Historically, the *Choral Journal* has been an important platform for discussions of adolescent voice change within choral settings. In 1977, John Cooksey first introduced his Contempora ry, Eclectic Theory in which he described adolescent male voice change in specific developmental stages of “premutational,” “early mutation,” “high mutation,” “postmutation,” and “early adult.” Since 1977, numerous articles have addressed the male changing voice in the *Choral Journal* with regard to intonation, voice training, recruitment, motivation, stigmas involved with the male changing voice, voice-part classification, classroom environment, and confidence. Two special editions of the *Choral Journal* in 2012 were dedicated to discussions of the adolescent male changing voice and teaching adolescent male choral students.

In 1985, Lynn Gackle published “The Young Adolescent Female Voice (Ages 11-15): Classification, Placement, and Development of Tone.” This article was the first of its kind, as none had previously distinguished vocal stages of the female changing voice. In this early article, Gackle defined the first three stages of female vocal development by age: Stage One (unchanged voices, Ages 9-11), Stage Two (Ages 11-13), and Stage Three (Ages 13-15). However, in 1991 Gackle published “The Adolescent Female Voice: Characteristics of Change and Stages of Development,” in which she further developed her original discussion and detailed four complete stages of female voice change. This 1991 article was groundbreaking and has been cited in at least fifty-one publications, designating Gackle an expert on the adolescent female changing voice and bringing attention to this topic in choral music education. Content analysis of the *Choral Journal* since Gackle’s pioneering 1991 publication, however, reveals that markedly fewer articles have addressed the adolescent female changing voice in comparison to those focused on the male changing voice during discussions of male voice change or articles devoted to other gender-specific matters within choral ensembles will not be reviewed here.

Through “a synthesis of current professional opinion and as a review of research regarding the characteristics of the female changing voice,” Gackle identified the four stages of female voice change as “prepubertal,” “pubescent/pre-menarcheal,” “puberty/post-menarcheal,” and “young
adult female/post-menarcheal” using criteria of mean speaking pitch, vocal range/tessitura, register breaks, and voice quality. Each stage involved different considerations for the female voice, as summarized below:10

• Stage I (prepubertal) typically includes females ages eight to ten. The mean speaking pitch is C4 (Middle C) or D4. Vocal range is A3 (below Middle C)-F4 (high F). Characteristics of a Stage I voice are a light, flute-like sound with no obvious register breaks. The voice is flexible and has a soprano quality similar to unchanged male voices at the same age.

• Stage IIA (pubescence/pre-menarcheal) typically includes females ages 11-12 and is the first stage of vocal maturity. Mean speaking pitch is B3-C4. Vocal range is A3-D4; register break appears between G4 and B4. Characteristics of this stage are breathiness in the voice and a loss of pitches in the lower singing range. Singing becomes difficult and uncomfortable; females are not capable of singing loudly. Female head-voice tone is much more breathy than the fuller chest-voice tone.

• Stage IIB (puberty/post-menarcheal) typically includes females ages 13-14 and is the peak stage of vocal mutation. Mean speaking pitch is A3-C4. Vocal range is G3-D4. Stage IIB is the most critical and frustrating time for female singers. Range can be limited upwards or downwards; register breaks and cracking voices make singing very difficult and uncomfortable. Vocal characteristics during this stage often lead female singers to believe they are chronically sick, but that is not the case. It is during this vocal stage that “lower notes are more easily produced, yielding an illusion of an alto quality; singing only in the lower range for an indefinite period of time can be injurious to the young unsettled voice because of the tendency to overuse the lower (chest) register. Vocalization should occur throughout the vocal range, always striving to avoid any unnecessary strain in the lower or upper range.”11 As a result, students’ voices should be assessed individually and often.

• Stage III (young adult/post-menarcheal) typically includes females ages 14-15. Mean speaking pitch is G3-B (below Middle C). Vocal range is F3-C4. Female vocal range has increased upwards at this stage, and there is a consistency in the voice when switching between registers. Breathiness is reduced, vibrato naturally appears, and vocal tone is deeper and richer. Singers find phonation to be much easier; volume, resonance, and vocal agility increase.

