

There are many physical, psychological, and social benefits to singing in choir, and students could benefit from development of vocal technique skills within the choral rehearsal—more specifically, within the choral warm-up. Vocal technique skills can be taught within the choral warm-up and integrated into repertoire throughout the choral rehearsal. In this approach, the overall objective in the choral rehearsal is to place emphasis on the horse before the cart. Choral teachers foster growth in the individuals (the horse) within the ensemble and use music (the cart) as a vehicle for applying and developing those skills. As vocal technique is developed, students can better evaluate and refine their performance within the ensemble and understand the various technical components of singing expressively.

The National Association for Music Education's (NAfME) national music standards for ensembles include: Creating, Performing, Responding, and Connecting. Within the Performing standard, students in the choral ensemble should be able to evaluate and refine personal and ensemble performances, individually or in collaboration with others; and perform expressively, with appropriate interpretation and technical accuracy, and in a manner appropriate to the audience and context.¹ But how can teachers help students more effectively evaluate personal performance and learn expressive performance skills?

A student's ability to demonstrate an understanding of the foundational elements of vocal technique (the relationship between breath, onset/phonation, and resonance) is a prerequisite skill objective to effectively meet these standards. Students must know how to change various elements of vocal production in order to effectively self-evaluate and alter a performance. Students can also benefit from understanding how positional changes in the anatomic structures of vocal production influence expressive musical elements such as dynamics, articulation, and phrasing.

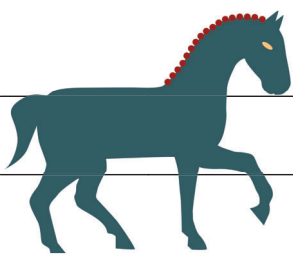


THE HORSE BEFORE THE CART

**REDEFINING THE
CHORAL WARM-UP**

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THE HORSE BEFORE THE CART

Unfortunately, students and parents might not have the financial means to pay for private voice instruction to build these singing skills, and many school districts lack the funding to afford private voice instruction for students as part of the choral curriculum. For these reasons, choral teachers are often the only vocal instructors that students have from whom to learn sustainable vocal technique.

Importance of the Choral Warm-up

Although it can be challenging for choral teachers to effectively teach both musical skills (sight-singing literacy skills, music theory, music history, and music composition, to name a few) and sustainable vocal technique skills to sing a variety of styles within the choral rehearsal, they are not mutually exclusive. Throughout the warm-up, choral teachers can link vocal technique and musicianship skills to showcase how vocal technique can enhance sight-reading skills; how aural awareness of music theory harmonic progressions can be influenced by a student's ability to sing with effective intonation; how varying vocal technique to fit historical performance practice is helpful in teaching contextual music history; and how music composition can relate to vocal skill development. Not all choral teachers include voice-building exercises in the rehearsal, however, and some choose warm-ups without fully understanding the intended function of each exercise.²

James Jordan suggests that the choral warm-up should focus on “preparing the voice for correct and healthy singing, and providing aural instruction and music aural literacy for the choir.”³ In this context, the choral warm-up typically includes time spent on preparing the body to sing with physical stretching, alignment exercises, vocal exploration, breath management, sight-reading, and melodic and harmonic exercises. After students perform each exercise, choral teachers ideally give feedback sometimes using imagery or metaphor (e.g., sing with a more forward sound or sing with a taller space) rather than providing specific feedback with a focus on vocal technique.

Robert Shaw warned against making the choral warm-up into a voice lesson, stating that “only the skilled teacher, working privately over a considerable period of

time, is in a position to build or aid an effective vocal technique.”⁴ Yet, Shaw desired a vast spectrum of vocal control, dynamic contrast, and range of vocal colors from amateur singers within his choirs.⁵ Students within typical school choral programs in the United States often lack prior skill and experience to apply Shaw's ideals without specific vocal training. The choral warm-up can then be a significant component of the choral rehearsal that focuses on targeted vocal exercises connected to specific anatomic movement and coordination needed for phonation, aural awareness, and the development of musicianship skills.⁶

Integration of Voice Training Principles into the Warm-up

In recent years, there has been an increase in research suggesting the benefits of targeted vocal function exercises developed by Joseph Stemple.⁷

Vocal Function Exercises

- Very softly sustaining an [i] vowel for as long as possible on F3 for tenors / basses and F4 for sopranos/altos.
- Gliding from lowest note to highest note on [o].
- Gliding from highest to lowest note on [o].
- Sustaining musical notes C4, D4, E4, F4, G4 (an octave lower for tenors / basses) for as long as possible on [o]. Repeat these notes twice.

