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TEACHING THE FEMALE ADOLESCENT TO SING: A SURVEY OF CHORAL CONDUCTORS AND VOICE INSTRUCTORS

By

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Abstract

Although existence of female voice change is not disputed, symptoms are subtle and not widely understood. Due to the recent nature of research conducted on the female adolescent voice, the researcher investigated what information had reached teachers of singing. The primary research question sought to determine what is known by voice instructors and choral conductors regarding the female adolescent voice and how was this knowledge acquired. Results of the 44 surveys and 4 follow-up interviews lead the researcher to conclude: 1) participants believe that female adolescents experience voice change; 2) the majority of participants believe they have a “fairly complete” understanding of the physiological and pedagogical elements of the female adolescent voice; 3) Despite “fairly complete” understanding of the female adolescent voice, symptoms of voice change are not consistently identified or understood; 4) voice instructors focus on the individual needs of students rather than trends or tendencies of age group or gender.

Abstrait

Bien que l'existence de changement de la voix féminine n'est pas contestée, les symptômes sont discrets, et très peu comprise. En raison du caractère récent des recherches menées sur la voix de l'adolescente, le chercheur a étudié quelles informations avaient atteint les professeurs de chant. La question de la recherche primaire a cherché à déterminer ce qui est connu par des instructeurs voix et aux chefs de chœur en ce qui concerne la voix adolescente et comment ces connaissances acquises. Résultats des 44 enquêtes et 4 entretiens de suivi mener le chercheur de conclure: 1) les participants croient que les femmes adolescents changement de la voix d'expériences; 2) la majorité des participants croient qu'ils ont une "assez complète" compréhension des éléments physiologiques et pédagogiques de la voix chez les adolescentes; 3) Malgré "assez complète" compréhension de la voix chez les adolescentes, les symptômes de changement de la voix ne sont pas toujours identifiés ou compris; 4) les professeurs de chant se concentrer sur les besoins individuels des élèves plutôt que des tendances ou des tendances du groupe, d'âge, ou sexe.

Introduction

The voice change experienced by adolescent females was once considered fairly insignificant, a non-disruptive part of vocal maturation. Due to the relatively recent acceptance of the adolescent female voice change, the purpose of this research is to determine what elements of the current research (Gackle 1985, 1987 & 1991; Thurman & Welch, 2000) have affected the way the adolescent female voice is being taught in the choral rehearsal as well as the voice studio.

Instructors have realistic expectations for the adolescent male mutating voice during the different phases of vocal maturation because of the increased awareness of the physiology of the changing voice (Cooksey, 1992; Cooksey & Welch, 1998; Hook, 2005). Because of the research conducted on the adolescent male voice, phases of mutation have been identified and the symptoms and abilities of the changing male voice are well-understood (Collins, 1982; Cooksey, 1977; Naidr et al., 1965; Frank & Sparkber, 1970; Swanson, 1959). Research suggests that boys have also benefited from the information imparted by informed vocal instructors and choral conductors (Killian, 1990). While the list of symptoms of the female voice change shares several characteristics with the better-known symptoms of the boy's voice change, there is limited research on the pattern of development specific to the adolescent female voice.

The commencement of vocal mutation in both males and females is aligned with hormonal changes associated with puberty. During puberty there is evidence of substantial overall physical as well as laryngeal growth. While the female larynx grows a moderate 3-4 millimeters in length (ante posterior growth) it also increases in height (lateral growth) (Kahane, 1978). In comparison to the ante posterior growth of

the boy's larynx (nearly 10 millimeters), the female laryngeal growth is less dramatic (Hirano, 1981; Sataloff & Linville, 2008). However, the lateral growth, vocal-fold lengthening and thickening, and the impact of hormonal fluctuations in the female larynx result in a period of adjustment not unlike the boy's voice change (Hirano, 1981; MacKenzie, 1956; Phillips, 1992; Sataloff & Linville, 2006; Thurman & Klitzke, 1994).

A common dysphonia, the mutational chink, found in the adolescent female singer is caused by weakness in the intrinsic and extrinsic musculature of the larynx to fully adduct the vocal folds (Thurman & Klitzke, 1994; Vennard, 1967). Air escapes through this space and is heard as breathiness in the singing tone. Aside from this very audible change, the adolescent female will also experience insecurity of pitch, development of noticeable register breaks, increased huskiness, decreased and inconsistent range capabilities, voice cracking, hoarseness, and discomfort while singing (Huff-Gackle, 1987). The symptoms of female adolescent voice change have been documented by many pedagogues (Alderson, 1979; Gackle, 1991; Harrison, 1975; Sipley, 1993).

The understanding of singing is an ever-developing science, building on new information about the human physiology, the acoustics of sound and psychology. Marilee David believes that research in areas of voice science have caused "a new voice pedagogy [to emerge] which is based on an understanding of the structure and function of the vocal and respiratory tracts"(2007). However, historical vocal pedagogy methods continue to be taught throughout the world, and likely still pre-dominate the field. These methods predominantly reflect the teachings developed

during the bel canto period of the 17th century, a method traditionally passed down orally from Master to Apprentice. The recognized weakness of this system is the difficulty of infusing the lineage with developments in voice science (Callaghan, 2000; Miller, 2006; Edwin, 2008).

If Marilee David is correct, the relatively recent research available on the adolescent female voice based on physiological measurements of the laryngeal apparatus, levels of hormonal fluctuation, acoustical analysis of vocal characteristics, measurements of muscular impulses, as well as audible characteristics will be, at some time in the future, part of standard pedagogical information.

Due to the nature of the research conducted on the topic of the adolescent female voice, the researcher speculates that these useful findings have not yet reached the voice studio and choral rehearsal. By surveying conductors and voice instructors the researcher hopes to determine whether contributions from the fields of vocal physiology, acoustics and pubertal development have reached the musical community. If so, how are they being applied in the voice studio and choral rehearsal? If not, what is impeding the inclusion of this information in the teaching the adolescent female to sing?

CHAPTER ONE

Review of Literature

A literature review was conducted on the following topics for the purpose of this research: physiological changes during adolescence, pattern of laryngeal growth, non-laryngeal growth associated with puberty, classification systems for the male and female adolescent voice, perceptual characteristics of the female adolescent voice, choral pedagogy and vocal technique, and choral pedagogy and the adolescent voice change. The review of literature is presented in the order listed above.

Physiological Changes During Adolescence

The term "adolescence" is generally understood as the period of time preceding adulthood or the period from puberty to adulthood. The biological definition for adolescence refers specifically to the period of development between the onset of puberty and maturity. It is the biological definition of adolescence that is used for the purposes of this study (adolescence, *Merriam-Webster Online Dictionary).*

Prior to discussing the adolescent singing voice the physiological growth associated with puberty is reviewed. The laryngeal growth pattern from birth to puberty is outlined and is followed by a detailed revision of the overall physical growth that affects the singing mechanism. A physiological overview of pubertal changes will allow for proper analysis of the factors influencing the development of the adolescent singing voice in the chapters to follow.

Pattern of Laryngeal Growth

The larynx, like many structures of the body, is not fully developed in the newborn child. An infant's laryngeal cartilage is much smaller, rounder, softer and more compact than the adult larynx. It has an equal proportion of cartilage to soft tissue, and has not yet developed a vocal ligament - a membranous portion of the vocal fold. The lamina propria, tissue that is just below the epithelium, is uniform and pliable and does not resemble the complex structure of the adult larynx.

Between ages 1 to 4 the vocal folds become stronger and more defined. The vocal ligament emerges during this time, although it remains thin and immature. Despite significant changes in structure and size during childhood, the vocal folds are not completely developed because the lamina propria is not yet a three-layered structure. Only after puberty does the three-layered complex lamina propria appear consisting of the superior, intermediate and deep layers of tissue, otherwise described as the body-cover model. The body refers to the deep layer of lamina propria and the vocalis muscle, and the cover is the epithelium in addition to the lamina propria's superficial and intermediate layers (Stemple et al, 2000).

Prior to puberty, the male and female larynx cannot be differentiated (Kahane, 1978). At 10 years of age, laryngeal gender differences become apparent. During puberty the male larynx and the female larynx show gradual but consistent gender development that changes the overall length and width of the vocal folds and the ratio of membranous to cartilaginous portions of the vocal folds (Kahane, 1978). It is at this point that some perceptual characteristics of the voice can be attributed to the laryngeal structures themselves because it is during puberty that a major change in

voice occurs (Spiegel et al, 1997).

Puberty is a result of a hormonal signal from the brain that causes the gonads to release a variety of hormones. Among these hormones are growth hormones that induce the intense period of growth that accompanies puberty. Puberty's hormonal fluctuations affect many areas of the body including those most commonly linked with adolescence, such as the development of secondary sex characteristics, menarche, and the lowering of the male voice. Other physiological changes that occur as a result of pubertal growth are increased chest circumference, laryngeal descent, development of oral-facial structures and other more subtle changes that can also affect the voice (Gackle, 1991). It cannot be denied that the male voice change is a dramatic and obvious part of puberty; however it is important to note that the female voice is also affected by this period of growth, although not as dramatically. As Harrison states, "since the larynx enlarges with the rest of the body, everyone experiences mutation" (p.16, 1978).

The onset of puberty is the instigator of vocal mutation and as such, Sipley believes that it is very important for the choral conductor and voice instructor to determine the exact age of a voice student (1993). Knowledge of pubertal onset can aid the instructor in determining what developmental changes are taking place. It was once believed that the appearance of primary and secondary sex characteristics was an accurate predictor of vocal mutation onset (Cooksey, 1977), however incidences of puberty are observed as young as 8 years of age when, obvious secondary sex characteristics have not yet developed (Whincup et al., 2001). A more accurate predictor of vocal mutation is a crown-heel measurement, found to be linearly related

to laryngeal dimensions (Thurman & Klitzke, 1994). A general guideline, however, is that puberty usually begins between ages 8 and 15 in females, and between 9.5 and 14 in males (Spiegel et al, 1997) and is normally complete in both genders by the age of 15.

At the onset of puberty the adolescent male experiences a period of intense growth, one that can be witnessed in the changing laryngeal dimensions (Kahane, 1978). The primary growth of the larynx is ante-posterior growth (front-to-back). The male larynx grows nearly 67% anteposteriorally of its total length during puberty (4 to 11mm). It also increases in weight, 10.60 grams on average, and develops a 5.3 to 1.0 ratio of membranous to cartilaginous vocal fold tissue (Kahane, 1978). An increase of the hormone testosterone causes the thyroid cartilage to grow and for the thyroid notch to protrude from the neck at a 90 degree angle (the Adam's apple).

Table 1: Laryngeal Dimensions

	Prepubertal (mm)	Pubertal (mm)	Growth (mm)	% increase
Male	17.35	28.21	10.86	66.69
Female	17.31	23.15	5.84	24.03

Table IV-2-1 from Kahane 1983 in Thurman and Welch's, *Bodymind and Voice*, 2000.

The adolescent female also experiences a rapid period of growth during puberty although the laryngeal dimensions do not increase as significantly (from 1.5 mm to 4.0 mm) and the majority of the vocal fold growth is in height, rather than in length (see table I). Hirano found the ante posterior measurement to increase by 25% of its overall length while the weight of the larynx increases by approximately 3.93 grams (as quote in Thurman & Welch, 2000).

Table 2: Developmental Changes of the Larynx

	Newborns	Adult Females	Adult Males
Total	2.5-3 mm	11-15 mm	17-21 mm
Membranous	1.3-2 mm	8.5-12 mm	14.5-18 mm
Cartilage	1-3 mm	2-3 mm	2-3 mm
Membranous to cartilaginous ratio	1.5:1	4.0:1	5.3:1
Thyroid cartilage angle	130 degrees	110 degrees	90 degrees
Cricoid level in the neck	C2-C3	C6	C7

Table 2-4 found in Stemple (2000) but originally taken from:
Hirano, M. Kurita S., Nakashima T. Growth, development, and aging of human vocal folds. In: Bless DM, Abbs J, eds *Vocal Fold Physiology*. San Diego, Calif: College Hill Press; 1983: 22-43.

Hormonal Changes Occurring in the Adolescent Female Voice after Menarche

The female adolescent is significantly affected by hormonal fluctuations of the menstrual cycle, after the onset of menarche. As estrogen levels decline laryngeal tissues absorb water, causing swelling (Luchsinger & Arnold, 1965; Sergeant & Welch, 2009; Seth & Guthrie, 1935). Lowered estrogen levels increases blood supply, and more blood increases the vocal fold mass. Studies of the effect of water retention and increased blood supply due to hormones have provided interesting insight into the female voice. According to research published by Luchsinger and Arnold, small hemorrhages at the submucosal level of the female vocal fold are found during the premenstrual phase and during menstruation (1965). Seth and Guthrie report signs of swelling and redness of the laryngeal mucosa and a thin coating of mucous that resembled early signs of laryngitis (1935). The female adolescent copes with voice changes due to pubertal growth and to fluctuating hormone levels that result in temporary vocal conditions that change the way in which they feel and use their voice.

Non-Laryngeal Growth Occurring during Puberty

Although puberty causes many changes to occur in the laryngeal structure of both males and females, growth that affects the singing voice is not limited to the larynx. The vocal tract is also changed by pubertal growth. Tonsil and adenoid tissues atrophy during these years and then partially disappear. The loss of the adenoid tissues may cause changes in resonance because the oropharyngeal and nasopharyngeal dimensions have changed (Kerschner & Merati, 2008; Spiegel et al., 1997). Also affecting resonance is pharyngeal growth which is mostly complete by age 9. The vocal tract continues to lengthen and enlarge throughout puberty, reaching full growth in early adulthood (Sundberg, 1987).

Tongue position and mouth opening can also change during puberty as dental development occurs (Spiegel et al., 1997). Dental malalignment and/or injury can cause discomfort and shifting in the jaw. It is often advisable for young singers to deal with dental and orthodontics problems as early as possible before compensatory behaviours affect or disturb healthy vocal production (Kerschner & Merati, 2008).

Overall growth includes an increase in chest circumference as well as increases in abdominal strength (Gackle, 1991). These two areas of the body contribute to the power source for the voice and as child-like sounds are replaced by adults ones many are due to an increase in breath capacity and muscular strength in the pulmonary surroundings.

Classification Systems for the Adolescent Male Voice

In most vocal pedagogy and voice method books a section is usually directed toward the developing voice within which a large portion is dedicated to the adolescent male voice change. The dramatic voice change experienced by the adolescent male is discussed and contemplated as both a physiological and pedagogical challenge. Vocal pedagogues were once involved in a long-standing debate regarding the treatment of the adolescent male voice. Traditionally, while a boy's voice changes, vocal rest is recommended, however with diminishing numbers of boys returning to singing after voice change, pedagogues began to reconsider complete vocal rest. Several methods proposed by pedagogues enlivened the debate on the treatment of the boy's changing voice by recommending continued singing during vocal mutation. A relative consensus was reached with additional research in the area of vocal physiology and adolescent growth which provided a clearer understanding of the elements of voice change.

Historical Context

During the 19th century and the 20th century vocal pedagogues presented their opinions on the training of the changing boy's voice. Manuel Garcia II (1805-1906), considered the "grandfather of vocal pedagogy," was the first pedagogue to suggest complete voice rest for males during voice change (as found in Cooksey, 1992). He believed singing while the voice was unsettled would cause injury. Garcia, to whom the invention of the laryngoscope is attributed, published the first collection of visual observations of the vocal cords and the larynx in 1855.

It has been difficult for vocal pedagogy to overcome Garcia's depiction of voice change as a period of time in which the voice is particularly fragile and easily harmed; however, current approaches to the male changing voice no longer reflect Garcia's beliefs. Vocal pedagogues now encourage singing during voice change and some pedagogues believe that good vocal technique prior to mutation will result in a smoother transition into the changed voice (Cooksey, 1977; MacKenzie, 1956; Phillips, 1991). As a result several approaches have emerged that deal specifically with the period of voice change experienced by the adolescent male; each method built on the research and experience of their predecessors.

English Choral Tradition

Prior to 1950, the English choral tradition was the formal and authoritative opinion dominating the discussion of the boy's voice. The English tradition spoke mostly of what is now called the "break" theory, in which a boy's voice "broke" during puberty and consequently boys were encouraged to refrain from singing during this time. For approximately two to three years, boys, who had been singing every day of their life as choir boys, were encouraged to sit out and wait for their voice to develop into an adult tenor or bass. In the 1885 study of the opinions of vocal and choral pedagogues published by Bennie and Browne, the predominant belief was that "the bulk of the evidence most strikingly proves the injurious and even ruinous consequences arising from the exercise of the voice by singing during the period of change"(p.84). In the 1967 edition of *The Singer's and Actor's Throat*, Punt declares,

"And, of course, whilst the voice is actually 'breaking' singing must be forbidden" (p.56).

Perhaps this "golden rule" may have continued to pervade pedagogy were it not for the decreasing numbers of boys who returned to singing after their period of rest (Cooper & Kuersteiner, 1973). The choirmaster found that boys did not return to their singing with their fully changed voices; instead this imposed period of rest was diminishing the ranks of the adult males of the choir. The methods and classification systems for the changing voice originated from the choirmaster's and music educator's desire to find a way to keep the English boy choir tradition alive by including boys with changing voices. A general overview of the approaches follows in chronological order.

