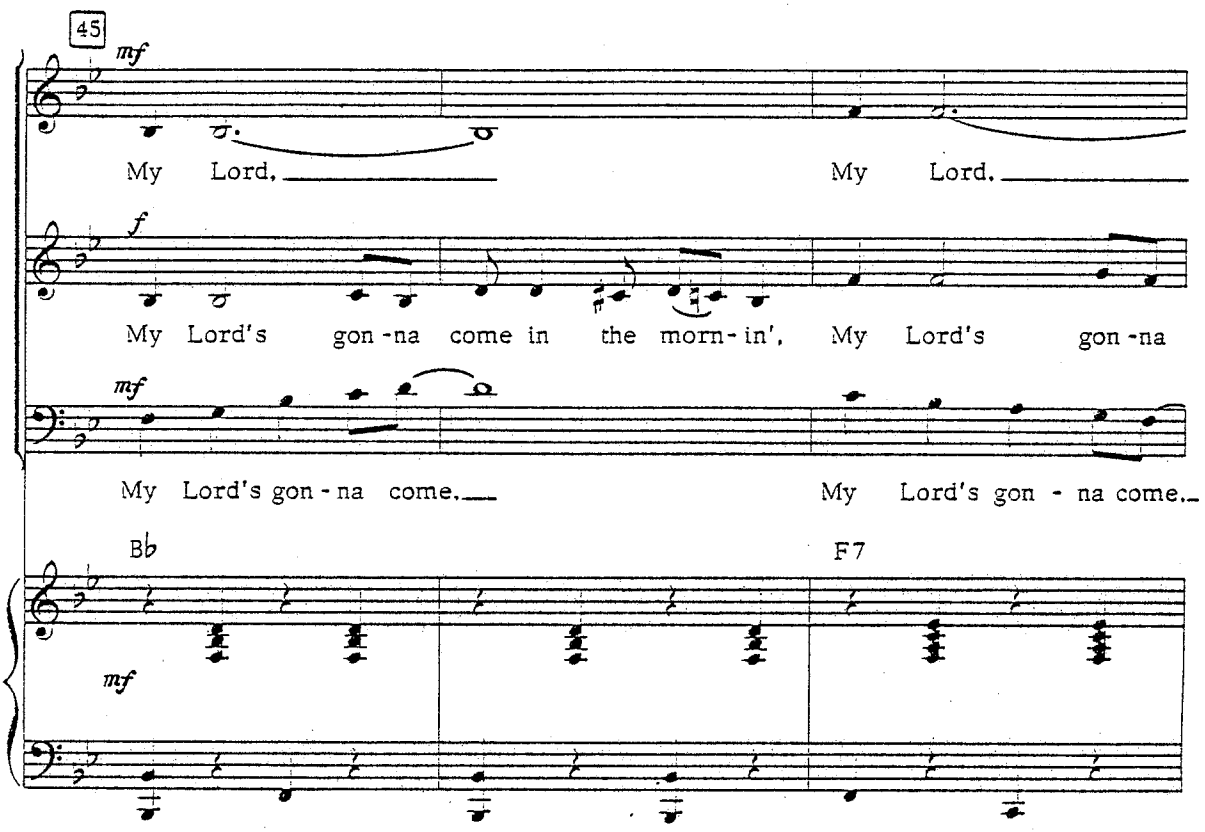
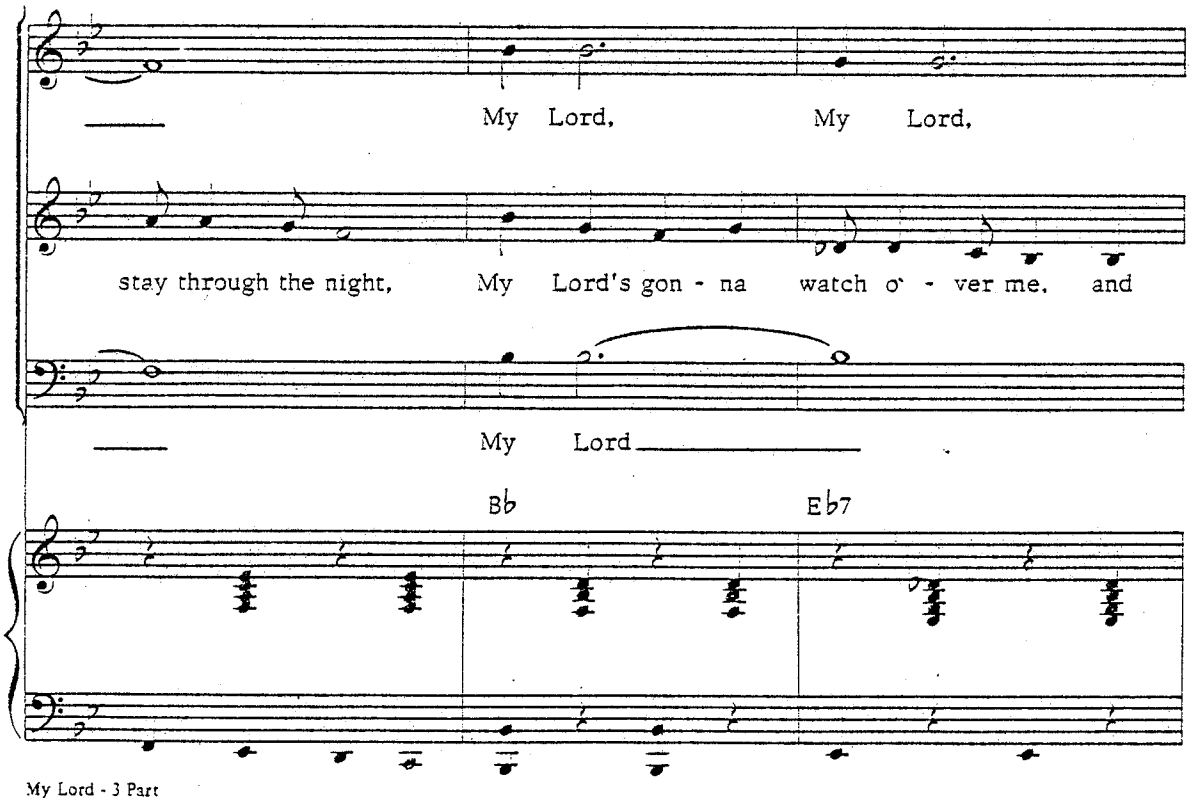
Musical Example 2


34
mf
But they had faith that the Lord a - bove would
Then the wa - ters part - ed, let Mo - ses through, but
Then the chil-dren of Is - ra - el gave a shout and
B♭
F
mf
come and save the day,
Phar-oah's ar-my was drowned,
fol-lowed them a - way,
And I could swear I heard those fel-lows
And from the shore came Mo-ses' thank-ful
And ev' - ry - bod - y heard their he - ro
Gm
E♭
1-2 cresc.
3 cresc.
say,
sound,
say,
D7
F
D7
F



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Musical Example 3

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6

(Basses command center of attention and sing in a complaining tone.) *(Tenors take over;*

With movement *(in two)*

Hm,
Hm,

The ten-or part af-

I'm tired of sing-ing bas-so and low notes all the time,

With movement *(in two)*

individuals may make appropriate gestures) *(Altos take their turn)*

Hm.

fects my dis-po-si-tion, Hm,

The al-to is so bor-ing, Nev-er

Hm,

Hm,

(Now the Sopranos)

So-pra-no parts, the bane of com-po-si-tion.

reach-es heights sub-lime,

Hm,

Hm.

Hm.

Hm,

rit.

rit.

rit.

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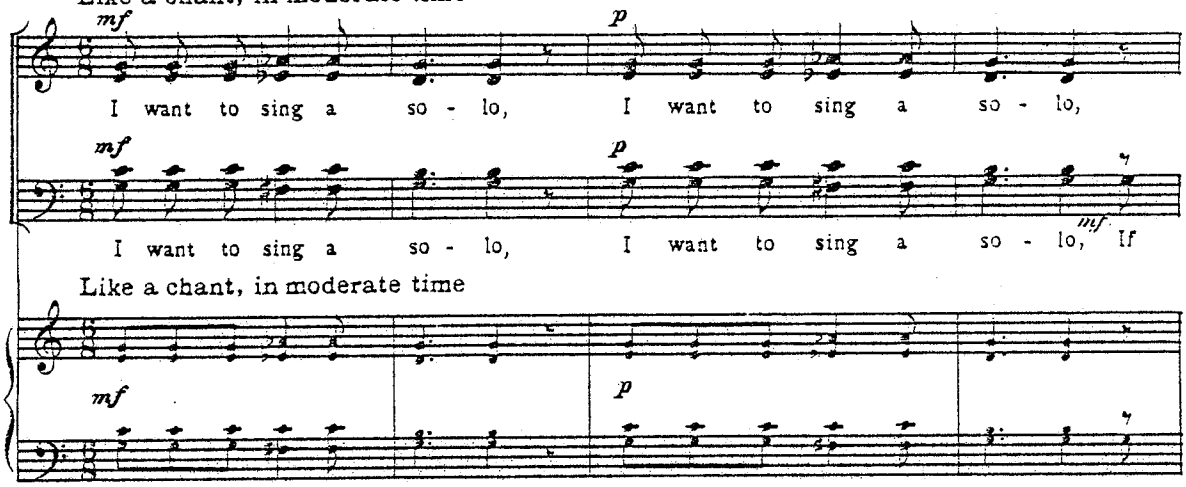
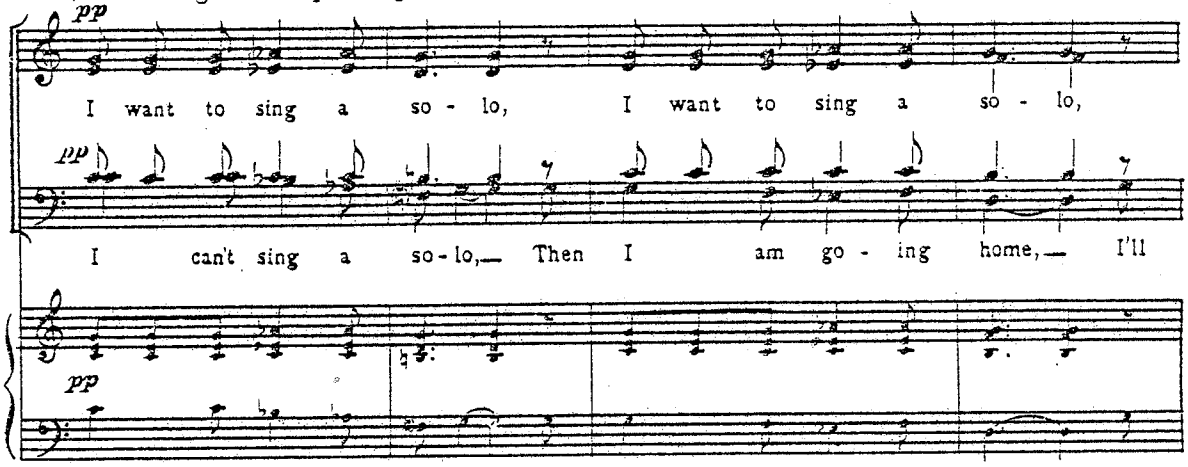
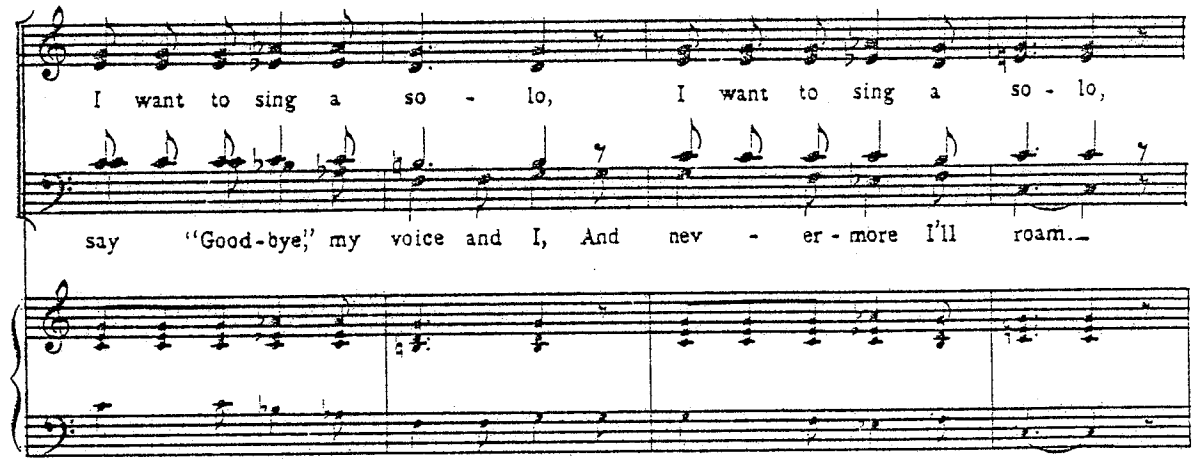
7

(Choir members assume serious, immobile facial expressions)

Like a chant, in moderate time



Like a chant, in moderate time

(Basses sing in a complaining tone)

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5. A short videotape of a young female singer will be shown. From this observation identify four vocal problems and briefly suggest suitable remediation. (30)

A P P E N D I X 4

Student Questionniare

Overall Module

1. I felt the module was (Circle one)

extremely interesting | interesting | of some interest | little interest | boring

2. I felt I learned (Circle one)

a great deal | some | little | very little | no answer

General Comments:

Lecture (Videotape)

1. I felt the lecture was (Circle one)

extremely interesting | interesting | of some interest | little interest | boring

2. I felt I learned (Circle one)

a great deal | some | little | very little | no answer

General Comments on the Lecture:

Program Booklet 1 - Characteristics of the Adolescent Changing Voice

1. I felt the booklet was (Circle one)

extremely interesting | interesting | of some interest | of little interest | boring

School of Music and Department of Curriculum & Instruction

Program Booklet 1 (Cont'd)

2. I felt I learned (Circle one)

a great deal some little very little no answer

General Comments on Program Booklet 1:

Videotape 1-Characteristics of Adolescent Voices

1. I felt the videotape was (Circle one)

extremely interesting interesting of some interest of little interest boring

2. I felt I learned (Circle one)

a great deal some little very little no answer

General Comments on VT 1:

Program Booklet 2-Ranges of the Adolescent Voice

1. I felt the booklet was (Circle one)

extremely interesting interesting of some interest of little interest boring

2. I felt I learned(Circle one)

a great deal some little very little no answer

General Comments on PB 2:

Videotape 2-Ranges of the Adolescent Changing Voice

1. I felt the videotape was (Circle one)

extremely interesting | interesting | of some interest | of little interest | boring

2. I felt I learned (Circle one)

a great deal | some | little | very little | no answer

General Comments on VT 2:

_____

_____

_____

_____

Program Booklet 3-Methods for Selection of Suitable Literature

1. I felt the booklet was (Circle one)

extremely interesting | interesting | of some interest | of little interest | boring

2. I felt I learned (Circle one)

a great deal | some | little | very little | no answer

General Comments on PB 3:

_____

_____

_____

_____

Videotape 3-Choral Rehearsal

1. I felt the videotape was (Circle one)

extremely interesting | interesting | of some interest | of little interest | boring

2. I felt I learned (Circle one)

a great deal | some | little | very little | no answer

General Comments on VT 3:

_____

_____

Program Booklet 4-Methods for Adolescent Voice Instruction

1. I felt the booklet was (Circle one)

   extremely interesting interesting of some interest of little interest boring

2. I felt I learned (Circle one)

   a great deal some little very little no answer

General Comments on PB 4:

Videotape 4-Voice Lessons

1. I felt the videotape was (Circle one)

   extremely interesting interesting of some interest of little interest boring

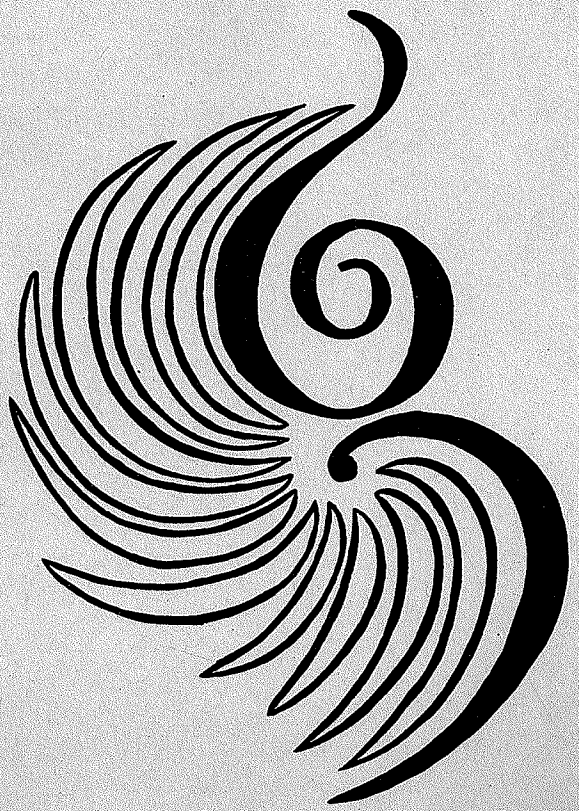
2. I felt I learned (Circle one)

   a great deal some little very little no answer

General Comments on VT 4:

Final Comments:

Characteristics of the Adolescent Changing Voice



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Methods for Selection of Suitable Literature

University of Wisconsin - Madison
School of Music and Department of Curriculum & Instruction

Instructional Module On The

Changing Voice

Instructional Booklet 1

CHARACTERISTICS OF THE ADOLESCENT CHANGING VOICE

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Jeanne Raemisch, Editor

Trudy Woods, Project Assistant

Debbie Tompkins, Graphics

Instructional Module On The

Changing Voice

Instructional Booklet 3

METHODS FOR SELECTION OF SUITABLE LITERATURE

Anthony L. Barresi, Project Director

Mona Goetsch, Assistant Project Director

Jeanne Raemisch, Editor

Trudy Woods, Project Assistant

Debbie Tompkins, Graphics

Voice mutation or voice change is intricately related to the psycho-physiological changes occurring during the teenage years. This period, called adolescence, generally occurs between the ages of 11 and 20. It is a time of individual differences both biologically and psychologically.

We are primarily concerned with that period of adolescence called puberty. This is the time when the most radical changes occur in the bodily structure. These changes strongly affect the psychological attitudes of the adolescent. Unless specified, the following physiological changes occur in both the male and female during puberty. These changes include:

Choral selections for the junior high singer must be chosen to suit the psychological and physiological changes of the adolescent. At the same time, quality music chosen for its lasting value must be considered. We believe that by understanding the unique requirements of the adolescent singer, we can more knowledgeably select suitable music for this age level.

It is important to begin selecting music by examining the ranges of each vocal part within a score. The music should lie within the comfortable middle range of each mutational stage in order that vocal tension will not occur. Each range should approximate the following:

1) Rapid growth in height and weight. The adolescent can grow an average of 4 inches per year during puberty.