Recent voice research has also investigated exercise physiology principles and their application to vocal skill development. Warm-ups may aid in fatigue-resistance training⁸ and lead to decreased perceived vocal efforts.⁹ Saxon and Berry suggest applying a vocal training routine over the course of a year in five phases: anatomic adaptation, maximum strength, conversion, maintenance, and transition.¹⁰

Leborgne and Rosenberg, voice and speech pathol-

REDEFINING THE CHORAL WARM-UP

ogists, discuss exercise physiology principles in training “vocal athletes.” They suggest students maintain a regular practice regime of at least three days a week “to achieve vocal growth, muscle memory, and vocal fitness.” They further suggest singers should cross-train registers to avoid imbalance between registers since many muscles exist in antagonist pairs¹¹ These training principles contrast the choral pedagogical view that “vocally immature choirs should not be asked to develop vocal technique for contrasting styles concurrently.”¹² Choral teachers can help students by training the entirety of the vocal instrument.

There are various vocal training models that teach anatomic components of vocal production and their connection to technical and musical skill development.¹³ Specifically, Estill Voice Training® (EVT) is an effective educational model for developing voice quality and allows singers a higher level of control of voice quality.¹⁴ Vocal quality can be defined as the characteristic of an individual voice or style of voicing, independent of speech sounds, pitch, and loudness.¹⁵ EVT has been shown to help singers and actors target and engage specific muscles to improve their quality of voice.¹⁶

The EVT model focuses on developing conscious control of thirteen anatomic structures (Figure 1) of voice production through the practice of “figures,” exercises that train precise control of each structure into one of two or three positions. Singers can then create various vocal qualities or “recipes” for multiple styles of music by selecting and combining specific options for each structure.¹⁷

Choral teachers can incorporate aspects of exercise physiology and targeted functional training exercises using Stemple’s Vocal Function Exercises, Estill’s Figures for Voice,[™] or a multitude of other science-based training models directly in the choral warm-up. For example, if programming Eric Whitacre’s *Sleep*, teachers could first choose one or two structures from Figure 1 corresponding to the repertoire or a choir’s skill development (e.g., True Vocal Fold Onset/Offset and False Vocal Folds). Vocal warm-up exercises could then be developed exploring all conditions of these structures (TVF Onsets—Glottal, Aspirate, Smooth; FVF—Constrict, Mid, Retract) on various vowels throughout the vocal range. Once students are able to perform these conditions, teachers can