Alto-Tenor Approach

Duncan McKenzie's 1956 publication, *Training the Boy's Changing Voice*, was the first documented approach advocating a young male to continue singing during vocal mutation. McKenzie clearly states that prior to his publication, "Compilers and editors of music texts designed to meet the conditions of boys' changing voices usually review the topic in their prefatory remarks on the types of arrangements they consider possible for voices in the junior high school…even so, there are very few books which deal specifically with the modern theory concerning the boy voice"(vii, 1956).

McKenzie believed that continuing to sing was key to handling the change more easily. Discarding the beliefs of pedagogues that came before him; particularly

rules that suggested a boy rest his voice during mutation, he felt it important to evaluate the changing voice as it progressed through mutation. McKenzie provided guidelines for conductors and instructors, to ensure that a boy was capable of comfortably singing during each phase of maturation.

McKenzie's voice change categories are founded on the assumption that a boy's voice change follows a gradual, predictable process. According to the author, the boy loses notes at the top of his range and subsequently gains an equal number of notes at the bottom of his range. Based on this process, McKenzie divided the changing voice into three categories: soprano, alto-tenor and bass. All unchanged voices were categorized as sopranos until the onset of puberty, at which time they became alto-tenors. Only after the voice reached its lowest limits did McKenzie categorize the boy's voice as bass. Clearly, due to the nature of the category names, this was an approach best suited to boys singing in choir, and perhaps more exclusively to boys singing in an all male choir.

Cambiata or Limited Range Approach

The Cambiata or Limited Range Approach is the most practiced approach for the changing voice in North America. First developed by Dr. Irvin Cooper and continued by his student Dr. Don Collins, the Cambiata Approach appeared in response to McKenzie's restrictive alto-tenor approach. In Cooper's book *Teaching Junior High Music,* he outlined a four phase program (1973).

Like McKenzie, Cooper believed that boys should sing through mutation, provided that they did so in appropriate ranges. Cooper's Cambiata Approach is based

on the key assumption that voice change is sequential and part of a recognizable pattern - as a boy ages he naturally moves from one phase to another. The first phase is the unchanged voice or treble, followed by cambiata, new baritone, and then bass.

Cooper described the quality of the cambiata voice (or the changing voice) as "rich and woolly." He warned conductors that an "aural illusion" can be heard in the cambiata voice during mutation and that this illusion may lead an instructor to assign a boy as a changed voice when in fact there has only been a change in the quality of the sound, not the range. Cooper speculated that this aural illusion contributes to much of the confusion surrounding the male adolescent voice, in the case of an inexperienced conductor or instructor.

Although Cooper's system accommodated all the phases of the changing voice, the restricted comfortable range of singing for the cambiata voice made finding suitable repertoire very difficult. It was this dilemma that led to the establishment of the Cambiata Press. Founded in 1972 by Cooper and his student Don Collins, the Cambiata Press continues to provide arranged choral works with the boy's changing voice in mind.

Contemporary Eclectic

John Cooksey, a professor of Music and Director of Choral Activities at the University of Utah, criticized both the Alto-Tenor Approach and the Cambiata Approach as being too limiting. Through his experience, Cooksey discovered that vocal maturation occurred at different rates depending on the individual (1977). Contrary to McKenzie and Cooper's systems that are based on a sequential voice

change, Cooksey wanted to allow for the boy's voice that did not follow this pattern of development.

Cooksey participated in several scientific research pursuits on the boy's changing voice, developing a system that provided 6 classifications that covered nearly all the variations in the boy's changing voice (1977).

1. Unchanged
2. Midvoice I - initial period of mutation
3. Midvoice II - mutational period
4. Midvoice IIa - climax of maturation/transitional stage
5. New Baritone
6. Settling Baritone

Cooksey rarely found a true tenor or true bass in the boy's changed voice and therefore preferred to refer to the changed boy's voice simply as baritone. Cooksey believed that a boy should sing where the core of his voice was, thereby exercising his voice in the most comfortable range. While pedagogues agree that this is an accurate depiction of the boy's changing voice, Cooksey's system is difficult to put into use in choral literature, but is easily applicable in the private voice studio (Phillips, 1991).

Adolescent Bass or Extended Range Theory

Unlike the measured descent of a boy's voice change described by Cooksey, Cooper, and McKenzie, Swanson found the boy's voice change to be quite rapid (1959), usually occurring within 6 months to 1 year. Swanson observed a drop of an octave in the boy's speaking voice and singing voice at the onset of puberty, which allowed the lower part of the voice to develop first. In addition to these newly discovered low notes, Swanson found that boys maintained parts of their treble range.

He encouraged boys to sing in this range using falsetto, if they were able to, rather than using only the restricted range of the new voice.

Following the descent of the voice, Swanson also noticed that a "blank spot" may develop around middle C between the upper and lower voice (K.E. Miller, 1988). Swanson employed falsetto in this case, believing that bringing the boy's voice down using falsetto was a useful tool toward filling out these "blank spots."

Swanson concluded that the rapidity of voice change and the struggles facing a male singer during puberty were excellent reasons for individual study: private lessons would allow the boy to proceed in his own way through his vocal instability.

Modified Extended Range Theory

In Kenneth Phillips influential book *Teaching Kids to Sing,* the author provides a synthesis of the literature and methods of the changing male voice (1991). His method takes into consideration all of the voice change scenarios mentioned by Cooksey, Collins, McKenzie and Swanson and provides a definitive approach for the boy's changing voice. Phillips includes an approach for the boy whose voice "drops overnight", resulting in a limited range, but also reflects the sequential pattern of mutation that is the basis for other methods. Phillips' system outlined the following categories:

1. Junior High Treble I (both male and female voices - singing interchangeably with Treble II)
2. Junior High Treble II (both male and female voices - singing interchangeable with Treble I)
3. Junior High Tenor - unchanged voice (not seated with girls)
4. Junior High Tenor II - changing voices (usually Grades 7 and 8)
5. Junior High Bass - voice changed quickly with no middle range

6. Junior High Bass/Baritone - newly changed voices

Phillips carefully labels the maturing boy's voice with names attributed to the adult male voice, and not the female voice, thus "adult changed voice" terminology is used to ease the transition from unchanged voice to changed voice.

Voice Pivoting

Most recently, Sally Herman (1988) has added to the literature of the changing male voice by suggesting voice pivoting in choral literature. In her system, each boy is assessed and given a title according to his phase of mutation (Herman labeled these: first tenor, second tenor, baritone and bass – not to be confused with the adult categories for the male changed voice). The boy then pivots from alto to tenor to bass to soprano, in whatever order, to create a vocal line that best suits his abilities. Herman considers this an effective method for maintaining the changing voice in choirs while also using quality repertoire that does not require a special arrangement for the boy's changing voice.

Summary

An overview of the adolescent male voice change literature demonstrates an evolving approach to the changing voice. Initially, practical reasons necessitated to be developed to cope with the changing voice as boys were not staying in choir. Each method presented reflects the male changing voice as it was understood at the time. More sophisticated research conducted in the areas of physiology and biology

informed the discussion of the changing voice and the approaches to the male adolescent voice changed to reflect these new findings.

What cannot be overlooked, however, is that the demands being placed on the boy's changing voice altered considerably during this period. All male Cathedral Choirs now include females in the ensemble to sing the soprano parts and vocal education for boys is not a requirement in many primary and secondary schools. In general, vocal education has moved farther down the list of educational priorities and because of this many boys reach puberty with very few singing skills, making voice change even more difficult for singer and teacher.

Classification System Used for Female Adolescents

Although less research focuses particularly on the female adolescent voice there is still mention of the general characteristics and abilities of the female adolescent singer in most pedagogical treatises. Several methods have been tailored specifically to the adolescent male voice change but because of the more subtle nature of female voice change only one classification system has been developed.

Lynne Gackle made the most significant contribution to the research concerning the characteristics of the female voice during adolescence when she conducted her longitudinal study on the stages of vocal development during adolescence. An overview follows of Lynne Gackle's classification system for the adolescent female voice.

Lynne Gackle

Gackle performed a longitudinal study of the nature and qualities of the female voice between the ages of 8 and 16 (1987). She then categorized her observations and developed a chronological guide to the adolescent female voice change, which is upheld as an important and original contribution to the research on the developing voice (see Appendix A). Since its publication, Gackle's research has influenced both the scholarly vocal and choral community and has been included in most notable choral and voice pedagogy texts (Collins, 1991, 1999; Philips, 1991; Welch, 2000).

Gackle's classification system is divided into four stages:

1. Stage I (prepubertal)
2. Stage IIA (prepubescence/pre-menarcheal)
3. Stage IIB (puberty/post-menarcheal)
4. Stage III (young adult).

Stage I (ages 8-10)

Gackle found that the prepubertal female voice was easily produced. She described the sound as a light, flute-like voice with a soprano quality. The prepubertal female manages interval skips easily and is a flexible voice, with a range encompassing Bflat3 to F5. The only audible difference between the male and female prepubertal voice is that the female's voice is not capable of as much volume.

Stage IIA (ages 11-12)

Upon entering puberty, but still prior to menarche, the first signs of physical maturation are evident. The female voice contains breathiness in the tone and the singer may have difficulty producing sounds in the chest voice. A noticeable

characteristic is the emergence of a register break between G4 and B4. The female adolescent may experience the following symptoms of voice change: difficulty or discomfort singing, difficulty achieving volume, and an obvious 'flip' into a breathy voice from lower register to upper register.

Stage IIB (ages 13-14)

Following the onset of puberty is Stage IIB that Gackle identifies as the "critical time" in which range and ability fluctuate. This post-menarcheal phase is perceptually categorized by a breathy, husky speaking voice. The adolescent female may feel comfortable in different tessitura during this phase and she should be frequently reassessed as her range fluctuates and narrows at both ends. During this Stage the girl may feel that she can sing more easily in her lower register and although this may be permitted for short periods she should not yet be labeled an "alto"; it is advised that vocalization continue throughout the range despite the discomfort. Two register breaks will become more pronounced between G4 and B4 and also between D5 and Fsharp5. The singer may experience hoarseness even though there is no upper respiratory infection and she may also endure voice cracking, discomfort, and a lack of clarity in her tone.

Stage III (14-15)

The final stage is the young adult female, Stage III. Gackle observed the emergence of a full-bodied richness in the tone and the return of ease in the singing voice. Vibrato may appear alongside increased volume, resonance, and agility. The

young adult voice may also gain lower notes, as the range increases, but again categorization of voice part must be done with extreme caution as the young adult adjusts to the muscle coordination her new voice requires.

The ages, supplied by Gackle, for each category are a general guideline. It must be noted that recently statistics have shown that menarche is occurring at an earlier age (nearly 6 months earlier every decade), therefore results of Gackle's study may not reflect the ages at which these stages would occur just 20 years later (Tanner, 1972).

Perceptual Characteristics of the Adolescent Female Voice

Although the female adolescent voice change is less dramatic than the adolescent male voice change, there are many perceptual characteristics of the female voice associated with mutation. Because most of the physiological changes that directly affect the voice cannot be observed by the adolescent female or her instructors, the most accurate indicators of vocal mutation appear in the perceptual or sound characteristics of the voice.

In an article written by Lynne Gackle, the author outlines the general characteristics of the mutating female adolescent voice. The salient characteristics are a lowering of average speaking pitch, voice "cracking" and abrupt register "breaks", increased breathiness, roughness, or hoarseness, decreased and inconsistent range capabilities, effortful singing and delayed onset, rough or thin tone quality, and insecurity of pitch intonation. It must be noted that Gackle is not the only researcher to have come across these sound characteristics (Alderson, 1979; Harrison, 1975;

Hoffer, 1983; Howard & Welch, 2002; Huff-Gackle, 1985; Ingham & Keaton, 1983; Sipley, 1993).

Breathiness

Breathiness in the singing tone is perhaps the most commonly-known characteristic of the female adolescent voice (Hoffer, 1983). Breathiness can be caused by a "mutational chink", a term coined by William Vennard (1967), but first identified as early 1866 by Fournier (cited by Weiss, 1950). Vennard defines the mutational chink as the incomplete glottic closure that often occurs in the adolescent female voice (1969). During adolescence, laryngeal growth is intensified and as a result some adolescent females develop a triangle-shaped space at the back of the glottis that is not fully adducted during phonation. This has been attributed to weakness in the surrounding musculature, particularly the interarytenoids which are responsible for medial compression of the vocal folds (Hoffer 1983; Ingham & Keaton, 1983). Vennard described the resulting sound as "wild air" in the tone (1967).

A study conducted by Barlow and Howard compared the closed quotient readings of female adolescents with those of female adults and found the readings to be lower in adolescent females (2006). In other words, during an average phonatory phase the glottis is abducted (open) for a longer period of time in adolescent females when compared with adult females. Barlow and Howard also compared the results of trained adolescent female singers to their untrained peers and found that in both groups the closed quotient readings were lower in adolescence, perhaps suggesting that training cannot remedy this physiological vocal characteristic (2006).

Noticeable Register Breaks

What Lynne Gackle observes in the singing registers of adolescent females is a noticeable shift from one register to another, an abrupt register shift resulting in a voice "crack." The definition of a singing or speaking register has been much discussed in pedagogical literature and is complicated by sensation definitions which vary significantly between individuals. The difficulty of defining a register arises because of its use as both a signifier of an acoustic and/or a physiologic/laryngeal change. Appelman said that "in the human voice, registration is a physiological *and* an acoustical fact" (1967, p.86). According to a more recent definition provide by Johan Sundberg, a register is "a phonation frequency [pitch] range in which all tones are perceived as being produced in a similar way and which possess a similar timbre" (1987, p.49). Conversely, Hollien defines a register as "a totally laryngeal event", but goes on to acknowledge that an operational definition of a register must "depend on supporting perceptual, acoustic, physiologic, and aerodynamic advice"(1974, p.38). For the purpose of the voice instructor and choral conductor, who are unable to view the laryngeal mechanism as it functions, the researcher will refer to specific qualities of timbre in a register, thereby focusing on the acoustic elements of a register change.

What Gackle (1991), Sipley (1993), Harrison (1975), and Alderson (1979) reported were increasingly abrupt register transitions in the adolescent female's voice. Singing from one register to another requires fine coordination of the laryngeal musculature, therefore an abrupt register change, it could be hypothesized, is due to the growing laryngeal dimensions and the resultant awkwardness of using this "new

voice." Miller defines a “crack” or register break as “a momentary loss of control” (2006). Cryier observed a rising upper transitional pitch between 14 and 15 year old adolescent females (1981), therefore further confirming the data collected by Lynne Gackle that denotes register transition areas change according to the age of the singer.

A longitudinal study conducted by Howard and Welch (2002) further confirms these findings. The authors tested three girls over three consecutive years, beginning at the age of 12. The data collected was a closed quotient reading using electroglottography while the three girls sang a set singing test piece. All three girls were members of the Wells Cathedral choir program and thus received similar training. Chorister 1 showed a clear register shift in Year 2 (at approximately 13 years of age) that was not apparent in Year 1. Chorister 3 also exampled a clear register shift that was first noticeable in Year 1 (12 years old). However, by Year 3 of the study both girls had smooth register shifts. Although the small sample size of this study must be considered, the results from these two choristers follow the developmental projections made by Gackle: no registers shifts are followed by the appearance of a clear register shift, and finally, a smoothing of the register shift.

Inconsistent and/or Decreased Range

Sung pitches, or phonation frequencies, are determined by the tension and the thickness of the vocal folds. Vocal fold tension is varied by a stretching action: when vocal folds are tense, thin, and long, a high frequency is produced whereas relaxed, thick, and short vocal folds produce low frequencies. Varying the length of the vocal folds, by contracting the cricothyroid muscles, and stiffening or relaxing of the vocal

folds, by contracting the vocalis muscle, will determine the phonation frequency. Many other small adjustments are being made to stabilize the laryngeal musculature when tension and length vary, however the two muscles are primarily responsible for the tension and thickness of the vocal folds are the cricothyroid and the vocalis muscle.

Inconsistent and decreased singing range affects the adolescent female most obviously during peak mutation, or Stage IIB as indicated by Gackle. It is during this time that the comfortable singing range is sometimes no larger than a six or seven note range (Gackle, 1991). The diminished range and discomfort is significant when compared with the comfortable two octave range of a prepubertal female's flexible and soprano-quality voice. After mutation, the adolescent female voice will experience an increase in overall range: gaining a semitone at the bottom of the range - from Bflat3 to A3 - and gaining a third at the top of the range - from F5 to A5 (Gackle, 1991).

Singing in the wrong range is believed to be damaging to the proper development of good vocal habits (Collins, 1982). Because of the narrow comfortable singing range of some adolescent females are given the title of "alto" in choral ensembles and often they remain in this role for the duration of their adolescent years. Many pedagogues state that all adolescent female voices should be considered soprano, and conductors are encouraged to have singers switch parts or choose equal-voiced music (Aaron, 1992, 1993; Blatt, 1983; Corbin, 1986; Cooper, 1982; Doscher, 1991; Fiocca, 1986; Ingham & Keaton, 1983; Robinson & Arnold, 1976).

Huff-Gackle warns that because of limited range all adolescent girls should be considered second sopranos or mezzo sopranos at best (1987), until voice mutation is

complete. It is tempting to quickly identify a voice part for a student early, but classifications should be considered temporary and regularly reassessed by directors (David, 2007; Skoog & Niederbach, 1983; Thurman, 1988). Gackle suggests assessing the adolescent female voice as either "light midvoice" or "rich midvoice," thereby avoiding permanent classification as either soprano or alto, a label that is still applicable after voice mutation (2000).

