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# A Comprehensive Study of the Male Voice Mutation

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Running Head: A COMPREHENSIVE STUDY OF THE MALE VOICE MUTATION

A Comprehensive Study of the Male Voice Mutation

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Senior Honors Project in Music

The University of Akron

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### Abstract

This research project is a comprehensive study of the male voice mutation. The beginning of the document will provide a brief history of the approach to the male voice mutation dating back to the ancient Greek and Roman times. Information and pedagogical middle school classroom application of the contemporary voice mutation theories by Duncan McKenzie, Irvin Cooper, Frederick Swanson, and John Cooksey will also be discussed. The second section will include an analysis of individual voice testing results from boys in 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grade at Miller South School for the Visual and Performing Arts in Akron, Ohio. Age, previous piano and other music experience, range, pitch matching, tonal memory, sense of rhythm, and vocal strength were evaluated and documented on a standard individual vocal assessment form. The test group of the research were the boys from the 7<sup>th</sup> grade choir. The project culminated in selecting appropriate choral warm-ups and literature to select for the boys in the 7<sup>th</sup> grade choir.

Adolescence, the period between childhood and adulthood, is a time of physiological, emotional, and psychological change. This multitude of instability makes educating students at this age challenging. In the choral classroom, adolescence is a time of voice mutation for both males and females, making the job of middle and high school choral educators even more formidable. Males experience a more dramatic voice mutation than females, which is why many theories about the male voice mutation have evolved. Overall, the way in which males experience the voice mutation can determine whether or not they continue to sing in future years (Oakes, 2005).

Choral educators need to understand how to apply voice mutation theories and pedagogy to the 21<sup>st</sup> century middle school choral classroom. This research document will focus on the history of the approach to the male voice mutation, prominent male voice mutation theories, a review of results from individually voice testing male students in grades 5-8 at Miller South School for the Visual and Performing Arts, and the application of the results of the voice testing to the 21<sup>st</sup> century middle school choral classroom.

### **History of the Approach to the Male Voice Mutation**

Recognition of the male voice mutation began during the Greek and Roman times. Around 2000 B.C.E., the main focus was to keep the male voice from changing. The method of castration was used during this time and continued predominantly through the eighteenth and early nineteenth centuries to create males with an artificial soprano or alto voice (Collins, 1999). Males that were castrated during boyhood were called castrati. Castrati had a young larynx and a chest and lungs of an older male that created a powerful and unique sound (Castrato, 2014).

By the end of the eighteenth and early nineteenth centuries, castration ended and new ideas on approaching the male voice mutation emerged. The no-sing theory emerged during the

eighteenth century was influenced by voice training in boy choirs. Since the young male voice breaks (i.e. develops distinct head and chest registers) during puberty, this theory advocated for males to stop singing until the voice completely changed. Many public school masters and cathedral masters stated the male voice was useless until it matured (Hook, 2005). Controversy in regards to the approach of the male voice mutation continued through the 1940s and 1950s. By this time, three changing-voice theorists emerged each with a separate theory about the male voice mutation: Duncan McKenzie, Frederick Swanson, and Irvin Cooper (Collins, 1999).

### **Voice Mutation Theories**

#### **Contemporary Voice Mutation Theory #1 – Duncan McKenzie**

Duncan McKenzie presented an alto-tenor plan in his book entitled, *Training the Boy's Changing Voice*. Throughout his career, he taught in the public schools of Montreal, served as the manager of the music department of Oxford University Press, and served as chairman of the music Department of Douglas College from 1943 to 1952 (Collins, 1994). His approach to the male voice change was called the alto-tenor plan. McKenzie stated that the boys' voice changes gradually by losing the upper register. As the upper register is gradually lost, notes are added to the lower register of the male voice. The alto-tenor range spans one octave from  $g-g^1$ . When the male voice continues to develop, even lower notes are added to the range with the loss of notes upper register (falsetto). Some males could lose some of the lower register and add notes to the upper register. McKenzie believed that the longer a male stays in the alto-tenor range during the voice change, the more likely the male would be a tenor after the voice change (Phillips, 1992). The process of the change would occur faster for voices that would become basses. According to this theory, the change in the speaking voice will indicate a change in the singing voice (Collins, 1992).