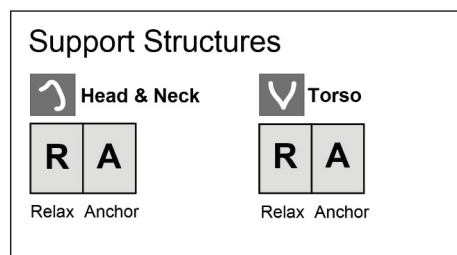
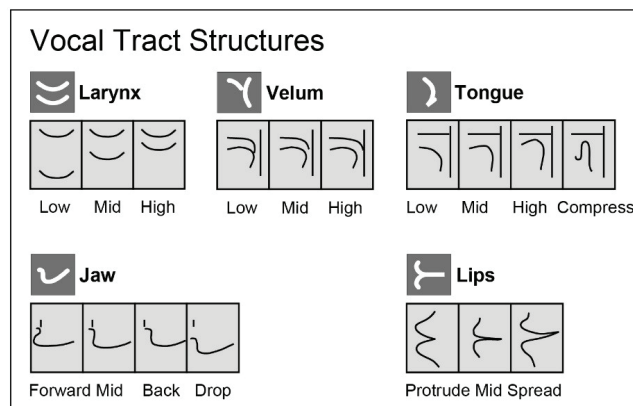
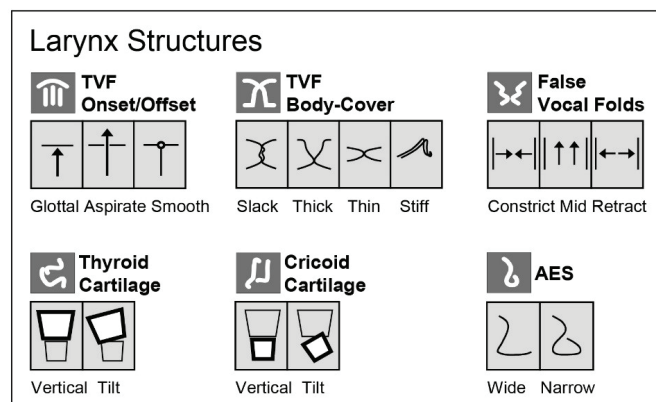
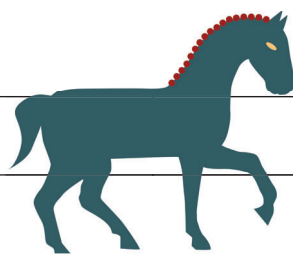


Figure 1. Used with permission from Estill Voice International. TVF = True Vocal Folds; TVF Body-Cover = Configurations that modify the vibratory mode of the true vocal folds, commonly referred to as registers but are not pitch dependent in EVT; FVF = False Vocal Folds; AES = Aryepiglottic Sphincter, aka epilarynx or space above the vocal folds and between the epiglottis and arytenoids; Velum = Soft palate; Support Structures = muscles of the Head & Neck and Torso. For further information see Steinhauer et al. (2017) *The Estill Voice Model*.



THE HORSE BEFORE THE CART

help students explore which conditions best fit the chosen repertoire. In the case of Whitacre's *Sleep*, smooth onsets and retracted false folds would help promote the desired vocal quality. Since all thirteen structures are involved in creating voice quality, any structure can be explored to meet the instructional goals of each rehearsal. Further examples will be explored throughout this article.

Defining Choral Pedagogy and Redefining the Choral Warm-up

For the purposes of this article, choral pedagogy will refer to the art of teaching sustainable and transferable vocal and musical skills related to varied styles of repertoire and ensemble singing contexts. The choral warm-up can incorporate many of the principle ideals of choral pedagogy and emphasize acquisition and eventual transference of skill and content knowledge. Nevertheless, the name "choral warm-up" is not sufficient in describing these ideals. Instead, it is beneficial to think of this portion of the choral rehearsal as the "choral tech-up," which places emphasis on both the warm-up and technical skill development.

The choral tech-up focuses on "Teaching Every Choir How to Unlock Possibilities" within their voice. The tech-up includes the traditional components of the choral warm-up and encourages further technical skill (tech-up) development through focused, target-specific exercises. However, skill acquisition will vary with each individual within the ensemble depending on previous experience and learning styles. David Kolb's experiential learning theory can be beneficial in developing a tech-up, as it breaks down learning into a four-stage cycle:¹⁸

- 1) Concrete Experience (learner focus)—teacher acts as facilitator
- 2) Reflective/Observation (meaning focus)—teacher acts as subject expert
- 3) Abstract Conceptualization (subject focus, thinking)—teacher acts as evaluator
- 4) Active Experimentation (action focus)—teacher acts as coach

Within the choral tech-up, stage one can represent the students' exploration of sound and active dialogue regarding those sounds/sensations, and how they relate to prior knowledge. In stage two, the teacher vocal models the desired sounds and target exercises with specific, measurable outcomes. During this stage, students observe and reflect upon what the teacher is doing/showing. In stage three, students dialogue in groups or as an ensemble about their observations; the teacher assesses students' knowledge and provides specific feedback prior to stage four. In stage four, students actively experiment with the desired skills in both individual and group exercises. During this stage, the teacher can assess or coach individuals, sections, or the entire ensemble. The process then returns to stage one with new experience, ideas, and understanding.