Speech Fundamental

A speaking fundamental is a mean frequency of habitual speech. Although this is a salient element of the male voice change (dropping approximately an octave in pitch) the lowering of the adolescent female's voice happens more gradually. In Gackle's preliminary studies, the researcher discovered a successive decrease in speech fundamental from the ages 8 to 15 in her female subjects (1987). On average, an adolescent female who has completed puberty has a speech fundamental that is a minor third below that of her prepubertal speech fundamental (Duffy, 1958; Hollien, 1978; McGlone & Hollien, 1963; Seth & Guthrie, 1935; Wilson, 1972). The lowering of pitch in the speaking fundamental is due to the growing vocal folds during puberty. Although the length of the vocal folds is an important factor in the speaking fundamental, the size of other resonating sources can also affect the fundamental, *i.e.* vocal tract, chest circumference, epiglottis position (Spiegel et al, 1997).

Increased Huskiness *(Breathy or Rough Tone)*

Perhaps one of the more difficult words to define in the perceptual qualities of the female adolescent voice is "huskiness", although its use is widespread in the descriptive literature of the adolescent female voice (Alderson, 1979). The word husky is derived from the now obsolete word husk, which refers to a dry cough. It is for this reason that several other descriptors are used alongside huskiness, such as heavy, breathy, or rough tone. Breathy in this case refers to the amount of noise in the tone. Roughness, however, can be described by many different acoustical properties of the voice. Sergeant and Welch use the following descriptions to specify what is meant by roughness as a perceptual quality, "impression of irregular [vocal fold] vibrations, fluctuation of [fundamental frequency] and amplitude of glottal sound, low frequency aperiodic noise, crackling of glottal fry, irregular pulses, wide [fundamental frequency] range, uneven, modes of vibration lacking synchrony"(2008, p.324).

Insecurity of Pitch

A greater occurrence of pitch insecurity was found by Gackle in the adolescent female voice. Boltezar (1997) found that “the main characteristic of adolescent voice is the instability of amplitude (loudness) and specifically the instability of pitch” (p. 185). Pitch insecurity is difficult to isolate as a symptom of vocal mutation because it is generally considered to be linearly related to the developing voice and therefore not an anomaly in the inexperienced singer. However, significant results have shown a “6th grade slump” in vocal development. Rutkowski found that children’s voices

"were not developing along a progressive continuum in the use of their singing voices" (1996, p. 362).

The changing voice confounds the standard tools of assessment because the singer is adjusting to physiological developments that render their previous skills insufficient. Pitch is determined by the frequency of the vocal fold vibration, while frequency is determined by the mass, length, and tension of the vibrating structures. David (2007) explains that "there is little to no direct control over the actions of the larynx's musculature", therefore the lengthening vocal folds, increased weight, and growing laryngeal structures affect the body's ability to produce accurate pitch.

Discomfort or Effortful Singing

Due to changes in the physical size of the laryngeal apparatus and other physical adjustments occurring simultaneously, both male and female adolescent voices show strain. It is important to note that self-reporting done by male and female adolescents found that girls report significantly more post-pubescent voice complaints than do boys (Bodt, 2007). Perhaps this suggests that some ongoing difficulties faced by female singers may first present indications of difficulty during adolescence, and then persist through adulthood. In addition, Tepe et al. found that, when comparing the results of boys and girls who were involved in voice training, there was an increased incidence of vocal difficulties in trained girls who reached puberty (2002). In an attempt to manage the changing voice it seems that some girls used compensating techniques which were subsequently identified as vocal difficulties by both the singers and instructors.

Summary

Adolescent girls experience many changes in the perceptual qualities of the voice during mutation. The list of symptoms that occur after the period of rapid growth is a natural occurrence in most adolescent females' vocal development. Anatomic structures enlarge rapidly and muscular structures take time to resume function as they adapts to new dimensions.

Adolescents interested in music continue to pursue their studies during vocal mutation. Voice instructors deal with individual students as they pass through stages of vocal development however choral conductors must cope with vocal development in a group setting, a more challenging environment for instructing vocal technique and coping with the individual needs of singers.

Choral Pedagogy

The physiological changes affecting the adolescent voice become apparent to both voice instructor and choral conductor. It is more difficult, however, for the individual needs of each singer to be addressed in a choral setting because each singer is rarely heard on his own. How then do choral conductors address vocal technique in the choral rehearsal? And what strategies are used by choral conductors to cope with the adolescent voice change?

Vocal Technique in the Choral Rehearsal

Choral conductors seek a particular aural sound that they must communicate to their choristers verbally and gesturally. Most conductors use a combination of physiological instruction as well as interpretive language in rehearsal. When interpretive language and gestural quality do not achieve the desired effect, some choral conductors turn to vocal pedagogy for answers. In an effort to provide their singers with the guidance they require, conductors rely on choral method books and the experience of their colleagues to complement their knowledge (Cottrell, 2007). Method books generally include multiple approaches to gesture and choral techniques; however voice science is not equally emphasized as a vital skill in a conductor's arsenal.

Little formal training in vocal physiology and pedagogy is required in most choral conducting programs. Musical competence is, perhaps, the most important skill for a choral conductor and as a result the musical backgrounds of choral conductors are diverse. Some conductors began as pianists, organists, accompanists, and others music education histories where vocal training is not required. Due to lack of education in vocal instruction many university graduates from choral conducting programs feel ill-prepared for the needs of their singers.

The specific rehearsal techniques of successful choral conductors have always been of interest to their peers. A study performed by Fiocca found the following qualities in rehearsals conducted by successful school choral directors: beginning rehearsals with warm-ups, teaching good, healthy voice usage, knowing how to deal with voice mutation, and evidence of good vocal pedagogy in the sounds of their

choirs (Fiocca, 1986). Most method books agree that in order to achieve the desired choral sounds you must understand the voice and its capabilities (Collins, 1999; Emmons & Chase, 2006; Fiocca, 1986; Hefferman 1982). Many choral masters also encourage the private study of voice to help improve their understanding of the voice and the way it functions (Corbin, 1986; Fiocca, 1986; Hefferman, 1982; Sipley, 1993).

It is not always possible for choral conductors to spend time with individual choristers although it is likely all conductors would find this useful. For most choristers, the choral conductor is the only source of vocal instruction they will ever receive (Sipley, 1993). Of necessity, conductors assume many leadership responsibilities, including administrative and artistic, but none of these is more important than the role of singing teacher.

A variety of approaches to vocal pedagogy exist in the field of music education and choral conducting. Some conductors become fully informed vocal pedagogues in addition to their training as choral conductors, while others prefer to teach from an entirely interpretive base, discussing imagery and musical intentions with their choristers. Lamble interviewed choral conductors on the topics of their approach to vocal technique in rehearsals and found a response that varied from "I try not to think about it", to complete explanations of the vocal mechanism (2004).

Most choral conducting texts, however, favor information on the physiology of voice (Bartle, 2008; Collins, 1993; Cottrell 2007). Skoog and Niederbach encourage the choral conductor to include as much vocal instruction as possible in rehearsals (1983). In order to do so, a choral conductor requires a solid education in vocal

pedagogy as well as personal experience as a singer. Conductors will hear and see the benefits of the students' increased singing skill when rehearsal time is devoted to vocal pedagogy (Corbin, 1986; Sipley, 1993). Corbin discovered significant results in improved diction, precision and tone quality when vocal pedagogy was introduced into the choral rehearsal (1986).

Choral conductors spend years developing sensitivity to intonation and error identification. Determining challenging vocal passages is also an important aspect of listening but is only of value to a chorister if solutions for these challenges are provided. Addressing voice technique in the rehearsal allows a chorister to grow and develop new abilities. If a conductor hopes that multiple trials will solve the problem, without providing pedagogical guidance, a faulty technique may be ingrained in the singer, or perhaps worse, both conductor and singer will begin to accept an incorrect vocal model (McKinney, 1982).

In *Prescriptions for Choral Excellence,* Emmons and Chase declare, "it is imperative that choral directors understand the vocal techniques that underlie the sound they wish their choirs to produce" and that a director should understand the "functioning, capabilities, and frailties of the human voice in order to shape the raw material into something of beauty."(2006, p.6) Conductors have the opportunity to influence the singing of many students at a time and are in a unique position to assess a singer's vocal development in direct comparison to the singer's peers.

Adolescent Voice Change

Some conductors may see the adolescent voice as one stage in the developmental acquisition of singing skills however, it is choral conductors that have led the field in research on the adolescent voice and the particular needs of this age group. Perhaps the most specific advice for the effective organization of a middle school choir comes from Anthony Barresi. Barresi examines repertoire choices in order to determine whether the material is appropriate for the developing voice (1984). Appropriate repertoire allows for growth of the singer but does not overestimate nor overlook the abilities of the developing voice. Barresi suggests the following repertoire considerations:

- appropriate melodic contour: no rapid intervallic leaps or florid passages
- tempo and rhythm: moderate tempos, avoiding slow tempos
- dynamic markings: ff and pp are difficult for the developing singer to perform tunefully
- lengths of compositions: young singer does not have the physical or intellectual endurance of an adult
- text: topics which adolescents can relate to
- melodic interest: quasi-contrapuntal style, more interesting for all sections
- states of change: four and three part music is more useful than unison

In Kenneth Phillips' *Teaching Kids to Sing*, different approaches to the adolescent voice through the history of choral singing are discussed (1991). Phillips provides an outline of each approach and assesses the strengths and weaknesses of it

when compared to more modern approaches to the teaching of singing: Systems analyzed by Phillips include the following:

The Adolescent Male Voice:

- Royal School of Church Music
- McKenzie: Alto-tenor approach
- Cooper and Collins: The Cambiata Approach
- Cooksey: The Contemporary Eclectic Approach
- Swanson: Baritone-Bass Approach

The Adolescent Female Voice:

- Gackle: Classification System for Adolescent female voice change.

Phillips' summation is a most complete and thorough analysis of current choral pedagogy approaches for the developing voice and provides guidance for conductors seeking a middle school method. The purpose of each method is to improve the effectiveness of rehearsals, ultimately leading to the success of the choir while also providing aural and physical markers of the adolescent voice change for the conductor

Bartle lists the following characteristics of successful children's choirs: rehearsals free of tension, good singing posture, singing supported by breath, correct tonal placement, relaxed tongues and jaw, "space/feeling of yawning", and good repertoire in appropriate vocal ranges (2008). Bartle stresses the importance of solid

vocal technique in children's choirs because of the long-term effect of the vocal habits instilled at a young age (2008).

In McClung's study of master teachers in middle-level choral music, all conductors listed individual and group vocal technique as an essential skill component of success (2006). Most method books agree that in order to achieve the desired choral sounds one must understand the voice and its capabilities (Collins, 1999; Emmons & Chase, 2006; Fiocca 1986; Hefferman 1982). Emmons and Chase believe that the conductor has a special responsibility to young singers who do not yet know enough about their voice to determine whether they are employing appropriate singing technique (2006).

McRae suggests that "a no man's land" exists in the instruction of the adolescent choir and states there is a lack of pedagogical guidance for the conductor of this age group (1991). Discussions of the developing voice in method books often center on issues of enrollment and the importance of choral singing to the music education curriculum. Adolescents are discussed as a challenging group of students who cope with a negative stigma attached to singing and who face overwhelming pressure from their peer groups. Although these sociological discussions are important to the conductor or teacher, they do not address the vocal development issues of the adolescents who have chosen to remain in choir.

The majority of research on the developing voice has been conducted by choir directors and public school music teachers, rather than by vocal pedagogues. Of these, their work has generally appeared in journals that focused on education and choral singing. Perhaps it is the number of students that choral directors and music teachers

have the opportunity to work with (and listen to) at one time that created the desire to seek out systems for the effective education of this group of singers.

Summary of Research Problems

Given the research reviewed it is clear that the female adolescent singer, in both voice lessons and choral ensembles, has been overshadowed by the vocal challenges of her male adolescent peers. The existence of a female voice change is not in question; however methods to cope with the limitations and abilities of the female adolescent voice are few. Due to the relatively recent nature of the research conducted on the female adolescent voice it is of interest to pedagogues and conductors how much of this research is known in the vocal community and to what degree this information influences the way in which the female adolescent is taught to sing.

The research addresses the following research problems that were identified after completion of the review of literature.

- Do voice instructors and choral conductors believe that the female adolescent experiences a voice change?
- Are voice instructors and choral conductors noticing the symptoms of voice change in the adolescent female voice?
- Are voice instructors and choral conductors aware of the laryngeal changes experienced by the female adolescent during voice change?

- What resources are voice instructors and choral conductors using regularly to inform their teaching?
- What resources, specific to the adolescent female voice, are voice instructors and choral conductors using regularly?
- Do teachers find the female adolescent voice challenging to instruct during voice change?
    - How does it compare to the adult female voice?
    - How does it compare to the male adolescent voice?
- Are there differences between choral conductors and voice instructors in their understanding of the female adolescent voice?
- What do voice instructors and choral conductors know about voice science?
    - How useful do they find voice science in the teaching of singing and in the teaching of the changing voice?
    - How does educational background affect knowledge of voice science?

CHAPTER TWO

METHODOLOGY

A thorough review of the literature was conducted on the following topics: vocal pedagogy, choral pedagogy, historical voice pedagogy, the physiology of adolescence, and the physiology of speech. After the general review was complete, the researcher concentrated on each of the preceding topics and its relationship to the developing voice.

Upon completion of the literature review, a reassessment of the research question led the researcher to believe that a questionnaire targeted to choral conductors and music educators would provide baseline data demonstrating current practices and perceptions toward the developing voice. To augment the survey results, detailed follow-up interviews would be conducted with four selected participants. The researcher speculated that survey participants would not respond to detailed questions on the adolescent female voice due to a general lack of knowledge on this voice type.

The purpose of the survey was to identify the educational background of the participants, their knowledge of the adolescent female voice and the educational resources or instructional aides that influence their teaching of singing. The interviews delved more deeply into the pedagogical philosophies of the participants, exploring what experiences contributed to their personal philosophy. The interviewees were also asked to describe some of their experiences teaching the adolescent female voice.

Survey Format

Using themes emerging from the literature review the survey was divided into five sections: demographics, professional career, teaching experience, the adolescent singer, and additional comments. The survey questions were of several types: open-ended text questions, Likert item scale, multiple choice, true or false, and short answer commentary. The survey used vocabulary found in the literature review whenever possible, especially when describing vocal characteristics. Voice instructors and choral conductors have highly varied educational backgrounds and the researcher was careful not to use vocabulary (physiological or acoustical) that might cause participants to feel "under-qualified" to complete the survey. To encourage participants of various backgrounds to participate in the survey, free response questions and multiple choice questions comprised the bulk of the questionnaire.

The first part, Section A: Demographics, collected information on the participant's age, place of residence, and gender. The age of the participant provides general information about the level of experience of the participant as well as the years in which they received their musical training. The nature of the research question could be affected by the participant's proximity to a library and/or educational institution and therefore "place of residence" would allow the researcher to draw conclusions between knowledge of the female adolescent voice and the participant's proximity to educational resources. Gender of the participant may affect his/her knowledge or level of comfort instructing the opposite gender.

The next section, Section B: Professional Career, dealt with the participants' area of employment in music and the number of years of experience in each field.

Because many music educators work as choral conductors, professional singers, and voice instructors, participants were asked to determine their primary role. The researcher speculated that the number of years of experience could affect the amount of knowledge acquired by the participant, and would therefore increase the participant's likelihood of possessing knowledge on the adolescent voice.

The following section, Section C: Teaching Experience, determined the age, gender, and experience level of the participant's students. Questions also probed the participants for teaching preferences in age and gender and allowed them to extrapolate on their preferences. The researcher wished to determine whether instructors preferred working with specific age groups or genders and what was the relationship between these preferences and knowledge of the adolescent voice. Following this were questions regarding the nature of their educational background, and level of singing experience. The researcher hoped to determine the relationship between educational background and knowledge of the female voice, as well as personal singing experience and knowledge of the female voice.

In Section D: The Adolescent Singer, specifically addressed aspects of teaching the adolescent singer. Participants were asked to indicate their familiarity with areas of voice science, and the frequency of occurrence of some female adolescent vocal characteristics (a list of qualities taken from Lynne Gackle's research). The researcher wanted to compare partipants' perceived familiarity with voice science and knowledge of the perceptual characteristics of the adolescent female voice. Participants also rated their perceptions of the difference between teaching adults and adolescents. Questions regarding resources and instructional aides used by

the participants were a combination of free commentary and selection from lists of possible resources. This information was collected in hopes of determining the primary resources used by voice instructors and choral conductors.

The final section, Section E: True or False, was a series of true or false questions on the existence of vocal mutation in male and female voice, confidence in teaching the mutating voice, and the type of resources consulted by the participants. The majority of the True or False questions were a triangulation of similar questions throughout the survey.

On February 25th, 2009, a draft of the questionnaire was pilot tested to 2 experienced, independent subjects, one from each category. Several revisions occurred as a result of the pilot test, including a greater emphasis on the source of knowledge of the respondents (i.e. resources and instructional aides used in the teaching of the adolescent female voice and the singing voice in general). Also, questions were added to the true or false section to triangulate responses from other sections (See Appendix B for a copy of the survey).