Gackle also identified symptoms of female adolescent voice change as
insecurity of pitch, development of noticeable register breaks, increased huskiness in the voice, decreased and inconsistent range capabilities, and voice cracking.

Though Gackle’s stages were very important, her larger purpose was to bring attention to the female changing voice. In doing so, she reviewed the scant literature available within choral music education and voice science and encouraged further research on female voice change.

Three years following Gackle’s article, Kenneth Sipley published his research in the 1994 Choral Journal article, “Improving Vocal Self-Image and Tone Quality in Adolescent Girls: A Study.” The purpose of Sipley’s study was to provide choral music educators background on the female changing voice and promote research-supported vocal techniques that “will allow these singers to experience successful vocal development throughout adolescence.” He divided a class of female eighth-grade choral students into four treatment groups with whom he worked over an eleven-week period. Subgroup 1 received no training from the investigator; Subgroup 2 participated in instruction sessions comprising vocal exercises; Subgroup 3 received instruction comprising only information about the vocal mechanism and the vocal development process, but no sessions involved vocal exercises; Subgroup 4 participated in the same program of vocal exercises as Subgroup 2, coupled with the information about the vocal mechanism and the vocal development process given to Subgroup 3.

Among his findings, Sipley reported that the combination of exercises and knowledge provided to Subgroup 4 resulted in “a significant difference in the subjects’ attitudes toward their singing voices.” Although Sipley did not directly report whether or not this difference in attitude was a positive or negative shift, his additional findings suggested that receiving the
combination of exercises and knowledge led the female choristers to a positive attitude shift, including: (a) Exercises and knowledge combined made the singers more comfortable when beginning a song or phrase; and (b) A program of vocal exercises combined with knowledge about the vocal mechanism eliminated the perception of tension in young singers.

He also reported that neither the vocal exercises nor vocal information strongly affected the female choral students’ attitudes toward their preferred voice part. Ultimately, Sipley recommended that “the dissemination of information concerning the vocal mechanism and the regular use of exercises to aid the vocal development process should be included in any vocal training program for young adolescent singers.”

In 1995, Kenneth H. Phillips addressed the idea of the changing voice as an albatross or “something that causes persistent deep concern or anxiety” and “something that greatly hinders accomplishment: encumbrance.” Phillips stated that “voice change is a natural part of growing up for both males and females” and, although his article was more heavily focused on the male changing voice, he briefly—but specifically—addressed female vocal range and register within the first part of his paper. Importantly, Phillips encouraged choral educators to refrain from assigning young adolescent girls to a voice part prior to the completion of their vocal development because of potential detrimental impact to register development, writing, “Girls who sing only the alto part often develop


Patrick K. Freer, The Male Choral Singer–From Adolescence to College Part II [Special issue], *Choral Journal* 52, no. 10 (May 2012).


a one-register quality—chest voice. Some girls who sing only soprano also learn to sing in one vocal register—upper, much like boys in the English choral tradition…Junior high is too early to limit a girl’s voice to one vocal classification.”

There was a ten-year gap following Phillips in the conversation about female changing voices in the *Choral Journal*. In 2005, David Friddle published an extensive review of research and publication on the changing voice. Within a section of his article, Friddle addressed female voice change through a summarization of Gackle’s article and stages of adolescent female voice change, prefaced with the following disclaimer:

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

Friddle discussed research that was published by Joel C. Kahane in the 1978 *American Journal of Anatomy* and addressed laryngeal growth in male and female adolescents at various stages of puberty. According to Friddle, Kahane confirmed that “in physical appearance and vocal ability, prepubescent boys and girls can be said to share virtually identical vocal mechanisms,” but with regard to the adolescent larynx following puberty, “prepubescent and pubescent girls undergo minimal growth; and, finally that the most dramatic mutation occurs between prepubescent and pubescent males.”