Developing the Choral Tech-up

The first step in developing the choral tech-up is to assess the skills of the individual musicians within the ensemble. If the teacher is in a new position and has never taught the ensemble, listening to prior recordings, sending out self-assessment surveys, or asking for general skill assessments from a predecessor can be beneficial. In an ideal setting, information can be gleaned while working with the ensemble in the final interview process. However, research comparing choral ensemble and individual performance achievement found no significant relationship between ensemble and individual sight-singing or expressivity achievement scores.¹⁹ It might be pragmatic to then spend the first week compiling individual assessment achievement skills formally or informally during the first week of classes. Once the individual needs are assessed, the teacher can set goals for the marking period, semester, and year. From these goals, exercises can be developed, and repertoire can be chosen that will allow students to practice and transfer skills developed within the tech-up. The tech-up is broken down into the following sequence:

- 1) Listening awareness
- 2) Engage audiation and subvocalization imagery

REDEFINING THE CHORAL WARM-UP

- 3) Physical warm-up
- 4) “Check-in,” semi-occluded vocal tract exercise
- 5) Target-specific exercises in coordinating breath/onset
- 6) Target-specific resonance exercises
- 7) Vocal quality building
- 8) Harmonic exercises
- 9) Sight-singing with vocal quality

Incorporation of Kolb’s experiential learning theory throughout the tech-up will ensure that all learning styles are being met. For example, the teacher can be in stage two and employ vocal modeling and should follow that with stage three, incorporating individual and group feedback. It is recommended that steps two through seven of the tech-up are unaccompanied to promote the development of listening and audiation skills. Steps seven and eight can utilize accompaniment for harmonic context rather than playing in unison with the voices. Students can develop both improved intonation and literacy skills from this type of harmonic structure.²⁰ Students should also take time to build skills singing with just intonation without accompaniment. In this type of tuning, the choir spends time tuning intervals that are not in equal temperament, such as tuning (and hearing) fifths slightly higher than what is played on the piano.²¹

Before Sound

According to NAfME’s music standards for ensembles, students should be able to develop personal interpretations that consider creators’ intent.²² Listening and analyzing vocal qualities and choices prior to singing can help students develop a list of vocal possibilities to better meet this standard. The tech-up begins with the development of a common language with students and building aural discrimination skills. This corresponds to stage one of Kolb’s experiential learning theory, in which the teacher acts as a facilitator guiding student learning and discussion by listening, labeling, and critiquing record-

ed sounds. The teacher should preface that our biases (whether we like a sound or not) should not influence our description of sound, and students should be introduced to a wide variety of diverse recordings and vocal qualities.²³

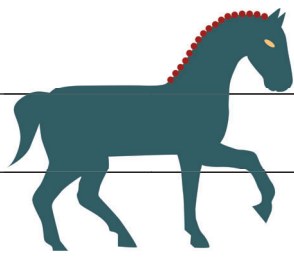
“Listening and analyzing vocal qualities and choices prior to singing can help students develop a list of vocal possibilities to better meet this standard.”

Descriptors such as dark, bright, and brassy work well when first listening to examples.²⁴ Descriptors can then be translated, using EVT or a similar model, into components within the vocal mechanism associated with the creation of those sounds—e.g., what is heard as breathy can be translated into an aspirate onset or stiff folds (Figure 1).

Utilizing exemplary vocal models can help students develop listening skills and eventually help students create those sounds more successfully. Scott McCoy suggests students should first discuss and describe various sounds they hear from the vocal models. It can be helpful to create handouts that direct the students’ listening and ask them to describe the sounds. These are some example questions:

- Breath management and airflow: Is the sound breathy or non-breathy? Is the sound pressed, constricted, or weak?
- Onset: Does it sound like the attack of each note utilizes a glottal, aspirate, or smooth onset?
- Resonance and space: Is the sound dark, bright, brassy/twangy, nasalized, tall, or wide? Is the larynx in high, middle, or low position?