2) The bones grow rapidly. Shoulder broadening is evident in the male.

3) Muscles develop and strength increases.

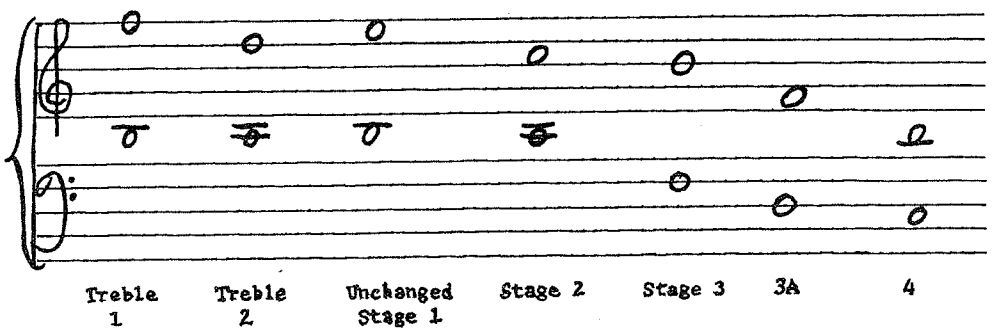
4) The soft skin of childhood becomes thicker and the pores enlarge. The sweat glands become more active; sometimes acne will occur.

5) The lungs and heart increase significantly in size.

6) A fat layer forms over the chest, back, and abdomen (especially in males).

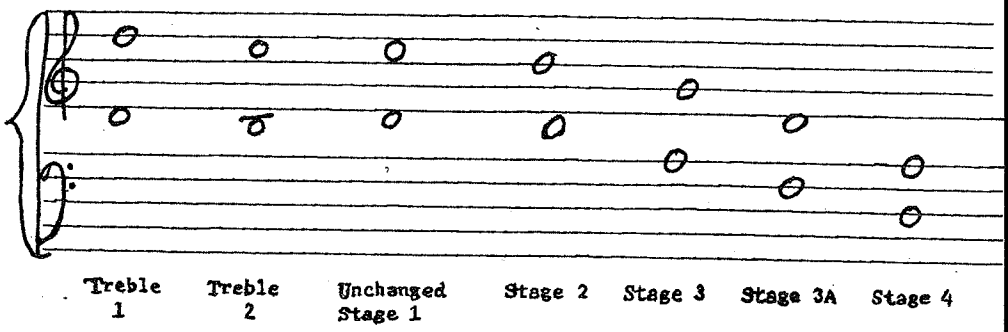
7) The reproductive organs attain functional maturity. Menstruation begins in girls.

RANGES:



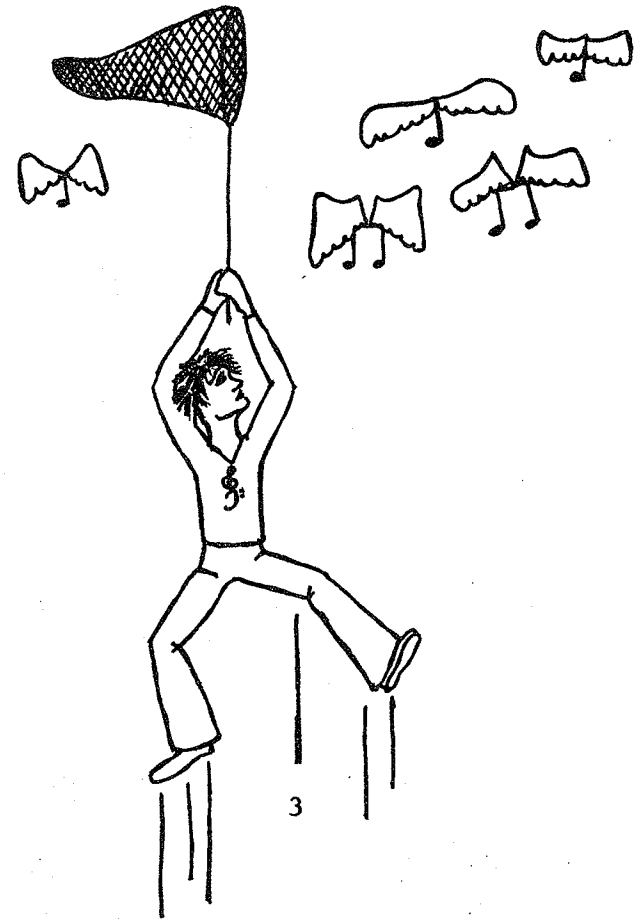
The tessitura for each vocal part should generally coincide with the following guidelines:

TESSITURAS:

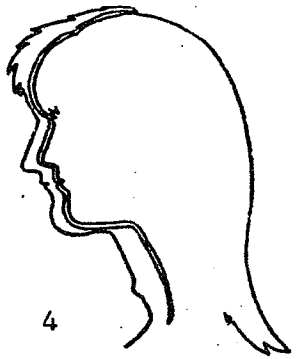


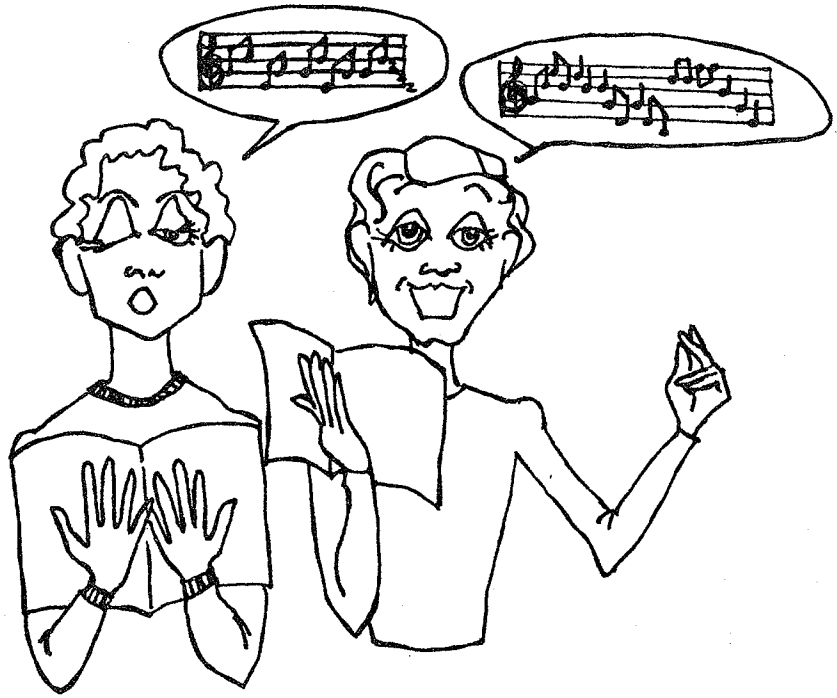
8) As the primary sex organs mature, hormonal secretions trigger physical changes within the body. These changes become evident to the observer through the development of secondary sexual characteristics. In males these characteristics are most evident in the growth of the facial and pubic hair. Female secondary sexual characteristics are most evident in breast development and hip broadening. Voice change relates directly to the maturation of the primary sex organs, and usually occurs in males and females concurrently with the development of secondary sexual characteristics.

If the tessitura of a composition is too high, the singer will strain to reach the higher notes. By relying upon incorrect muscular action in the neck and laryngeal areas, poor vocal habits may result.



The organs of phonation used in vocal production increase in size during puberty. Breathing capacity increases because the length and circumference of the chest is increasing rapidly at this time. As the neck increases in length and width, the larynx grows downward within the neck. In females this growth is downward with little growth in width. The male larynx grows in length but also grows in an anterio-posterior direction (front-back). This growth is marked by the protrusion of the "Adam's Apple"---a sign that the male is experiencing vocal mutation.



The choral director should select music containing interesting parts for all singers. Although the soprano part is often the melody, efforts should be made to find selections which have interesting melodic lines for the changing voice part.

The vocal cords lengthen 3-4 mm. in females, while male cords lengthen by 1 cm. The male cords not only become longer but much thicker than the female's, resulting in a lower, fuller sound.

Since the treble singers have similar voice ranges, occasionally switching voice parts by having the treble 1 sing the alto part and treble 2 sing the soprano part may be desirable. This gives each singer the opportunity to sing the melodic and harmonic vocal parts, while strengthening the entire vocal range, and increasing aural skills.

QUESTIONS

Vocal mutation is intricately related to:

a. sociological aspects of the adolescent's environment.

b. psycho-physiological changes occurring during adolescence.

c. the aesthetic opinion of the adolescent.

If you have chosen (a) turn to page 7.

If you have chosen (b) turn to page 8.

If you have chosen (c) turn to page 9.

QUESTION

On page 7 is quoted a musical excerpt from a choral selection. Decide which stages of adolescent vocal development are applicable to each vocal part <u>as written</u>.

a. Part I - Treble, High and Low
   Part II - Stage 3, High Mutation
   Part III - Stage 4, Post-Mutation

b. Part I - Treble, High
   Part II - Treble, Low
   Part III - Stage 2, Early Mutation

c. Part I - Stage 2, Early Mutation
   Part II - Stage 3A, Transitional Mutation
   Part III - Stage 4, Post-Mutation

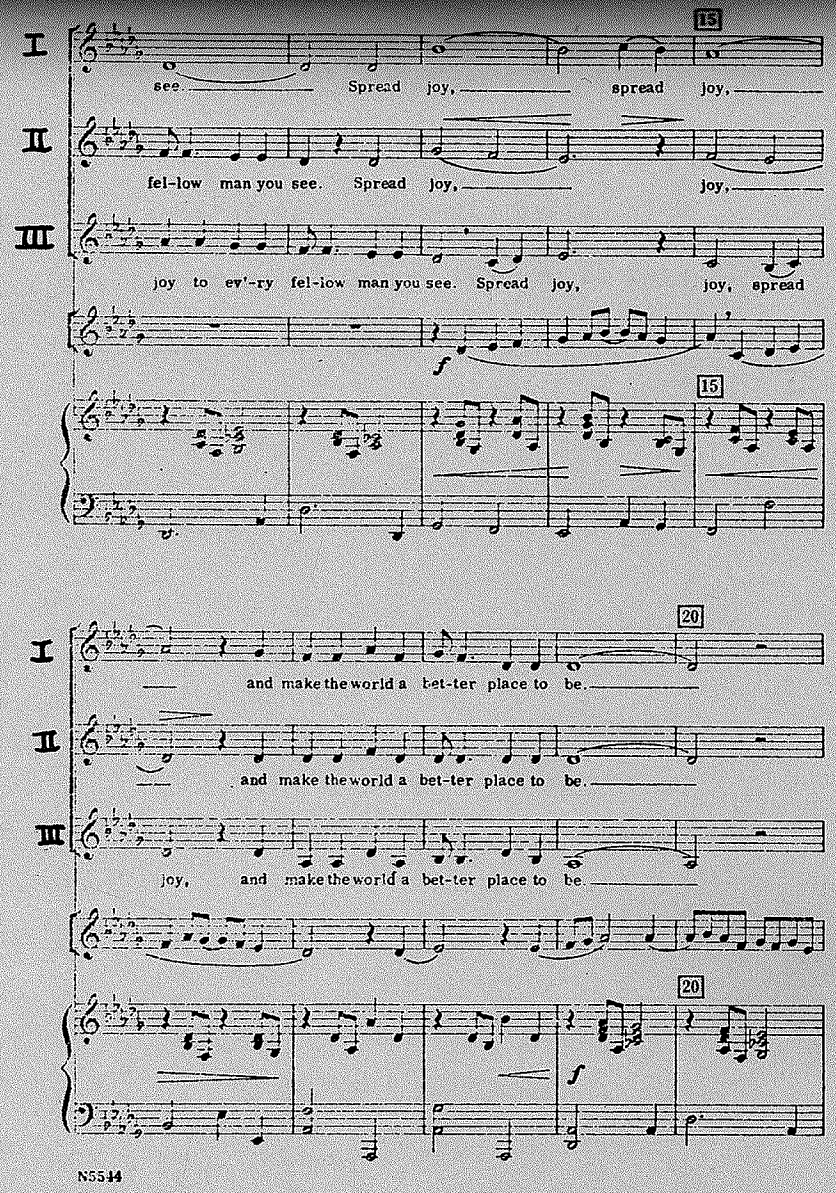
d. Part I - Stage 1, Pre-Mutation
   Part II - Stage 2, Early Mutation
   Part III - Stage 3, Transitional Mutation

If you have chosen (a) turn to page 8.

If you have chosen (b) turn to page 9.

If you have chosen (c) turn to page 10.

If you have chosen (d) turn to page 11.

a. We agree that sociological aspects of the adolescent's environment could affect vocal maturation. However, we believe that this factor is not <u>intricately</u> related to vocal change. Return to page 1 to reinforce this concept, and then try the question again.

From SPREAD JOY by Natalie Sleeth.
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b. You are correct! The psycho-physiological changes are intricately related to vocal mutation. Proceed to page 10.

a. The range of Part III would be too high for the stage 4 singer. Return to page 2, and then try the question again.

c. The aesthetic opinions of the adolescent could influence vocal maturation. However, we do not feel that this is intricately related to vocal maturation. Return to page 1 to reinforce this concept, and then try the question again.

b. This is a reasonable arrangement. Each singer could easily sing the ranges of their part. There is another correct answer. Can you find it? Return to page 6 to review the question again. After finding the other correct answer, proceed to page 12.

Jane has become very moody. One day she is amiable and content. The next day she suddenly bursts into tears. She has become very conscious of her body contour. She has started to develop breasts.

As a teacher I might observe that she is entering a period called:

a. moodiness.

b. puberty.

c. adolescence.

If you have chosen (a) turn to page 11.

If you have chosen (b) turn to page 12.

If you have chosen (c) turn to page 13.

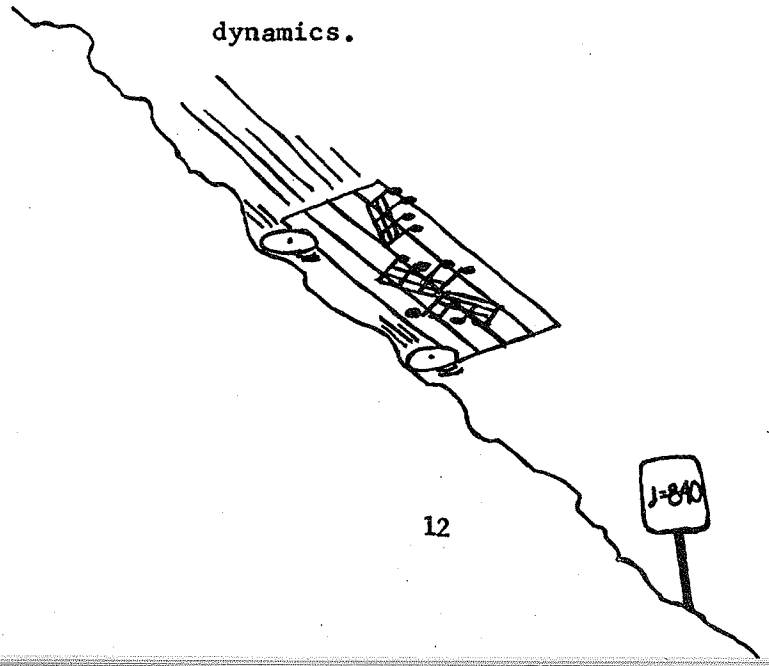
c. The ranges of parts II and III would be too high for the Stage 3A and 4 singers. Return to page 2 to reinforce this concept, and then try the question again.

a. Jane is displaying more than occasional moodiness. The biological changes of puberty are probably causing her to experience some emotional turmoil. Return to page 1 to reinforce this concept, and then try the question again.

d. This would be an appropriate arrangement for a boy's choir, stages 1, 2, and 3. Each range of the vocal part adapts to the ranges of the singers. There is another correct answer. Can you find it? Return to page 6 to review the question again. After finding the other correct answer, proceed to page 12.

b. You're correct. The combination of psycho-physiological factors seem to indicate puberty. Proceed to page 14.

With the rapid extension and growth of the vocal mechanism, the male singing range narrows and consistency in pitch accuracy becomes a problem. The uneven growth of the laryngeal muscles and vocal cords limits flexibility in pitch articulation and narrows the dynamic range of the voice. Selections should be avoided which contain fast moving passages, florid passages, long sustained phrases in the upper range, and extremes in dynamics.



c. You're almost right. She is entering a stage of adolescence called puberty. Puberty is the height of psycho-physiological change. Return to page 1 to reinforce this concept, and then try the question again.

Physically, the young singer is unable to handle these techniques even when he thinks he is capable. Use compositions that contain melodic patterns, because the pattern once learned can be sequenced effectively at the same or different pitch levels within the range of the singer. Although the baritone part should have melodic interest, it should frequently employ tonic and dominant pitches. Since this part is usually the lowest sounding part of the chordal structure, the employment of tonic and dominant pitches provides a solid foundation for intonation.

Transescence is a period of pronounced and accelerated physical development. Interest patterns follow physical changes, and awkwardness results from disproportionate changes in weight and muscle development. People in the transescence stage are characterized by extreme restlessness and need a daily release of energy.

This description is similar to:

a. hyperactivity,

b. puberty.

c. menopause.

If you have chosen (a) turn to page 15.

If you have chosen (b) turn to page 16.

If you have chosen (c) turn to page 17.

If a suitable vocal part is selected for stage 3 singers, this group will become a solid vocal section. Once the vocal part is learned correctly, the stage 3 singers should sing with certainty. However, if the vocal part is taught incorrectly, remediation will be very difficult.

a. Hyperactivity is frequently associated with abnormal behavior. We do not feel that the adolescent usually demonstrates abnormal behavior. Return to page 1, and then try the question again.

QUESTION

Would you select the following composition for a junior high chorus? (Refer to page 16)

a. No, the range is inappropriate.

b. No, the text is inappropriate.

c. No, the dynamics are inappropriate.

d. Yes, it is appropriate.