The survey package also included a one-page description of the nature of the research (See Appendix B) highlighting the researcher's status as a Masters of Arts Music Education student at McGill University, Schulich School of Music. The participants were informed that the survey would take approximately 20 minutes to complete, and that they could complete the survey in whatever way they desired to properly represent their opinions and knowledge. Subjects were informed that their participation was voluntary and that the researcher would protect their anonymity. Upon completion, participants mailed or emailed their survey to the researcher at her

home address. Participants were informed that they were under no obligation to participate and could withdraw from the research project at any time.

Survey Participants

The survey was distributed to the members of the Association for Canadian Choral Communities (ACCC – formerly the Association of Canadian Choral Conductors) and to voice instructors in the Canadian Federation of Music Teachers' Association, through the provincial Registered Music Teachers of Canada Associations (RMTCA) in April 2009. The ACCC is a national association that is open to anyone interested in choral music, but is primarily made up of active conductors. The RMTCA requires a member to have teacher or performer certification from a recognized institution. The survey accompanied the ACCCs bi-annual newsletter and was mailed to the participants; the researcher did not receive a list of the members' addresses. Nearly 550 surveys were distributed to ACCC members. Membership of the RMTCA is much smaller, however nearly 175 surveys were distributed to RMTCA voice instructors using the addresses provided for members on provincial music associations websites.

Return rates of the survey were extremely low from members of the ACCC (1.5%) and were also low from RMTCA members, although more reasonable (11%). The total of returned surveys from the ACCC initial mail-out was too low for statistical purposes, therefore the researcher emailed all personal contacts that were members of the ACCC and asked them to complete the survey and ask one other member to complete the survey. Upon receipt of the surveys from personal contacts, a

sufficient number of surveys were completed to continue with the interview portion and to commence analysis of the data from the survey. In total, 44 completed surveys were collected. The McGill Research Ethics Board II issued a *Certificate of Ethical Acceptability of Research Involving Humans* for this research – REB #307-0209. See Appendix C.

Interview Format

Interviews were conducted over the telephone between August 2nd and August 25th, 2009, on weekday evenings. Subjects were four females, two voice instructors and two choral conductors. Interviews were audio taped using a Sony V-O-R Microcassette-corder M-635VK on to Maxwell MC-90UR microcassettes. The interviews were then transcribed with only minor adjustments to improve comprehension and to eliminate speech pauses. The interviews were between 25 and 52 minutes in length. Questions were prepared by the researcher, however, the interviewees were encouraged to respond and extrapolate as they needed (see Appendix D for the Interview Questions). Some prompting on the part of the researcher was required to encourage the interviewee to continue their explanation.

Interview Participant Selection

The final question on the survey asked the participants in the survey portion whether they would consider being contacted for a follow-up interview. Thirty-three of 44 survey participants agreed to participate in the interview portion if selected. The interview participants were chosen because they expressed opinions on the teaching of

the adolescent female voice, and objected or agreed with elements of the survey. The question regarding the vocal characteristics of the female adolescent voice caused many participants to comment on the usefulness or existence of the list of characteristics. The researcher wished to explore this more and therefore chose two participants for the interview who objected to these vocal characteristics in some way.

The geographical location and educational background of both choral conductors chosen for the interview are remarkably similar. CC1 responded to the first round of survey distribution (through the ACCC newsletter) without any extra solicitation. Although CC1 was known to the researcher as a successful choral conductor, they were not personally acquainted. CC2 was a choral conductor who responded to the survey through the researcher's personal network.

The majority of the choral conductor participants answered the second portion of the survey with very little information. Both CC1 and CC2 displayed a vast knowledge and complete understanding of the female adolescent voice and must be considered exemplary candidates. In no way do CC1 and CC2 represent the rest of the choral conductors who participated in the survey.

All four interviewees provided comprehensive answers throughout the survey and had a minimum of ten years in their field.

CHAPTER THREE

SURVEY RESULTS

Participant Demographics

Four questions were posed of the demographics of the 44 participants, including gender, age, and location of residence. Participants were asked to select an age bracket from the choices provided: under 20, 20-29, 30-39. 40-49, 50-59, and 60 and over. Ninety-six percept of the participants were over 30 years of age and the majority (n=13) of the participants were 50 to 59 years old. Figure 1 outlines the age of the 44 participants.

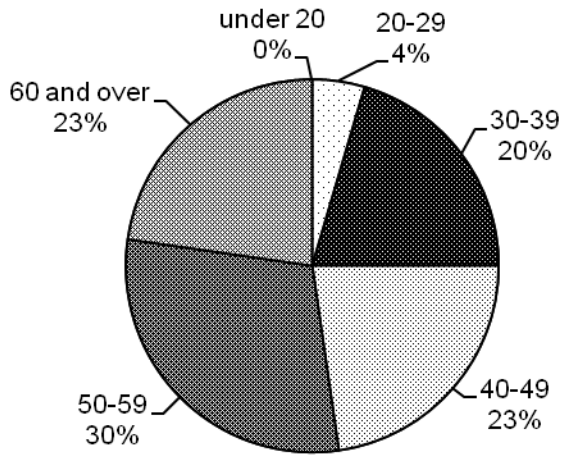

Figure 1. Age of Participants

The overwhelming majority of participants, 84% (n=37), were female. Results for population of the participants' residences were distributed across the options provided, varying from a residence of less than 10,000 to over 200,000. The majority (46%), however, of respondents live in cities (population of over 200,000 people). Figure 2 shows the self-reported population of the participants' residences.

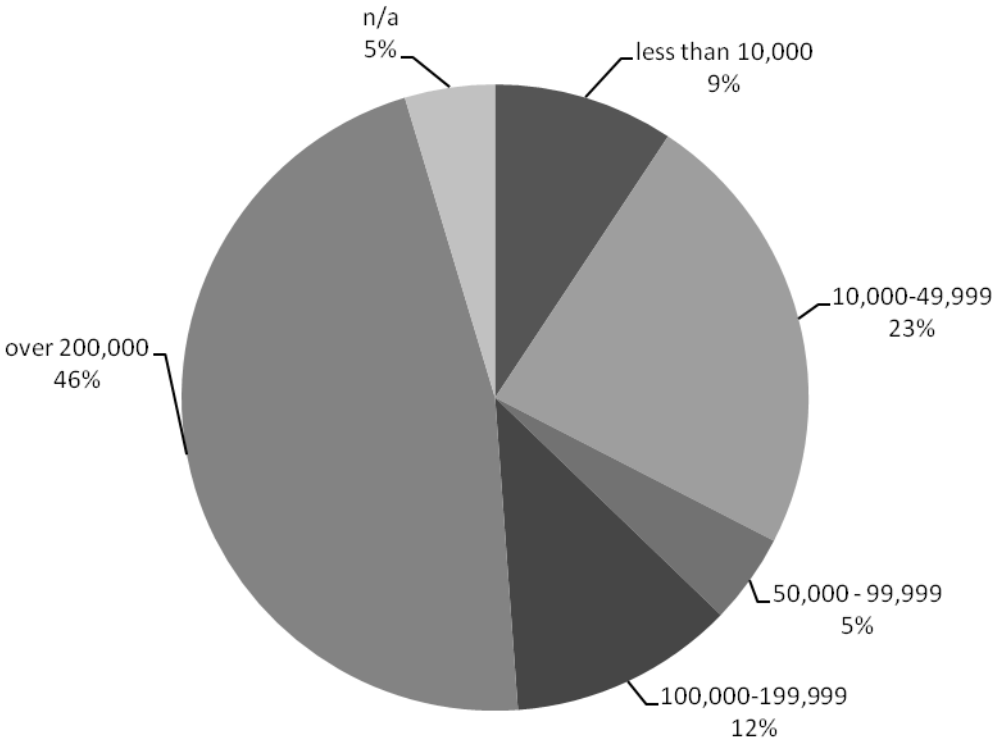

Figure 2. Self-Reported Population of Residence

Professional Career

Four questions were asked relating to the participants' professional career. The majority of the participants described "voice instructor" as their primary employment (n=26), 12 participants said "choral conductor", 2 indicated "professional singer" and 3 considered themselves some combination of the categories offered. Of the participants who worked as professional voice instructors (n=35), the average number of years of experience was 21.6 years. Of the participants who worked as professional choral conductors (n=32), the mean number of years of experience was 18. Finally, of those who worked as professional singers (n=26), 21 was the mean years of experience.

Many participants worked as professionals in more than one field: 14 responded “yes” to all three, 24 responded “yes” to “choral conductor” and “voice instructor”, and 18 responded “yes” to “professional singer” and “choral conductor.” Two participants indicated they had only worked in one field professionally. Of note, none of the participants indicated only “choral conductor”, and none of the participants indicated only “professional singer.” Other participants (n=2) could not choose and instead made notes such as “these each comprise 50% of my teaching time.”

Educational Background

Participants were asked to describe the highest musical education that they have received and were asked to choose between high school, undergraduate degree, and postgraduate degree. Fifty-eight percent of the participants had postgraduate degrees and 28% had undergraduate degrees. Some participants added to these options with teacher training through the Royal Conservatory of Music. Figure 3 represents the results of the highest musical education received by the 44 participants.

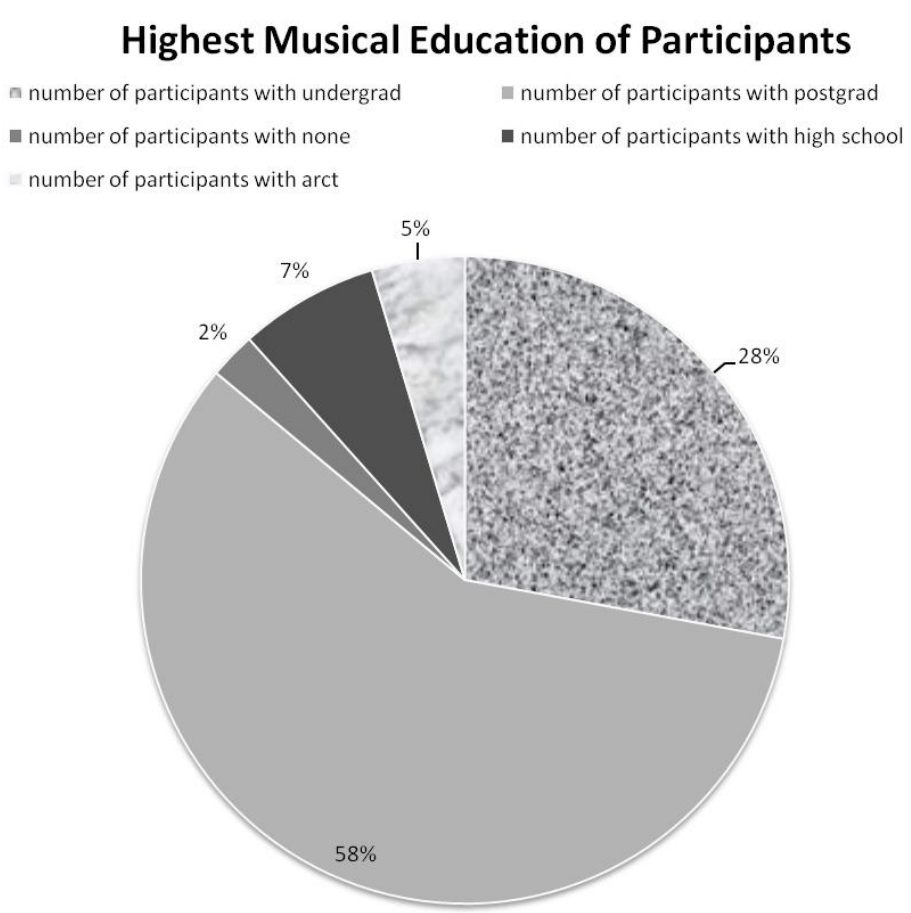

Figure 3: Highest Musical Education Received by Participants

Teaching Experience

Participants were asked to name the age group that best described the majority of their students: 0 to 8 years, 9 to 13 years, 14 to18 years, 19 to 64 years, and 65 and over. The majority of participants selected 14 to 18 years of age (n=24), and 70% of respondents selected 9 to 13 years of age and/or 14 to 18 years of age. The experience level of the participants students' amateur (n=27), beginning (n=21), semi-professional (n=7), and professionals (n=3).

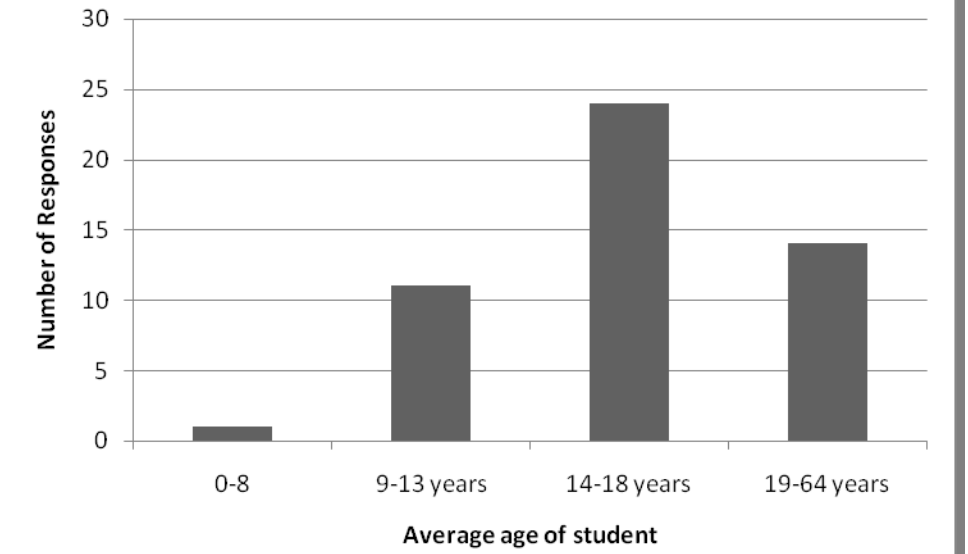

Figure 3. Average age of respondents' students

When asked what age groups the participants preferred to teach, 14 % (n=6) chose children, 50 % (n=22) adolescents, 36 % (n=16) adults, 0 % (n=0) seniors and 27 % (n=12) had no preference. When asked what age groups they found most difficult, 11 participants selected children, 5 selected adolescents, 7 selected adults, 6 said seniors and 14 indicated no difference. When asked what gender was most difficult 14 participants said males, 5 participants said females and 24 participants said there was no difference in difficulty. All 14 participants who chose "male" to be more difficult were female while the 4 participants, who chose "female", were male.

When participants were asked why they found a particular age group difficult these themes emerged:

Table 3: Age Groups and Reasons for Teaching Difficulty

Age Group	Number of Selections	Reasons
Seniors	6	• Physical limitations (hearing loss, overall strength • Poor habits ingrained
Adults	7	• Limited practice time • Work commitments interfere with progress • Inhibited
Adolescents	5	• Emotional instability • Concerned with peer acceptance • Voice change (only mentioned once)
Children	11	• Shorter attention span • Immature voices • For specialists

When participants were asked why they found particular gender more difficult to teach the following themes emerged:

Table 4: Gender and Reasons for Teaching Difficulty

Gender	Number of Selections	Reasons given
Males	14	• Exampling is challenging (for female instructors) • Finding appropriate repertoire • Elements of the changing voice
Females	5	• No comments
No Difference	24	• Equally challenging because both go through voice change • Received specific training in both

Thirty-three of 44 participants indicated that voice was their primary instrument while other participants who had other primary instruments listed piano (n=9), trombone (n=1), and trumpet (n=1). Of the choral conductors who indicated that voice was not their primary instrument (n=6), all had taken voice lessons, for an average of 4.67 years.

The Adolescent Singer

The participants were asked to rate their familiarity with the following topics: physiological changes of the male adolescent voice, physiological changes of the female adolescent voice, the science of vocal acoustics, and the physiology of singing. Of the four topics, participants were most familiar with the female adolescent voice, followed by the physiology of singing, and least familiar with the science of vocal acoustics.

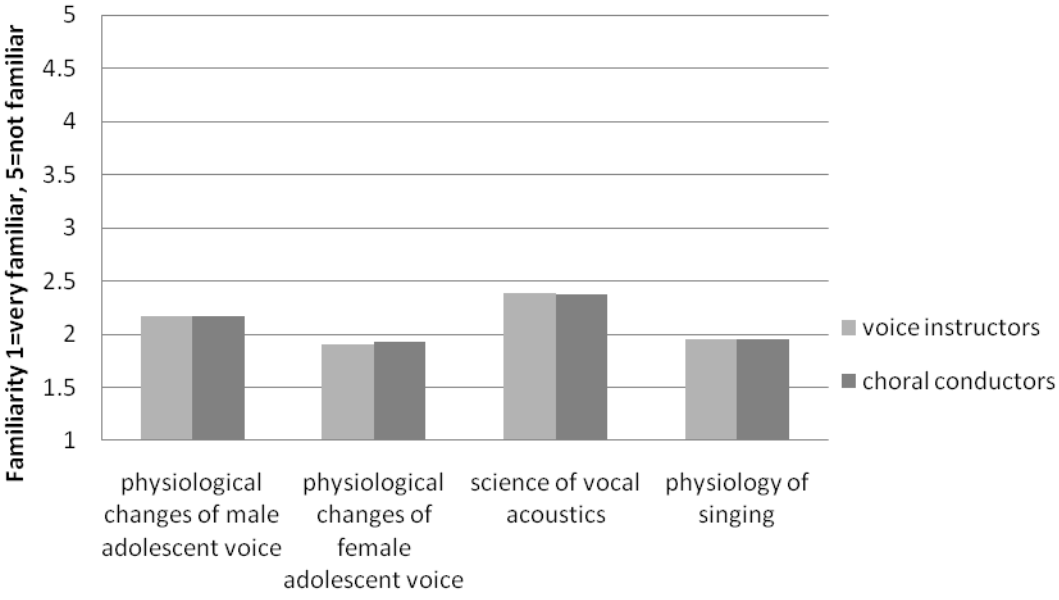

Figure 5: Average Ratings of Familiarity with Areas of Voice Science

When asked to compare the teaching of the adult female voice with the adolescent female voice, 67% of participants chose "somewhat different", 36% "very similar" where as the instruction of the adolescent male voice was considered "somewhat different" by 53% of the participants, and "very similar" only 6 %.

