Teaching the Changing Voice:
Analysis and Pedagogical Strategies for the Singing Voice Across the Lifespan

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I. Introduction

The human voice is a dynamic system and an ever-changing instrument shaped by biological development, hormone fluctuation, and lived experience across the lifespan. For singers, these changes can influence vocal function, artistic identity, and musical expression. This paper examines the relationship between hormones and the voice with particular attention to periods of significant vocal transition. It explores the adolescent male voice change as a critical pedagogical moment, emphasizing functional and flexible strategies that support healthy development rather than avoidance or suppression. This research also investigates vocal changes experienced by women at significant moments of hormonal shifts, including those associated with the menstrual cycle, pregnancy, postpartum recovery, and menopause. In addition, this paper addresses the experiences of transgender and gender-diverse singers, whose voices may change in ways that do not align with traditional pedagogical models. By integrating current research, physiological considerations, and inclusive pedagogical practices, this paper advocates for a reimagined approach to vocal identity.

II. Language

For the purposes of this document, the terms ‘female’ and ‘male’ refer to sex determined at birth and are not intended to describe gender identity.

III. Hormones and The Voice

Hormones affect human behavior in complex and multifaceted ways, contributing to behavioral changes while also playing a critical role in regulating physiological processes throughout the body. The vocal folds seem particularly sensitive to sex hormone levels which are known to fluctuate throughout the life cycle. Hormones have been found to affect speech and singing by thickening and lengthening the vocal folds resulting in a deeper tone. This is seen most notably in males during puberty and in female subjects prior to ovulation, as well as during pregnancy and menopause.

The link between higher levels of testosterone in a male or estrogen in a female resulting in a markedly lower or higher voice is still inconclusive according to recent study. Additionally, data is inconclusive on whether hormones can affect a change in formants as individuals can

actively adjust formants by shortening the vocal tract (larynx raising, lip spreading) or lengthening it (larynx lowering, labialization), therefore altering vocal fold tension.[1]

IV. Adolescent Male Singers

The adolescent voice change, often referred to as mutation, has long been a source of anxiety for singers and teachers alike. Historically misunderstood and sometimes avoided altogether, this developmental process is now recognized as a critical pedagogical opportunity rather than a period of vocal suspension. Effective teaching through voice change requires flexible pedagogy that prioritizes function over range, process over product, and student advocacy over prescribed technique.

A. Vocal Changes During Adolescence

In boys, the thyroid cartilage grows primarily front-to-back, particularly at the very front tip which forms the 'Adam's apple'. The male folds grow nearly twice that of the female in length and thickness: 65% increase in male and 34% increase in female. This results in a lower frequency of vibration and consequentially a lowering of both the speaking and singing pitch.[2] The larynx gradually descends from its C2 (second cervical vertebra) position of infancy, through childhood, and puberty to C5 or C6 (fifth or sixth cervical vertebra). By the end of puberty, the vocal tract is significantly longer than during infancy and early childhood.

In addition to a change in pitch, resonant frequencies decrease. The secondary descent of the larynx contributes to reduced formant frequencies and decreased formant dispersion, bringing the formants into closer proximity. The combined change in pitch with the lowering of frequencies results in the acoustic effect of a deeper and often more imposing voice attributed to the adult male.[3]

The structure of the respiratory system also changes during adolescence. Over the course of this period the skeleton, lungs, trachea, larynx, and vocal tract grow. As the lungs and airway grow, the respiratory function begins to reach adult levels and vital capacity increases. Elastin fibers in the lung which are rapidly multiplying during infancy, mature through age 15. This maturation results in a higher potential for elastic recoil. As the trachea grows in diameter,

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[1] 1. Melanie Weirich, Adrian P. Simpson , and Nadine Knutti, "Effects of Testosterone on Speech Production and Perception: Linking Hormone Levels in Males to Vocal Cues and Female Voice Attractiveness Ratings."

[2] 1. Jenevora Williams, Teaching Singing to Young Children and Young Adults, 2nd ed., vol. 1 (Oxford, UK: Compton Publishing , 2019), 65.