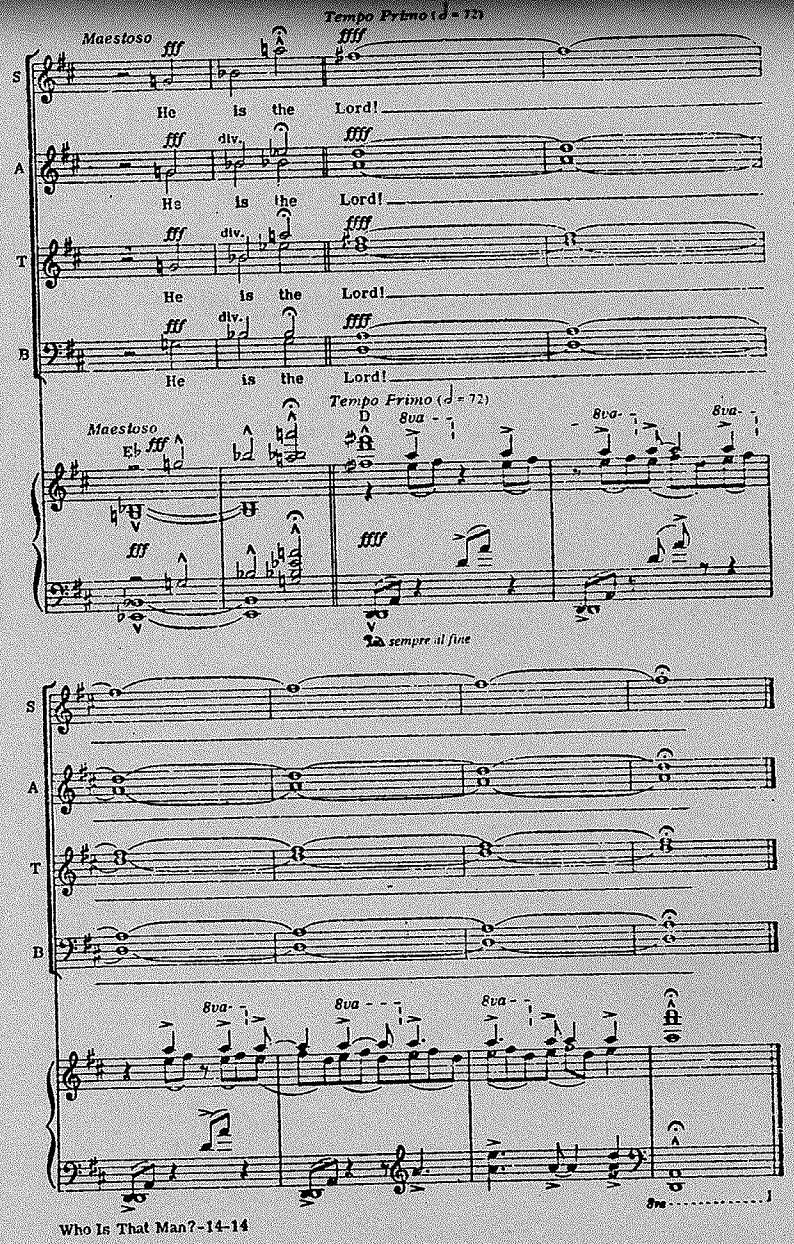
If you have chosen (a) turn to page 17.

If you have chosen (b) turn to page 18.

If you have chosen (c) turn to page 19.

If you have chosen (d) turn to page 20.

b. You are correct. Transescence is another term for puberty and the characteristics of the adolescent. This term is currently used in literature describing this stage of adolescence. Extreme restlessness and a daily release of energy are normal characteristics of the transescent.

Proceed to page 18.

From WHO IS THAT MAN? by Arnold Freed.
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c. Sorry! Too late! Return to page 1, and then try the question again.

c. The extreme dynamics demanded in this section would be the <u>greatest</u> problem. Remember, extremes in dynamics (ffff) can be damaging to the young voice. There is another correct answer. Can you find it? Return to page 15 to review the question again. After finding the other correct answer, proceed to page 21.

Why is the "Adam's Apple" visible in males and not in females?

a. The vocal cords are lengthening and thickening within the larynx.

b. The larynx grows downward in the neck.

c. The male larynx is longer than the female's.

d. The male larynx grows in two directions.

If you have chosen (a) turn to page 19.

If you have chosen (b) turn to page 20.

If you have chosen (c) turn to page 21.

If you have chosen (d) turn to page 22.

b. Judging from this short section, it would be difficult to say that there is a definite problem with the text. Return to pages 12-13, and then try the question again.

a. The vocal cords are lengthening and thickening within the larynx. This does not cause the "Adam's Apple" to become visible. Return to page 4, and then try the question again.

c. The extreme dynamics demanded in this section would be the greatest problem. Remember, extremes in dynamics (ffff) can be damaging to the young voice. Proceed to page 21.

b. Male and female larynxes grow downward in the neck. This does not make the "Adam's Apple" visible. Return to page 4 to reinforce this concept, and then try the question again.

d. This statement is false. Return to pages 12-13 to reinforce the concepts of suitable junior high music, and then try the question again.

c. The male larynx is longer than that of the female. This does not make the "Adam's Apple" visible. Return to page 4, and then try the question again.

As a rule, the music or text of the composition must capture the students' interests. Adolescents require a text which their experience will allow them to understand. For example, overly romantic literature should be avoided because peer pressure frequently discourages positive reaction to romantic literature.

d. You're correct! Male and female larynxes are growing downward. The male's larynx also grows in an anterio-posterior direction (front-back). This growth causes the protrusion of the "Adam's Apple". Proceed to page 23.

Foreign language texts may be used effectively as a challenge to the young singer. Though initial reaction might be negative, with teacher persistence, the students should come to enjoy it. In making your selections, read the text of the composition, relate it to the adolescent, and weigh it against the musical value of the composition.

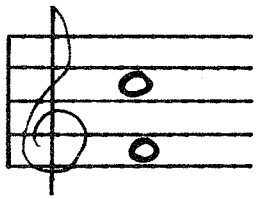
The length of a composition is important in relation to the total performance time. The junior high singer does not have the endurance to sustain good vocal production over a long time period. A composition which is too long may lead to vocal fatigue resulting in poor vocal production.

HOW DO THESE PHYSICAL CHANGES AFFECT THE VOICE QUALITY?

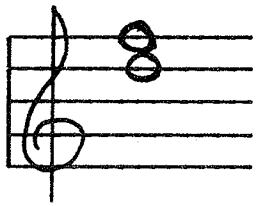
Research into the adolescent female voice has been very limited because the female vocal mutation, while similar to the male process, is not as dramatic. The adolescent girl's voice has a treble vocal quality that does not have the clarity and strength of the boy's unchanged voice. It's quality is usually thin, colorless, and breathy. All girls at this age should be classified as treble voices. With the constant strengthening of the muscles and cartilages surrounding the larynx, the lower range (approximately a below middle c to e directly above middle c) strengthens and more power is attained in this vocal range.

Shorter performance times interspersed throughout the program work effectively with this age group. The junior high ensemble is a viable performance ensemble with a distinct excitement and beauty of its own. Do not regard it as an immature high school choir. Choose the literature suitable for your singers.

The adolescent female singer frequently attempts to carry this heavier quality into the middle and upper ranges of the voice.



Middle



Upper

However, the vocal cords are unable to withstand such forced pressure, causing them to separate and produce a breathy tone. A definite register differentiation or auditory change in vocal quality begins to occur. Two sounds become evident---a powerful lower range and a breathy upper range. Moreover, by carrying this heavier quality into the upper ranges a harsh shrill quality develops in the upper vocal range.

QUESTIONS

Which of the following texts would most appeal to a mixed (male/female) junior high chorus?

*a. "Were I a little bird and had two tiny wings, I'd fly to you."

*b. "Anywhere I wander anywhere I roam, 'til I'm in the arms of my darling again, my heart will find no home."

*c. "Hush-a-bye, don't you cry. Go to sleep my little baby."

*d. "What will the world be like tomorrow?
Will this land of ours be free?
And will every man a brother be?"

If you have chosen (a) turn to page 25.
If you have chosen (b) turn to page 26.
If you have chosen (c) turn to page 27.
If you have chosen (d) turn to page 28.

*See Appendix I for Publisher's Permission.

We recommend that all females experiencing vocal mutation be classified as treble voices. Because the lower range of some girls develops more quickly than others, the voice instructor may wish to divide female singers into high and low treble voices. However, we have avoided the use of the standard female soprano/alto designations so that confusion with corresponding mature ranges and qualities will be lessened.

Vocalises should include work with both the upper and lower ranges of the voice. Unforced vocalizing from the upper to the lower range will help to develop a consistent clear quality throughout the adolescent female's voice.

a. Although this text is taken from a beautiful Robert Schumann art song, the adolescent may have difficulty relating to its text. Return to page 21, and then try the question again.

(See videotape 1 - Mary and Jessica)

AFTER VIEWING V.T. 1 - MARY AND JESSICA, GO TO PAGE 27.

b. Although this is a beautiful selection, the adolescent male might have problems relating to this text because it may be out of the realm of his experience. Return to page 21, and then try the question again.

QUESTIONS

Which of the following statements is false?

a. Adolescent female voices should be classified as treble high or treble low.

b. The adolescent female voice has the same quality as the boy's unchanged voice.

c. The female voice mutation is similar to the male process.

d. The strengthening and lengthening of the laryngeal muscles allow power to develop in the lower range.

If you have chosen (a) turn to page 28.

If you have chosen (b) turn to page 29.

If you have chosen (c) turn to page 30.

If you have chosen (d) turn to page 31.

c. This text may be out of the realm of experience of the adolescent male. However, suitable arrangements of this text are frequently successfully performed by a young junior high chorus. Return to page 21, and then try the question again.

a. This statement is true. You've made the wrong choice. At this time of maturation there should be little division in classification. Return to pages 23-25 to reinforce this concept, and then try the question again.

d. This text would be most suitable for a mixed group. The adolescent is concerned about the future and how he relates to the world around him. Proceed to page 29.

b. This statement is false. You've made the right choice! The quality of the two voices are <u>not</u> the same. The adolescent female voice has the treble quality but not the clarity and strength of the boy's unchanged voice. Proceed to page 32.

A mixed junior high choir has just finished a rock Christmas cantata lasting 25 minutes. After a short applause, they continue their program with four more selections lasting approximately 15 minutes. What might you expect to hear during the last composition on the concert and why?

1. Vocal fatigue
2. Intonation problems
3. Brilliant sounding vocal quality
4. Good articulation

due to:

5. a variety of selections.
6. the performance of rock music.
7. a lengthy performance.
8. the stages of vocal development.

a. 2 & 6
b. 4 & 5
c. 1 & 7
d. 3 & 8

If you have chosen (a) turn to page 30.
If you have chosen (b) turn to page 31.
If you have chosen (c) turn to page 32.
If you have chosen (d) turn to page 33.

c. Sorry. This statement is true. The process of vocal mutation is similar in both male and female voices. However, the female voice mutation is not as dramatic. Reinforce this concept by returning to pages 23-25, and then try the question again.

a. Though intonation problems may occur under the conditions described, usually these problems do not result from the type of music performed. Return to pages 12-14, and then try the question again.

d. This is a true statement. The lengthening and strengthening of the laryngeal muscles allow for power to be attained in the lower range. Return to pages 23-25, and then try the question again.

b. Articulation may suffer during a lengthy performance due to vocal immaturity. Return to pages 22-23, and then try the question again.

How can register differentiation develop in the adolescent female singing voice?

a. By requiring the singer to "sing out!" in the upper range.

b. By vocalizing from the upper to the lower range.

c. By working for a clear tonal quality.

d. By avoiding the use of the heavier vocal quality in the upper ranges.

If you have chosen (a) turn to page 33.

If you have chosen (b) turn to page 34.

If you have chosen (c) turn to page 35.

If you have chosen (d) turn to page 36.

c. This is correct! Junior high singers perform best when singing shorter performance segments. Vocal fatigue would most likely occur from the described program. Proceed to page 34.

a. You are correct. How many times have we heard this? Forced, loud singing will cause register differentiation to occur. Remember, the vocal cords are unable to withstand such pressure. Proceed to page 37.

d. The sound will become fatigued and lose some of the brilliance usually present in the higher voices. Return to pages 22-23, and then try the question again.

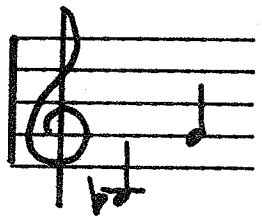
b. This is a good way to develop consistent tone quality and avoid register differentiation. Return to pages 23-25, and then try the question again.

THE PROBLEMS WITH PUBLISHED MUSIC

Using the criteria previously presented, one might surmise that there is no suitable literature written for junior high choirs.

Unison singing may be used effectively in 7th grade if few voices have changed. But during the 8th grade year when many of the voices are in the Mutational period, unison singing becomes impractical.

c. The encouragement of a light singing tone throughout the entire range will help in the development of a clear tone quality. Register differentiation results when this approach is ignored. Return to pages 23-25 to reinforce this concept, and then try the question again.

If unison songs are attempted, this composite range, which may be doubled at the octave, should be employed.

This is obviously a limiting factor since most compositions utilize a wider range.

SA arrangements work well with girl's voices, unchanged, and stage 2 voices. The problems arise for the 3-3A singers because the SA parts are often too high and/or too low if doubled an octave lower. In order to utilize an SA arrangement, an additional part should be written to accommodate the 3-3A voice.

d. No. This is a good way to develop consistent tone quality and avoid register differentiation. Return to pages 23-25, and then try the question again.

QUESTION

Which statement is true?

Unison singing in the 8th-9th grade may be inappropriate because:

a. students don't like to sing at this age.

b. the articulation of the unison song may be too difficult.

c. the range of the unison song may be inappropriate.

d. the texts of unison songs are usually uninteresting to the adolescent.

If you have chosen (a) turn to page 37.

If you have chosen (b) turn to page 38.

If you have chosen (c) turn to page 39.

If you have chosen (d) turn to page 40.

Now let's consider the male voice. Many times, the lowering of the speaking voice is used as an indicator that the voice is changing. However, the speaking voice changes faster than the singing voice (over a period of 3-6 months). Actually, the beginning of the speaking voice change precedes that of the singing voice. The singing voice change may extend over a period of one to two years. After mutation (voice change), the pitch of the speaking voice remains at the lower part of the singing range (approximately 4 semi-tones above the lowest point of the singing range). The quality of the speaking voice becomes "husky" due to the incomplete closure of the vocal cords. However, this quality disappears as the cords thicken and lengthen.

a. This is an incorrect answer. The problems of vocal mutation frequently make singing difficult for the adolescent. However, there is little evidence to support the idea that all students of this age dislike singing. Rather, they may enjoy singing if given appropriate voice instruction and vocal literature. Even within the general music class, changing voices need to be accommodated for with parts suited to their ranges. Return to page 35, and then try the question again.

The pitch of the singing voice lowers one octave during the active phase of mutation. The timbre of the voice changes from light and childlike to a young adult sound. The first noticeable changes in range and quality of the adolescent male singer generally begin at age 12 and reach a climax at the age of 14 or 15. This development continues, though less dramatically, for several years.

Studies pertaining to the male adolescent voice change by Naidr, Zboril, and Sevcik, and voice pedagogical theories by Irvin Cooper and Duncan McKenzie support a pattern of voice mutation that proceeds through a gradual lowering process. Although the singing voice mutation proceeds at various rates for each individual, the following predictable, sequential pattern can be followed:[1]

b. This statement is true. Articulation could be a problem in fast moving sections of a unison song. There is another correct answer. Can you find it? Return to page 36 to review the question again. After finding the other correct answer, proceed to page 41.

Stage 1---Pre-Mutation

Approximately 10-12 years

Rich, full treble quality throughout the range. This range is the fullest of the childhood voice. It has a brilliant quality with good dynamic variation, flexibility, and no lift points. (Lift points are specific tones within the range that signal change in the vocal quality.)

(See videotape 1 - Jim)

AFTER VIEWING V.T. 1 - JIM, GO TO PAGE 40.

c. This statement is true. At this age, a composite range of:

must be used for effective unison singing. There is another correct answer. Can you find it? Return to page 36 to review the question again. After finding the other correct answer, proceed to page 41.

Stage 2---Early Mutation

Approximately 12-13 years

There is no drastic change in range or quality of the singing voice. Some males are losing the high pitches in their range, but it is variable. Hormone secretions are causing bodily changes in the male. Increased breathiness and strain above c (an octave above middle c) are occurring due to the uneven growth of the vocal cords. The voice shows little body or resonance of tone in the extreme lower part of the range.

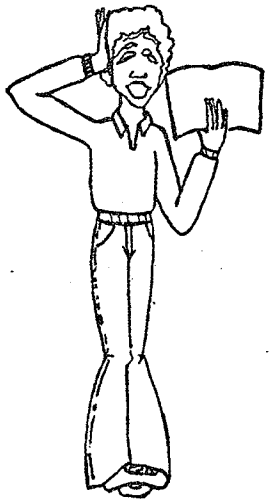
(See videotape 1 - David)

AFTER VIEWING V.T. 1 - DAVID, GO TO PAGE 41.

d. This statement is false. Although some texts may be uninteresting to the adolescent, there is little evidence to support the idea that they find most unison song texts uninteresting. Return to pages 34-35, and then try the question again.

Stage 3---High Mutation

Approximately 13-14 years



This is a crucial time for careful voice cultivation. The vocal tone quality can become harsh, breathy, or pleasing in quality due to the teacher's vocal instruction. The male is developing a distinct vocal quality which contains characteristics of the alto and baritone voices. The male is experiencing a loss of vocal agility and is unable to move freely from the high to low notes with total accuracy. The external and internal growth of the laryngeal muscles becomes sporatic. Control of volume becomes difficult, the range and tessitura of the voice become restricted, and the falsetto voice begins to emerge.

SSA music may be used effectively if there are only a few changed voices in the ensemble. Care must be taken to select music appropriate for male interests. This music should always be suited to the tessituras of male voices in the Early Mutational stage (stage 2).

In SAB music, the baritone ranges may fluctuate greatly depending on the composer/arranger's knowledge of the changing voice. Often the baritone part does not properly accommodate all of the late stages of vocal mutation (stages 3, 3A, and 4). Sometimes the high/low notes of the written part are outside of the ranges of these voices and its tessitura is frequently unsuited for stage 3, 3A, and 4 singers.

Above the falsetto develops the "whistle" register which has a "hooty" quality. The tones located an octave and a fifth above middle c are producible tones with little usefulness to the male singer. This "hooty" quality is usually thin and squeaky. Register differentiation develops. This is characterized by a definite change in vocal quality between the full voice quality and falsetto.

(See videotape 1 - Lee)

AFTER VIEWING V.T. 1 - LEE, GO TO PAGE 43.

Because most SATB music has been written with adult voices in mind, the junior high choral director, when selecting SATB arrangements, should choose the music to fit the vocal ranges of his/her junior high singers. Although this is an adult style of arrangement, one should not expect an adult vocal quality to emerge from a junior high choir. The adolescent female can never be expected to attain adult soprano or adult alto vocal quality. The range and tessitura of the tenor part is often too low for the stage 2 voice and the bass part is too low for the newly changed baritone. Abrupt pitch and register changes, and dynamic and rhythmic demands may render SATB music impossible for the junior high choir.

Stage 3A---Transitional Mutation

Approximately 14 years

This is a brief period, sometimes lasting for as short a time as 3 months, as the voice attains the quality of a newly changed baritone. This baritone quality is heard in the lower half of the singing range while top pitches of the range are produced with more strain. Visual signs of tightness in the neck area are an indicator of this strain. A register lift point (change in vocal quality) d above middle c is beginning to appear. Because head and neck dimensions are approaching those of the mature male, the resonators are more capable of producing a mature sound.