When dealing with male voice mutation, McKenzie suggested that choral directors and educators keep boys singing in the comfortable part of the singing range depending on the stage of change. Boys could sing one part lower if the current part became too difficult. He recommended to always avoid having boys sing in the extremities of the range while the voice was in the changing process. If boys sing within the comfortable part of the range during the change, forcing should never become an issue (Collins, 1992).

### **Contemporary Voice Mutation Theory #2 – Irvin Cooper**

Irvin Cooper served as the Professor of Music Education at Florida State University from 1950-1970. He created the Cambiata Approach, which received international attention and emerged as one of the leading voice mutation theories (Collins, n.d.). Cooper realized that boys could sing through the voice change if specific music was arranged for the unique ranges and voice types during the time of change (Collins, 1992). This concept stated that there are four categories of the male voice between grades 4-12: boys unchanged, first stage of change (cambiata), second stage of change (baritone), and boys changed (bass). Cooper believed that many boys enter the first stage of voice change in 7<sup>th</sup> grade as a cambiata. The term ‘cambiata’ was created by Cooper to describe the male voice during the first stage of change and has a slightly lower and smaller range than an alto voice (Ashley, 2015). At this time, the lower register expands with a range from f to c<sup>2</sup> and tessitura of a to a<sup>1</sup>. When most boys enter 8<sup>th</sup> grade, the voice enters the second stage of change and becomes a baritone. In *Teaching Kids to Sing*, Kenneth Phillips states the following about the Cambiata Concept, “The cambiata approach prescribes that 90 percent of all boys’ voices change and lower according to a common pattern: first change to cambiata in seventh grade, and second change to baritone in eighth grade” (1992).

When applying this concept to the middle school choral classroom, Cooper advises to avoid unison singing as it is difficult to find a common range for all voices in different phases of the change. Next, SATB music is not appropriate for junior high/middle school choral ensembles because the tenor and bass parts are generally too low for cambiatas and baritones. The voicing of middle school choral ensembles should be soprano 1, soprano 2, cambiata, and baritone. Don Collins founded the Cambiata Press, which publishes a multitude of arrangements in the cambiata concept (Phillips, 1992). Collins was also a student of Irvin Cooper and continues to use his methods today.

### **Contemporary Voice Mutation Theory #3 – Frederick Swanson**

Frederick Swanson worked with boys at the middle school level throughout his career in music education. His theory is entitled the Adolescent Bass Theory. First, Swanson believed that 30 to 40 percent of boys become new basses immediately when the voice changed (Collins, 1992). This usually happens between the eighth and ninth grades. Boys in seventh grade are typically unchanged and sing either the soprano or alto part. Swanson also found that some boys, have a phonation gap around middle C where no tones can be produced (Phillips, 1992). During the change, these boys have two distinct chest and head voice registers (Collins, 1992).

Applying this theory to the middle school choral classroom, Swanson recommended that boys and girls be divided into separate classes to cater to the specific needs of each gender in regards to the voice mutation. TTB arrangements are not appropriate for middle schools boys, and special arrangements are therefore needed. Having a separate boys chorus will also allow for specific training on smoothing the break between the chest and head voice registers. In general, choral educators could give specific attention to the voice change in gender specific choirs (Phillips, 1992).

**Contemporary Voice Mutation Theory #4 – John Cooksey**

John Cooksey served as a professor at the University of Utah, Memphis State University, and California State University-Fullerton throughout his career. He also taught public school secondary choral music in Tampa, Florida. Cooksey's approach, Contemporary Eclectic Theory, divides the male voice mutation into six stages: boy soprano, Midvoice I, Midvoice II, Midvoice IIA, New Baritone, and Settled Baritone. His research was published in a series of four articles in the American Choral Directors Association's *Choral Journal* from October 1977 to January 1978. When conducting research on this topic at California State University-Fullerton in collaboration with medical colleagues, Cooksey discovered and concluded many things about the male voice mutation. Choral educators need to recognize that every voice is unique and therefore is the same for each individual voice going through change. Next, there are parallels between puberty and the stages of the voice mutation. The voice mutation begins for most boys around ages 12 to 13 and the changed voice appears around ages 14 to 15 (Collins, 1992). John Cooksey stated that the voice change occurs at different times and speeds depending on the person, but the pattern in which it will occur is predictable (Phillips, 1992).