[3] 1. Sarah Evans , Nick Naeve, and Delia Wakelin, "Relationships between Vocal Characteristics and Body Size and Shape in Human Males: An Evolutionary Explanation for a Deep Male Voice,"

resistance in the airway is reduced. The adolescent male will now have the capacity to have more of a command over their breath coordination as it relates to singing.[4]

B. Patterns of Mutation

The body goes through pubertal development and change in a predictable sequence, though it may be non-linear. Males often have bursts of change through their teenage years and possibly continuing into their twenties. Cracking, breathiness, instability, and other coordination issues are common during this time and are generally considered a sign of mutation rather than pathology. This instability can generally be observed six months prior to voice mutation in adolescent males.[5] While every singer is different, pedagogues have found marking milestones as a helpful tool in training through the changing male voice. The following is a synopsis of the possible signs of change outlined by John Cooksey: growth spurt, changes in timbre in the mid-range of the singing voice, decrease in control in the top of the singing range, change in timbre of the speaking voice, increased variability.[6]

C. Pedagogical Strategies for the Adolescent Male Singer

Rollo Dilworth summarized the main principles in working with adolescent male singers: emphasize good posture and breathing, craft vocalises that descend from above and emerge into chest voice, avoid repertoire that encourages straining, review and reteach their new bodies and voices, provide good vocal models, let them sing where they are comfortable, and avoid vocal fatigue.[7]

Adolescence is a critical time to train the singer's breath coordination. By the time a singer reaches 14 years old, their instrument will be both capable of and responsive to breath support. The adolescent singer is capable of achieving silent inhale and breath free of superfluous tension or movement enabling them to utilize elastic recoil.[8] There are several methodologies on breath for singing without a one-size-fits-all solution. Teachers may incorporate a variety of strategies in order to achieve adequate breath support for a singer. Options include but are not limited to: *Appoggio*; Italian bel canto breath technique emphasizing costal and diaphragmatic movement; *Abdominal/Diaphragmatic Breathing*, colloquial terms emphasizing abdominal movement during inhalation and exhalation; *Passive Breath Management*, allows for elastic

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[4] 1. Karen Brunssen, The Evolving Singing Voice: Changes across the Lifespan (San Diego, CA: Plural Publishing, 2018), 48.

[5] Jenevora Williams, Teaching Singing to Young Children and Young Adults, 2nd ed., vol. 1 (Oxford, UK: Compton Publishing , 2019), 63.

[6] 1. John Marion Cooksey, Working with Adolescent Voices (St. Louis, MO: Concordia Pub. House, 1999).

[7] 1. Rollo Dilworth, "Working with Male Adolescent Voices in the Choral Rehearsal," Choral Journal , 9, 52 (n.d.)

[8] 1. Karen Brunssen, The Evolving Singing Voice: Changes across the Lifespan (San Diego, CA: Plural Publishing, 2018), 66.

recoil of the respiratory system to manage breath use; and *Stylistic Breath Use*, (often used in CCM styles) breath management dictated by textual and narrative demands.

Once a singer has command of their body and breath coordination, 'semi-occluded vocal tract exercises' can be introduced. Starting with straw phonation allows the adolescent to experience the sensation of sub glottic pressure from airflow. Straw phonation has been shown to improve vocal fold closure and encourage the coordination of vocal tract shape. After these sensations are experienced through straw phonation, the singer may have similar success with semi-occluded vowel shapes such as /i/ and /u/ due to the proximity of the tongue to the roof of the mouth. Once there is a balanced interaction with airflow and vocal tract shape, the singer can apply other vowels and plosive consonants such as /b/ and /p/. Plosive consonants encourage continued breath coordination in addition to naturally modifying vocal tract shape by means of the soft palate.[9]

One particular pedagogical strategy for working with the adolescent voice is to assess the voice stage. This can be done by assessing their "Speech Fundamental Frequency", or the pitch(es) at which the voice naturally fluctuates during speech. This work begins by asking the singer to count backwards from 20, which offers a framework for where the speaking voice naturally falls and therefore where to begin with the singing voice. The singer should then gently hum in their speaking range, gradually increasing that range as the work progresses. This exercise should be repeated frequently throughout the mutation period.[10]

It is important to allow the singer to phonate where they are comfortable and to be prepared for that range to change lesson-to-lesson. Just as it is important for any singer, a student working through a changing voice should continue to explore all aspects of their comfortable range. In her book, *Teaching Singing to Children and Young Adults*, Jenevora Williams writes, "assuming you have a healthy boy…the main thing to do is to trust your basic instinctive judgement: if he looks and sounds comfortable, he probably is."[11]

D. Puberphonia

Puberphonia, often called 'functional falsetto', is a condition in which an adolescent male is reluctant to accept the changes in his voice.[12] This often presents as the subject continuing to speak in a high pitch despite his voice having shifted. Symptoms of puberphonia include: high pitch, breathiness, neck and throat tension, breaks in phonation. The singer may refuse to attempt

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[9] 1. Karen Brunssen, The Evolving Singing Voice: Changes across the Lifespan (San Diego, CA: Plural Publishing, 2018), 68.