Gackle published a second *Choral Journal* article in 2006 that was an extended and evolved version of her 1991 paper. In the 2006 article, Gackle included a summarization of voice care and human development research and literature published between 1949 and 2000 with a focus on symptoms exhibited by adolescent female changing voices and details of the actual physiological changes (e.g., growth in the larynx, vocal tract length, hormonal secretions, and singing and speaking fundamental frequencies). She also discussed strategies for classifying female voices throughout the voice changing process, which she had recently begun to consider in terms of “phases” rather than “stages” because of the gradual, subtle changes that occur during female voice change over time.

As the female voice develops, the azure blue vocal color changes to a deeper blue, to a royal blue, to a navy blue—still a treble voice, still blue, but a different shade of blue. Thus, with proper vocal training, the resulting sound of the girl choir has a warm resonance that is unlike the boychoir, the women’s choir, or even the children’s choir. It is truly an entity unto itself.

At the conclusion of her article, Gackle encouraged choral music educators to be mindful of the inherently personal nature of adolescent voice change, especially for female singers. She introduced connections between work with adolescent female singers and the character Ophelia from Shakespeare’s *Hamlet*, who “loses herself” as a result of adolescence. A brief discussion of Gackle’s subsequent book on the topic follows later in this article.

At the 2008 Central ACDA Division Conference, Karen Brunssen presented a session titled “Ages of the Voice.” An article version of her presentation was published in the August 2010 *Choral Journal* and provided a detailed and physiologically technical account of vocal function at all ages, from newborn to eighty-plus years old. Her discussion of female voice change was separate from that of male voice change and, as a professional singer, she included considerations for those teaching singers at adolescent stages of vocal development. For example:

Typically, changing voices have a mutational chink. It is a weakness of the interarytenoid muscles that causes a gap between the arytenoids and therefore an airy tone. Young females should not be forced to eliminate this wispiness, but rather allow the vocal folds to naturally strengthen with the new surge of hormones and resulting changes to the length and thickness of the vocal folds. It is hard to imagine that such sweet, sometimes
airy head tones have great potential for optimum ring and vibrancy in the years ahead.32

Since 1991, the adolescent female changing voice has been discussed on five occasions in the Choral Journal. In most of these articles, discussions are reiterations of previous publications on the topic, with the exception of Sipley’s study, and largely focused on anatomical changes for female singers. Therefore, content analysis of the Choral Journal indicates that although there has been acknowledgment of female voice change during the past two and a half decades, few authors have provided new understanding about this phenomenon.

**Beyond Choral Journal: Recent Publications on the Adolescent Female Changing Voice**

There are two additional publications focused on the adolescent female changing voice worthy of mention and consideration by the larger choral music education profession. The first is Gackle’s 2011 book, *Finding Ophelia’s Voice, Opening Ophelia’s Heart*, in which she used Shakespeare’s Ophelia—a happy, young adolescent girl who experiences great tragedy and is destroyed by her quest for approval and self-doubt—to frame discussions of female voice change in terms of physiological, mental, and emotional development during adolescence. Gackle significantly expands the discussions introduced in her 1991 and 2006 Choral Journal articles. She provides greater details than previous publications and additional strategies, exercises, and lessons for working with female changing voices. A compelling section of Gackle’s book (and new to her conversation about female voice change) is her...
inclusion of commentary from female singers (ages 11 to 36) who responded to questions about their involvement with singing during voice change, the effect of singing and music on perceived self-image, and the impact of singing on their overall well-being. The interviewees made much mention of emotional highs and lows throughout voice change, as well as their enjoyment and frustration with singing experiences. For example:

“There was a time when I couldn’t sing certain notes when I shifted something in my singing mechanism…I felt slightly unconfident and sad when I couldn’t sing those notes.” (Megan)34

“I remember when I could not sing as high, purely, and freely as I had in the past. There was hesitation because I knew my voice wouldn’t allow me. I felt a slight ‘musical identity’ crisis because I could no longer produce those soaring notes I once could; somehow like I wasn’t good enough anymore.” (Mandy T.)35

“During high school voice lessons, I recall my voice becoming ‘bigger.’ I struggled with this, because I’d been singing so long and suddenly it felt different. When I felt like I had mastered my new voice, and was able to sing with a consistent tone throughout my range, I felt very empowered as a singer!” (Katrina M.)36

Gackle’s focus on mental and emotional experiences expanded the discussion of female voice change beyond classification systems and characteristics of vocal development phases.