Applying Cooksey's theory to the choral classroom, boys should also sing in the most comfortable part of the range during the voice change. Even when a voice changes to a different stage of change, the use of the comfortable part of the range is crucial in order to prevent vocal problems or disorders. Leading boys in using the comfortable part of the singing voice during the voice change will result in an extended range later on. Exercises will also help in shifting between the registers of the voice. Overall, the voice change is a gradual process (Collins, 1992). Cooksey also suggests that choral educators select music that fits all the stages of the male voice mutation.

### **Miller South School for the Visual and Performing Arts**

Miller South School for the Visual and Performing Arts is a school in the Akron Public School district for students in grades four through eight selected by audition from elementary schools within the Akron Public School district and many surrounding suburban school districts. This school is considered an arts magnet school. The student body consists of 490 students with 84 percent of teachers holding a master's degree or higher. This school offers the study of five different areas in the arts: visual art, vocal music, instrumental music, dance, and drama (Miller).

#### **Individual Voice Testing Process**

All parents that have students in the Miller South School of the Performing Arts choral program received a letter stating the nature of the project and that all results will be used anonymously. I tested 5 students in the 5<sup>th</sup> grade choir, 5 students in the 6<sup>th</sup> grade choir, 11 students in the 7<sup>th</sup> grade choir, and 5 students in the 8<sup>th</sup> grade choir. The individual voice testing process included an assessment of range, pitch matching, tonal memory, sense of rhythm, and vocal strength. The students were also asked about previous music experience and if they played additional instruments.

This process was standardized for each student based on the John Cooksey voice testing procedure. First, each student was instructed to count backwards from 10 to 1 like a rocket ship. The purpose of this exercise was to find the lowest terminal pitch, which is generally a minor third below the speaking fundamental frequency. I started slightly above the speaking fundamental frequency and led the students in a descending 5-4-3-2-1 exercise on an [u] vowel. I descended by half steps on the piano until reaching the lowest terminal pitch. Next, I started near the middle of the range and led the students in an ascending 1-2-3-4-5 exercise on an [a] vowel. I ascended by half steps until reaching the upper terminal pitch. If the student had an audible voice

break between registers, they were instructed to flip from chest to head voice. Third, the students were instructed to sing *My Country Tis of Thee* with piano accompaniment. There was a copy of the sheet music on a music stand if they did not know the music or text for the song. The key in which the students sang the piece depended on the voice and what key would be most comfortable to sing in. Fourth, I assessed tonal memory by singing three solfege patterns and instructing the students to echo sing back. These patterns were as follows: Sol-Fa-Mi-Re-Do, So-Mi-Do, Do-Mi-Fa-Sol. Lastly, I led the students in echo clapping two rhythms to assess the sense of rhythm. The rhythms were as follows: 4 quarters notes, 2 eighth notes – 1 quarter – 2 eighth notes – 1 quarter. The pitch matching from *My Country Tis of Thee*, tonal memory, and sense of rhythm were all evaluated using a 5-point scale.

### **Analysis of Voice Testing Results**

The following students voiced tested in the 5<sup>th</sup> grade choir range between ages 10 and 11. The range results are quite typical for the age and grade of the students as most boys do not enter the voice mutation until approximately age 12 (Phillips, 1992). A majority of the boys' voices are still unchanged with one in the changing phase. A lowest terminal pitch of an F3 is usually the dividing line between an unchanged and changing voice. These students had an average pitch matching score of 5, an average tonal memory score of 4.4, an average sense of rhythm score of 5, and an average vocal strength score of 4.