Although advantageous to begin describing sounds using imagery or metaphor, those descriptors should be



THE HORSE BEFORE THE CART

connected with the actual anatomy. Too often, phrases such as “support from the diaphragm,” “place it in the mask,” “imagine throwing your sound across the room,” or “that is flat or sharp” can lead to confusion and unintended vocal tension. Furthermore, not all students experience sound, vowels, or imagery in the same way. The phrase “support from your diaphragm” holds little validity, as singers cannot be in direct control of their diaphragm and it does not support sound. Utilizing the term “placement” in teaching pedagogy can cause students to literally place their sound in a specific area, causing tension and confusion.²⁵ Using imagery such as “throw your sound” can cause students to force air against highly adducted vocal folds, causing tension, a pressed sound, and constriction of the false vocal folds. In addition, phrases such as “you are flat” or “you are sharp” might not help students understand *how* to improve their intonation and negatively affect their psyche and self-confidence. Instead, teachers can explore the anatomic reason for the intonation concerns (perhaps the tongue or larynx is overly low causing flattening).

Once students develop a simplistic anatomic language in regard to breath, onset/phonation, and resonance they can begin exploring these characteristics in the creation of vocal qualities, alone and in groups. Throughout the year teachers should advocate that students eventually describe sounds with terminology connected to the anatomic structures causing the created vocal quality. This common language and terminology can also benefit the students as they transition into the voice studio because they will be able to discuss specifically what they are working on in choir.

As students enhance their listening discrimination skills, they can begin to develop and heighten their audiation skills in step two of the tech-up. Gordon defined audiation as the “process of assimilating and comprehending (not simply rehearing) music heard in the immediate past, days, weeks, months, or years ago...Sound is only audiated after it is perceived.”²⁶ As students become more adept at describing sounds with anatomic understanding, they can audiate those sounds and employ subvocalization; the integration of audiation with motor imagery, or “imagined voice-related sounds and actions.”²⁷

Throughout the year, subvocalization and silent practice can help students develop their sense of the awareness and position of muscles and structures in the body (proprioception) as they relate to vocal production. Students can also benefit from applying external focus via kinesthetic awareness to these movements—e.g., feeling the ribs expand and remain expanded with the sensation of a smooth onset, or feeling the larynx as it lowers or rises to make a darker or brighter sound. As the year progresses, step one can incorporate listening to concert recordings of the choir to engage in self-assessment skills.

Physical Warm-up and “Check-in”

The next step of the tech-up is performing a physical warm-up followed by a daily “check-in” with the voice. Within the tech-up, the physical warm-up can be done earlier, later, or in conjunction with the “check-in.” The goal of the physical warm-up should be to get the body ready for singing and encourage proper alignment. This includes, but is not limited to, physical stretching of muscles utilized in vocal production; the neck, shoulders, ribs, and back. Teachers may also wish to perform some aerobic exercises to get the body in motion and elevate energy levels.

The “check-in” allows students and teachers to feel and hear how the voice is responding to various isometric and isotonic muscle activities. Utilizing Stemple’s VFE initial exercise, sopranos/altos should sustain [i] on F4 (F3 for tenors/basses) or another comfortable unison pitch as long and quietly as possible. Students can repeat this independently. This can be followed by an isotonic vowel sliding exercise on [o] or any semi-occluded vocal tract exercise (SOVTE)²⁸ such as singing through a small or large diameter straw, singing into the fist, singing on a lip trill, or on an “ng” as in the word “sing.” The goal in this exercise is for students to perform these slowly ascending and descending without feeling or hearing any noticeable “breaks” or shifts in the register (or true vocal fold body-cover in Figure 1).

REDEFINING THE CHORAL WARM-UP

Exploring Onsets

The next portion of the tech-up focuses on breath management and activation exercises as they relate to onsets. Teachers should utilize a breath gesture (i.e., a preparatory breath) associated with expansion of the rib cage and epigastric area. Students can also create physical gestures associated with various sensations of the breath/onset coordination throughout the tech-up.²⁹ This can help build connection to the conductor's gesture.³⁰

Students should explore various onsets (glottal, aspirate, and smooth) in connection with the repertoire being rehearsed. Exercises should begin in a singer's comfortable mid-range on a single pitch. Singing on one pitch allows students to focus on the desired onset without varying other elements of vocal production (Figure 2). Teachers should incorporate both free practice and group practice on these exercises with all vowels during the tech-up.