(See videotape 1 - Rick)

AFTER VIEWING V.T. 1 - RICK, GO TO PAGE 44.

Carefully selected SATB music which properly fits your adolescent singers' voices may be used very effectively. Look for selections with high tenor parts to accomodate the changing voice. In recent years, composers/arrangers have become aware of the problem of music for the junior high choir. Some SATB music is now being written with this age level in mind.

A list of publishers who are especially concerned with producing choral music for the junior high singer will be provided for you at the conclusion of this module.

Stage 4---Post-Mutational Period

Approximately 14½-17 years

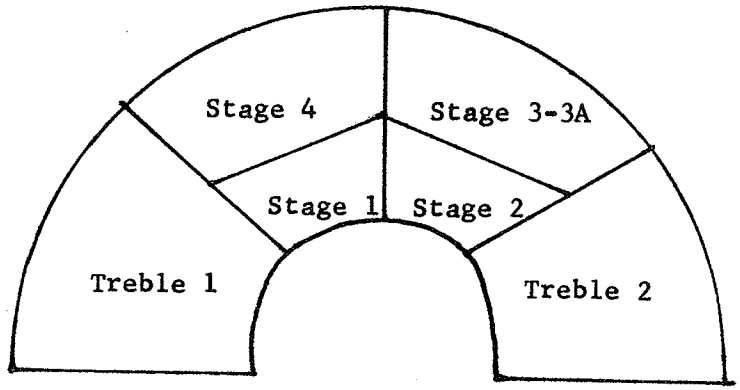
The childlike treble vocal qualities are gone, yet the full adult sound is not present. The power and intensity of pitches below b^b (2nd line, bass clef) must still be developed. The quality is that of a light, mid-baritone which is still unsettled. Definite lift points are found at d (above middle c) for future baritones, and e-f (above middle c) for future tenors. There is still limited vocal agility especially with fast intervallic leaps of more than a perfect 4th or 5th. Problems with intonation and tone quality may occur on those pitches where the singer may produce sound in either the full or falsetto voice. As a rule, resonance instruction should be postponed until the singer is age 15 or well into the Post-Mutational stage.

(See videotape 1 - Bruce)

AFTER VIEWING V.T. 1 - BRUCE, GO TO PAGE 45.

CHORAL SEATING ARRANGEMENT FOR THE JUNIOR HIGH CHOIR

Although male ranges may still be in the Unchanged or Early Mutation stage, it is important to keep the male seated in a male section. The male singer might resent singing soprano/alto parts surrounded by female singers. The following diagram illustrates a possible seating arrangement.



QUESTIONS

Lift points:

a. develop naturally during male vocal maturation.

b. last three months.

c. are found throughout the male vocal range.

d. are evident in the boy's unchanged voice.

If you have chosen (a) turn to page 46.

If you have chosen (b) turn to page 47.

If you have chosen (c) turn to page 48.

If you have chosen (d) turn to page 49.

QUESTION

You are preparing a spring concert. Your choir consists of:

20 High Treble singers.
20 Low Treble singers, including 3 Stage 2 singers.
0 Stage 3-3A singers.
10 Stage 4 singers.

Which one of the following excerpts would be best for this choir?

a. Excerpt I

b. Excerpt II

c. Excerpt III

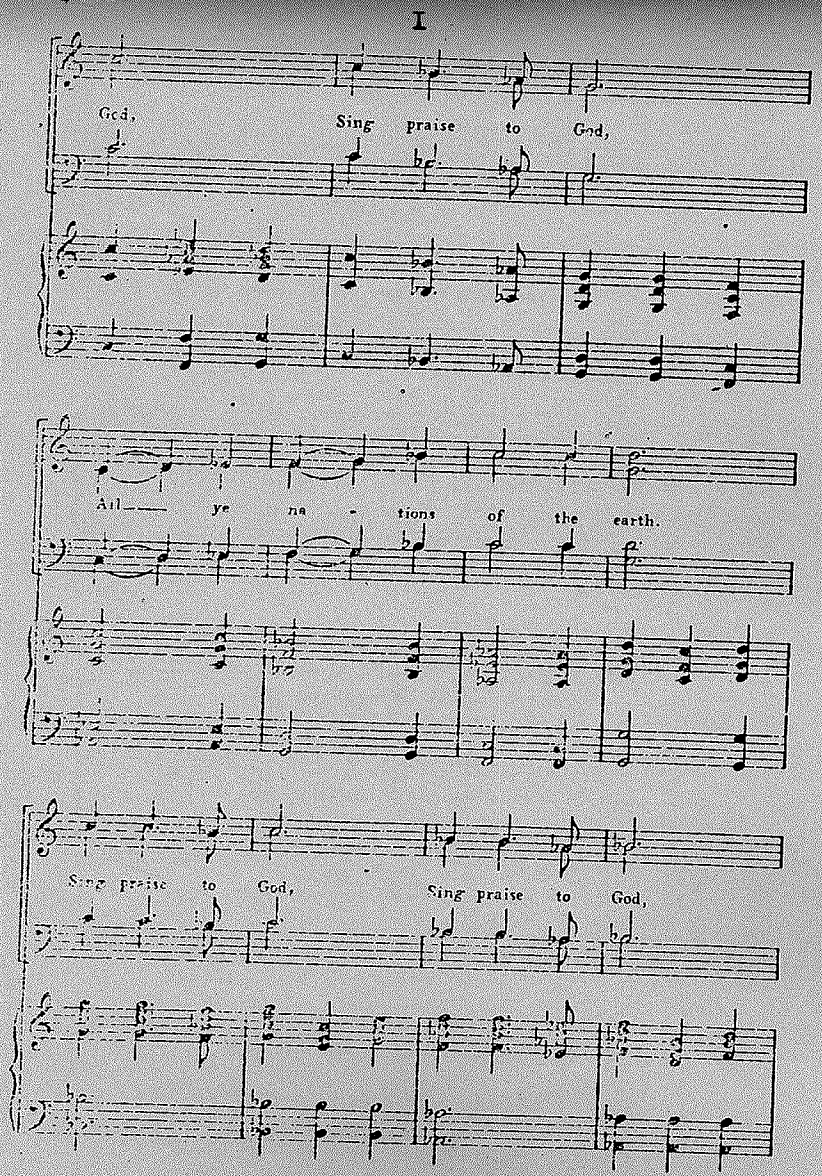
d. Excerpt IV

If you have chosen (a) turn to page 50.

If you have chosen (b) turn to page 51.

If you have chosen (c) turn to page 52.

If you have chosen (d) turn to page 53.

a. You're correct. Lift points are part of the gradual maturation process of the adolescent male voice. Proceed to page 50.

From LAUDATE DOMINUM by Gordon Young.
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Delaware Water Gap, PA., 18327
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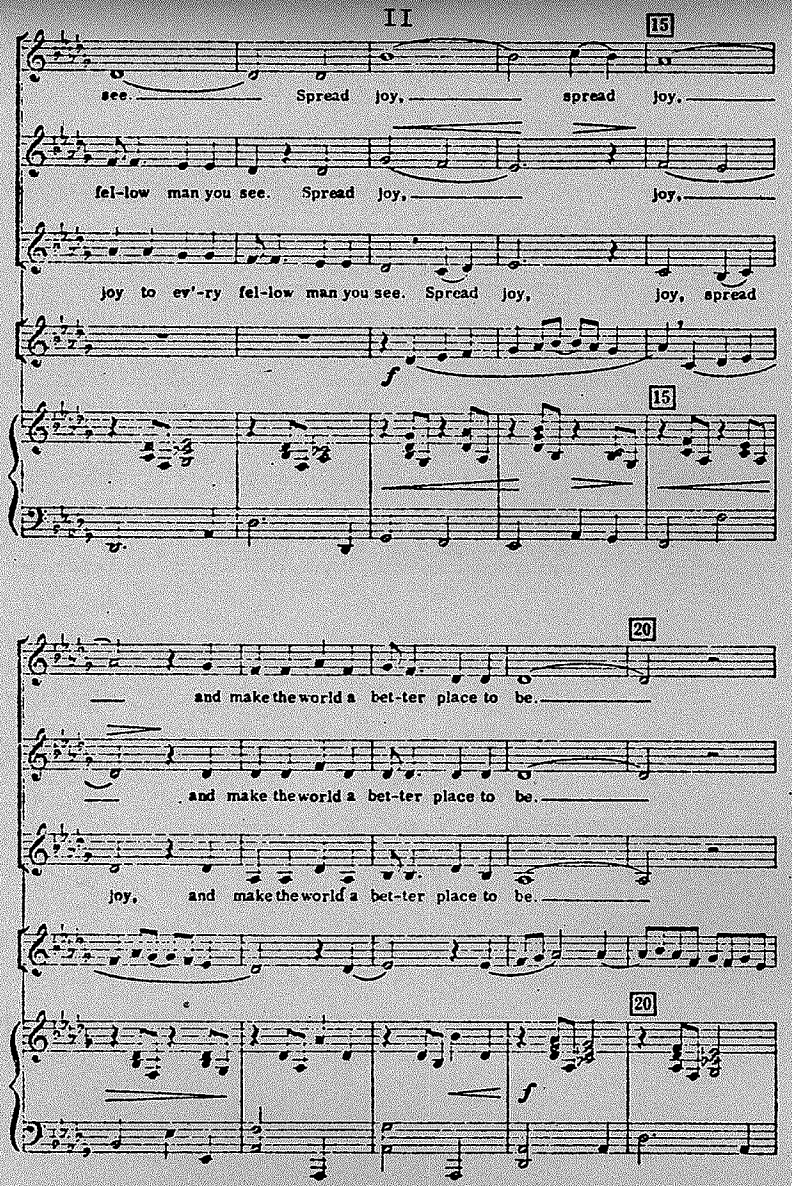
b. No, lift points begin during the Transitional Mutation stage (stage 3A) of the male voice change. Definite lift points develop during the Post-Mutational stage (stage 4) and continue strengthening into adulthood. Return to page 43, and then try the question again.



From SPREAD JOY by Natalie Sleeth.
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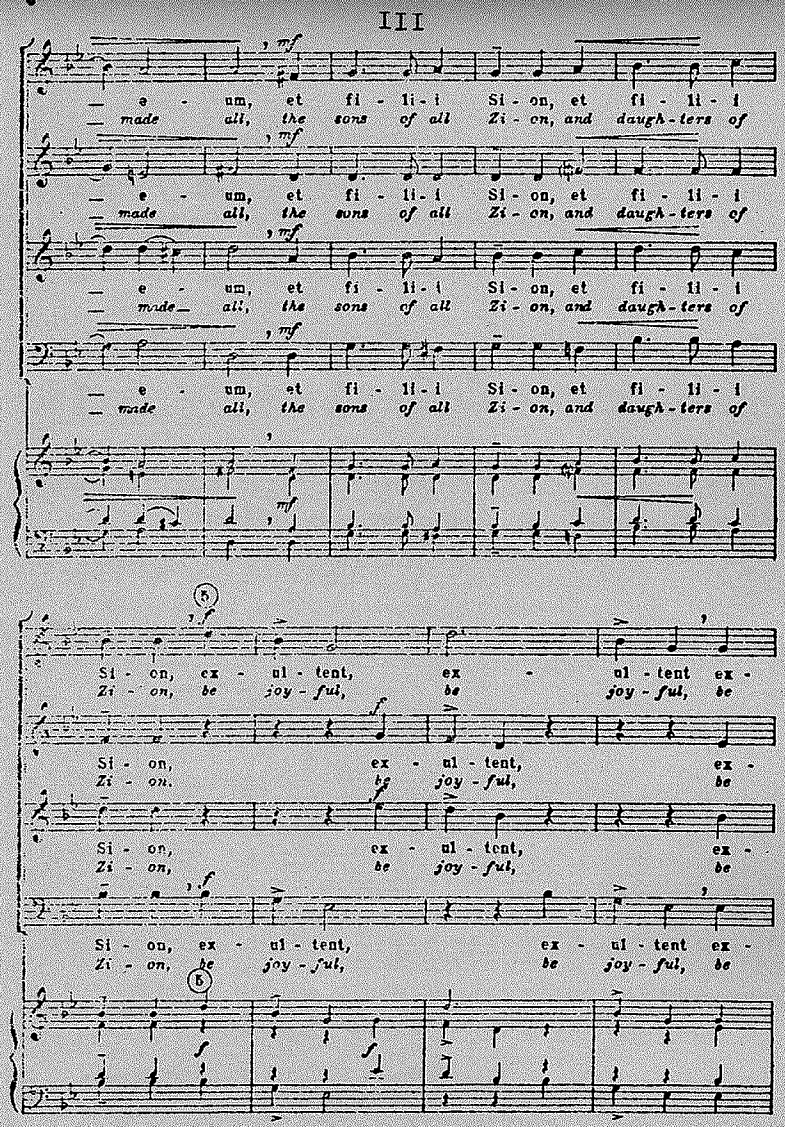
c. No, the lift points are individual tones where a change in vocal quality is evident to the listener. These tones are usually located near points of register differentiation (full voice, falsetto). Return to page 43 to reinforce this concept, and then try the question again.

From CANTATE DOMINO by Pitoni-Greyson.
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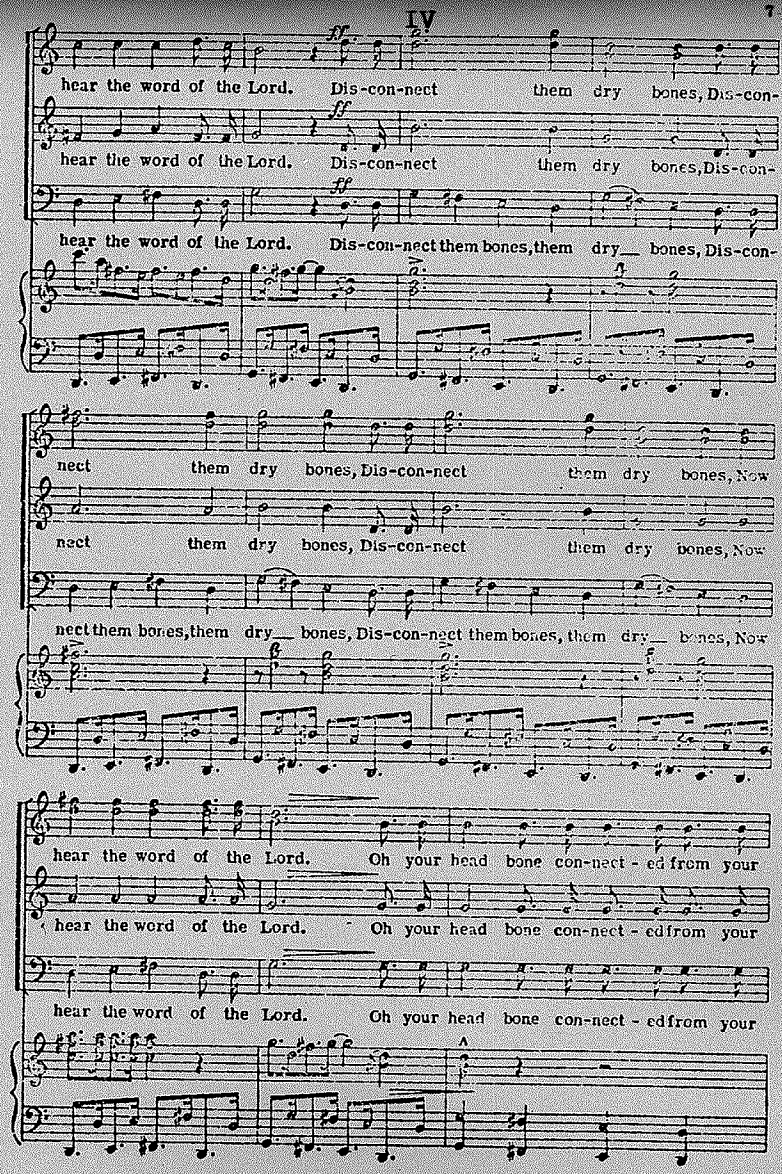
d. No, lift points are not evident, because there has been no physical growth within the larynx. Return to page 39 to review this concept, and then try the question again.

From DRY BONES arr. by Theron Kirk
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Belwin-Mills Pub. Co.
Melville, New York

Which of the following changes does not occur during puberty (in either males or females)?

a. Facial hair develops.

b. Hips widen.

c. The singing voice reaches full adult sound and quality.

d. The lungs significantly increase in size.

If you have chosen (a) turn to page 51.

If you have chosen (b) turn to page 52.

If you have chosen (c) turn to page 53.

If you have chosen (d) turn to page 54.

a. This is not the best selection for your choir. The written part on the words "All ye nations of the earth" is too low for the ranges of the 3 and 3A singers. Return to page 42, and then try the question again.

a. The appearance of facial hair <u>is</u> an indicator of male pubertal change. Return to page 3 to reinforce this concept, and then try the question again.

b. This is not the best selection. The third part is too high as written for the stage 4 singer. Return to page 41, and then try the question again.

b. The widening of the hips <u>is</u> an indicator of female pubertal change. Return to page 3 to reinforce this concept, and then try the question again.

c. This is the best selection for your choir. Every range fits into the vocal parts given. Proceed to page 55.

c. Bravo! The singing voice never reaches a full adult sound during puberty. It takes many more years to achieve the stability, resonance, and strength of the adult sound. Proceed to page 55.

d. Even though this is an SAB arrangement, it is not the best selection for your choir. The high treble ranges and extreme dynamics may cause intonation and vocal problems to occur. Return to pages 12 and 41, and then try the question again.

d. The lungs do increase significantly in size during puberty. Reinforce physiological changes by returning to page 2, and then try the question again.

APPENDIX I

a. WERE I A TINY BIRD by R. Schumann.
Text used by permission of
Mark Foster Music Company
Champaign, IL.

b. ANYWHERE I WANDER by Frank Loesser.
Text used by permission of
Frank Music
Boston, MA.

c. HUSH-A-BYE arranged by Michael Richardson.
Text used by permission of
Mark Foster Music Company
Champaign, IL.

d. WHAT WILL THE WORLD BE LIKE TOMORROW
arranged by John Coates, Jr.
Shawnee Press, Inc.
Delaware Gap, PA.

TEST

DO NOT WRITE ON THE TEST BOOKLET. ANSWER SHEETS ARE AVAILABLE AT THE CHECKOUT DESK.

Place T in the blank for true.

Place F in the blank for false.

_____ 1. Male voice maturation is a gradual lowering process.

_____ 2. The speaking and singing voices change concurrently.

_____ 3. The adolescent female voice has more vocal agility than the changing male voice.

_____ 4. Maturation of the primary sex organs directly relates to voice change.

_____ 5. During the High Mutation stage, the study of resonance should be included in vocal instruction.

TEST

DO NOT WRITE ON THE TEST BOOKLET. ANSWER SHEETS ARE AVAILABLE AT THE CHECKOUT DESK.