The second publication of note is this author’s own recent research, “The Adolescent Female Changing Voice: A Phenomenological Investigation,”37 which revealed that female singers in middle and high school can experience the same physiological and emotional struggles that males encounter during voice change. I followed phenomenological protocol for this study, as it “operates with the assumption that there is an essence to an experience that is shared with others who have also had that experience.”38

In this 2015 investigation, I studied fourteen female choral students in grades 6-12 across an academic school year at the Durham School of the Arts in Durham, North Carolina. The choral directors identified students who demonstrated a variety of degrees of voice change characteristics, from vocal breathiness to limited vocal range, and students who were believed to “have something to say.”39
The singers whom I studied were found to encounter lack of phonation in certain areas of their singing range; excessive breathiness in the singing voice; holes in their range; and voice cracking—all physiological symptoms identified by changing voice male singers. In addition, these young women used words such as “embarrassment” and “fear” to describe their voice change experiences, just as did male singers who were experiencing voice change. Female participants reported feelings of isolation and aloneness, just as did male singers experiencing voice change. For example, Alysa (a seventh grader) discussed her ongoing struggle with feelings of “humiliation” (her word) when her voice cracked while she was singing.

Alysa: Yeah, cause I don’t, cause I…cause nobody else’s voice does that. Like I haven’t heard it.

Researcher: Are you sure?

Alysa: Um, other than boys, no. I’ve only heard guys’ voices do that.40

In addition to validating the vocal development experiences of these female singers undergoing voice change, within this phenomenological study I found that the essence of these female students’ voice change experience was that “vulnerability and fear of embarrassment determined all use of the females’ singing voices, resulting in risk assessment for each singing situation and setting.”41

Looking Forward in Choral Music Education

The modest amount of attention devoted to the adolescent female changing voice in the *Choral Journal* indicates that female voice change is not held in the same regard as male voice change. Numerous authors have commented that female voice change is not nearly as noticeable for females as it is for males; others have outwardly stated that the physiological growth of the female vocal mechanism during puberty is not as severe as that of the male vocal mechanism. While this may be true, it does not diminish the research and empirical evidence that females experience a voice change during adolescence and that female voice change can be a traumatic experience for many of our adolescent female choristers. As stated in the implications of my study on adolescent female voice change:

There should not be a severity threshold that limits or withholds assistance from female adolescent singers, especially with knowledge that they are self-deprecating or feel “humiliated” from physiological occurrences out of their control. To disregard such challenges and struggles, we discount the experiences of our changing-voice female singers and potentially expose them to the same psychological and emotional risks with which adolescent male singers have struggled.42

Whether or not our female singers overtly demonstrate outward struggle with their changing voice, we must remain sensitive to the potential emotional and psychological ramifications of this physical transition for all adolescent female choristers.

Even though discussions of female voice change have taken place within the pages of the *Choral Journal*, focus on this topic (both in the *Choral Journal* and larger choral music education profession) has been sporadic and far between in promoting awareness of the existence of female voice change and an understanding of what this developmental experience encom-
passes for female singers. As a result, public lack of acknowledgment of female voice change has perpetuated the problem that many choral teachers and directors simply do not know that it exists at all.

Thus, what is to be done for our female singers experiencing voice change? First and foremost, as choral directors are encouraged to consider and work with male voices on an individual basis, female voices must also be approached individually. Voice change is a growth spurt of the larynx; it is a unique process for all, and some female singers will struggle with it more than others.