[10] 1. Jenevora Williams, Teaching Singing to Young Children and Young Adults, 2nd ed., vol. 1 (Oxford, UK: Compton Publishing , 2019) 70.

[11] 1. Jenevora Williams, Teaching Singing to Young Children and Young Adults, 2nd ed., vol. 1 (Oxford, UK: Compton Publishing , 2019), 68.

[12] "Puberphonia," ColumbiaDoctors, May 3, 2023.

lower pitches both in speech and in singing. In this case, it is best for the individual to be referred to a certified speech therapist.[13]

V. Female Voice Change Through Life

Women's voices, while comparatively less studied, undergo significant changes across the lifespan. The changes in a female voice during adolescence may be less drastic than that of a male, however they experience lifelong changes affecting the voice including during menstruation, pregnancy, and menopause.

A. Vocal Changes Through the Menstrual Cycle

Over the last two decades, there have been many studies performed on the various changes in women's behavior throughout the menstrual cycle. Studies have shown that during the fertile period women experience changes such as: an increased preference in male masculine traits, consumption of fewer calories, and changes in body odor. Receptors for sex hormones have even been found on the vocal folds, which suggests a link between hormone levels and vocal fold function. A study by Banai (2017) investigated acoustic changes in the voices of naturally cycling women compared to users of hormonal contraceptives across the menstrual cycle. Banai found increased estrogen levels during the late follicular phase resulting in a thickening of the laryngeal mucosa and increased mucus production, while increased progesterone levels during the luteal phase result in drying of the laryngeal mucosa. The study concluded that naturally cycling women exhibited a significantly higher minimum fundamental frequency during the late follicular phase compared to the menstrual phase, as well as reduced vocal intensity during the luteal phase. Average pitch remained relatively stable across the cycle, suggesting that hormonally driven vocal changes are subtle and context- dependent. These findings support the presence of hormone receptors in the vocal folds and underscore the influence of hormonal variation on vocal function, while also highlighting the limited perception of these changes.[14]

While changes to the vocal folds may be subtle, the singer may feel functionally different depending on their hormonal period. Because changing hormone levels affect the body outside of the vocal mechanism, (e.g. changes in mood, irritability, behavioral chances, sleep quality, and digestive issues) consistency is not always reflected in measurable acoustic changes. These alterations can influence breath management, muscular coordination, and cognitive focus, all of which are critical in sound production.[15] As a result, singers may report diminished control, increased fatigue, or altered proprioceptive feedback during certain hormonal phases which

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[13] 1. Jenevora Williams, Teaching Singing to Young Children and Young Adults, 2nd ed., vol. 1 (Oxford, UK: Compton Publishing , 2019), 68.

[14] 1. Irena Pavela Banai, "Voice in Different Phases of Menstrual Cycle among Naturally Cycling Women and Users of Hormonal Contraceptives," PloS one, August 22, 2017.

[15] 1. Cleveland Clinic medical professional, "Menstrual Cycle (Normal Menstruation): Overview & Phases," Cleveland Clinic, December 8, 2025.

highlights the importance of acknowledging the singer's subjective experience alongside objective vocal assessment.

B. Vocal Changes During Pregnancy

It is known that women navigating pregnancy will experience the affects of changing estrogen and progesterone levels, but how that affects the voice is still being researched. One study investigating British English mothers found a lowering of mean f0 and less f0 variation one year after giving birth compared to during pregnancy or before (i.e. a temporarily lowered voice following pregnancy). The same study notes not only a lowering in pitch but the voice becoming more monotone in the year postpartum. The same women had been studied in the five years pre-pregnancy with little to no change to the f0, therefore the study concludes that the f0 lowering observed postpartum cannot be attributed to aging.[16] However, Weirich and Simpson found contradictory results with a lowering of mean f0 after pregnancy in German mothers but not in Swedish mothers. This points to possible socio-psychological factors besides hormonal influences causing mean pitch fluctuation during pregnancy.[17]