### **5<sup>th</sup> Grade**

Student 1: Age 11

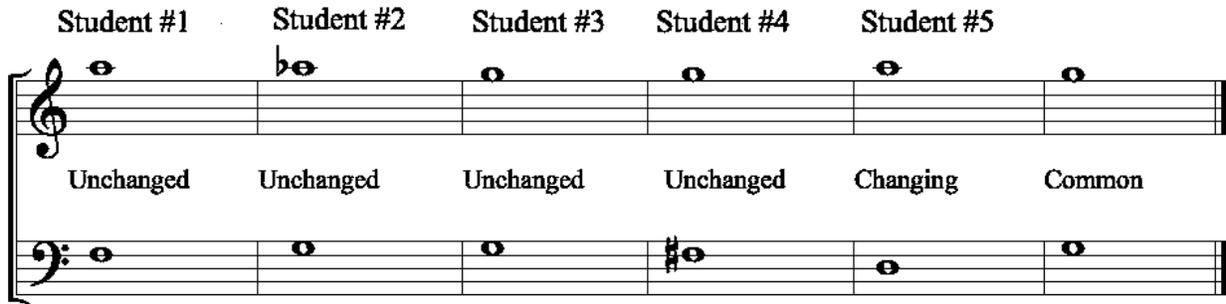
Student 2: Age 10

Student 3: Age 11

Student 4: Age 11

Student 5: Age 11

Figure 1. Voice Ranges for 5<sup>th</sup> Grade Boys.

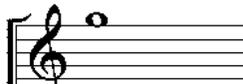
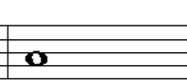
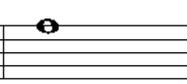
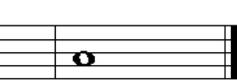
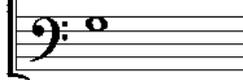
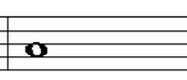
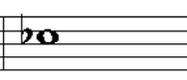
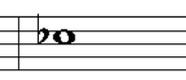
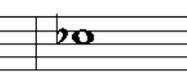
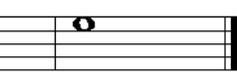


The following students voice tested in the 6<sup>th</sup> grade choir ranged between ages 11 and 12. The boys in this group include 1 unchanged voice with 4 changing voices. The results of this group are not typical of 6<sup>th</sup> grade boys. When I arrived to voice test these students, they were the first group that I voice tested for this project; therefore, there could be some inaccuracies in regards to the range evaluation. When initially starting to complete the voice testing process, it is hard to find the speaking fundamental frequency and listen for the lowest and upper terminal pitches. Because I was getting used to this process, the results for the 6<sup>th</sup> grade choir are likely skewed. However, according to my results the average pitch matching score was 5, the average tonal memory score was 3.2, the average sense of rhythm score was 5, and the average vocal strength score was 3.8. I find that the average tonal memory and vocal strength scores are quite low for these students. Again, these results could be low due to the fact that this was my first group of students to voice test.

### 6<sup>th</sup> Grade

Student 1: Age 12  
 Student 2: Age 12  
 Student 3: Age 12  
 Student 4: Age 12  
 Student 5: Age 11

Figure 2. Voice Ranges for 6<sup>th</sup> Grade Boys.

Student #1	Student #2	Student #3	Student #4	Student #5	Student #6
					
Unchanged	Changing	Changing	Changing	Changing	Common
					

The following students voice tested in the 7<sup>th</sup> grade choir range between ages 12 and 13 with a majority at age 13. This is the test group for which I selected a choral warm-up and one piece of literature if these students were a 7<sup>th</sup> grade boys choir. The stages of change in this group ranged from unchanged, changing, and changed. The dividing line for a voice to be considered changed is a low B. The results for this group are typical as 7<sup>th</sup> grade is usually a time of change for many students. It is not uncommon to find a 7<sup>th</sup> grade choir with voices in all three stages of change. The evaluation results for this group include an average pitch matching score of 5, an average tonal memory score of 4, an average sense of rhythm score of 4.9, and an average vocal strength score of 3.6. The lowest average score is the vocal strength score. This result is typical of these students as many voices are in the changing phase of the voice mutation process. Lastly, most of the boys in the 7<sup>th</sup> grade choir also displayed an audible register shift between chest and head voice. The register break is the note in the middle of each range displayed in Figure 3. This register break was not present in the voices of the 5<sup>th</sup> and 6<sup>th</sup> grade boys.