Place T in the blank for true.

Place F in the blank for false.

_____ 1. The selection of music is influenced only by the ranges/tessituras of your singers.

_____ 2. The use of SSA music is ineffective with a mixed junior high group.

_____ 3. Treble singers should occasionally switch vocal parts.

_____ 4. Foreign language song texts should not be used in junior high choruses.

_____ 5. Unison, SA, and SSA music may be used effectively in 7th grade.

_____ 6. The peak of male vocal mutation generally occurs between the approximate ages of 13-14.

_____ 7. The Early Mutation stage for male singers is easily detectable.

_____ 8. The "whistle" register is located above the falsetto.

_____ 9. Baritone quality becomes evident during the High Mutation stage.

_____10. All adolescent female voices should be treated as treble voices.

NOW CHECK YOUR ANSWERS ON PAGES 57-59.

_____ 6. It is best to keep the male singer within the male group even if he is singing the soprano or alto vocal part.

_____ 7. Because of his changing voice, the stage 3 singer should seldom be given a vocal part that contains a melody.

_____ 8. The use of quality music should be abandoned for appropriate vocal ranges.

_____ 9. The baritone range of an SAB composition will determine the suitability of this piece for use with your group.

_____10. Publishers are becoming concerned with the changing voice phenomena.

NOW CHECK YOUR ANSWERS ON PAGES 57-60.

ANSWERS

T 1. Male voice maturation is a gradual lowering process. (38)

This theory is supported by the vocal pedagogical theories of Irvin Cooper and Duncan McKenzie.

F 2. The speaking and singing voices change concurrently. (37)

The initial speaking voice change precedes that of the singing voice.

T 3. The adolescant female voice has more vocal agility than the changing male voice. (4-5)

The female vocal cords only grow 3-4 mm. in length as compared to the male's (total growth 1 cm.). Because the female larynx does not grow to the same extent as the male's, the muscles and cartilages surrounding it are more capable of minute articulation adjustments. Therefore, the female voice has more vocal agility.

ANSWERS

F 1. The selection of music is influenced only by the ranges/tessituras of your singers. (1)

The psychological aspects of the adolescent are also of primary importance in music selection.

F 2. The use of SSA music is ineffective with a mixed junior high group. (41)

A mixed junior high choir which contains young male singers could use SSA music effectively. The ranges of the stage 1 and 2 singers will readily adapt to the SSA arrangement.

T 3. Treble singers should occasionally switch vocal parts. (5)

Switching vocal parts enables both high and low treble voices to maintain agility in their high and low ranges. It also gives the high treble singer an opportunity to sing a harmony part and the low treble a melody part.

T 4. Maturation of the primary sex organs directly relates to voice change. (3)

This is the determinate of voice change.

F 5. During the High Mutation stage, the study of resonance should be included in vocal instruction. (44)

The study of resonance should be postponed until the singer is well into the Post-Mutation stage.

T 6. The peak of male vocal mutation generally occurs between the approximate ages of 13-14. (41)

This is the peak of psycho-physiological change.

F 7. The Early Mutation stage for male singers is easily detectable. (40)

The vocal quality is so similar to the Premutation stage that detection is sometimes difficult.

F 4. Foreign language song texts should not be used in junior high choruses. (22)

Foreign language releases the instructor from regional dialect, accent, and slang. Junior high singers seem to enjoy the challenge of a foreign language text. In addition, the use of such text broadens the students' experience.

T 5. Unison, SA, and SSA music may be used effectively in 7th grade. (34, 35, 41)

The ranges of the 7th grader will generally be that of the unison, SA, or SSA arrangements. Most male 7th graders are only in the early stages of voice mutation.

T 6. It is best to keep the male singer within the male group even if he is singing the soprano or alto vocal part. (44)

This is very important. By placing the stage 1 and 2 singers on the ends of the male section next to the Treble 1 and Treble 2 sections, the boy may be seated in the male section, sing his appropriate vocal part, and still be one of the guys!

F 7. Because of his changing voice, the stage 3 singer should seldom be given a vocal part that contains a melody. (4)

Short melodic parts are feasible for the stage 3 singer if they are within his vocal range. The changing voice enjoys an occasional melody.

F 8. The use of quality music should be abandoned for appropriate vocal ranges. (1)

Never. Ranges are not the only qualifier of music selection.

T 8. The "whistle" register is located above the falsetto. (42)

This register has a "hooty" quality which may be characterized as thin and squeaky.

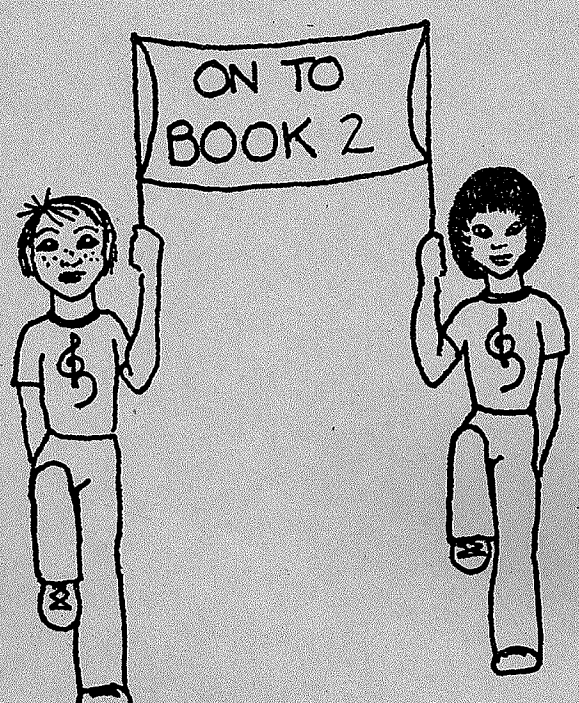
F 9. Baritone quality becomes evident during the High Mutation stage. (43)

Baritone quality becomes evident in the Transitional stage. This indicates that the male voice is moving toward Post-Mutation.

T 10. All adolescent female voices should be treated as treble voices. (25)

The term "treble" is used to avoid the comparison of immature soprano and alto tone qualities and ranges with their adult counterparts.

IF YOU HAVE ANSWERED ALL QUESTIONS CORRECTLY, PROCEED TO THE NEXT BOOKLET. PLEASE CHECK ANY INCORRECT ANSWERS BY REFERRING TO THE BOOKLET PAGES INDICATED IN THE ANSWER SHEET.



T 9. The baritone range of an SAB composition will determine the suitability of this piece for use with your group. (41)

The ranges of the changing voices will have to accommodate the range of the baritone part. If the baritone part is too high, the stage 4 singer will experience vocal strain. If the baritone part is too low, the stage 3 singer will never reach the lower notes.

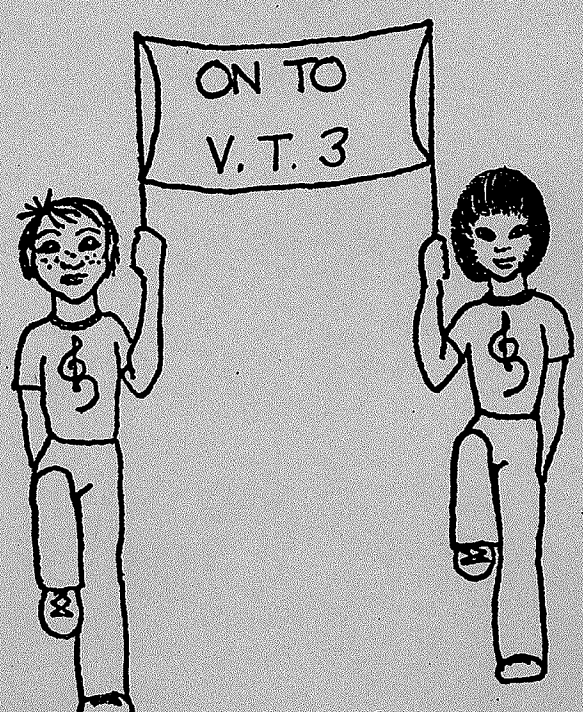
T 10. Publishers are becoming concerned with the changing voice phenomena. (43)

Fortunately this is true. We must continue to insist on new music to accommodate the junior high singer.

FOOTNOTE

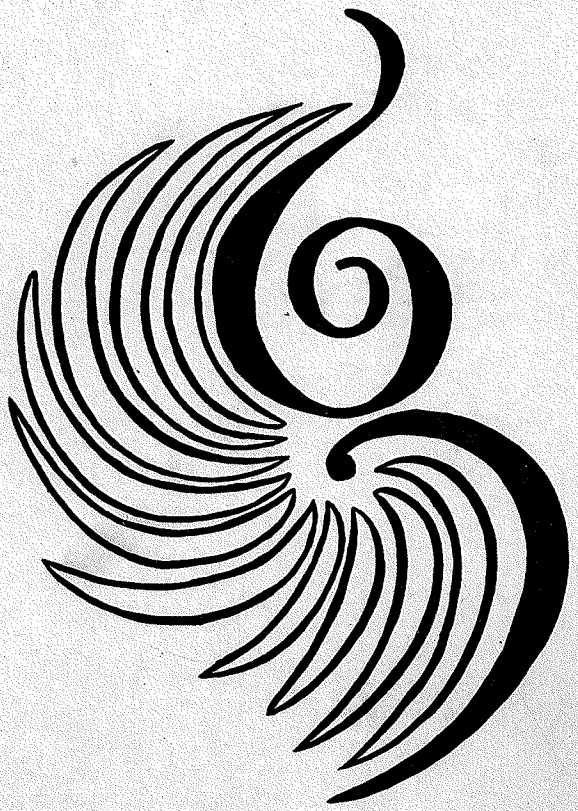
[1]The writers wish to express special appreciation to John Cooksey, Professor of Music Education at California State University, Fullerton, for his range/tessitura guidelines used to develop our stages of vocal mutation.

PLEASE CHECK ANY INCORRECT ANSWERS BY REFERRING TO THE BOOKLET PAGES INDICATED IN THE ANSWER SHEET. IF YOU HAVE ANSWERED ALL QUESTIONS CORRECTLY, PROCEED TO VIDEOTAPE 3. AFTER VIEWING V.T.-3, PROCEED TO THE NEXT BOOKLET.



2

Ranges of the Adolescent Changing Voice



University of Wisconsin - Madison
School of Music and Department of Curriculum & Instruction

4

Methods for Adolescent Voice Instruction

University of Wisconsin - Madison
School of Music and Department of Curriculum & Instruction

Instructional Module On The

Changing Voice

Instructional Booklet 2

RANGES OF THE

ADOLESCENT CHANGING

VOICE

Anthony L. Barresi, Project Director

Mona Goetsch, Assistant Project Director

Jeanne Raemisch, Editor

Trudy Woods, Project Assistant

Debbie Tompkins, Graphics

Instructional Module On The

Changing Voice

Instructional Booklet 4

METHODS FOR

ADOLESCENT VOICE

INSTRUCTION

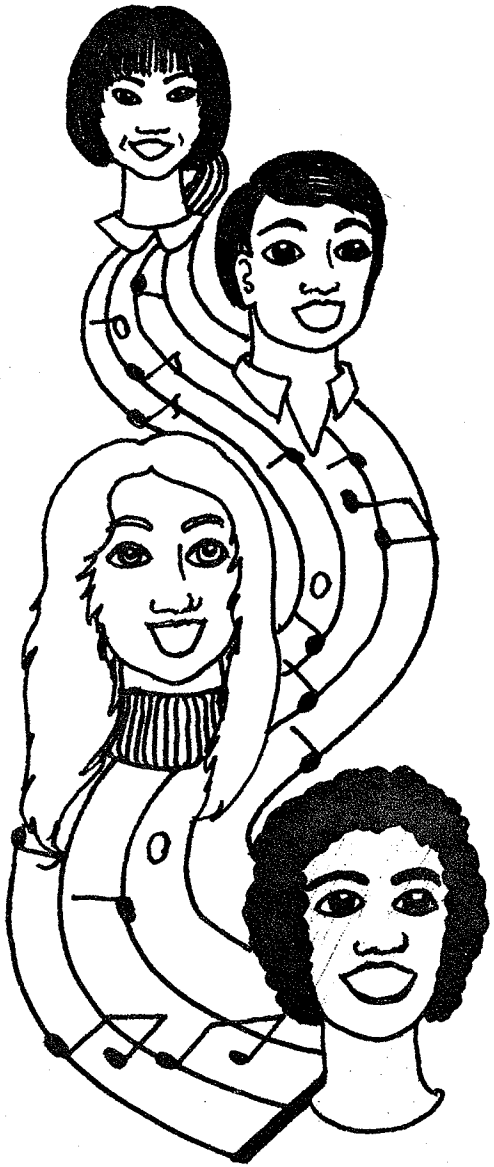
Anthony L. Barresi, Project Director

Mona Goetsch, Assistant Project Director

Jeanne Raemisch, Editor

Trudy Woods, Project Assistant

Debbie Tompkins, Graphics



The voice of the adolescent singer is one of wide variability in range, tessitura, and quality. The female voice frequently develops a lower vocal range as the vocal cords lengthen and thicken. The male voice proceeds through stages of vocal mutation as described in our previous booklets. The challenge, then, becomes one of developing techniques and methodologies to train the adolescent voice through each mutational stage. These approaches should be based upon knowledge of the physiological changes which affect vocal mutation, psychological characteristics of the adolescent, and correct breathing and accurate vowel formation.

The five developmental stages of voice mutation discussed in Book I offer a point of reference for determining the range and tessitura of the adolescent voice. Vocal ranges of singers experiencing mutation should correspond approximately with those to be presented. Each stage of development is classified by range and tessitura. Range refers to the entire compass of pitches sung in the normal register of the voice (not falsetto or whistle register). Tessitura is that part of the singer's range in which the voice sounds best and functions with ease. Memorize each range/tessitura as you encounter it in this booklet.

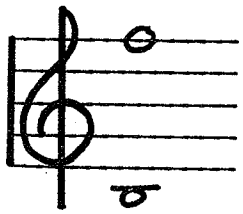
The first step to the development of suitable teaching methodologies is the identification of common vocal problems experienced by young singers. The following material identifies the vocal problems and provides information for the aural/visual detection of these problems.

Because singing is an integrated process, many of the problems cited may have similar aural/visual detectors.

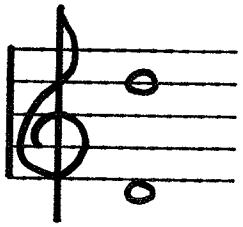
PROBLEM	AURAL/VISUAL DETECTORS
1) Poor Tone Quality	poor posture closed mouth with little lip movement breathy tone lack of energized sound in the tone facial and neck tension
2) Poor Diction	indistinct pronunciation indistinct initial and final consonants closed mouth with little lip movement tight jaw

FEMALE RANGE/TESSITURA

Girl High Treble



RANGE



TESSITURA

This range is characteristic of the high treble adolescent female voice, which will remain generally in this range throughout adolescence. The quality of the voice tends to be thin and breathy.

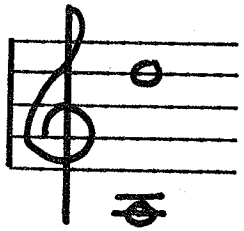
(See videotape 2 - Mary)

AFTER VIEWING V.T. 2 - MARY, GO TO PAGE 3.

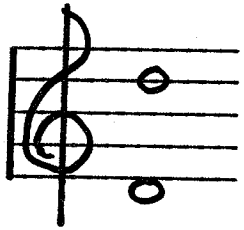
3)	Poor Phrasing	"gulping" breath, shallow, quick breaths high chest breathing poor posture problems of breath management thereby affecting the ability to shape the vocal line raised shoulders when taking a breath
4)	Poor Intonation	usual tendency to underpitched singing poor posture closed mouth with little lip movement tight, jutting jaw lack of energized sound in the tone
5)	Limited Range	intonation problems at the extremes of the range change of vocal quality at extremes of the vocal range tension in the facial and neck areas

FEMALE RANGE/TESSITURA

Girl Low Treble



RANGE



TESSITURA

As the vocal cords thicken and lengthen, a fuller quality frequently develops in the lower range of the voice. Remember, the vocal teacher must be careful not to force the newly acquired power of the lower range into the upper range.

(See videotape 2 - Jessica)

AFTER VIEWING V.T. 2 - JESSICA, GO TO PAGE 4.

6)	Limited Resonance (limited until the later stages of the singers' vocal development)	lack of fullness in the vocal tone breathy tone quality
7)	Limited Dynamic Range	inability to produce extreme dynamic variation (pp,ff)
8)	Poor Phonational Articulation	"sluggishness" in movement of the vocal line inability to coordinate quick melodic patterns
9)	Closed Throat	closed mouth with little lip movement tight, forced tone tension in the facial and neck areas
10)	Tight Jaw	jutting jaw, especially on higher pitches tension in the facial and neck areas raised chin

QUESTIONS

Tessitura is

a. the best part of a singer's range.

b. the highest pitch of the range.

c. a Russian novel.

d. the vibration of the vocal cords.

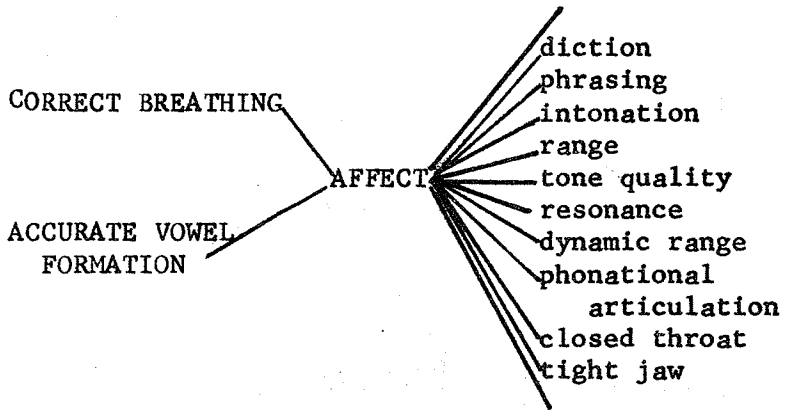
If you have chosen (a) turn to page 5.

If you have chosen (b) turn to page 6.

If you have chosen (c) turn to page 7.

If you have chosen (d) turn to page 8.

All of these problems may be helped through two basic techniques - correct breathing and accurate vowel formation. Correct breathing implies the effective employment of the breathing mechanism for proper vocal production. Accurate vowel formation implies the correct shaping of the vocal resonators which contribute to vowel production.



a. You're correct. Tessitura is that part of the range in which the voice sounds best and functions with ease. Proceed to page 9.

QUESTION

Jill, an adolescent singer, sang a solo in the local contest. Though she was very nervous before an audience, she sang her solo well. However, there were a few vocal problems which lessened the quality of her performance. Throughout the solo she exhibited vocal tone which was "unenergized" in quality. Lack of breath at the ends of phrases and tension in the jaw area were also apparent.