In addition to potential changes to the vocal tract, the vocal mechanism will also be in flux due to changes in the respiratory system. A pregnant woman will experience a decrease in lung capacity in both mechanical and biochemical ways. The increased volume of the uterus results in an overall rise in the internal organs, therefore rising the diaphragm and restricting space for lung expansion. Hormones are also to blame for the change in respiration during pregnancy. Progesterone gradually increases during the course of pregnancy and is the cause for multiple alterations in respiratory function. Progesterone increases the sensitivity of the respiratory centre to carbon dioxide. Additionally, progesterone alters the smooth muscle tone of the airways resulting in a widening. It also mediates hyperemia (the excess of blood) and swelling of mucosal surfaces, causing nasal congestion.[18]

C. Rebuilding Postpartum

Most women are able to sing throughout their pregnancy up to the midpoint of their third trimester. Postpartum singers should expect that as the body recovers and hormones rebalance, they will need to rebuild in both stamina and flexibility.[19] Women who have recently given birth should allow time for their body to heal before diving back into rigorous vocal training including

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[16] Pisanski, Katarzyna. "Women's Voice Pitch Lowers after Pregnancy." Science Direct, July 4, 2018.

[17] 1. Melanie Weirich, Adrian P. Simpson, and Nadine Knutti, "Effects of Testosterone on Speech Production and Perception: Linking Hormone Levels in Males to Vocal Cues and Female Voice Attractiveness Ratings," science direct.com, September 1, 2024.

[18] 1. Antonella LoMauro and Andrea Aliverti, "Respiratory Physiology of Pregnancy: Physiology Masterclass," Breathe (Sheffield, England).

[19] 1. Marci Daniels Rosenberg and Wendy DeLeo LeBorgne, The Vocal Athlete: Application and Technique for the Hybrid Singer (San Diego, CA: Plural Publishing, 2026), 359.

special consideration to healing the pelvic floor before commencing body-breath coordination work. The length of time necessary for rehabilitation will vary greatly and a medical professional should be consulted before a practice regimen is resumed.[20]

When working with the postpartum singer, it can be useful to begin with postural work. The body has spent nine months adjusting to carrying a child and steps should be taken to realign during the recovery period postpartum. Exercises that encourage freeing the neck and shoulders, opening the chest and intercostals, and re-strengthening the core are recommended. As mentioned, the changes to the respiratory system during pregnancy are not insignificant. A postpartum singer may feel their breath support is entirely different than it was before. Rebuilding respiratory function is not unlike training an adolescent body breath support for the first time. Though cognitively the trained postpartum singer will have a deeper foundation, the body may not be as responsive to their needs. When working with a postpartum singer, it is important to remember that the body will likely not bounce back to the way it was before.[21]

D. Vocal Changes Throughout Menopause

Unfortunately, changes to the voice during menopause have been studied very little. This is in part due to increased lifespan over the last century making the aging voice previously of limited interest. It is clear that with increasing age there is a decrease in sex hormone levels in both men and women. In women, the decrease results in a nearly complete loss of estrogen which blocks androgens such as testosterone. An increase in the prevalence of testosterone may result in an increase to the vocal fold thickness resulting in a lowering in the mean f0, as well as dryness due to changes in the glands that secrete fluids near the vocal folds.

During menopause, progesterone is no longer produced. The dropping of progesterone levels causes the nerve that innervates the vocal fold to have slower conduction which may be the reason for slowing of the vibrato rate. The vocal folds, which respond similarly to the shedding of cells during the menstrual phase, show mucosal thinning during this period. Additional laryngeal changes may include atrophy and an increase in vein dilation. These changes to the larynx significantly affect the sound and function of the voice.[22]

From a mechanical standpoint, the elasticity of lung tissue decreases and the costal cartilages of the ribcage begin to ossify as we age making breath coordination more difficult. The

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[20] 1. Cara Williams, Rehabilitation for Singers Following Pregnancy and Childbirth Rehabilitation for Singers Following Pregnancy and Childbirth, accessed July 12, 2023, 38-42.

[21] 1. Cara Williams, Rehabilitation for Singers Following Pregnancy and Childbirth Rehabilitation for Singers Following Pregnancy and Childbirth, accessed July 12, 2023, 38-42.