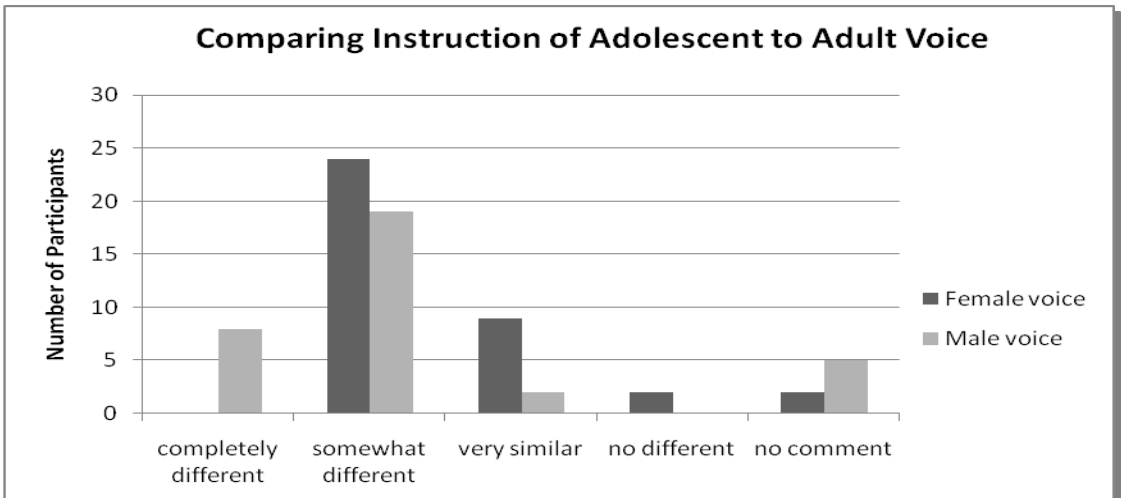

Figure 6: Comparison of Adult and Adolescent Instruction

The researcher provided a list of Lynne Gackle's characteristics of the adolescent female voice and participants were asked to rate the frequency with which they noticed these characteristics in the adolescent female voice. Participants were asked to rate the frequency on a Likert scale: 1 being "always" and 7 being "never"(see Figure 8, p.60).

Six participants did not use the Likert scale provided for the characteristics of the adolescent female voice although, their reasons varied. One participant stated, "These categories do not reflect my approach." Three participants thought that these were symptoms of poor vocal technique rather than conditions of voice change. Six participants found the categories to be "too general" or "ambiguous."

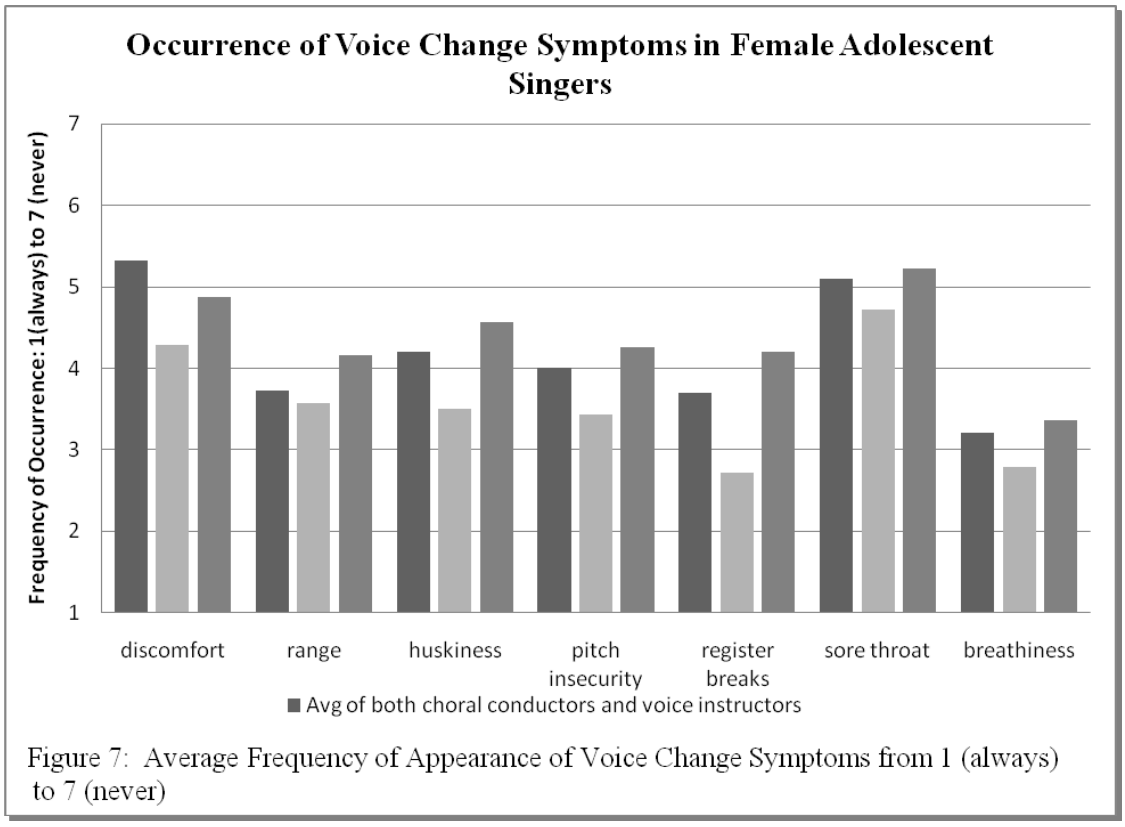

Figure 7: Average Frequency of Appearance of Voice Change Symptoms from 1 (always) to 7 (never)

Most of the ratings were located on the upper half of the rating scale (from 4-7). The ratings in the higher part of the scale accounted for 32 of 39 for evaluation of "discomfort while singing", 29 of 39 for "frequently complaining of sore throat", 26 of 39 for "pitch insecurity", 24 of 39 for "increased huskiness", 22 of 39 for "decreased or inconsistent range", 20 of 39 for "developing noticeable register breaks", and 14 of 39 for "breathiness."

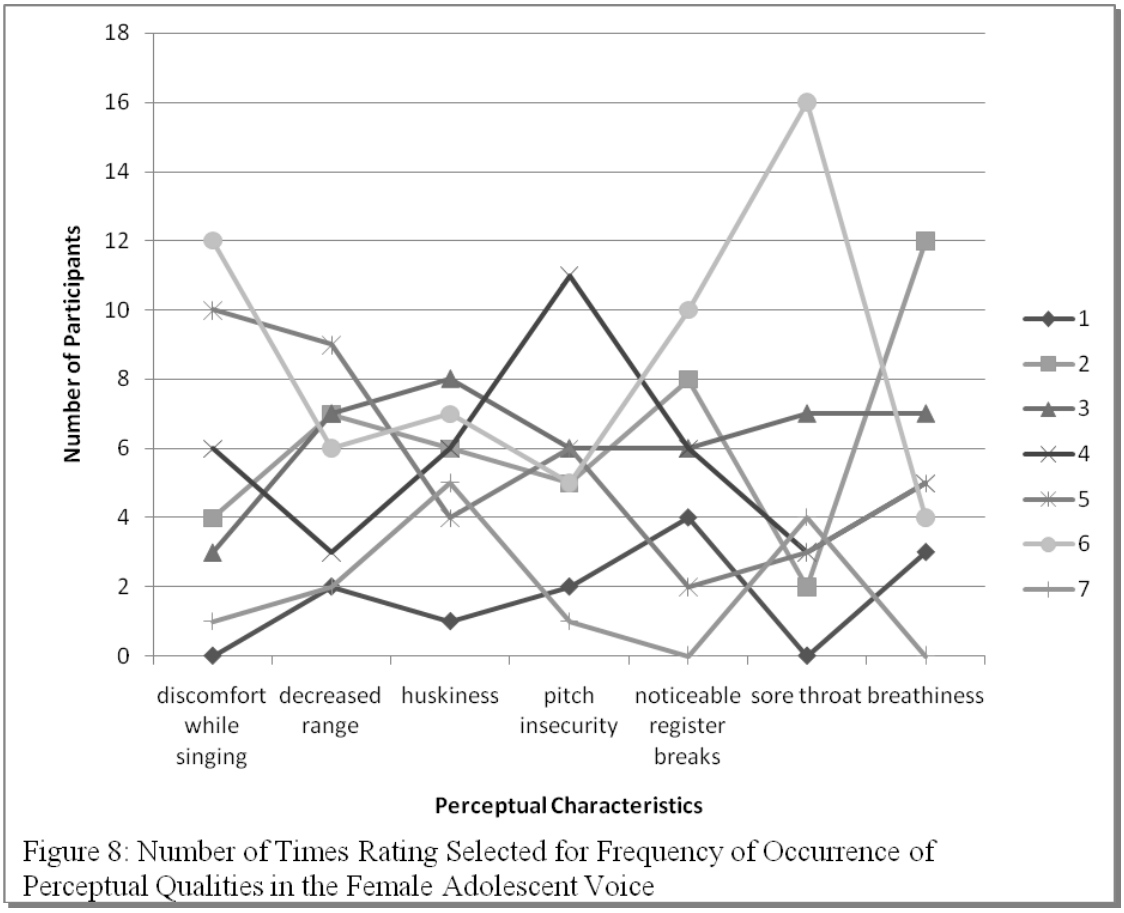

Figure 8: Number of Times Rating Selected for Frequency of Occurrence of Perceptual Qualities in the Female Adolescent Voice

Participants were asked about their level of understanding of the physiological and pedagogical elements of the male and female adolescent voice. When asked about the male adolescent voice, 61% of the participants responded "fairly complete," whereas when asked about the female adolescent voice, 55% chose "fairly complete":

likely due to the higher number of participants who chose "complete" (n=8) for the female adolescent voice as opposed to the results for the male adolescent voice (n=3). Some participants (n=2 for adolescent male voice, n=1 for adolescent female voice) chose not to respond because of the "lack of experience" with the adolescent voice change.

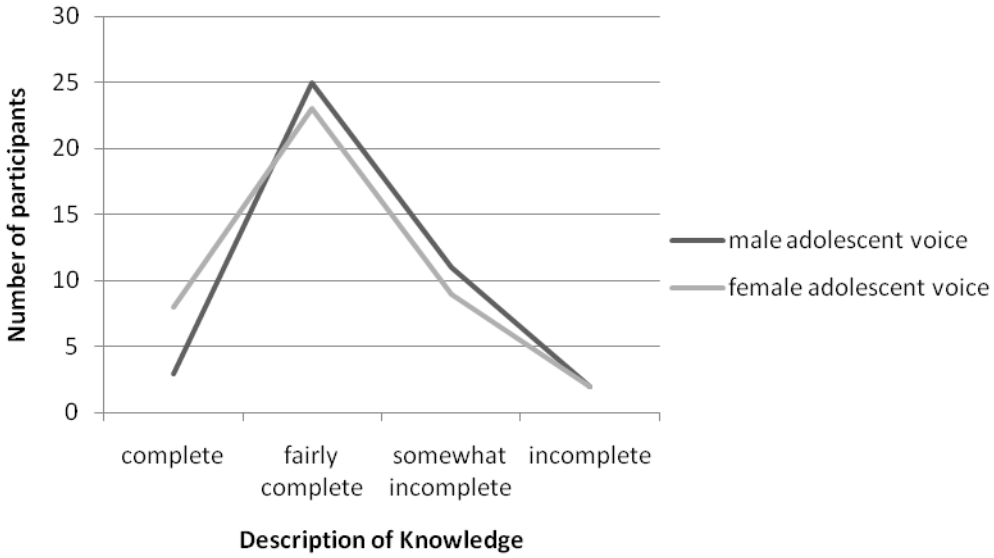

Figure 9: Understanding of Physiological and Pedagogical Elements of the Adolescent Voice

Teaching Resources

A variety of instructional aides and resources are used by choral conductors and voice for the teaching of the adolescent female voice including: personal experience (n=8), workshops (n=7), vocal pedagogy texts (n=8), colleagues (n=7), periodicals (n=5), developmental repertoire collections like Royal Conservatory of Music grade books (n=5), recordings of singers (n=4), diagrams of anatomy (n=3), warm-up exercises (n=3), sight-reading books (n=2), physical body training (n=2),

adjudications from festivals (n=2), recorded accompaniments (n=2), recorded lessons (n=2), mirror (n=2), ear-training CDs (n=1), listening to professional singers live (n=1), text translation websites (n=1), diction books (n=1), internet (n=1), NATS membership (n=1), recordings of past voice students (n=1), David Jones website (n=1), solfege (n=1), exercise ball (n=1), and speech therapist and otolaryngologist (n=1).

Participants were also asked what texts, journals, or internet sites they used regularly for the teaching of vocal pedagogy and a long list of pedagogy texts (Vennard, McKinney, David Jones), IPA guides, journals (Canadian Music Educator, Journal of Research in Music Education), and other materials were listed. Most frequently listed resources were the Journal of Singing (n=7), Richard Miller texts (n=5), and Kenneth Phillips' text, *Teaching Kids to Sing* (n=6).

Several questions in the True and False section directly corresponded to the resources used by choral conductors and voice instructors. These questions were:

Table 5: Use of Informational Resource

Question	True N=	%	False N=	%	Blank N=
I have consulted my **colleagues** regarding the adolescent female voice.	**37**	**86**	**6**	**14**	**0**
I have consulted my **colleagues** regarding the adolescent male voice.	**39**	**91**	**4**	**9**	**0**
I have consulted **scholarly journals** regarding the adolescent female voice.	**25**	**58**	**18**	**42**	**0**
I have consulted **scholarly journals** regarding the adolescent male voice.	**32**	**74**	**11**	**26**	**0**
I have consulted **the internet** regarding the female adolescent voice.	**12**	**28**	**31**	**72**	**0**
I have consulted **the internet** regarding the male adolescent voice.	**16**	**37**	**27**	**63**	**0**
I have attended **workshops** on the adolescent voice.	**27**	**63**	**16**	**37**	**0**

Responses to the true and false section were largely in agreement with the statements. A portion of the participants drew attention to the use of the word "mutation" in the following two statements: "I believe the adolescent female voice goes through a period of mutation" and "I believe the adolescent male voice goes through a period of mutation." One participant thought that perhaps it was the "wrong word" and another was concerned with the negative "baggage" that accompanies the word mutation.

CHAPTER FOUR

INTERVIEW RESULTS

The following results are those gathered from four interviews conducted with two choral conductors and two voice instructors. All the interviewees were female. The participants are coded V1 and V2 for the voice instructors, and CC1 and CC2 for the choral conductors. V1 had a comprehensive career as a soloist, a professional chorister and now instructs voice at a college in British Columbia. V2 began her career as a high school music educator, where she led choral ensembles in Saskatchewan for approximately ten years. She no longer teaches in the public system but continues to teach voice privately in her home. CC1 currently conducts one of Canada's leading children's choral ensembles based out of Alberta and continues to teach singing and piano privately in her home. CC2 is a University educator in Alberta. She conducts several choral ensembles and teaches courses in conducting, choral literature and pedagogy, and aural and sight singing skills. The results are organized by theme and include selected highlights from the interviews. The responses are organized by question with some information extracted from other questions when they directly influence a response to an earlier question. In some cases an ellipsis has been used to truncate some of the responses given by participants in the interest of length and relevance.

Musical and Educational Background

Question 1: Can you tell me a bit about your educational and professional background? For example what school you attended? What training you received? What choirs you've conducted or students you've taught?

The first question asked the participants to describe, in detail, the formal and informal musical training that they received. All four participants are university graduates and both choral conductors have post-graduate degrees. V1 has a Bachelor of Music in Voice Performance and V2 has a Bachelor of Education with a major in English and minor in Music.

A detailed list of each participant's post-secondary education is listed below.

V1 is a graduate of the University of British Columbia where she completed a Bachelor of Music in Voice Performance.
V2 is a graduate of the University of Regina where she completed a Bachelor of Education with a major in English and a minor in Music.
CC1 has a Bachelor of Music in Piano Performance from the University of Lethbridge. Upon completion of this degree CC1 considered a Masters of Music in Piano Performance before deciding to attend the Kodaly Institute in Hungary for a year. After returning from Hungary, CC1 continued her studies at the University of Alberta in the Masters of Choral Conducting program, which she completed.
CC2 also has a Bachelor of Music in Piano Performance. She graduated from the Piano program at University of Alberta where she took voice as a second study. Following her Bachelors, CC2 took completed a Bachelor of Education degree at the University of Alberta. After several years teaching music in the school system, CC2 pursued further studies at the Kodaly Institute in Hungary. CC2 returned to Edmonton, Alberta and completed a double Masters in Choral Conducting and Voice Performance at the University of Alberta.