It is important that students quantify the effort or energy used while performing an exercise. This effort scale ranges from 1 to 10 (10 equating to maximal effort). If a scratch or tickling sensation occurs at the true vocal fold level during any exercise, the student may be constricting the false vocal folds by using too much effort to perform the onset or pushing too much air against the vibrating folds (causing overadduction).³¹

Students can also utilize onsets as ploys to find various vibratory modes (associated with registration theory) or various conditions of the true vocal folds (associated with the body-cover theory). A glottal onset [i] can be used as a ploy to find "chest voice" of a thick fold condition, a smooth onset [ji] can be used to find head voice or a thin fold condition, and an aspirate onset [hi] can be used to find falsetto register or a stiff fold condition. In advanced exercises, any onset can be used with any registration or body-cover.³² For a more advanced exercise, students can perform Figure 2 and sustain the final note for as long as possible while varying dynamics. Students will continue to gain strength and stamina with the incorporation of these conditioning exercises into each tech-up. Teachers should feel free to create their own exercises in any portion of the tech-up. The ideas in this article are simply to help teachers begin to think of ways to create target-specific vocalises for a

more effective tech-up with your ensemble.³³

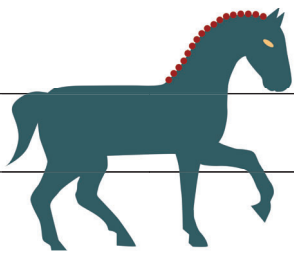
Exploring Resonance

As with the previous onset exercises, exploring resonance includes specific focus on anatomic structures above the true vocal folds (Figure 1), in combination or isolation, that affect changes in vocal quality. Such exercises might explore changes in laryngeal height, lip shape, jaw position, tongue position, aryepiglottic sphincter (epilarynx space) width, or the position of the velum. Shifts within any of these components will change the perceived brightness or darkness of the quality by acoustically highlighting higher or lower harmonic frequencies produced by the true vocal folds. Changing the shape and size of the vocal tract also affects the formants within the vocal tract that create vowels and also emphasize certain bands of harmonic frequencies (giving them a boost of energy) while absorbing others.

As a starter exercise, students can feel their larynx with the fingers of one hand while performing a swallowing exercise. Teachers can direct students' attention to the sensations occurring both externally and internally while swallowing. Students will notice that the larynx rises and then lowers during the swallow. This shows the variability of laryngeal position that can occur during singing. Certain styles require a lower laryngeal position (some western classical and crooning styles, which emphasize lower harmonics) and a higher laryngeal position (some musical theatre and various contemporary commercial music styles, which emphasize higher harmonics). Singers must also allow the larynx to rise to access the highest pitches in their range.³⁴ With training, singers can sustain various laryngeal positions in isolation of other vocal components. For



Figure 2



THE HORSE BEFORE THE CART

example, during a swallow the larynx rises and the false vocal folds constrict to the midline (toward the middle) position. With training, singers can learn to avoid false vocal fold constriction when singing with a higher laryngeal position.³⁵

Students can explore laryngeal height by using various ploys (such as cartoon characters). Have students sing the exercises in Figures 3 and 4 with a higher and lower laryngeal position. To find a higher position, have students giggle like a younger version of themselves or think of a smaller cartoon character. Once students find the sound, have them monitor effort for a scratch or tickle, and then sing the exercise on [i] while maintaining the laryngeal position. To find a lower position, have students sob or think of Eeyore from “Winnie the Pooh.” Once students find the sound, have them monitor effort and then sing the exercise on [u] while maintaining the laryngeal position. Eventually, students will be able to gain a heightened awareness of internal proprioception (awareness of movement and position of the body) and will no longer need to feel the laryngeal movement with the fingers while singing. Students will also become more adept at maintaining a tongue position in isolation of laryngeal movement in order to have accurate vowel formation. Resonance exercises can become more advanced as students become more anatomically aware and versatile.