[22] 1. Karen Brunssen, The Evolving Singing Voice: Changes across the Lifespan (San Diego, CA: Plural Publishing, 2018), 210.

laryngeal cartilages also ossify as we age and there is a breakdown of the stain and collagen fibers resulting in a decrease in flexibility of the vocal mechanism.[23]

In a study of 56 women, common problematic symptoms prior to their final period included: dry throat, unpredictable voice quality, decreased range, decreased volume, and decreased stamina, and new, temporary pitch matching issues. After the final period, hormone levels calm down and become less chaotic. At this stage, women report greater stability, more consistent tone, improved intonation, new timbral qualities, and easier high range and agility.[24]

VI. Gender-Diverse Singers

In recent years, transgender and gender-diverse individuals have become increasingly present in educational, artistic, casual, and professional music settings. While gender-diverse people are not new, contemporary conversations around gender identity have shifted and exposed the limitations that binary models of vocal pedagogy present. Western classical vocal music has historically functioned in the binary distinction of 'male' and 'female' voices, relying on puberty patterns to identify the passaggi and therefore voice type classification.[25] The voice classification system (or Fach System) does not accommodate a singer's lived experiences or artistic intentions, nor does it address the needs of gender- diverse singers.

In society, the voice is considered an important marker of gender identity. Perception of pitch, the rhythm of speech, and inflection are used as identifiable markers for how masculine or feminine the speaker might be. Studies have even been conducted to assess how attractive a person may be based on their tone of voice. The 2024 study entitled *Effects of testosterone on speech production and perception: Linking hormone levels in males to vocal cues and female voice attractiveness ratings* found that female voice stimuli with higher mean f0 and formants are rated as sounding more attractive than stimuli with lower mean f0 and formants. The same study concluded that listeners with low testosterone show an increased sensitivity to these vocal cues of female attractiveness.[26] Because of the social implications a person's voice may have, voice training has been shown to be beneficial for many transgender and gender diverse people.[27]

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[23] 1. Marci Daniels Rosenberg and Wendy DeLeo LeBorgne, The Vocal Athlete: Application and Technique for the Hybrid Singer (San Diego, CA: Plural Publishing, 2026).

[24] 1. Nancy Bos and Joanne Bozeman, "Singing Through Change: Women's Voices in Midlife, Menopause, and Beyond," NATS: National Association of Teachers of Singing , n.d.

[25] 1. Richard C. Miller, The Structure of Singing: System and Art in Vocal Technique (Boston: Schirmer, 2013).

[26] 1. Melanie Weirich, Adrian P. Simpson , and Nadine Knutti, "Effects of Testosterone on Speech Production and Perception: Linking Hormone Levels in Males to Vocal Cues and Female Voice Attractiveness Ratings," science direct.com, September 1, 2024.

[27] 1. Z Paige L'Erario, "Voice Training Is a Medical Necessity for Many Transgender People," Scientific American, May 29, 2025.

A. Affects of Hormone Therapy

A singer undergoing gender-affirming hormonal therapy may experience vocal changes unfamiliar to their pedagogue. An individual using masculinizing hormones would have an experience similar to that of the adolescent male, but to call it identical would be incomplete. Singers whose bodies naturally produce testosterone experience a gradual shift in vocal range, accompanied by simultaneous shifts in laryngeal cartilage structure. Transgender and nonbinary singers who undergo testosterone therapy after adolescence may experience incongruence of vocal fold mass and laryngeal cartilage size. Many trans masculine people begin hormone treatment after adolescence, resulting in the laryngeal cartilages inability to grow large enough to adequately accommodate the vocal folds.[28] Testosterone therapy is also known to cause early ossification of the cartilages in the larynx. The ossification process happens abruptly because of the onset of hormonal change. A stiffer, less pliable laryngeal structure can limit vocal fold movement significantly, preventing control of dynamics and difficulty navigating a new pitch range. Another adjustment is the descent of the laryngeal structure though the degree of this can vary widely amongst individuals.