Private Music Lessons

All the participants received private lessons as children and adolescents. Notably both CC1 and CC2 began their musical studies as pianists and as adolescents began to study voice in private lessons. V1 and V2 both described vocal education from a very young age. V1 continues to pursue her vocal studies, while V2 ceased her voice lessons in her mid-twenties.

Other sources of education

Both CC1 and CC2 attended the Kodaly institute in Hungary and therefore received additional education at this institute. V1 described her performing experiences after University as the most influential to her education. V2 mentioned continuing to attend conferences and festivals in the recent years through professional development and involvement in music conferences. All four interviewees had pursued education through several institutions.

Most influential Education

Question 2. Of the training that you received at school or someplace less formal, what is the information that most influences the way you teach?

The interview participants were asked what musical education they received that has most influenced their teaching. V1 cited experiences that she had outside of her university education in more performance-oriented settings. V2 was strongly influenced by a voice instructor she had at a young age and then also by a mentor conductor who became dean of a University.

CC1's most influential education was one she received while listening to the local choirs in Hungary during her education at the Kodaly Institute. The aural definition of beautiful choral sound was remarkably different from Canada and it changed CC1's own conception of "good choral singing." CC1 revised her aural expectations for adolescent's and children's voices because of the "full" and "rich" sound she heard from Hungarian choirs.

CC2 was influenced by a voice teacher she was taught by in her twenties. CC2 said that this voice instructor did not rely on one singing method but combined them to create a holistic approach.

Below are the highlights from the answers to the question regarding the most influential education that the participants received.

V1: [The most influential instruction I received was] after university…I had some really good teachers after university, when you start being able to apply what you're learning. It would not be in the school system. You learn some stuff, but it's basically more through practice, I would say… And applying it out of the context of the very controlled environment of the university.
V2: What most strongly influences the way I teach is what I learned from my teacher. So, I learned specific techniques from my first teacher, a beautiful lady named Sister [name omitted]. I was a little girl and she taught me how to breathe. And then at University I had the tremendous pleasure of working with a [female music educator] who went on to be the president of a University in Halifax and now she's moving to Victoria.
CC1: It wasn't so much the program [at the Kodaly Institute], as what I observed in the [Hungarian] choirs. Part of the program was to go and observe music classes in the school system. Music was all taught vocally…[The most influential thing was] what I heard in the singing.
CC2: I think it probably would be my time with [a former voice instructor]. Her whole approach to teaching which is …I guess her connection with Alexander Technique, freedom and to some degree a lack of. It wasn't a technique based on any one thing. You'll go to a teacher and just, they're *just* Lindenbaum, *just* their mentor. It was something that came from [my former voice instructor's] unique being and her experience as a singer. I guess, with her, the thing I loved the most…was the clarity of tone, and ease, relaxation that spoke to me.

Influence of Interviewees' own Private Lessons

Question 3. In terms of vocal pedagogy, how much did the way you were taught to sing contribute to your own approach?

The third question asked the participants how their experience in private lessons has influenced their teaching of singing. The question hoped to illuminate how much of the Master-Apprentice method remains in the training of singers. Are

choral conductors and voice instructors passing along the voice lesson methods that were given to them?

CC1 spoke of an impactful negative experience as a young singer. The incident affected her teaching careers and alerted her to the particular sounds of the developing voice. CC1 does not believe that she received quality education as a young singer.

CC2 expressed her interest in the sensation approach that was passed to her from a past voice instructor. She also discussed her concern that technique in singing is negated in comparison to other instruments. She believes that this lack of structure through technique leaves a singer without the tools to practice and learn effectively independent from the instructor.

CC1: "It was very poor teaching [that I received as an adolescent]. Now that I look back and know now what I know about the voice, it was really poor teaching. And, I understand why I was told…I was only 10 or eleven when the music school teacher told me, 'You have a horrible voice, you can't match pitch and you should never sing.' And I run into my voice type all the time and I understand what she didn't know about voices that would make her say that. It's interesting to see how much it all goes back to what I experienced as a child."
CC2: "[Something influential to my teaching has been the] sensation approach to singing. If it feels goods it's right! I guess also too… I think learning from one's mistakes. However, the more I taught as the years went by, and being connected to [an accomplished pianist], and his connection with technique, I really felt more and more that sometimes technique is negated in the teaching of singing. I think focusing on older students…guiding the singer so that they have a concrete, conscious approach to practice which I find with singing teachers is generally not addressed very much. What do I do now? What is the right way to practice this? How do I do this on a daily basis?...really giving very specific things to focus, then [students] have something to look for.

The voice instructors also spoke of their experiences as singers but in a more general way. V2 spoke again of her first voice teacher who was musically nurturing

and V1 spoke of her current voice instructor as an influential teaching model. V1 also raised her concerns about education without performing experience. She suggested that education alone was not enough to qualify an instructor.

> V1: You have to remember that most of these colleagues that you're speaking of, most likely is my guess, is that they teach in colleges and universities. They're not performance venues. They're not, they're not, um, you know their main thing is not generally performance, you know? You know…we have to fill our time with history, with theory, and all that other stuff and it's not that generally, performance-based tools. […] …and you can know every name of muscle and the cricoarytenoid, and all the workings etc. that's all fine and dandy but it doesn't make you, in that sense, a better singer. It often can confuse new young singers…Speak every day, so people can understand. So that they can communicate the best they can.

Singing as Skill-Based

Question 4. In Kenneth Phillips' book *Teaching Kids to Sing* he repeatedly talks about singing as "skill-based" and singing as a "learning" process. Do you think that singing is based on the acquisition of skills? If so, how do you evaluate the changing voice of the adolescent?

In Kenneth Phillips' book *Teaching Kids to Sing*, he emphasizes singing as a learned skill, thereby emphasizing the process of learning to sing as skill acquisition. Phillips' philosophy is at odds with the belief that singing is a "gift" that few possess. The researcher gathered information from the instructors on their experiences teaching singing and whether they believed that singing is skill-based. All four interviewees agreed that singing is a skill-based activity, although three interviewees commented on the nature of skills as not the "whole story." V1 said that knowledge of the act of singing would allow a student to improve, while V2 and CC1 spoke of "innate" voice quality and the limitations or possibilities that innate voice quality can exert. CC2 fully embraced Kenneth Phillips' method including the philosophy of learning to sing as the acquisition of skills.

V1: Yes, it's skill, absolutely. Well, some people can, just like swinging a golf club, you know but to be able to improve on it they have to understand what the heck they are doing.
V2: I've worked with many, many students over the years and I've never come across a student who couldn't match pitch, so in terms of "Is it skill-based?" Absolutely. Can you teach it? Absolutely. On the other hand, there are some students who are more naturally gifted and no matter how many skills they have, may only progress so far as their abilities take them…Not everyone can be phenomenal, you know, I can't draw. You can teach me the basics behind drawing but I'll never [be] Monet. We certainly can teach the skills.
CC1: Absolutely. I mean voice quality is innate. The best teacher in the world won't change a mediocre instrument into an operatic voice but you can take a mediocre instrument and make it function to the best of its ability. So that it's a sound that's pleasing to the listener and that it's pleasing for the singer to produce, which is the most important thing. That is all easily doable. And that's just acquiring the skills you need, and that is understanding the coordination. It's really a coordination game.
CC2: [Kenneth Phillips] addresses that you learn by freedom by making noise and trying to put the voice in a placed without constriction. I just felt like [*Teaching Kids to Sing* was] the bible.

Recognizing Voice Change in the Adolescent Female

Question 5. Lynne Gackle conducted a study over several years of the adolescent female voice. She observed symptoms of voice change (hoarseness, huskiness, limited range, breathiness etc.) occurring from age 9 to 15. In your opinion, is it possible to differentiate symptoms of voice change from signs of an inexperienced singer?

Inexperienced and young singers often exhibit the symptoms listed by Gackle in her list of perceptual characteristics of the adolescent female voice change. The interviewees were asked if they felt it was possible to recognize the symptoms of voice change in the female adolescent singer. This question seemed pertinent because of the apparent similarities between sound characteristics of the inexperienced singer and the female adolescent. In order for a classification system to be useful it must be

possible to differentiate the inexperienced singer from the singer in the midst of voice change.

V1did not clearly state whether the symptoms of voice change were identifiable but she did express concern that addressing these vocal characteristics might be focusing too much on subtle changes and thereby making a "mountain out of a molehill." V2 did not recall any of her female adolescent pupils displaying the perceptual characteristics of voice change other than breathiness. V2 explained that she regularly encounters students who "don't know how to breathe" but once they are taught how to correctly breathe, breathiness seems to "go away." CC1 stated assuredly that it was possible to recognize the symptoms of voice change as long as "you know what you're looking for." CC1 also observed that the process of learning a new vocal coordination after mutation can happen very quickly, and the female may learn how to manage her new voice rapidly. CC2 emphasized that continuing to work on the fundamental skills of singing prior, during, and after voice change will help the instructor determine whether a student is experiencing vocal mutation.

V1: "So in my view, I'm trying to remember my experience as a singer and I never experienced that…I think sometimes you have to be careful as a teacher that you don't create a mountain out of a molehill. You don't speak to the singer or say "oh, well that's your… voice is going to change" and I don't think that the female voice is actually changing and shifting. But again, I don't work with a whole lot of really young adolescents. It was never my experience, as a singer, and I was singing and competing since I was thirteen….When it comes down to it, I don't focus a lot and say, 'oh, well this is your…', I don't use the word break, 'as your voice is transitioning', because you're physically…There's a lot of stuff going on, anatomically, physiologically, so I have them take that in stride. And I try to take it in stride myself."
V2: "I'm thinking about your description…I just can't think of a student that I've taught who had a hoarse or husky voice….Except if it was because they didn't know how to breathe….I'm just scrolling in my mind, and I don't think I've encountered that. I've encountered students who don't know how to breathe…and

then [once they learn to breathe I] find that some of those things just go away. I see the kids through that teenage stage [and] typically when they come to me they are very breathy, they don't know how to project their sound. Those types of things, and we just work on breathing and the sound comes and their voices settle into where their pitches should be. But in terms of being hoarse and husky I cannot think of one student, ever."
CC1: "Oh, absolutely. Yup, if you know what you are looking for… but [only until] they learn a new coordination, which can happen very quickly."
CC2: "You just have to keep working on [the foundational skills: breathing, vowel formation, and posture]. Whereas someone who is just going through a voice change, the basics are not affected, the sound will be affected but the basic physiological posture, breath, vowel shape is not affected. Just because they are going through a voice change they don't have to be slouching, with bad vowel shapes."

Benefits and Weaknesses of Classification Systems

Question 6. There are many classification systems for the changing male voice (they talk about phases that the boy's voice will pass through). What do you think are the benefits/weaknesses of this sort of classification system?

The male adolescent voice has several classification systems that outline the vocal development of the changing boy's voice. The creation of these systems has allowed instructors to set realistic goals and expectations for the adolescent male. The researcher asked the interviewees what, in their opinion, are the benefits and weaknesses of classification systems.

V1 believes that caution is required when analyzing vocal development because of the individual nature of rate of growth during adolescence as well as maturity. V1 warns against the "over-analysis" of the process. CC1 was in agreement that systems of classification can lead to the complication of something quite simple, however she did agree that the systems can be useful in defining what exactly can occur during female voice change. V2 does not object to the classification systems ideologically but she did not find the classification systems for the male adolescent

voice of use and therefore speculated that a system for the female adolescent voice would be much the same.

CC2 felt that classification systems can be very helpful to the instructor, although she reiterates that instructors may have students that do not conform to the system. Sharing information about voice change with the student, CC2 stated, should be done selectively depending on the student's needs.

V1: Yeah, you have to be careful with the language, I think. What may be a challenge for one singer may not be an issue for another singer. It's just not been my general experience . You know there's trends and tendencies but you know, just because a singer is fourteen or fifteen or sixteen, and some mature later and maybe experience it much later… You have to be cautious not to overanalyze stuff.
V2: You know, Megan, honestly I don't think I ever use them in my own teaching…When I would be working with the young men, I would show them on the piano, your voice used to be up here, now you're down here, fantastic. So, let's start and get some breathing going. I would just transfer all the stuff down to their timbre and go. I'm not sure I really ever used them as you suggest. Just didn't have time to sort it out.
CC1: Um, I think there may be benefits. I don't tend to enjoy making things too academic. That just sounds like that is something that is very much more complex than it needs to be. But there may be benefits to that, certainly the female voice goes through a voice change just like a male voice. Because it's not a complete change in register, it's not really as drastic. It's not an emotional trauma for girls, unless they can't make their voice function.
CC2: I think there are real benefits to the teacher because it helps to get some kind of idea of what's going on although the labels themselves, you may have students who blow those labels out of the water…It's hard to, it is hard to label and make generalizations but it is absolutely useful…but I would tend to not share the labels with the student unless the student demonstrates some kind of intellectual need. So if you look on this chart…for some kids that might be kind of helpful.

Dissemination of Information on the Adolescent Female Voice Change

Question 7. The results of the survey I distributed lead me to believe that the symptoms of voice change that Gackle talked about in her study are not recognized as aspects of voice change for the majority of female singers. What would you guess is the reason for this? (Is this knowledge difficult to put into use in the studio? Are the signs too subtle?)

The results of the survey suggest that specific characteristics of the female voice change are not widely recognized by choral conductors and voice instructors. The researcher asked the interviewees to speculate on the reasons for the apparent lack of information on the female voice change had by choral conductors and voice instructors.

V1 expressed uncertainty that the language used in the description of adolescent voice change is helpful. V1 called it "jargon", "b.s.", and "jibber jabber".

CC1 believes that the adolescent female voice change is not well-understood by the public or by voice instructors and choral conductors. The voice change experienced by females is more subtle and therefore requires more specific knowledge in order to identify which may explain the lack of awareness.

CC2 speculates that choral conductors don't hear the individual voices in their choirs enough to recognize the symptoms of voice change, let alone to address them. She also says that some of the ways we hear adolescent voices, like through microphones, obscure what is going on at a vocal level. CC2 says that "breathiness" especially is seen as a vocal "style" and therefore is rarely recognized as a physical limitation during voice change.

V1: Everyday, normal words. Careful of that scientific jargon-y stuff that you read… And we have to be careful that we don't become, "Well, I'm a doctor and have, you know, this is a science of…" It's okay and wonderful when colleagues of this like mind get together and they can, you know, jibber jabber and all that kind of stuff, but to the young singer it's such a…It's just B.S. Pardon me, but it really is. You have to be really, really careful and sensitive to language you use. And I think, you know, with your colleagues as well. Mutant, I would never use the word mutation and mutant you know, in that sense, with my students. I mean it just, where did that come from? Is that your own word or did you read that from someone else's, you know, literature.

CC1: I think most people don't think of girls as going through a voice change. They are unbelievably surprised that I'm talking about a voice change with a girl. So I know that the common perception is that girls don't go through a voice change. I think there are a lot of choral conductors and voice instructors who don't have an adequate understanding of the instrument. So, they are probably operating under that same understanding, we don't hear the voice change, we don't hear the shift in register, so it doesn't seem like there is any big change…although I know that when I do a lot of adjudicating work where conductors just accept that sound as a part of the age, so it's sort of associated with an age but not a voice change.
CC2: You see, I wonder actually how many choral conductors are teaching privately and hearing the kids on their own. That might be one of the reasons. You hear so many kids in high school, you know, singing with [microphones], sometimes the [microphone] can mask it. But also, in terms of what someone hears, their imitating some kind of pop star, it's kind of the style. Is it interpreted as style?

Further Findings

Semi-structured interviews allow for interviewees to respond to the questions asked but also allows for expansion into topics that have not been specifically addressed. Some of the most interesting and unexpected conclusions were derived from the moments in which the interviewee revealed their personal motivations or philosophies regarding the teaching of singing.

Negative or Positive Experiences as Young Singers

Without asking a direct question regarding the personal singing experiences of the interviewees, they all volunteered information about their early singing success or failure. CC1 described an incident at a very young age where she was told she was a terrible singer. "I was only 10 or 11 when the music school teacher told me, 'You have a horrible voice, you can't match pitch and you should never sing.'" A similar experience occurred in CC2's life in which an instructor during university labeled her a "non-voice." "When I was doing my [Bachelor of Music] and taking [singing]

lessons as a second study, one of the voice teachers, who was a Master's student at the time, said, '[CC2] you are a non-voice.' Primarily because I didn't have much vibrato, so I was kind of pegged as the *non-voice non-singer*."

In contrast, both V1 and V2 recalled mostly positive experiences as young singers. V2 had a nurturing singing instructor that positively influenced V2's singing and teaching career. V1 described early success as an adolescent singer, participating in regional festivals and performing regularly.

Importance of Educational Backgrounds

V1 became hostile at the mention of educational training and the teaching of singing. In her opinion, singing is an act of "communication," and singers should be seen as "communicators." V1 suggested that effective pedagogues are sometimes vocal technicians and not interpreters.

> "[My current teacher is] really one of the best voice teachers you could ever, um, ever find. He understands…has a very good ear and knows the voice in the sense, technically. Interpretively, that would be something else…When you say, "the voice", I'm assuming, kind of on a technique basis. Yeah, you can have a doctorate in performance and not be a very good performer. And I met a couple of those when I was going to school, they got a doctorate in voice performance and all that which is hunky dory fine but they weren't that great of a performer, they didn't have much of a performing career."