Visual feedback can also help students understand various changes in resonance. There are a number of



Figure 3



Figure 4

spectral analysis software programs (VoceVista, Voiceprint, and various free apps) that showcase these various changes. In the previous laryngeal exercise, a spectrogram will show a lowering and raising of all formants with the respective changes of singing with a lower to higher laryngeal position.

Putting it All Together

The last three steps of the tech-up include exploring the vocal quality desired for specific repertoire and performing harmonic exercises and sight-reading examples that transition into the subsequent repertoire in the rehearsal plan. Vocal Quality focuses on maintaining the quality throughout the range. This differs from registration theory, which suggests vibratory modes are associated with specific pitch ranges. Choral teachers should choose repertoire based on the initial assessment and goal setting for the year with focus on the desired vocal quality and structural components. This requires some research in performance practice of various styles of music. A speech, twang, or belt quality may be desirable for singing gospel music, whereas a choral cry quality may be desired for a standard twenty-first-century choral octavo written in a pan-diatonic, chord cluster style.

The vocal quality labels do not matter as much as the “ingredients” that comprise the intended quality or “recipe.” Vocal components within speech quality remain more neutral (as in the speaking voice), twang has the characteristic narrow aryepiglottic sphincter (bratty child sound), belt requires the least amount of airflow,³⁶ and the choral cry quality has the characteristic thin fold, “head voice” sound, with a mid larynx position, and is sung either with straight tone or shimmering, low amplitude vibrato (possibly created by only slightly tilting the thyroid cartilage).³⁷ Teachers will find success developing desired vocal qualities by first working extensively on targeted anatomic exercises in the previous steps of the tech-up.

These vocal qualities can then be incorporated into harmonic exercises with focus on first tuning octaves and stacked fifths. Students should also focus on matching the vocal quality within their section of the ensemble and then matching the vowel when performing harmonic exercises. This places emphasis on developing the founda-

REDEFINING THE CHORAL WARM-UP

tional vocal quality independent of vowel changes. This may be the reverse of the typical procedure in achieving choral blend; however, singers can sing *any* vowel in *any* quality and can be trained to shift vowels without shifting vocal quality.

Students can begin to understand how their quality fits in the vertical and linear tuning between sections of the choir once they are matching vocal quality within their section. There are times when the basses will need a slightly varied vocal quality than the sopranos in order to emphasize a certain pitch within the vertical sonority. Teachers should also have students focus on maintaining the desired vocal quality while sight-reading (whether on a neutral syllable, solfège, or text) in order to build muscle memory and stamina. Often times, singers use “sight-reading” quality while sight-reading new music instead of the desired quality. Sight-reading quality might be associated with breath noise, constriction, or pressing of air that can occur when attention is on pitches and rhythms rather than vocal production.

It is also beneficial for teachers to help students explore the relationship between vocal technique and expressive performance skills. Singers can *crescendo* or *decrescendo* and perform syllabic stress by maneuvering various vocal structures. For example, a change in registration from chest to head voice, TVF body-cover from thick to thin folds, or velum from high to mid position can all result in a perceived decrescendo. Choral blend can be enhanced if students match the same action to achieve expressive performance elements. *For an example choral tech-up lesson template, visit www.brianwinnie.com/professionalresources.*

Assessment and Feedback

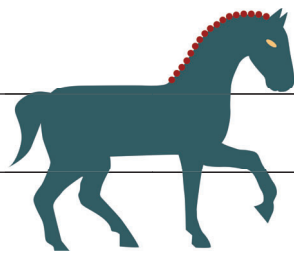
Throughout the year together, teachers will be able to create more advanced exercises within the tech-up focusing on extremes of register and harmony. When developing the tech-up and rehearsal exercises, teachers should continually assess student achievement in the areas of breath, onset/phonation, and resonance. This connects to stage three and four of Kolb’s experiential learning theory; teachers provide feedback and coach through the active experimentation process. This keeps the teacher’s focus on the underlying vocal issues causing musical and expressive concerns, and encourages the

teacher to internally ask questions such as, “What am I hearing and what one structure can help alter to fix this concern?” “Can the vocal issue be solved by a change in breath, onset, or resonance?” “Will a change in my breath or onset gesture help change the quality?”