From this description, identify the vocal problems experienced by Jill, and select suitable corresponding solutions.

b. Sorry. The highest note of the range is not the tessitura. Return to page 1 to reinforce this concept, and then try the question again.

Problem	Solution
1. poor intonation	5. work with breathing
2. limited dynamics	6. have her smile
3. poor phrasing	7. have her vocalize loudly and softly
4. limited resonance	8. work with vowel formation

a. 1, 3, 5, 8

b. 1, 2, 6, 7

c. 2, 3, 7, 8

d. 3, 4, 5, 6

If you have chosen (a) turn to page 8.

If you have chosen (b) turn to page 9.

If you have chosen (c) turn to page 10.

If you have chosen (d) turn to page 11.

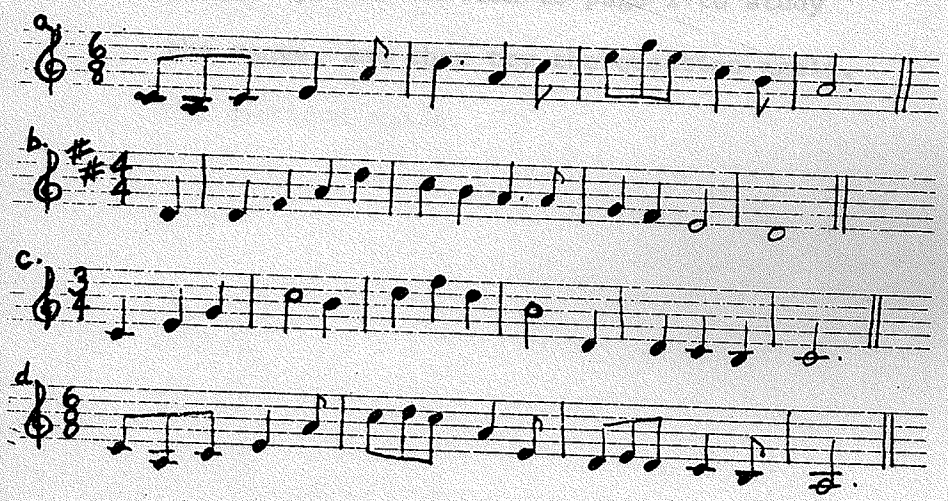
c. **Nyet! Return to page 1 to reinforce the concept, and then try the question again.**

a. You are correct. The vocal problems are poor intonation and poor phrasing. By working for correct breathing, sufficient breath supply will be available for phrase completion. Emphasis on accurate vowel formation will tend to open the mouth and free the jaw so that better singing will result. Proceed to page 12.

d. Vibration of the cords is not the tessitura. Return to page 1 to reinforce this concept, and then try the question again.

b. No. You have selected poor intonation and limited dynamics as the vocal problems. Though you are correct in one selection, neither problem may be solved through smiling or dynamic variation. Return to pages 2-5, and then try the question again.

The following melody which best fits the range of the girl high treble is:



If you have chosen (a) turn to page 10.

If you have chosen (b) turn to page 11.

If you have chosen (c) turn to page 12.

If you have chosen (d) turn to page 13.

c. Your selection of limited dynamics and poor phrasing as the problems is partially correct. However, neither solution is completely applicable to the problems identified. Return to pages 2-5 to reinforce this concept, and then try the question again.

a. No. This melody uses the range of an adult mezzo-soprano. Return to page 2 to study the range, and then try the question again.

d. Your selection of poor phrasing and limited resonance as the problems is partially correct. Though poor phrasing may be helped by effective breathing techniques, direct teaching toward resonant vowel production should be deferred until the resonators are fully developed. Return to pages 2-5 to reinforce this concept, and then try the question again.

b. This melody uses the tessitura of the high treble female voice. Return to page 2 to study the range, and then try the question again.

Good posture is essential for good breathing. In order to maintain an erect but non-tense posture, the student should be encouraged to stand straight, with head erect, while maintaining a high, relaxed chest. The head, neck, and spine should be aligned, the pelvis tipped forward, and the body weight evenly distributed on the balls of the feet.

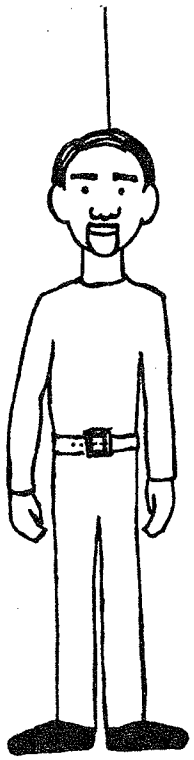
The following exercises have been effectively used to teach the concept of posture.

EXERCISES FOR GOOD POSTURE:

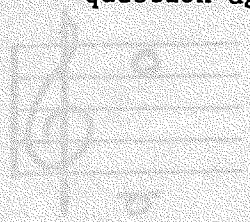
1. For: good posture -
   a) Extend the arms over the head.
   b) Slowly lower the arms to the sides of the body, keeping the chest high.

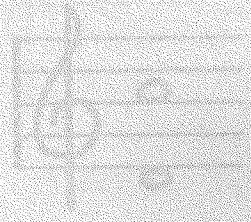
c. You are correct. This melody uses the range of the female high treble voice. This range may lower upon the lengthening and thickening of the vocal cords. Proceed to page 14.

2. For: good posture -
   a) Teacher stands beside the student, instructing him/her to imagine that a string is attached to the top of the head.
   b) Teacher pulls the imagined string upward, causing the student to adopt an erect position.
   c) Teacher releases the imagined string while encouraging the student to maintain the established posture.



d. This melody uses the range of the female low treble voice. Return to pages 2-3 to study the ranges, and then try the question again.





The process of breathing occurs by the contraction and relaxation of the diaphragm, intercostal, and abdominal muscles.

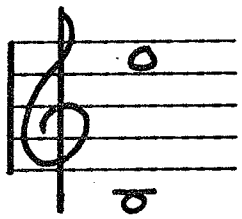
The diaphragm is a large dome-shaped muscle which separates the thorax (chest cavity), containing the heart and lungs, from the abdomenal area.

The process of inhalation may be described as follows:

When the diaphragm contracts, a void is formed in the thorax (chest cavity). The pressure in this void is less than the atmospheric pressure. The lungs passively expand as air flows in from outside the body, thus equalizing the internal and external pressures.

MALE RANGE/TESSITURA

Stage 1---Pre-Mutation



RANGE

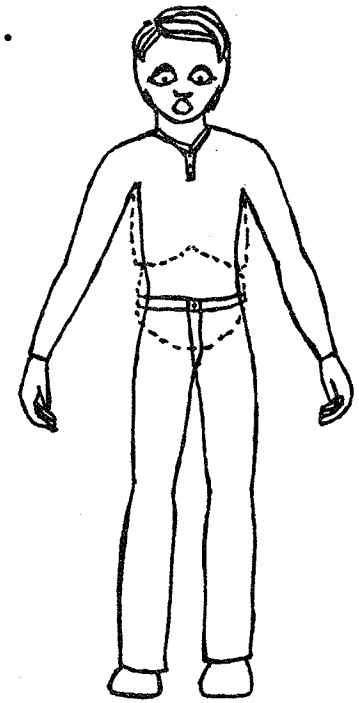
TESSITURA

The boy unchanged voice (boy soprano), possesses a brilliant, full-sounding singing voice. This vocal quality and accompanying range occurs previous to the onset of vocal mutation and may exist from one to two years, usually extending into the seventh grade.

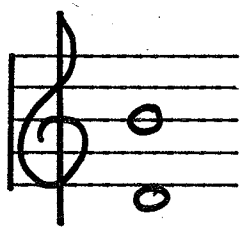
(See videotape 2 - Jim)

AFTER VIEWING V.T. 2 - JIM, GO TO PAGE 15.

The exterior intercostal muscles (rib muscles) are signaled by the breathing center of the brain to pull the rib cage sideways and the sternum (breastbone) forward. This action greatly increases the volume of the lungs. When the diaphragm contracts, it descends into the abdominal area, causing the abdominal muscles to stretch.



Stage 2---Early Mutation

RANGE

TESSITURA

This range is usually classified as the boy alto. The majority of male singers reach this stage during seventh or early eighth grade. Early mutation is difficult to detect because no extreme change has occurred in the singing range, quality, or the speaking voice. The length of this vocal mutation stage extends from three to nine months, and may be regarded as the transitional stage to High Mutation.

(See videotape 2 - David)

AFTER VIEWING V.T. 2 - DAVID, GO TO PAGE 16.

Exhalation is initiated with the contraction of the abdominal muscles and relaxation of the diaphragm. The abdominal organs lift the diaphragm wall upward into the thorax, forcing air out of the lungs. Simultaneously the interior intercostal muscles are signaled by the brain to move the rib cage back into its original position, thus reducing the lungs' volume. The process ceases when the diaphragm is completely relaxed (original dome-shaped position).

Breath control or breath management is the artifical prolongation of exhalation. As the abdominal muscles contract, the diaphragm slightly resists this contraction resulting in a controlled steady air flow. Primarily, this process involves an interaction between the diaphragm and the abdominal muscles. The degree to which this interaction occurs dictates the rate of air flow.

When visible signs of vocal discomfort in the higher range occur in the boy alto (stage 2), the singer is probably entering the High Mutation period (stage 3).

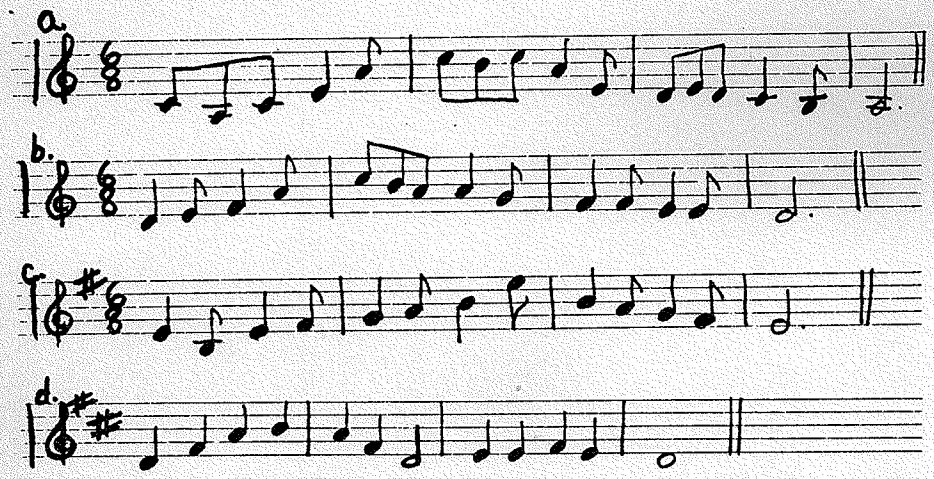
Therefore, effective teaching of the complete breathing process will help to facilitate breath management, thereby aiding in the natural development of the singing voice.

Since breath management or control is a basic tenet of good singing, an understanding of the complete breathing process is essential. The ability of the singer to manage the breath increases with physical and vocal maturation.

In order to teach the breathing process, the teacher must:

1) Have a practical understanding of the physiological function of the breathing mechanism.
2) Explain to the student, in simple terms, this physiological process.
3) Develop approaches whereby the student may consciously sense the physical workings of the breathing mechanism.

QUESTIONS

The following melody which best fits the range of the unchanged boy's voice (stage 1) is:

If you have chosen (a) turn to page 18.

If you have chosen (b) turn to page 19.

If you have chosen (c) turn to page 20.

If you have chosen (d) turn to page 21.

The following exercises have been effectively used to teach correct breathing techniques.

EXERCISES TO DEVELOP CORRECT BREATHING TECHNIQUES:

1. For: full intake of air -
   a) Exhale completely drawing the abdominal muscles toward the backbone.
   b) Inhale deeply, returning the abdominal muscles to their original position.

2. For: self-monitoring of expansion in the abdominal-waist area -
   a) Exhale completely as in Exercise 1.
   b) Place the hands tightly in the muscular area above the hips.
   c) Inhale, feeling the muscular expansion in this area.
   d) Repeat the exhalation process.

3. For: freedom of air flow -
   a) Repeat Exercise 1.
   b) On "ss", release air for 10 steady counts.

a. Sorry. This melody uses the range of the boy alto - stage 2. Return to pages 14-15 to study the ranges, and then try the question again.

4. For: general controlled breathing -
   a) Place the hands on the waist, partially on the lower ribs. Exhale.
   b) Inhale for 5 (7) (10) counts.
   c) Hold for 5 (7) (10) counts.
   d) Exhale on a whistle or sing for 5 (7) (10) counts.
      Feel the abdominal and intercostal muscles' effect on exhalation. Have students try to sense the resistance of the diaphragm against abdominal action.

Additional exercises and approaches involved with breathing may be designed by the teacher to meet the particular needs of students.

b. You're almost correct. This melody uses the tessitura of the unchanged boy's voice. Return to page 14 to study the range, and then try the question again.

QUESTIONS

Why should a knowledge of the breathing process and mechanism affect the teaching of breath management?

a. Because this knowledge will help in the development of appropriate instructional techniques.

b. Because maturation of the breathing mechanism leads to the natural development of effective breath management.

c. Because the teacher realizes that inhalation is breath management.

d. Because the teacher understands that the accomplishment of breath management can only be achieved by adults.

If you have chosen (a) turn to page 21.

If you have chosen (b) turn to page 22.

If you have chosen (c) turn to page 23.

If you have chosen (d) turn to page 24.

c. You're right. This melody uses the range of the unchanged boy's voice - stage 1. Proceed to page 22.

a. You are correct. By knowing and understanding the breathing process and mechanism, the teacher may design approaches which allow the singer to experience the appropriate physical sensations of breath management. Proceed to page 25.

d. Sorry. This melody uses the tessitura of the boy alto - stage 2. Return to pages 14-15 to study the ranges, and then try the question again.

b. You are incorrect. Mere maturation does not insure the development of effective breath management. Return to page 17 to reinforce the concept, and then try the question again.

The vocal ranges of the unchanged boy soprano - stage 1 and the boy alto - stage 2:

a. are the same in tessitura.

b. differ in that the lower part of the boy alto range extends downward by a third.

c. are different in that the higher part of the boy soprano range extends upward by a third.

d. are indicated by differences in the speaking voice.

If you have chosen (a) turn to page 23.

If you have chosen (b) turn to page 24.

If you have chosen (c) turn to page 25.

If you have chosen (d) turn to page 26.

c. You are incorrect. Return to page 16 to review the definition of breath management, and then try the question again.

a. You are incorrect. There is a difference in range and tessitura. The difficulty in detecting differences is caused by the subtlety of the vocal change. Return to page 14 and 15 to reinforce this concept, and then try the question again.

d. You are incorrect. Breath management is a physiological process which is not restricted to adults only. Adolescents can learn the technique well, although its development will likely be enhanced by maturation. Return to page 17 to reinforce this concept, and then try the question again.

b. There is a difference, but not in the lower part of the range. Return to pages 14 and 15 to reinforce this concept, and then try the question again.

After correct posture has been established, one should initiate correct breathing techniques in a "breath exercise for full intake of air" by:

a. inhaling.

b. exhaling.

c. holding the breath.

d. expanding the exterior intercostal muscles.

If you have chosen (a) turn to page 26.

If you have chosen (b) turn to page 27.

If you have chosen (c) turn to page 28.

If you have chosen (d) turn to page 29.

c. You are correct. The difference occurs in the high part of the range. The boy soprano range is approximately a third higher than that of the boy alto.

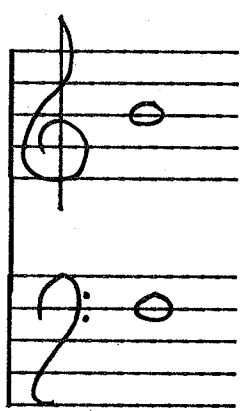
Proceed to page 27.

a. Unfortunately this is what many teachers ask their students to do first. We feel that this procedure often causes the student to pull in the stomach area during inhalation. Return to page 18 to reinforce this concept, and then try the question again.

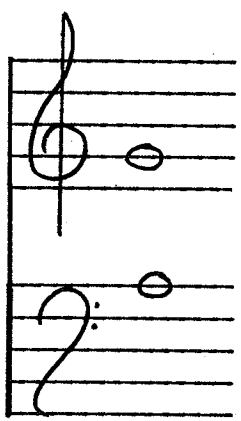
d. No. The speaking voice has not changed. Return to pages 14 and 15, and then try the question again.

b. This is correct. By exhaling first, the singer, upon inhalation, is likely to expand the rib cage and abdominal muscles. Proceed to page 30.

Stage 3---High Mutation



RANGE



TESSITURA

This is the height of pubertal change. This voice may be labeled in many ways, including "alto-tenor", "cambiata", or "changing". It seems to possess a distinct quality between alto and baritone. The first occurrence of register differentiation develops with the emergence of the falsetto register. The majority of males in this

c. Holding the breath momentarily stops inhalation and exhalation. This does not initiate correct breathing techniques. Return to page 18, and then try the question again.

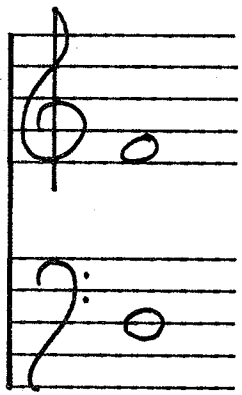
stage are found in the eighth grade. The High Mutation stage can last from three to twelve months. It is a crucial time for choral part assignment because the alto part becomes too high and the tenor part too low. Moreover, the singer is unable to move freely from high to low tones with accuracy. Individual testing at frequent intervals is necessary to accomodate the best assignment of each voice.

(See videotape 2 - Lee)

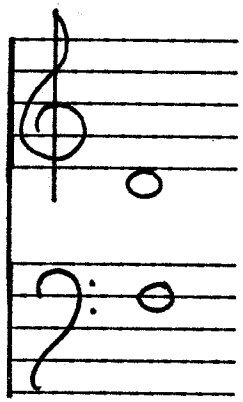
AFTER VIEWING V.T. 2 - LEE, GO TO PAGE 29.

d. The expansion of the exterior intercostal muscles is involved in the process of inhalation. We believe that exhalation should be the initial step in the exercise for the full intake of air. Return to page 18, and then try the question again.

Stage 3A---Transitional Mutation



RANGE



TESSITURA

We have classified this stage as 3A instead of classifying it as stage 4 because the brief duration of this stage makes it difficult to detect. This is a quick transitional stage to the newly changed baritone voice.