Insufficient Training in Post-secondary Degrees

A reoccurring theme among interviewees was a retrospective look at the degrees that they attained and whether they believed the training was sufficient for the work that followed graduation. V1's career centered on performance and she thought that the goals of her undergraduate program were not in line with a performance

career. "You know, their main thing is not generally performance, you know? …we have to fill our time with history, with theory, and all that other stuff and it's not that generally, performance-based tools."

V2 was not as critical of her undergraduate Bachelor of Education program, however, she did mention that in her courses on the developing voice there was limited discussion on the male adolescent voice, "but there was nothing on the female adolescent voice at all."

CC1 described in detail what she felt was lacking in Masters in Choral Conducting program and how she believes it contributes to the quality of education that singers are receiving.

> "One thing I found absolutely stunning when I finally did the Masters in Choral Conducting, there was no mention at all of vocal pedagogy or [an] understanding of the voice as an instrument. It is shockingly lacking in most conductors…I really do think that your job as a conductor is to teach. We're not all working with voices that are perfectly formed and understand their own individual technique. There seems to be a misunderstanding at university that you're going to get these singers that come to you with great voices."

CC2 remarked on a similar topic but from the perspective of instructors and conductors who leave university with no understanding of the developing voice due to its exclusion from the vocal pedagogy curriculum.

> "When it comes to vocal pedagogy at the undergraduate level, and maybe the course isn't long enough to address all the, in terms of physiology but I find that there is very little attention given to teaching kids. It's so important, because 9 times out of 10 a voice graduate will go out and teach and will have no idea how to work with younger voices… That's how it seems to me with the way vocal pedagogy is taught at the university level."

Tailoring Instruction to an Individual's Needs

V1 also emphasized teaching singing as instruction that must tailor to the individual needs of each student.

> "It's all very individual. You have to assess the individual, so it's not just 'Oh, he's a male', I'll approach him this way because he's affected by his own physical, emotional, spiritual well-being, etc. You know, one doesn't fit all. You have to see what one is capable of emotionally and physically at that time and also what they are able to do physically."

Attitudes Toward Singing as a Science

In several different ways V1 expressed her reluctance to speak about singing in generalizations and also showed an aversion to speaking about singing using physiological or acoustical vocabulary. The following four examples were spread throughout the 34 minute conservation:

"Yeah and singing, you know the science of singing, it's about communicating. It's simple and it's complex in that sense. But focus on the simplicity."
"You have to be cautious not to overanalyze stuff."
"You have to be really, really careful and sensitive to language you use."
"I think sometimes you have to be careful as a teacher that you don't create a mountain out of a molehill."
"And we have to be careful that we don't become, "Well, I'm a doctor and have, you know, this is a science of…" It's okay and wonderful when colleagues of this [that are like-minded] get together and they can, you know, jibber jabber and all that kind of stuff, but to the young singer it's such a…It's just B.S. Pardon me, but it really is."

V1 is not alone in her interpretation of singing as mostly an artistic endeavour into which science should be carefully introduced. CC1 also hesitated when asked about classification systems, stating that she doesn't enjoy making singing "too academic." Where V1 believes the teaching of singing to be an individual's journey through both

physical and emotional learning, CC1 wishes to not “make [the teaching of singing] more complex than it needs to be.”

CHAPTER FIVE

DISCUSSION

The following section discusses the significance of the results of the survey and the interview. Many of the themes overlap and therefore it is of interest to the researcher to compare and contrast the results of the two portions of the study.

Collecting Participants

Perhaps the most challenging portion of the research conducted was collecting responses from participants, particularly choral conductors. It was not as difficult to collect responses from voice instructors, although the return rate was still relatively low at 11%. Only 8 of 550 surveys distributed to choral conductors using the ACCC mailing list were returned to the researcher. As was mentioned in the methodology, due to the low return rate the researcher used her own personal network to solicit the participation of choral conductors from her musical community

Naturally, the researcher was very disappointed by the initial response to the survey. Why were choral conductors so unlikely to complete the survey? A possible reason arose from the researcher's brief exchange with choral conductor participants upon completion of the survey. One choral conductor bluntly stated, "Obviously the survey, especially the second section, was geared toward voice instructors because it was about teaching singing." It was a remarkable comment because it revealed that choral conductors do not necessarily see themselves as "teachers of singing."

The choral conductor as "teacher of singing" was a conclusion that arose from the review of the literature. In many different journals and books written by choral

conductors, the researcher found discussions on topics of the developing singer, vocal production, effective warm-ups, vowel placement and many more. Why then do choral conductors not consider themselves teachers of singing when books and journals for the choral conductor are full of information on the singing voice?

At first, the researcher speculated that choral conductors may not encounter the developing voice because the majority of conductors instruct adults but survey results show that of participants who consider themselves primarily choral conductors, 5 teach 14-18 year olds, 4 teach 9-13 year olds, 1 teaches 0-8 year olds, and 7 teach 19-64 year olds. Including participants who had worked as choral conductors the breakdown was as follows: 14 participants said the majority of their students were 14-18 year-olds, 12 said 19-64 year-olds, 7 said 9-13 year-olds and 1 said 0-8 year-olds. Therefore, 8 of 15 participants who consider themselves primarily choral conductors teach students between the ages of 9 and 18 years of age and the majority of participants who had some choral conducting experience taught students between the ages of 9 and 18 years of age. It can be concluded then that the majority of choral conductors surveyed instruct students who are experiencing vocal mutation.

Also revealed by results of the survey is that choral conductors are not necessarily experienced singers. Of the participants who indicated that they were primarily choral conductors (n=12), the average number of years in voice lessons was 0.67 years, with 7 participants having had no singing lessons. Although some conductors had multiple years of vocal training, some conductors started as instrumentalists, receiving little vocal training other than the incidental training

provided in the choral ensembles in which they participated. CC1 exposed the lack of training received by choral conductors in graduate programs:

> "One thing I found absolutely stunning when I finally did my Masters in Choral Conducting, [was that] there was no mention at all of vocal pedagogy or [an] understanding of the voice as an instrument. It is shockingly lacking in most conductors."

Perhaps the main reason for lack of interest in completing a survey on the topic of teaching the adolescent voice had little to do with the "female adolescent voice" and more to do with "teaching her to sing."

Certainly there are choral conductors who are also experienced singers. Twenty-five participants worked as voice instructors and choral conductors, exampling the multi-faceted training and expertise of the majority of the participants in the survey. Perhaps choral conductors with experience as voice instructors were more likely to complete a survey about the teaching of singing.

If, in fact, choral conductors do not consider themselves teachers of singing, are they limiting the potential of their singers? CC1 spoke passionately in her interview about the need for choral conductors to fulfill their role as voice instructor:

> "I really do think that your job as a conductor is to teach. We're not all working with voices that are perfectly formed and understand their own individual technique. There seems to be a misunderstanding at university that you're going to get these singers that come to you with great voices."

Resources used by Choral Conductors and Voice Instructors

When choral conductors and voice instructors were asked what resources they use in their teaching nearly all replied that they consulted their colleagues (n=40) and a number of participants (n=8) listed their own "personal experience" as a resource.

Other resources varied between participants (i.e. books, internet, and workshops) but 38 of 44 participants consulted their colleagues regarding the adolescent female voice and 40 of 44 participants consulted their colleagues regarding the male adolescent voice.

These results may be predictable; however, it was important to ascertain whether the instructional method known as the Master-Apprentice model continues to pervade the teaching of singing, whether in choral rehearsal or voice studio. The traditional Master-Apprentice model emphasizes the knowledge of the Master teacher and the experience of the pupil. It can be concluded from the survey results that "colleagues" and "personal singing experience" comprises the bulk of the resources used by both choral conductors and voice instructors.

As Victor Fields suggests, "Strong traditions prevail in the vocal teaching profession, preventing the infusion of new ideas (1977, p.8)." In the eighteenth century, voice teaching was passed from one generation to the next with the goal of conserving the methods of the Master Teachers. Beginning in the 1850s the field of vocal instruction passed from the preservation of the Master Teacher's Methods to a process of evolving by incorporating developments in related fields (i.e. biology, acoustics). Despite the acceptance of new information in the understanding of voice, methods that involve information from sources other than Master or Apprentice remain slow in entering the domain.

Role of Singing Teacher

Victor Fields defines training the singing voice "as a process of administering systematic instruction and exercise to the individual student for the purpose of developing those mental and physical abilities that enter into the artistic performance of vocal expression in song" (1977, p.20). No doubt the majority of voice instructors would agree with this statement, however as more surveys were collected and interviews were conducted it became clear that voice instructors see themselves in many different primary roles.

Technician or Vocal Coach?

In the interview with V1, she described her current instructor as a technician and said that interpretively "well, that's another story." Perhaps division between technicians and interpreters begins in music degrees at post-secondary educational institutions. In these programs voice students often have a voice teacher, for matters of technique, and a vocal coach that focuses on interpretive skills. Graduates of these programs may wonder which role should be emphasized, that of the technician or that of the interpreter?

Counsellor or Singing Teacher?

The title of the research survey was "Teaching the Female Adolescent to Sing." Many participants interpreted this title as a study of the adolescent female as a person, rather than the adolescent female as a voice type. Although this may have been clarified by the questions that followed, participants spoke frequently of the psychological and/or mental well-being of their students. Below is a listing of the

highlights from the written responses on the survey that lead the researcher to believe that instructors are coping with the mental well-being of their female adolescent students.

- "They're so busy thinking about what their friends will think, and just when you get them singing well, they have a fight with their mothers and it goes down the drain."

- "There are many, many factor[s] involved in teaching [adolescent females]. One must take in the physical, psychological, emotional, spiritual, [and] intellectual well-being and learn to develop each and coordinate. The adolescent is a developing and forming being at this part of their lives and must be respected and guided with a firm and compassionate hand."

- "The desire to be 'grown up' and 'be cool' of 'not wanting to look or sound stupid' can sometimes mean that the student will not allow themselves to try certain exercises for fear of making a [squeaky sound] or just 'not [sounding] pretty'."

- "I use a book called *My Lessons with Kumi* for those students experiencing more emotional turmoil during their adolescent years."

The highlights from the survey indicate that voice instructors often serve as part-time guidance counsellors as well as teachers of singing. Female adolescents taking voice lessons are no different from their adolescent peers struggling through the emotional challenges of puberty. As is highlighted by the answers of several participants, teaching an adolescent to sing requires the instructor to compassionately handle the challenges of a student's life as well as his/her singing.

Voice Instructor/Choral Conductor as Teacher of Singing

Although voice instructors spoke frequently about the emotional and social challenges of teaching the adolescent to sing, they rarely spoke of the physiological changes associated with the adolescent voice. Only 1 participant mentioned the work

of Lynne Gackle in the resources used specifically for the teaching of the female voice despite the results indicating that every participant has more female students than male. Even though the majority of the participants' students (n=38) are between the ages of 0-18 years, the majority of resources consulted by participants are not specific to the developing voice.

Female Voice Change and Gender Equality

What impedes the choral conductor and the voice instructor from seeking out new methods for instructing the female singer during voice change? There may be many reasons but it is difficult to ignore perhaps the larger philosophical discussion of gender equality in singing. It was not the purpose of this research to seek out the reasons for which the adolescent female singer is neglected in comparison to the adolescent male singer, however the results of the survey indicate that there may be practical, unintentional and even justifiable reasons for the choral conductors and voice instructors lack of knowledge of the female adolescent voice change.

Singing is Optional

In most public school systems there is no obligatory singing component in music education after the elementary level. Music is then offered as an optional course in junior high school and often the junior high program only includes a band program. Therefore, by the time most students are in the midst of puberty their singing pursuits likely occur outside of the classroom in extracurricular pursuits (i.e. church, choral ensembles, and voice lessons). Students who choose to pursue further

vocal education are those who have shown some ability prior to puberty. By the time students reach adolescence they have already decided whether they are good or bad at singing and therefore those students who do struggle do not end up in singing lessons or auditioned choral ensembles (Harrison, 1978).

The Majority of Singers are Female

The results of the survey indicate that every participant has more female singers than male singers, therefore it is right to conclude, as it was already assumed, that the majority of singers participating in choirs and voice lessons are female. Kenneth Phillips recognizes the differences in the treatment of the female and male developing voice: "because girls so outnumber boys in most choral programs, boys are made to feel special if they sing. For girls it is a normal expectation" (2004, p.109). O'Toole feels that there "is no time, space, or concern for what might irritate, annoy or disturb a female singer in choir"(p.26). The abundance of girls interested in singing permits instructors to choose those who show more "natural" ability and as a result instructors spend less time instructing females to sing.

It is not uncommon for choral conductors and even voice instructors to audition singers prior to their acceptance as a student. The number of females interested in both activities may allow instructors to choose females who have already passed through vocal mutation or who show greater coordination during voice change, therefore the female adolescents who do participate in ensembles and lessons may not represent the abilities of even the average female singer, let alone a below average singer.

Female Voice Change is More Subtle than the Male Voice Change

In comparison to the male adolescent voice change, it is possible to imagine a voice instructor or choral conductor who cannot identify the symptoms of voice change in a female singer. In no way does this mean that a female singer is not experiencing significant changes in vocal quality and muscular coordination but it may explain why very few participants spoke in detail about the perceptual qualities of the adolescent female singer. As CC1 stated in her interview, "we don't *hear* the voice change in the same way [we do the male voice change] because we don't hear the shift in register, so it doesn't seem like there is any big change." The relatively subtle nature of female voice change, especially when compared with the equivalent phenomenon in the male voice, may result in fewer voice instructors and choral conductors identifying vocal characteristics as consequences of voice change.

Recognition of the Perceptual Qualities of the Female Adolescent Voice

Although it was expected that many choral conductors and voice instructors would be unaware of the particular aspects of female voice change, the researcher was surprised to note that most of the participants did not acknowledge the symptoms of voice change in the adolescent female. Those participants who did not acknowledge the symptoms of voice change include a minority of individuals (n=6) who chose not to use the Likert scale of the female adolescent voice's perceptual characteristics (Question 21, see Appendix B). Several participants speculated that the list of vocal

characteristics were not symptoms of voice change but examples of poor vocal technique.

There may be several explanations for the lack of awareness of the female adolescent voice change. After analysis, the surveys and interviews pointed to several possible explanations.

Teaching the Individual Singer

A struggle faced by all voice instructors and choral conductors is the individual nature of the singing voice. Enabling a student to sing healthfully with his/her unique instrument is a goal shared by most teachers of singing and often the most rewarding aspect of the job. Specific cases of voice students were not covered in the survey; however general vocal characteristics of age groups and genders were discussed. Several participants did not feel that generalizing on the topic of singing properly represented the individual nature of singing, for example:

- "…every student has their unique challenges."
- "I hope you are aware of the individual nature of singing and approach to each singer. It is hard to give a blanket statement covering all singers."
- "Nothing is for sure or as black or white. Every person is different and you have to listen and identify what is the best method for each student."

The participants listed above were wary of over-generalizing the singing experiences of individual students.

Unlike choral conductors, voice instructors do not simultaneously instruct multiple students of the same age and gender. It may be unusual for voice instructors, to identify trends and patterns, and to reference groups of singers according to their

age and gender. Vocal classification systems for the developing voice provide a framework for the assessment of singers of similar age and gender may allow instructors to predict both physiological and perceptual qualities of the singing voice.

While the researcher also feels caution is required when applying classification systems, she wonders whether focusing on each individual student's emotional, spiritual, and physical needs may diffuse some of students' vocal progress. The delicate balance between over-simplification and over-individualisation is well-stated by Cooper & Kuersteiner when discussing singing range, "It is a gross error to assume that every voice in each category fits the prescribed range boundaries, but it is safe to say that the ranges apply in ninety percent of the cases studied (as quoted in Hook, 2005)." CC2 agreed, saying "I think there are real benefits to the teacher because [classification systems] help to get some kind of idea of what's going on …: It's hard to label and make generalizations but it is absolutely useful."

What is important for voice instructors and choral conductors to keep in mind is that the individual nature of the voice comes from an infinite number of physical ways in which the structure of the vocal apparatus varies but not from the unique way it functions.

Accepted Qualities of the Female Adolescent Voice

CC1 raised an interesting point when she said that, "conductors just accept that [breathy] sound as a part of the age, so it's sort of associated with an age but not a voice change." Although a minor difference, this may cause voice instructors and choral conductors to deal with the female adolescent voice differently. If CC1 is

correct, “breathiness” may be a vocal quality attributed to the adolescent female voice but not considered a symptom of voice change. As indicated by the results of the survey, “breathiness” is a perceptual quality more often attached to the female adolescent voice. Logically, most choral conductors and voice instructors would agree that due to the frequency of female adolescent singers with breathy vocal quality there is likely a common cause, or a common physiological root.

If in fact voice quality is due to physiological changes rather than a lack of vocal training, vocal training cannot fix the quality of the voice. Research conducted by Barlow and Howard further reinforces that voice change, like all phases of the developing voice, is a physical occurrence that can be well or poorly dealt with by a voice instructor or choral conductor but cannot be eliminated or avoided (2006).

Acknowledging the voice change of an adolescent female can relieve frustration from both instructor and student. Realistic expectations for quality and ability allow both participants in a voice lesson to be easily satisfied. In order to achieve these expectations firstly, teachers of singing must be aware of the symptoms of vocal mutation and secondly, must be able to differentiate symptoms of voice change from poor technique. CC1 and CC2 believe that differentiation is possible but instructors must “know what they’re looking for.”