The boys of the 7<sup>th</sup> grade choir at Miller South School of Performing Arts are the group for which I selected one choral warm-up and one piece of literature. An appropriate choral warm-up for these boys would be a descending 5-4-3-2-1 pattern on a hum or [u] vowel. Starting

this exercise high and descending by half step will encourage the use of the head voice and bringing the head voice down to blend the registers. This exercise will also help with forward placement of sound, raising the soft palate, and creating vertical space. The piece of literature selected for this group is *Codfish Shanty* by Vijay Singh (BL331) and published by BriLee Music. *Codfish Shanty* is a TB arrangement. Students 1 through 5 would sing the tenor part and students 6 through 11 would sing the bass part. The range of the tenor part is G – f and the range of the bass part is E – c. Figures 4 and 5 display the ranges and common range of the students who will sing each part in *Codfish Shanty*. The ranges of this piece fit all voices with harmonic support in the piano part.

**7<sup>th</sup> Grade**

- Student 1: Age 12
- Student 2: Age 13
- Student 3: Age 13
- Student 4: Age 12
- Student 5: Age 13
- Student 6: Age 13
- Student 7: Age 13
- Student 8: Age 12
- Student 9: Age 13
- Student 10: Age 13
- Student 11: Age 13

Figure 3. Voice Ranges for 7<sup>th</sup> Grade Boys.

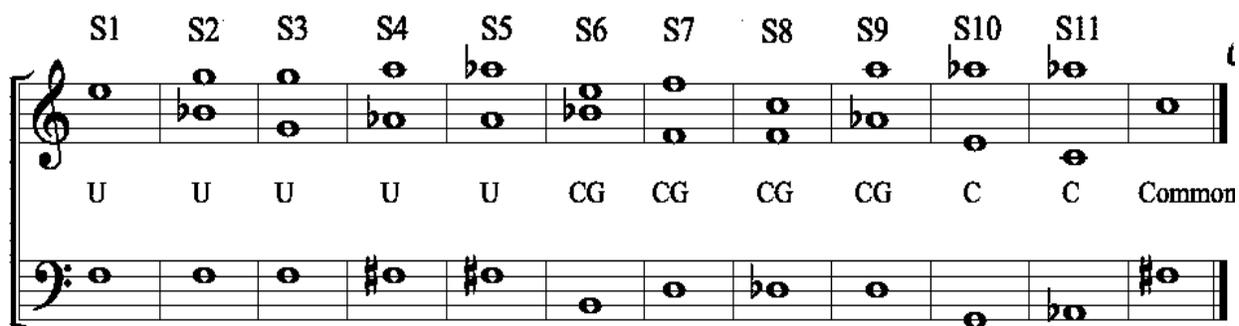


Figure 4. Voice Ranges for 7<sup>th</sup> Grade Boys on Part 1 (Tenor).

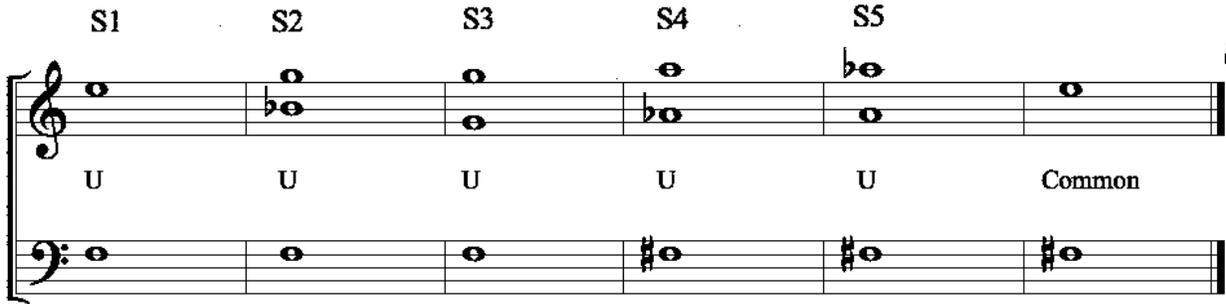
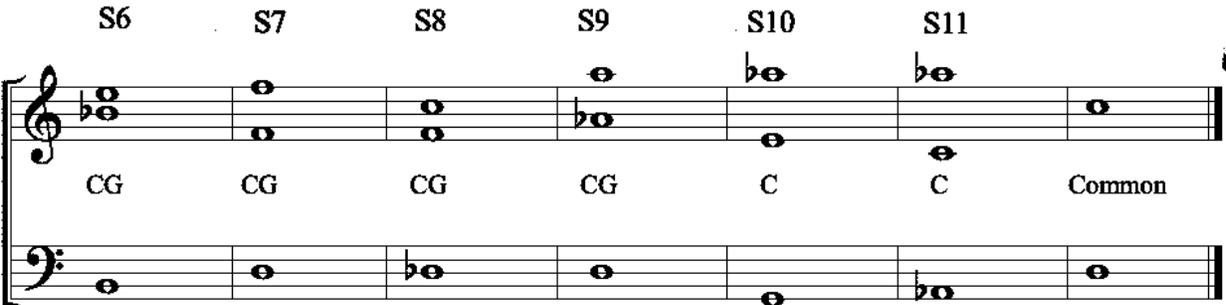