We believe that the teaching of accurate vowel formation is beneficial to the teacher and student because it:

a. frees the jaw, tongue, and throat of the student.

b. encourages the student to concentrate on the vowel sounds.

c. gives uniformity of vowel production, which is especially useful in choral blend.

d. aids the continued development of resonance. However, direct resonance training should not occur until there is stability in the growth of the phonation and resonator areas of the singer.

e. provides a basis for careful execution of diction and tone production.

f. provides the teacher with a method for visually monitoring the vowel formation of the singer.

It usually occurs in the spring of the eighth grade and may last from a few weeks to a month. A baritone quality is audible in the lower singing range. The high notes of the range are reached with strain---look for throat tightening.

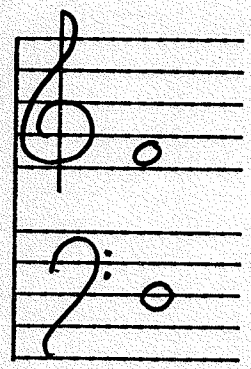
(See videotape 2 - Rick)

AFTER VIEWING V.T. 2 - RICK, GO TO PAGE 31.

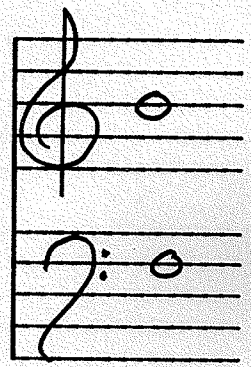
The five basic vowels (ah, ay, ee, oh, oo) will be used in our booklets. We have chosen only these vowels in order that their mastery can be easily learned and remembered by the student. The use of the mouth shapes for these vowels (left-hand column, page 33), combined with the tone produced, will aid the student and teacher to more effectively monitor accurate vowel formation. Modification of these vowels may occur to accommodate the English language.

QUESTIONS

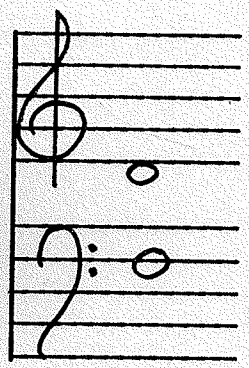
The range of the adolescent male during the High Mutation stage is:



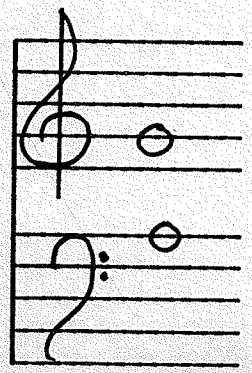
a.



b.

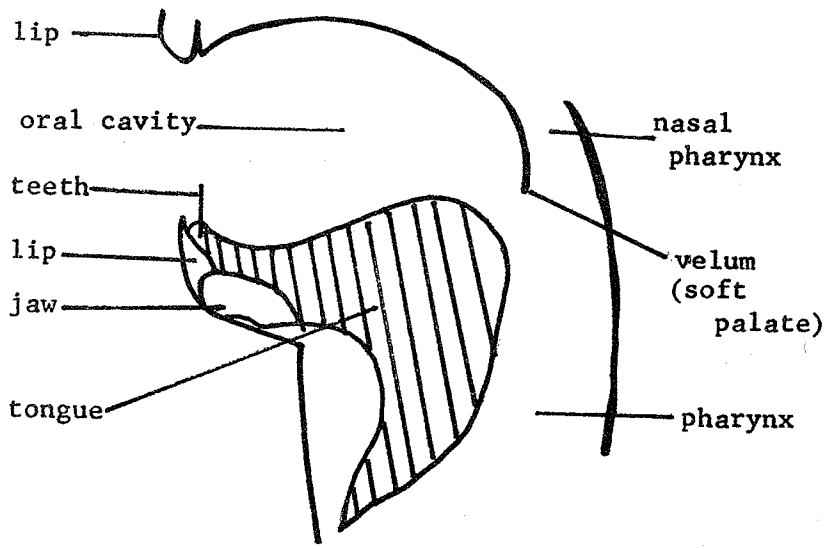


c.



d.

THROAT/MOUTH STRUCTURE



SIDE VIEW

If you have chosen (a) turn to page 33.

If you have chosen (b) turn to page 34.

If you have chosen (c) turn to page 35.

If you have chosen (d) turn to page 36.

VOWEL MOUTH SHAPES

Front view	Side view	Comments
AH (a)		Open throat (slight yawn), dropped jaw. Flattened, relaxed tongue. Balanced pharyngeal, nasal, and mouth resonance.
AY (e)		Open throat, medium mouth opening. Slightly raised tongue (in back). Raised tongue causes a bit more nasal resonance on this vowel. Slightly smiled mouth shape.
EE (i)		Open throat, narrow mouth opening. High raised tongue (in back). Highly arched tongue blocks the oral cavity resulting in more nasal resonance on this vowel. Lateral, slightly smiled lip shape.

a. This is the range of the Transitional Mutation stage 3A. Return to page 27, and then try the question again.

Front view	Side view	Comments
OH (o)		Open throat, medium mouth opening. Flattened tongue. "O" shaped lips. Lowered tongue and access to the mouth encourage pharyngeal and oral resonances.
OO (u)		Open throat, slightly lowered jaw. Flattened tongue. Puckered (whistle-like) lip shape. Lowered tongue and narrow mouth shape encourage emphasis on pharyngeal and oral resonances.

b. Bravo! This is the range of the High Mutational stage 3. Proceed to page 37.

The following exercises are provided to develop accurate vowel formation.

EXERCISES FOR VOWEL FORMATION:

1. For: developing consciousness of mouth formation -
   a) Place tip of tongue lightly against the lower teeth.
   b) Speak the vowel sounds in a sustained manner, exaggerating the mouth shapes.
   c) Move smoothly from one vowel to another so that the student senses the mouth changes.

2. For: free jaw movement -
   a) Sing Nah Nay Nee Noh Noo on one tone, moving from one vowel to another in a connected manner.
   b) The "N" consonant gives the vowel point and encourages natural resonance.

3. For: consistency in tone from bright to dark vowels -
   a) On one pitch, medium range, sing: Nee-ay-ah-oh-oo.
   b) Try to keep the illusion of brightness in the dark vowels and depth in the bright vowels.

c. This is the tessitura of the Transitional Mutation stage 3A. Return to page 27, and then try the question again.

4. For: Freedom in vowel formation and continuity throughout the range -
   a) Sing a 5-note descending pattern on Nee Nay Nah Noh Noo. Do not crescendo to the low tone. (Nee Nay Nah Noh Noo; 5-4-3-2-1)

5. For: Natural resonance -
   a) Use bright vowels ee, ay.
   b) Use a slight yawn to open the throat.*
   c) Sing a 5-note ascending pattern, in the medium range, alternating the vowel-consonant combinations Nee and Nay. (Nee Nay Nee Nay Nee; 1-2-3-4-5)

6. For: Choral blend (vowel continuity) -
   a) Have the choir sing vowel sounds on a chord.
   b) Listen closely, match vowels, and sing in tune.
   c) Students should look at one another to visually reinforce the vowel mouth shapes.

Additional exercises may be designed using these ideas as a basis.

*While singing all vowel sounds, the student should be encouraged to maintain a slight yawn so that the throat and tongue will remain relaxed and resonance natural to these vowels may result.

d. Sorry. This narrow interval is the tessitura of the adolescent male during High Mutation. Return to page 27, and then try the question again.

QUESTIONS

Which vocal problem can be most readily solved by accurate vowel formation?

a. dynamics

b. range

c. diction

d. tight jaw

If you have chosen (a) turn to page 38.

If you have chosen (b) turn to page 39.

If you have chosen (c) turn to page 40.

If you have chosen (d) turn to page 41.

Which statement is false?

The range of the Transitional Mutational stage:

a. is lowering to the new baritone range.

b. contains a newly changed baritone quality in it's lower register.

c. is difficult to detect.

d. is the only range where vocal strain becomes an indicator of transition to a new stage of vocal mutation.

If you have chosen (a) turn to page 38.

If you have chosen (b) turn to page 39.

If you have chosen (c) turn to page 40.

If you have chosen (d) turn to page 41.

a. The achievement of dynamics is most directly affected by the rate of air flow accomplished during the breathing process. Return to page 37 and then try the question again.

a. The range of the Transitional stage lowers to the range of the Post-Mutational stage. Return to pages 29 and 30, and then try the question again.

b. Though the singing of certain vowels (ah,oh) in the extremities of the range help in range extension, the singer's range is determined by his/her stage of vocal maturation. Return to page 37 and then try the question again.

b. The Transitional stage range does contain a baritone quality. Return to pages 29 and 30, and then try the question again.

c. Diction would be directly affected by vowel formation. There is another correct answer. Can you find it? Return to page 37 to review the question. After you have found the other correct answer, proceed to page 42.

c. This stage <u>is</u> difficult to detect. Return to pages 29 and 30, and then try the question again.

d. The tight jaw would be directly affected by vowel formation. There is another correct answer. Can you find it? Return to page 37 to review the question again. After you have found the other correct answer, proceed to page 42.

d. This statement is false. The Early Mutation stage also has vocal strain as being an indicator of transition to the High Mutation stage. Proceed to page 42.

The "oo" vowel:

a. balances the resonance among the mouth, nasal, and pharyngeal cavities.

b. is formed with puckered lips.

c. is a slightly smiled mouth shape.

d. causes the tongue to rise in formation.

If you have chosen (a) turn to page 43.

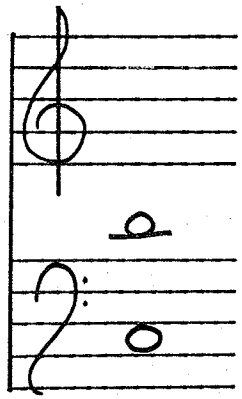
If you have chosen (b) turn to page 44.

If you have chosen (c) turn to page 45.

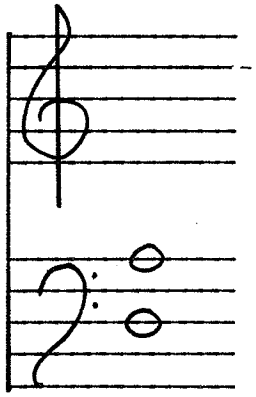
If you have chosen (d) turn to page 46.

THE ENTIRE PROCESS OF VOCAL MUTATION FROM EARLY MUTATION (STAGE 2) THROUGH TRANSITIONAL MUTATION (STAGE 3A) LASTS APPROXIMATELY FOURTEEN MONTHS.

Stage 4---Postmutational Period (New Baritone)



RANGE



TESSITURA

This "settling" period often begins near the end of the eighth grade or early ninth grade and extends to the tenth or eleventh grade.

a. When singing the "oo" vowel, resonance is located primarily in the pharyngeal and oral cavities. Return to page 34, and then try the question again.

Power and intensity in the lower range of the voice increase with maturation. The quality of the voice is that of a light mid-baritone. From the new baritone stage will emerge adult tenors or baritones. If he is to become a tenor, the lower pitches of the range will remain constant and the upper range will ascend. A definite lift point at f above middle c will develop. The baritone will retain the high pitches of the range and the lower range will descend. A definite lift point at d above middle c will develop. Because the new baritone has an increasing capacity to sing falsetto (head voice), it would be advisable to encourage the use of that voice when singing between c-f above middle c. As the voice matures, and with careful training, the use of full voice in that range becomes possible.

b. This is correct. The lips are formed into a whistle-like shape. Proceed to page 47.

(See videotape 2 - Bruce)

AFTER VIEWING V.T. 2 - BRUCE, GO TO PAGE 45.

c. The slightly smiled mouth shape is used for the "ay" vowel. Return to pages 33-34 to reinforce this concept, and then try the question again.

QUESTIONS

From the Pre-Mutational to the Post-Mutational stage, the singing voice:

a. has dropped in pitch by about an octave.

b. has dropped in pitch by about P5.

c. has not dropped at all.

d. has dropped in pitch by about 3-4 tones.

If you have chosen (a) turn to page 46.

If you have chosen (b) turn to page 47.

If you have chosen (c) turn to page 48.

If you have chosen (d) turn to page 49.

d. The tongue is flattened in the formation of the "oo" vowel. Return to page 34 to reinforce this concept, and then try the question again.

a. You are correct. Proceed to page 50.

We have identified some adolescent vocal problems and some visual ways of detecting them. The following suggested exercises are examples of effective vocalises for the adolescent singer. Remember, range and quality will vary with each adolescent singer. We have chosen not to arrange these vocalises on the staff so that the teacher may place them within the range of the individual singers. Numbers appearing below the notation refer to pitch movement.

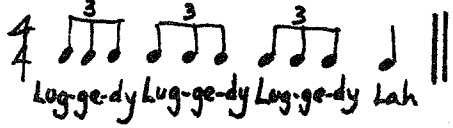
Remember, each of these exercises should be executed using good posture.

b. Sorry. The range drops much more than a P5. Return to pages 14, 15, 27, 29 and 42 to check the ranges, and then try the question again.

EXERCISES FOR VOCAL PROBLEMS

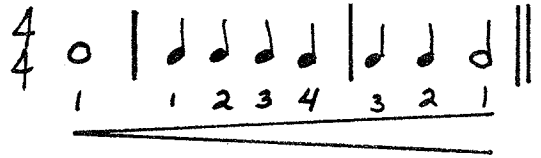
POOR TONE QUALITY:

1. For: opening the closed mouth -
   a) Sing the following words on a single pitch.



   b) The teacher should monitor the open mouth.
   c) Ascend and descend patterns by ½ steps within the range of the singer.

2. For: energizing the tone -
   a) Sing "kah" on each pitch of the following exercise:

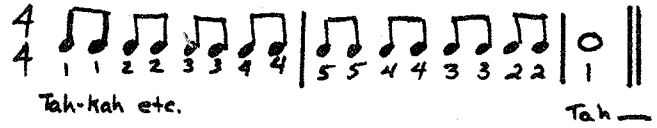


   b) Encourage connection between articulations.
   c) Work for a gradual crescendo. Secondly, perform the exercise with reverse dynamics (>).
   d) Ascend and descend by ½ steps within the range of the singer.
   e) Remember that the dynamic range of young singers is limited. Do not allow the singer to force the tone in order to achieve wide dynamic variations.

c. Wrong! The singing voice <u>has</u> dropped in pitch. Return to pages 14, 15, 27, 29 and 42, and then try the question again.

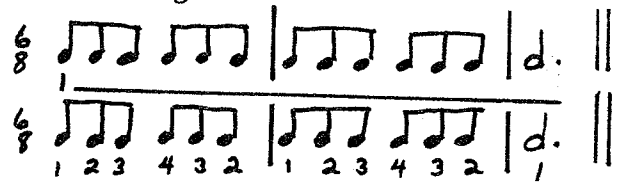
POOR DICTION:

1. For: distinct pronunciation -
   a) Sing "tah-kah" on each eighth note.



   b) The teacher should monitor the open mouth while encouraging a slight jaw movement.
   c) Use other consonants such as n, m, p, d, etc.
   d) Ascend and descend by ½ steps, within the range of the singer.

2. For: indistinct word endings -
   a) Speak in rhythm, "Diction is done with the tip of the tongue at the teeth."
   b) Sing, "Diction is done with the tip of the tongue at the teeth", on the following vocalises:

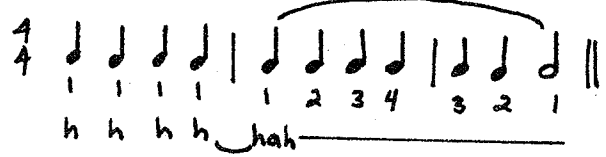


   c) Ascend and descend by ½ steps, within the range of the singer.

d. **Sorry. The range drops much more than 3-4 tones. Return to pages 14, 15, 27, 29 and 42 to reinforce this concept, and then try the question again.**

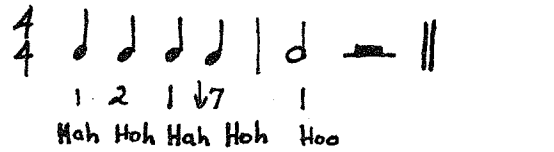
POOR PHRASING:

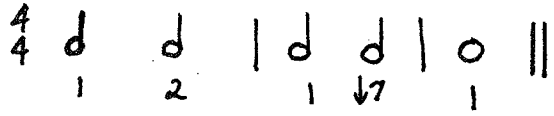
1. For: shaping the vocal line -
   a) Aspirate on "h" for four counts. Connect the "h" to "ah" and sing through the following exercise.

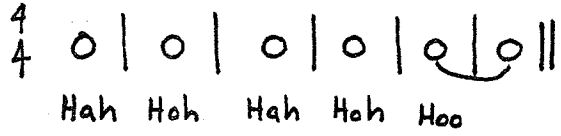


   b) The teacher should monitor a smooth connection between "h" and "ah". Make sure that the mouth is open.
   c) Ascend and descend by ½ steps, within the range of the singer.

2. For: breath extension -
   a) Sing Hah, Hoh, Hah, Hoh, Hoo as follows:







Tom had been in my junior high choir last year. As he entered the choral room to audition for this year's choir, I realized that he had grown about four inches in height, and gained 10 pounds over the summer. He was beginning to develop shoulder muscles. Upon our initial greeting I was surprised to hear a lower speaking voice. As we chatted, Tom became very embarassed when his speaking voice suddenly jumped to a high pitch!

What might I <u>anticipate</u> as his stage of vocal mutation?

a. Stage 1 - Pre-Mutation

b. Stage 2 - Early Mutation

c. Stage 3 - High Mutation

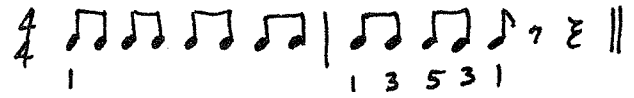
d. Stage 4 - Post-Mutation

If you have chosen (a) turn to page 51.
If you have chosen (b) turn to page 52.
If you have chosen (c) turn to page 53.
If you have chosen (d) turn to page 54.

b) Try to sing each exercise in one breath.
c) Ascend and descend by ½ steps, within the range of the singer.

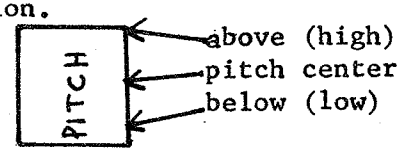
POOR INTONATION:

1. For: underpitched singing -
   a) Sing a staccato "hah" on each pitch.



   b) This exercise strengthens the arytenoid muscles within the larynx, causing these muscles to contract, thereby pulling the vocal cords together.
   c) Ascend and descend by ½ steps, within the range of the singer.

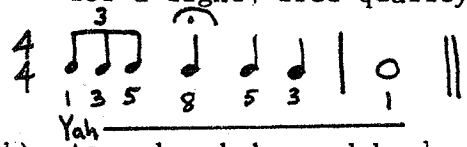
2. For: underpitched singing -
   a) Sing "ah" on a pitch in the medium range.
   b) Have the student raise the pitch slightly, then move back to the pitch center, then sing slightly below the pitch, and finally, return to the pitch center.
   c) The following diagram may help the singer to concentrate on pitch perception.