An individual using feminizing hormones will also experience a change in their voice, though very different from one undergoing masculinizing therapy. A person whose body has already has already produced testosterone during puberty will have undergone changes to the vocal fold and laryngeal size and shape that are irreversible. It is likely this individual will experience a less audible change in the voice, however less perceptible changes still occur. Increases in estrogen and decreases in progesterone can cause vocal fold swelling and production of thick, viscous mucus.[29] This may affect the ability of the vocal folds to vibrate freely with sufficient lubrication and could lead to decreased stamina and risk of cell damage to the outer layer of the vocal folds. The administration of the estrogen hormone decreases the presence of cells responsible for repairing vocal fold tissue which could mean that trans women are more susceptible to vocal injury.[30]

B. Pedagogical Strategies for Gender-Diverse Singers

Inclusive vocal pedagogy requires a re-imagination on how teachers conceptualize range, timbre, registration, artistic identity and integrity. In a 2023 NATS article, Loraine Sims argues that the first step in gender inclusive pedagogy is to reframe how voice types are identified. Conventional voice categories (soprano, alto, tenor, and bass) are historically gendered constructs that may marginalize singers whose vocal ranges align with these classifications but whose gender identities do not correspond to the categories themselves. Sims cites cisgendered

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[28] Constansis, A. N. (2008). The changing female-to-male (FTM) voice. Radical Musicology, 3, 32 pars.

[29] Kadakia, S., Carlson, D., & Sataloff, R. (2013, May/June). The effect of hormones on the voice. Journal of Singing, 69(5), 571–574.

[30] 1. Liz Jackson Hearns and Brian Kremer, The Singing Teacher's Guide to Transgender Voices (San Diego, CA: Plural Publishing, Inc, 2018), 87-99.

artists who sing outside of the range of cultural gender norms as an argument for allowing all singers to explore any range that feels comfortable to them regardless of gender identity. Sims states, "My question to you is why do we need this? Can we not merely use the labels soprano, mezzo soprano, contralto, tenor, baritone, or bass to mean a type of voice with a certain range and timbre of any gender? …it would certainly be more inclusive and less cumbersome to use these labels without any qualifying gender. Choirs might then see any gender in any section without any awkwardness. Opera or musical theater auditions would make it possible to consider anyone who can sing the role, regardless of presentation of gender, as a possible candidate for casting."[31]

Most singers using hormone therapy undergo a period of time when the voice is unstable and unpredictable. This can be expected for at least the first twelve months without settling until eighteen to twenty-four months. During this time it is important that the singer and teacher remain flexible and that the singer maintain exceptional vocal health. Singers should avoid exercises and repertoire that encourages pushing or straining as it will only lead to fatigue and possible injury. The singer may find that their rage has decreased, there is difficulty navigating the passagi, and facility in dynamic range has decreased. Previously referenced SOVT exercises will help the singer learn their new instrument without additional strain. Messa di voce and other exercises that explore changes in dynamics may be helpful to encourage flexibility and stamina in breath management and dynamic range.[32]

Much like the adolescent singer, a transitioning singer may have a different skill set in each lesson. Supporting a singer through this transition can be both exciting and challenging. It is important to honor the person and singer at all times, allowing them to explore what feels accessible.

VII. Conclusion

Change is an unavoidable aspect of singing that is shaped by many factors including: hormones, anatomy, aging, and identity. Rather than viewing these changes as obstacles to be endured, vocal pedagogy must recognize them as integral components in a singer's development. Vocal pedagogy must therefore be responsive in technical and repertoire adaption as well as to the physical and psychological changes that affect the voice over time. Western classical voice training has historically emphasized a fixed model of development rooted in binary classifications. This framework has offered useful structure, but it does not take into account the complexity of change in adolescents, women, and gender-diverse artists. While the physiological mechanisms underlying these changes vary, a consistent pedagogical principle emerges; singers thrive when instruction is adaptive, individualized, and grounded in functional vocal health rather than rigid classification.

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[31] 1. Loraine Sims, "Gender Neutral Voice Pedagogy: It's Not Just for Transgender Singers Anymore!," NATS Journal of Singing , July 27, 2023, 4.

[32] 1. Liz Jackson Hearns and Brian Kremer, The Singing Teacher's Guide to Transgender Voices (San Diego, CA: Plural Publishing, Inc, 2018), 93-97.

VIII. Additional Topics for Consideration

Additional topics warranting consideration but not addressed in this paper include: vocal pedagogy for prepubescent voices, pubescent vocal changes in females, hormonal senescence in males, the affects of hormone therapy and hormone replacement on the senescent voice, the role of technical development in vocal change, voice typing and its impact on young singers, guidelines for repertoire adaption to suit singers needs, the influence of psychosocial development on singing, and pedagogical strategies for creating inclusive and affirming learning environments during periods of vocal transition.

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