Figure 5. Voice Ranges for 7<sup>th</sup> Grade Boys on Part 2 (Bass).

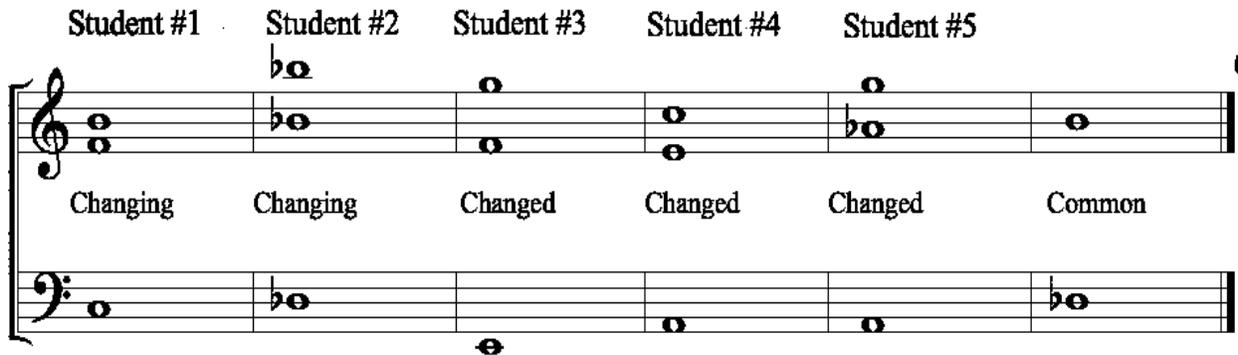


The following students in the 8<sup>th</sup> grade choir ranged between ages 13 and 14 with most at age 14. As displayed in Figure 6, all voices are either changing or changed. This group does not contain any boys with unchanged voices. Although male voices can still remain unchanged in 8<sup>th</sup> grade, these results are typical of 8<sup>th</sup> grade boys. Voices begin to settle in 8<sup>th</sup> grade as evidenced by 3 out of 5 changed voices. In regards to results, the average pitch matching score was 5, the average tonal memory score was 4.4, the average sense of rhythm score was 5, and the average vocal strength score was 4. The vocal strength score is slightly higher than the average for the 7<sup>th</sup> grade boys. This is to be expected as more of the 8<sup>th</sup> grade boys have changed and more settled voices.

**8<sup>th</sup> Grade**

Student 1: Age 14  
 Student 2: Age 13  
 Student 3: Age 14  
 Student 4: Age 14  
 Student 5: Age 14

Figure 6. Voice Ranges for 8<sup>th</sup> Grade Boys.



The results of this comprehensive male voice mutation study will directly apply to the middle school choral classroom and my future teaching. First, this study provided me with hands on experience with the individual voice testing process. Individually voice testing male students is difficult due to the various stages of change, finding the speaking fundamental, and determining comfortable tessituras and register break. It also takes a while to listen and find the speaking fundamental frequency. Next, this project provided me with a general overview of what to expect from male voices at each grade level. Although every voice is different, the results provide generalizations about the male voice mutation at each grade level. Third, knowledge of the history of the approach to the male voice and contemporary voice mutation theories are important to understanding how to pedagogically approach the male voice in the middle school choral classroom. Each theorist provides a different depth of knowledge and insight about the male voice mutation during adolescence. Lastly, this study continues to affirm the importance of knowing every voice and providing each student with an appropriate part to sing. Literature

selection is key at this age level and will guide teaching in the classroom. The male voice mutation during adolescence is an extremely important topic in which choral directors and music educators must have knowledge and pedagogy to apply to the middle school choral classroom.

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