Correct Terminology

Among choral conductors and voice instructors, a division extends between those who base their pedagogy in imagery and interpretation and those who focus on vocal function and skills. The researcher’s interest in vocal pedagogy stems from her

experience as a student, who was taught by both methods, and also as a voice instructor, who felt inadequately informed in her first year of instruction. Because of the different approaches to vocal instruction, finding common descriptive vocabulary for the perceptual and physiological characteristics of the singing voice can be challenging.

As Wright thoughtfully points out, anatomy and function of the voice developed apart from singing (1999), therefore vocabulary for sound and function differs amongst these fields. Due to their separate origins, perhaps it is not surprising that not all voice instructors and choral conductors have immediately embraced the terminology for the voice and its sounds used by biologists, physicists and physicians. It is difficult, however, to ignore the commonalities of these fields; an interest in the most efficient, healthful, and effective use of the vocal apparatus.

Of the 44 surveys completed, 6 participants commented on the researcher's use of the word "mutation" regarding voice change. The researcher used vocabulary found in the review of the literature on the topic of voice change, and therefore thought it an appropriate descriptive word for the "process of voice change" experienced by adolescents. Despite the word's inclusion in the literature, and its etymology as "the action of change," several participants objected to its use in the survey, particularly its connection to the word "mutant" and to possible sociological "baggage."

The importance of proper terminology is essential to effective voice teaching, as is demonstrated by the earlier discussion of registers. Debate continues over the appropriate terms for vocal registration - once labelled *chest voice* and *head voice*. It

is now understood that registration is a laryngeal action and has little to do with the chest or head despite the sensations of resonance in these areas (Sundberg, 1987). Since this discovery, debate has surrounded the use of these terms because they are inaccurate descriptions of vocal function.

Teachers of singing resist biological and acoustical terminology because it does not encompass the act of vocal instruction. Teaching singing requires many skills, interpretive, musical and aural, however the researcher agrees with McIver when he states that a thorough understanding of vocal function should serve as the cornerstone of vocal instruction.

> "What are the skills that permit teachers to build the egos of students? A complete and certain knowledge of the physiology and acoustics of singing is the only starting point. If we fail to take advantage of the enormous amount of factual information available to us in the twenty-first century, we are no better than our students who attempt to express songs and arias without first finding out what the text is about. Becoming grounded in one's subject matter does not limit one to mechanistic instruction. It should, however, ensure that whenever imagery is employed, it not call into play muscular action contrary to correct physiological function." (McIver, 2003, p. 374)

As Fields suggests, "Training the singing voice may be defined as a process of administering systematic instruction and exercise to the individual student for the purpose of developing those mental and physical abilities that enter into the artistic performance of vocal expression in song"(1977, p.20). It is difficult to "administer systematic instruction" without a good understanding of physiology and the physical factors that affect the singing voice.

CHAPTER SIX

SUMMARY OF RESEARCH PROBLEMS

Research Problems	Findings
Do voice instructors and choral conductors believe that the female adolescent experiences a voice change?	37 of 44 participants agree that female adolescent voices go through a period of mutation.
Are voice instructors and choral conductors noticing the symptoms of voice change in the adolescent female voice?	Symptoms of voice change are not consistently identified and can be mistaken for poor technique. Two exemplary choral conductors do agree that symptoms of voice change can be differentiated from poor technique.
Are voice instructors and choral conductors aware of the laryngeal changes experienced by the female adolescent during voice change?	Participants rated their understanding of the physiological changes of the female adolescent voice higher than the physiological changes of the male adolescent voice, the physiology of singing and vocal acoustics, although no participant referenced specific physiological growth that occurs during female voice change.
What resources are voice instructors and choral conductors using regularly to inform their teaching?	The most frequently mentioned resources were “colleagues” and “my own singing experience.
What resources, specific to the adolescent female voice, are voice instructors and choral conductors using regularly?	20 of 44 participants did not list any resources used specifically for the adolescent female voice. Also mentioned were vocal pedagogy texts by Richard Miller and Kenneth Phillips, and The Journal of Singing.
Do teachers find the female adolescent voice challenging to instruct during voice change?	Age: Only 5 participants chose adolescents as the most difficult age group to teach (reasons given were emotional instability and peer acceptance, voice change was only mentioned once). Gender: All female participants find it more difficult to teach males and all male participants find it more difficult to teach females.

o How does it compare to the adult female voice?	Most participants (n=24) find teaching the adolescent female voice "somewhat different" than the adult female voice. No participants found it "completely different."
o How does it compare to the male adolescent voice?	Most participants (n=19) find teaching the adolescent male voice to be "somewhat different" from teaching the adult male voice. Eight participants find it to be "completely different."
Are there differences between choral conductors and voice instructors in their understanding of the female adolescent voice?	Both groups showed a lack of understanding of the female adolescent voice change, however, both exemplary survey and interview participants were choral conductors.
What do voice instructors and choral conductors know about voice science?	According to their answers both groups feel fairly confident about most aspects of voice science with the exception of vocal acoustics.
How does educational background affect knowledge of voice science?	The majority of the participants had post-graduate degrees but did not correctly identify symptoms of the female adolescent voice change. Unlike other participants both choral conductor interviewees sought instruction outside of typical University courses and showed a greater understanding of the developing voice as a result.

Concluding Thoughts

The researcher hypothesized, prior to embarking on this project, that little was known about the female adolescent voice in the singing community. Although the teaching of singing has changed a great deal since its earliest incarnations, remnants of

myth and misunderstanding still fill the profession with inaccuracies. The results of the survey show that although many instructors do not have incorrect theories regarding the female adolescent voice, they do not have a complete understanding of the physiological changes affecting this singer and therefore cannot accurately identify or address the symptoms. The implications of partial knowledge are well-outlined by Hook:

> "As music educators become better informed about the voice change process, patience with singers under their tutelage may increase. When choral conductors understand that limitations during [adolescent voice change] are only temporary and discover information about voice change indicating that more and more practice leads to better results, then they may become better cheerleaders for the students and encourage them to keep trying. The greatest gift that a teacher gives her student is confidence in that student's ability to learn. The confidence factor for singers is a very big key to overcoming problems with the vocal instrument. This confidence factor can be intensified in students of this emotionally charged age group. Therefore, the music educator must continue to assess each student…on the basis of his personal best, and encourage him to enjoy finding the meaning of music in his own life." (2005, p.93)

Singing can be an emotional, meaningful and artful expression of the human experience; however, like speech and writing, it is more easily achieved when proper skills are provided. The main objective of choral conductors and voice instructors with all singers, including female adolescents, should be to provide skills that enable singers the opportunity to experience the full spectrum of music's power.

As we - teachers, scientists, and physicians - learn more about the instrument that we all share, we must continue to be passionately open to the changes it may bring.

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APPENDICES

Appendix A

CLASSIFICATION SYSTEM USED FOR FEMALE ADOLESCENTS

*SFF: Speech Fundamental Frequency

Stages	**Ages**	**Indicators**	**Singing Voice**	**Register breaks**	**Symptomatic signs**	**Recommendations**
Stage I: Prepubertal	8-10 (11)	SFF*: C4 - D4 ease in singing	light, flutelike, no register breaks, flexible, able to manage intervallic skips, soprano in quality, range is Bflat3 - f5	none that are obvious	none	not capable of as much volume as boys because of vital capacity differences
Stage IIA: Pubescence/ Pre-Menarcheal	11-12 (13)	First signs of physical maturation begin. SFF: B3-C#4	breathiness in tone, trouble producing chest voice, range is A3-G5	one break between G4 and B4	difficulty or discomfort singing, difficulty achieving volume, obvious 'flip' into breathy from lower to upper registers	
Stage IIB: Puberty/Post-menarcheal	13-14 (15)	Peak of Maturation SFF: A3-C#4, breathy or husky	critical time, tessitura may move up or down, narrowing at either end, at times lower notes more easily produced (may sound alto-like), range is A3-F5	two register breaks: between G4 and B4 between D5 and F-sharp5	hoarseness without upper respiratory infection, voice cracking, difficulty or discomfort singing, lack of clarity in tone	vocalization throughout vocal range, may sing in lower range for short periods of time for ease
Stage III: Young Adult	14-15 (16)	Full-bodied richness appears SFF: G#5-B5	overall range capabilities increase, breathiness decreases range is A3-A5	greater consisitency between registers, voice breaks more apparent as passaggio (D5 to F-sharp5)	ease returns, vibrato appears; volume, resonance, and agility increase, breathiness decreases	gaining lower notes at this time does not indicate an alto voice emerging.

Appendix B
Survey

McGILL UNIVERSITY – Schulich School of Music
The Adolescent Singing Voice: A Survey of Choral Conductors and Voice Instructors

Dear Participant,

I am inviting you to participate in a survey, ***Teaching the Adolescent Female to Sing: A survey of choral conductors and voice instructors.*** The survey focuses on the adolescent singing voice and the training of this particular group of musicians. This research is in partial completion of a Master of Arts in Music Education from McGill University.

The purpose of this research is to compile responses from both choral conductors and voice instructors regarding their perceptions, beliefs and knowledge of the adolescent female voice. It is my hope that the results will determine what information is available to music educators regarding the developing voice and how this information has influenced the teaching of this unique group of singers. Your responses could further our understanding of the teaching of the adolescent voice and may influence the training of future music educators.

The term *adolescent*, in this questionnaire, refers to individuals between puberty and adulthood. As music educators, I ask that you answer the following questions and that you feel free to elaborate on your responses so that they properly reflect your perceptions, beliefs or understanding.

I am asking you to look over and complete the questions, and then return the survey to me. The questionnaire should take 20 minutes to complete. You are not obligated to participate if you do not wish to and if you choose to respond, only the researcher will have access to your responses which will remain confidential and private. No personal information will be used to identify the participants, and none of this information will be divulged to a Third Party. By completing and returning the survey, you have shown your agreement to participate in the study.

I hope you will help to support my research by completing the survey and I thank you for your consideration of my request. If you have further questions, please feel free to contact the researcher at the address below. You may also contact Lisa Lorenzino, my supervising advisor, if you wish to know the results of the survey. Kindly return the survey to me by at the address below.

Sincerely,
Megan E. Hall

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Montreal, Quebec
H2V4E6
(514)504-8921
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Lisa Lorenzino
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Please return to Megan Hall at 4814A ave du Parc, (Montreal) QC, H2V 4E6 or by email at megan.hall@mail.mcgill.ca.

McGILL UNIVERSITY – Schulich School of Music

Teaching the Adolescent Female to Sing: A Survey of Choral Conductors and Voice Instructors

A. Demographics.

Please check the appropriate box.

1. What is your age? ☐ Under 20 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60 and over

2. What is your gender? ☐ Male ☐ Female

3. Which best describes the population of your residence?

☐ over 200,000 ☐ 100,000 – 199,999 ☐ 50,000 – 99,999 ☐ 10,000 – 49,999 ☐ less than 10,000

4. Please indicate your place of residence. _____

B. Professional Career

4. Have you worked as a professional singer?

☐ Yes ☐ No If yes, number of years _____

5. Have you worked as a voice instructor?

☐ Yes ☐ No If yes, number of years _____

6. Have you worked as a choral conductor?

☐ Yes ☐ No If yes, number of years _____

7. If you answered yes to more than one of the previous three questions, which employment would you consider to be your primary position?

☐ Professional Singer ☐ Voice Instructor ☐ Choral Conductor

C. Teaching Experience

8. Please circle which age group describes the majority of your students.

☐ 0 – 8 years ☐ 9 – 13 years ☐ 14 – 18 years ☐ 19 – 64 years ☐ 65 and over

9. The majority of my students are:

☐ Beginning singers ☐ Amateur singers ☐ Semi-professional singers ☐ Professionals

10. The majority of my students are: ☐ Male ☐ Female

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11. I prefer to teach: ☐Children ☐Adolescents ☐Adults ☐Seniors ☐No preference

Why?

12. I find it difficult to teach: ☐Children ☐Adolescents ☐Adults ☐Seniors ☐No difference

Why?

13. I find it most difficult to teach: ☐Males ☐Females ☐No difference

Why?

14. What is the highest level of musical education you have received?
☐ High school ☐Undergraduate degree ☐Post-graduate degree

15. Which of these other sources of musical training have you received?
Non-credit training ☐
Private Instruction ☐
RCM accreditation or equivalent ☐
Workshop ☐
Other ☐

16. Is voice your primary instrument?
☐ Yes ☐ No if no, what is your primary instrument? _____

17. If you answered no to question 16, have you ever taken voice lessons?
☐ Yes ☐ No If yes, number of years _____

D. The Adolescent Singer

18. Please circle the number that best describes your familiarity with the following topics:

	Very Familiar				**Not Familiar**
Physiological changes associated with the male adolescent voice.	1	2	3	4	5
Physiological changes associated with the female adolescent voice.	1	2	3	4	5
The science of vocal acoustics.	1	2	3	4	5
The physiology of singing.	1	2	3	4	5

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19. When compared with the teaching of the adult female voice, do you consider teaching the adolescent female voice to be:
☐Completely different ☐Somewhat different ☐Very similar ☐No different

20. When compared with the teaching of the adult male voice, do you consider teaching the adolescent male voice to be:
☐Completely different ☐Somewhat different ☐Very similar ☐No different

21. Rate the following characteristics on a scale of 1 through 7 for the frequency in which they appear in the adolescent female voice.

	Always						**Never**
Discomfort while singing	1	2	3	4	5	6	7
Decreased or inconsistent range	1	2	3	4	5	6	7
Increased huskiness	1	2	3	4	5	6	7
Pitch insecurity	1	2	3	4	5	6	7
Developing noticeable register breaks	1	2	3	4	5	6	7
Frequently complaining of sore throat	1	2	3	4	5	6	7
Breathiness	1	2	3	4	5	6	7

22. A) What resources or instructional aids do you rely upon for teaching the adolescent female voice?

B) How did you find these resources? (If other, please indicate these resources.)
- ☐ Part of musical education training
- ☐ Independent research
- ☐ Experience/Advice of Colleagues
- ☐ Internet Resources
- ☐ Other _____

23. Please list the texts, internet sites, and/or journals that you use regularly as a reference.

24. How would you rate your current understanding of the physiological and pedagogical elements of the adolescent male voice?
☐Complete ☐Fairly complete ☐Somewhat incomplete ☐Incomplete

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25. How would you rate your current understanding of the physiological and pedagogical elements of the adolescent female voice?

☐Complete ☐Fairly complete ☐Somewhat incomplete ☐Incomplete

26. Please answer the following questions as True or False.

A. I have consulted my colleagues regarding the adolescent female voice.	☐True	☐False
B. I have consulted my colleagues regarding the adolescent male voice.	☐True	☐False
C. I have consulted scholarly journals regarding the adolescent female voice.	☐True	☐False
D. I have consulted scholarly journals regarding the adolescent male voice.	☐True	☐False
E. I have consulted the internet regarding the adolescent female voice.	☐True	☐False
F. I have consulted the internet regarding the adolescent male voice.	☐True	☐False
G. I have attended workshops on the adolescent voice.	☐True	☐False
H. I believe the adolescent female voice goes through a period of mutation.	☐True	☐False
I. I believe the adolescent male voice goes through a period of mutation.	☐True	☐False
J. I teach my student's about vocal changes that occur during puberty.	☐True	☐False
K. I feel confident teaching an adolescent male to sing.	☐True	☐False
L. I feel confident teaching an adolescent female to sing.	☐True	☐False

27. Would you be willing to participate in an interview with the researcher by telephone regarding this topic?

☐ Yes ☐No

28. Please provide your preferred method of contact if the researcher wishes to contact you for a follow-up interview. Email _____ Phone (___)_____

Additional Comments:

Please return to Megan Hall at 4814A ave du Parc, (Montreal) QC, H2V 4E6 or by email at megan.hall@mail.mcgill.ca.

Appendix D
Interview Questions

INTERVIEW QUESTIONS

So, the topic surrounds the adolescent female voice and how choral conductors and voice instructors address these students. It's about how people perceive the female voice change, what observations they've made in their own teaching or dealings with this age group. It's also about how the methods of conductors and instructors have been influenced by information they have come across or maybe sought out.

I have a set of questions prepared that I'd like to get to but, of course, I am also willing to talk about aspects of this topic that interest you, or that you would like to talk about.

1. Can you tell me a bit about your educational and professional background? (ie school you attended, what training you received, what choirs you conducted or students you taught)

2. Of the training that you received at school or someplace less formal, what is the information that most influences the way you teach?

3. In terms of vocal pedagogy, how much did the way you were taught to sing contribute to your own approach?

4. In Kenneth Phillips' book *Teaching Kids to Sing* he repeatedly talks about singing as "skill-based" and singing as a "learning" process. Do you think that singing is based on the acquisition of skills? If so, how do you evaluate the changing voice of the adolescent?

5. Lynne Gackle conducted a study over several years of the adolescent female voice. She observed symptoms of voice change (hoarseness, huskiness, limited range, breathiness etc.) occurring from age 9 to 15. In your opinion, is it possible to differentiate symptoms of voice change from signs of an inexperienced singer?

6. There are many classification systems for the changing male voice (they talk about phases that the boy's voice will pass through). What do you think are the benefits/weaknesses of this sort of classification system?

7. The results of the survey I distributed lead me to believe that the symptoms of voice change that Gackle talked about in her study are not recognized as aspects of voice change for the majority of female singers. What would you guess is the reason for this? (Is this knowledge difficult to put into use in the studio? Are the signs too subtle?)