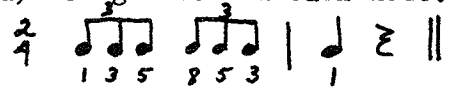
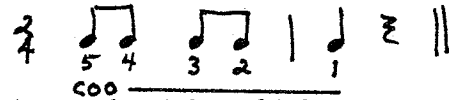
a. Stage 1 is the Pre-Mutational stage. Tom is showing definite signs of pubertal change. He has already passed through the Pre-Mutational stage. Return to page 14, and then try the question again.

LIMITED RANGE:

1. For: range extension -
   a) Sing the pattern on "yah". Don't force the high note; work for a light, free quality.



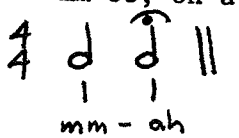
   b) Ascend and descend by ½ steps, within the range of the singer. Remember, don't go too high!

2. For: lightness in tone, range extension -
   a) Sing "coo" on each note.

   b) Sing the following exercise on "coo".

   c) Work with a light tone.
   d) Ascend and descend by ½ steps, within the range of the singer.

b. Stage 2 is the Early Mutation stage. Tom is showing definite signs of pubertal change. The changing speaking voice indicates that he is further into the mutation process than stage 2. Return to page 15, and then try the question again.

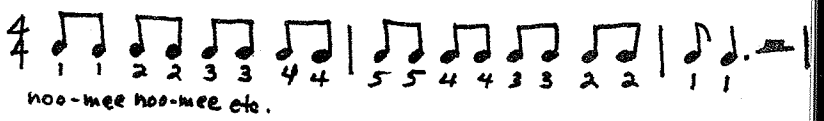
LIMITED RESONANCE:

1. For: resonance, vowel consistency -
   a) Sing mm-ah, mm-ee, mm-ay, mm-oh, mm-oo, on a single pitch.



   b) Work for the connection between "m" and the vowel.
   c) The teacher should monitor mouth shapes.
   d) Ascend and descend by ½ steps within the range of the singer.

2. For: resonance -
   a) Sing "noo-mee" on each eighth note pattern.

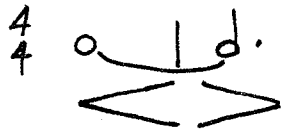


   b) Use other consonants and vowels. For example, "mah-nee" or "bah-dah".
   c) Ascend and descend by ½ steps, within the range of the singer.

c. You are correct. Stage 3 is the High Mutational stage. The muscular build, increase in height and weight, lowered speaking voice and lack of vocal manageability are characteristic of this stage. Proceed to page 55.

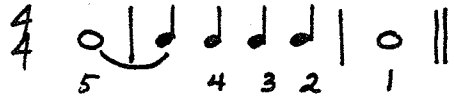
LIMITED DYNAMIC RANGE:

1. For: dynamic control -
   a) Sing "hah" on a single tone.



   b) Reverse the dynamics. (><)
   c) Ascend and descend by ½ steps, within the range of the singer.

2. For: dynamic control -
   a) Sing "nah" on a descending pattern.

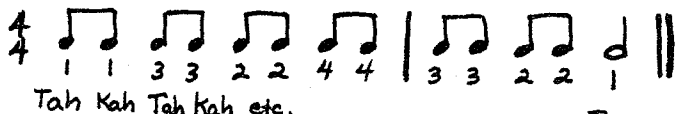


   b) Vary the dynamics within the pattern.
   c) Ascend and descend by ½ steps, within the range of the singer.

d. Tom's physiological characteristics are too "unsettled" for stage 4, the Post-Mutational stage. Return to page 42, and then try the question again.

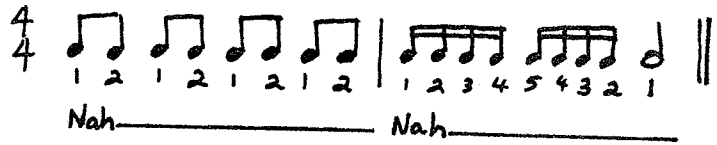
POOR PHONATIONAL ARTICULATION:

1. For: pitch agility -
   a) Sing "tah-kah" on each eighth note pattern.



   b) Ascend and descend by ½ steps, within the range of the singer.

2. For: rhythmic flexibility -
   a) Sing each measure on "nah", at a moderate tempo.



   b) Increase the tempo as the ability to articulate develops.
   c) Ascend and descend by ½ steps, within the range of the singer.

TEST

DO NOT WRITE ON THE TEST BOOKLET. ANSWER SHEETS ARE AVAILABLE AT THE CHECKOUT DESK.

Place T in the blank for true.

Place F in the blank for false.

_____ 1. The ranges and tessituras described in this booklet are related to the stages of vocal development.

_____ 2. As the range of the adolescent female lowers, the tessitura remains the same.

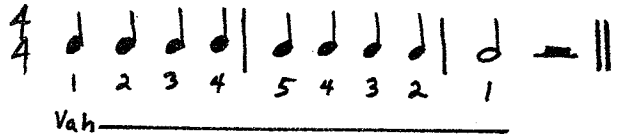
_____ 3. The Transitional stage is the height of pubertal change.

_____ 4. The entire process of vocal mutation from Early Mutation through Transitional Mutation lasts approximately fourteen months.

_____ 5. The duration of the unchanged boy's voice is three to nine months.

CLOSED THROAT:

1. For: relaxed throat -
   a) Using a light tone, sing a glissando on "oo", starting from a high pitch and moving slowly to a low pitch.
   b) Try to maintain a relaxed feeling in the throat by using a slight yawn.

2. For: closed mouth -
   a) Sing the following exercise on "vah".

   b) Keep the mouth open while maintaining a slight yawn.
   c) Ascend and descend by ½ steps, within the range of the singer.

_____ 6. The most important stages of vocal mutation are stages 1, 3 and 4.

_____ 7. Individual testing is useless in voice classification.

_____ 8. There is no drastic change in the quality of the singing voice during the Early Mutation stage.

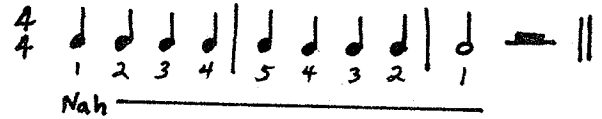
_____ 9. The Post-Mutational stage is a "settling" stage of vocal development.

_____10. The High Mutation stage lasts from approximately one to three months.

NOW CHECK YOUR ANSWERS ON PAGES 57-59.

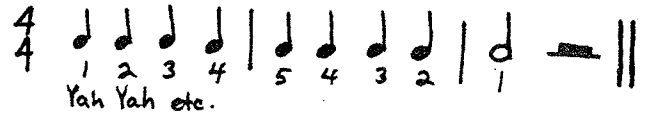
TIGHT JAW:

1. For: jutting jaw -
   a) Place the index finger lightly on the chin, and sing the following exercise on "nah".



   b) Don't let the chin rise as the pitch ascends. If the chin ascends, try lowering and relaxing the jaw as the pitch ascends.
   c) Ascend and descend by ½ steps, within the singer's range.

2. For: tight jaw -
   a) Sing the following exercise on "yah".



   b) Let the jaw move freely, in order to eliminate any tightness.
   c) Sing the exercise while slowly rotating the head in a circular motion.

ANSWERS

T 1. The ranges and tessituras described in this booklet are related to the stages of vocal development. (1)

The ranges and tessituras are highly influenced by stages of vocal development.

T 2. As the range of the adolescent female lowers, the tessitura remains the same. (2)(3)

Surprisingly, the tessitura does remain the same. This is a good reason to support the statement that all adolescent females should be classified as treble voices.

F 3. The Transitional stage (3A) is the height of pubertal change. (29)

The Transitional stage is a transition to the Post-Mutational stage. The height of pubertal change occurs during High Mutation.

If the singer is exhibiting correct breathing and accurate vowel formation techniques, but is still experiencing difficulties in articulation, tone quality, tonal accuracy, intonation, or vocal range, then his/her problems may be caused by the stage of vocal development and may improve with maturation of the vocal mechanism. Another consideration, though somewhat remote, is that the singer may be experiencing vocal dysfunction, in which case he/she should be referred to a voice therapist.

T 4. The entire process of vocal mutation from Early Mutation through Transitional Mutation lasts approximately fourteen months. (42)

This can vary with individual males, but seems to approximate the average of male voice change.

F 5. The duration of the unchanged boy's voice is three to nine months. (14)

The range of the boy soprano lasts approximately two years. Actually, this range occurs during childhood but we justify a two year period because choral voice classification usually doesn't occur before the age of 10.

T 6. The most important stages of vocal mutation are stages 1, 3 and 4. (14)(27)(42)

Stages 1, 3 and 4 are the peaks in voice mutation. Stages 2 and 3A Transitional stages to a new range and quality.

QUESTIONS

John's voice lacks brilliance and clarity of tone. At times, he lacks pitch control, and displays inaccuracy in pitch movements. He seems to display correct breathing techniques and accurate vowel production. What would you do to correct this voice?

a. Work on articulation.

b. Work on intonation.

c. Leave it alone.

d. Work on range extension.

If you have chosen (a) turn to page 60.

If you have chosen (b) turn to page 61.

If you have chosen (c) turn to page 62.

If you have chosen (d) turn to page 63.

F 7. Individual testing is useless in voice classification. (28)

Individual testing is the only effective way to classify the adolescent male voice.

T 8. There is no drastic change in the quality of the singing voice during the Early Mutation stage. (15)

This is the reason why the Early Mutation stage is difficult to detect.

T 9. The Post-Mutational stage is a "settling" stage of vocal development. (42)

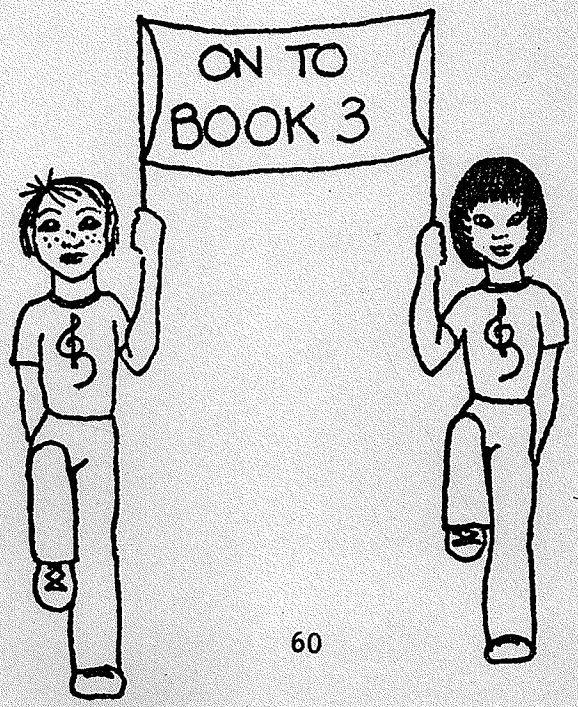
Physical and physiological changes are finally stabilizing. The voice settles into either a tenor or baritone range.

F 10. The High Mutation stage lasts from approximately one to three months. (28)

High Mutation can last from three months to one year.

a. If he is exhibiting accurate vowel production and correct breathing, the articulation problems may be due to his stage of vocal development. Return to page 58 to reinforce this concept, and then try the question again.

IF YOU HAVE ANSWERED ALL QUESTIONS CORRECTLY, PROCEED TO THE NEXT BOOKLET. PLEASE CHECK ANY INCORRECT ANWERS BY REFERRING TO THE BOOKLET PAGES INDICATED IN THE ANSWER SHEET.



b. If he is exhibiting correct breathing and accurate vowel production, the intonation problems may be due to his stage of vocal maturation. Return to page 58 to reinforce this concept, and then try the question again.

c. This is correct. If he is exhibiting correct breathing and accurate vowel production, the vocal problems which are occurring are usually due to his stage of vocal maturation and will only be eliminated through the growth of the vocal mechanism. Proceed to page 64.

d. Range extension will not solve the vocal problems. If correct breathing and accurate vowel production are evident, then the vocal problems may be due to his/her stage of vocal development. Return to page 58 to reinforce this concept, and then try the question again.

What is one vocal problem that may not be totally cured during adolescence?

a. posture

b. closed mouth

c. breathy tone

d. indistinct word endings

If you have chosen (a) turn to page 65.

If you have chosen (b) turn to page 66.

If you have chosen (c) turn to page 67.

If you have chosen (d) turn to page 68.

a. Posture can be improved with a constant reminder to stand tall. Return to pages 12-13 to reinforce this concept, and then try the question again.

b. The closed mouth can be improved by monitoring correct vowel formation. Return to pages 33-34 to reinforce this concept, and then try the question again.

c. Breathy tone may not be totally cured during adolescence. The arytenoid muscles within the larynx may not have matured enough to give full closure of the vocal cords. Proceed to page 69.

d. Indistinct word endings can be improved with the young singer. Return to page 49, and then try the question again.

HELPFUL HINTS FOR VOICE TEACHING

1. Keep the student singing lightly within his/her comfortable range.
2. Keep the student singing within a narrow dynamic range. (mp-f)
3. Work for a free, natural sound. Build your teaching from this point.
4. Breathy tone is part of the adolescent voice. Careful work with breathing and vowel formation may improve this problem.
5. Alternate teaching strategies to provide for variety and student differences. Have at least two solutions for each vocal problem.
6. Model sparingly or the adolescent will try to imitate your adult sound.

7. Become a critic of the students' vocal sounds by providing students with immediate feedback and evaluation.
8. Don't dwell on range extension.
9. Encourage movement while singing. This loosens the tightness that may occur within the throat, jaw, and the rest of the body.
10. Remember, everything won't happen in one lesson!
11. Don't tell the student everything. Only tell him/her what is necessary at that stage of vocal development.
12. When using exercises, explain their purpose to the student.

13. Work the warm-up in this order:

    1) breathing exercises

    2) long vowel exercises (ah, ay)

    3) move to the other vowels

    4) more active scalar passages

    5) highly articulated passages at a moderate tempo

14. Continue to teach correct breathing and accurate vowel formation through appropriate literature for the adolescent singer.

15. The best vocal hygiene is good vocal technique.

TEST

DO NOT WRITE ON THE TEST BOOKLET. ANSWER SHEETS ARE AVAILABLE AT THE CHECKOUT DESK.

Place T in the blank for true.

Place F in the blank for false.

_____ 1. Breath management or breath control is the result of interaction between the diaphragmatic, abdominal and intercostal muscles.

_____ 2. The diaphragm contracts during inhalation.

_____ 3. The five basic vowels are sometimes modified.

_____ 4. Correct breathing and accurate vowel formation are the remedies for adolescent vocal problems.

_____ 5. Instruction should focus on resonance during early stages of mutation.

_____ 6. Vowel mouth formations may be exaggerated during exercises.

_____ 7. Teach your students by the methods that worked for you.

_____ 8. The "oo" vowel formation has the most nasal resonance.

_____ 9. Placement of the tone should be studied during adolescence.

_____ 10. Vowel formation is the shape of the mouth for a specific vowel.

NOW CHECK YOUR ANSWERS ON PAGES 74-77.

ANSWERS

T 1. Breath management or breath control is the result of interaction between the diaphragmatic, abdominal and intercostal muscles. (16)

The interaction of these muscular areas results in breath management, a tenet of good singing.

T 2. The diaphragm contracts during inhalation. (14)

The diaphragm contracts, causing the abdominal muscles to expand as the lungs are being filled.

T 3. The five basic vowels are sometimes modified. (31)

These vowels are often modified in the singing of English and other languages.

T 4. Correct breathing and accurate vowel formation are the remedies for adolescent vocal problems. (5)

If we concentrate on the teaching of correct breathing and accurate vowel formation, we may indirectly solve many vocal problems of the adolescent.

F 5. Instruction should focus on resonance during early stages of mutation. (4)

Resonance study should be dealt with after the resonators and organs of phonation have reached a settled stage of maturation. During vocal mutation, resonance which occurs naturally in well produced vowels should be encouraged.

T 6. Vowel mouth formations may be exaggerated during exercises. (35)

This technique may cause young singers to move their mouths, lips, or tongues sufficiently when forming vowels.

F 7. Teach your students by the methods

that worked for you. (69)

This is a sad mistake. We must realize that we are dealing with a young, individual voice. The methods that were used in your voice lessons are probably more advanced in technique and suited for the adult singer. Design suitable methods for young singers. Have alternative methods for each vocal problem.

F 8. The "oo" vowel formation has the

most nasal resonance. (34)

When forming the "oo" vowel, the opening to the nasal cavity is closed. Most of the resonance for the "oo" vowel is occurring in the oral and pharyngeal cavities. Nasal resonance is limited.

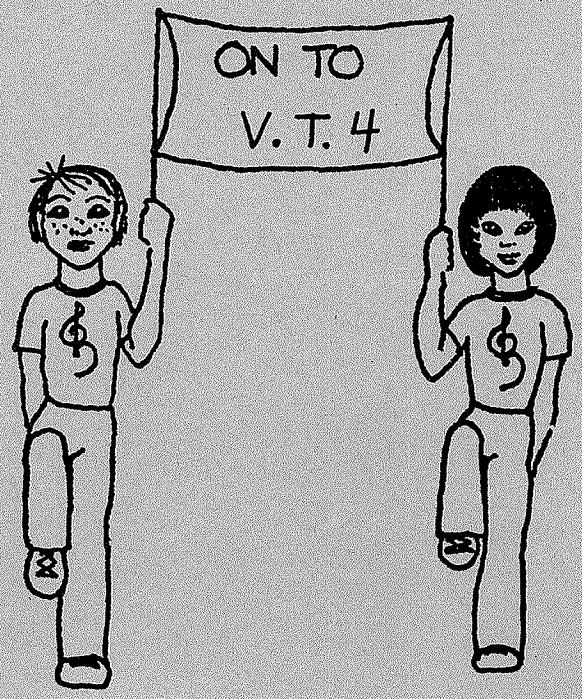
F 9. Placement of the tone should be

studied during adolescence. (4)

Tone placement is directly related to resonance. Do not pursue tone placement until the resonators and phonation organs have maturated.

F 10. Vowel formation is the shape of the mouth for a specific vowel. (30)

Vowel formation is <u>not only</u> the shape of the mouth for each specific vowel, but also includes the position and shape of the velum, tongue, lips, jaw, and throat in the formation of each vowel sound. All of these factors determine the size of each resonating cavity.

We strongly believe that the methodologies and philosophies presented in these booklets are suitable for the training of the adolescent voice. We hope that the presentation of this material has been useful in familiarizing you with the unique needs of the adolescent singer.

PLEASE CHECK ANY INCORRECT ANSWERS BY REFERRING TO THE BOOKLET PAGES INDICATED IN THE ANSWER SHEET. IF YOU HAVE ANSWERED ALL QUESTIONS CORRECTLY, PROCEED TO VIDEOTAPE 4.