Discussions about adolescent voice change must be common occurrences in changing-voice choral settings and include focus on the female voice for two primary purposes. First, adolescents are between their child and adult selves and often feel out of control of many aspects of their lives, especially their bodies. As a result, knowledge is power to adolescents. Discussions of laryngeal anatomy and function and detailed explanations of what physiologically takes places during voice change will empower our female singers. They will better understand the happenings and challenges of their voice and, as a result, better understand that this, too, shall progress forward. Consequently, it is likely that more students will persevere through voice change and continue singing.

Second, as female voice change has contributed to feelings of isolation for females experiencing vocal challenges, in-class discussions that acknowledge and validate their vocal experiences will assist female singers in feeling more supported and normal throughout this developmental process. Such an approach establishes an important atmosphere in the choral classroom: everyone is going through puberty, everyone is experiencing a
voice change of some kind, everyone will work through elements of vocal adversity, and everyone will celebrate moments of vocal triumph. We are all in this together, regardless of gender.

In addition, detailed discussions of female voice change will only further substantiate the work that we do as choral music educators to students, parents, colleagues, and school administrators. By teaching about the processes of the singing mechanism for all of our students, we legitimize our work as choral music educators and outwardly demonstrate our intentions to address the vocal needs of all of our adolescent choristers.

During voice change, it is also imperative that females not be infinitely labeled as soprano or alto. Such labels are often assigned because female vocal characteristics change due to voice change—such as breathiness in a particular register or ability to phonate certain pitches. As a result, young adolescent girls often end up an “adolescent alto,” quickly believing that they cannot sing high notes; or vice-versa with students labeled as soprano. Phillips, Gackle, and I support the strategy of rotating female singers on vocal parts to prevent them from mentally and emotionally locking themselves into a voice part identity before physiological growth is complete.44 To go a step further, assigning female singers to a myriad of both treble clef and bass clef voice parts can more aptly address various vocal and listening needs of changing voice female singers while developing musicianship skills as physical aspects of voice change settle.

For example, based on vocal areas in need of developing, female choristers can sing the bass vocal line up an octave; or different groupings of female (and male) singers can be assigned to all parts of a piece of choral music, singing their assigned line(s) in their own range. Perhaps female singers follow a different vocal line for every piece in a concert cycle or rotate vocal lines per concert cycle. There are numerous ways to encourage female vocal development while avoiding permanent assignment of a voice part. Ultimately, our changing voice females benefit greatly when we more mindfully and creatively fit music and learning experiences to our singers, rather than oblige singers to fit the music.

Meeting the needs of changing voice female singers is similar to meeting the needs of changing voice male singers. As music teachers and conductors, we must be overtly supportive. We must approach each female’s voice change process individually and validate her physiological, mental, and emotional experiences. We must inform and educate all of our female singers on the voice change process, stressing the importance of healthy singing at all stages. Every one of our adolescent singers will pass through puberty at some point, and part of our job as choral music educators and conductors of adolescents is to help our singers—both male and female—navigate vocal transitions and growth as smoothly as possible and as positively as possible.

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NOTES


2 See sidebar pages 40-41.

3 Patrick K. Freer, The Male Choral Singer—From Adolescence to


10 Ibid., 22-23.

11 Ibid., 23.


13 Ibid., 35.

14 Ibid., 36.

15 Ibid.

16 Ibid.

17 Ibid., 37.

18 Ibid.


20 Ibid.

21 Ibid.

22 Friddle, “Changing Bodies Changing Voices.”

23 Ibid., 36.


26 Ibid., 40.


28 Ibid., 30-32.


30 Ibid., 35.

31 Brunssen, “The Evolving Voice.”

32 Ibid., 47.

33 Gackle, *Opening Ophelia’s Heart*.

34 Ibid., 127.

35 Ibid.

36 Ibid., 126.


40 Ibid., 81.

41 Ibid., 84.

42 Ibid., 85.