Teachers can move back into any step of the tech-up when students find a section of a piece particularly difficult during rehearsal. Teachers can then pause and create an exercise or vocalise that helps students work on vocal technique concerns within that specific section. Likewise, creating a transitional tech-up can help set a new vocal quality as teachers move to another piece of repertoire that requires a different “recipe,” such as transitioning from western classical to contemporary musical theatre.

Teachers should also provide individual instruction, modeling, and feedback within the group ensemble setting. This rapport can be developed immediately and utilized within the entire tech-up. Incorporating individual instruction can provide peer-vocal models for students and allows individuals to get one-on-one attention within the rehearsal. Formal assessment of musical elements in choral ensembles often occurs at the group level especially during contest time at formal state and regional adjudications. However, as noted earlier, group ensemble achievement does not indicate individual achievement within the ensemble. These findings suggest the need to incorporate individual feedback more often in the development of individual skills within the ensemble setting.

Students may find one-on-one work within the group setting intimidating. Choral teachers can create a positive learning environment by slowly incorporating one-on-one work over the course of a semester. Students must understand that all sounds are good sounds (unless they cause a scratch or tickle) because they can teach something about the voice. Teachers can begin creating trust by emphasizing outstanding participation by individuals during any portion of the tech-up: “I like how Johnny is properly aligned,” “Susan is using strong energy to sing this sustained pitch,” or “Jenny’s eye contact is excellent!” Have students snap their fingers, or something similar, after each positive comment to affirm each other (clapping can be too loud). Next, teachers can have individuals share their responses and critiques during the



THE HORSE BEFORE THE CART

first step of the tech-up. As trust continues to build in the ensemble, the teacher should assess who can effectively model a particular exercise. “Sam, can you breathe like that again?” “Everyone notice how Sam is breathing this time. What do you see/hear?” Then have students model onsets and eventually entire exercises for one another. Teachers should be sure to provide feedback after each individual performs, first starting with a positive comment followed by something to try differently. The teacher can then work on that concept with the entire ensemble.³⁸

Developing individual skills within a group ensemble setting can be challenging; however, teachers can build these individual skills within the choral tech-up. Teachers can also benefit from utilizing Kolb’s experiential learning theory during each aspect of the tech-up process to engage all learning styles. The tech-up helps students gain skills in self-assessment and understanding of effective practice technique as they develop more awareness of how their voices work. It also helps students understand why certain vocal qualities are chosen for repertoire in regard to voice science, acoustics, and performance practice. The tech-up provides students with a daily vocal “check-in” regime. It also helps teachers create meaningful vocalises specific to desired outcomes incorporating elements of voice and exercise science. The tech-up can also increase students’ sight-reading ability by understanding the voice’s relationship to pitch and vocal quality. This overall approach to developing individual, transferable vocal technique skills within the ensemble can enhance a choir’s versatility in performing diverse repertoire. ◻

NOTES

¹ National Association for Music Education Online; “2014 National Music Standards (Ensemble).”

² Howard Swan, “The Development of a Choral Instrument,” in *Choral Conducting Symposium*, ed. Harold A. Decker and Julius Herford (Englewood Cliffs, NJ: Prentice Hall, 1988), 25; and Ingo R. Titze, “Choir Warm-ups: How effective are they?” *Journal of Singing* 56, no. 5 (2000): 31-32.

³ Michele Holt and James Jordan, *The School Choral Program: Philosophy, Planning, Organizing, and Teaching* (Chicago: GIA

Publications, 2010), 186.

⁴ Robert Shaw, *The Robert Shaw Reader*, ed. Robert Blocker (New Haven: Yale University Press, 2004), 60.

⁵ *Ibid.*, 61.

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⁷ Julianna W. Sabol, Linda Lee, and Joseph C. Stemple, “The Value of Vocal Function Exercises in the Practice Regimen of Singers,” *Journal of Voice* 9, no. 1 (1995): 27-36; Ingo R. Titze, “Getting the Most From the Vocal Instrument in a Choral Setting,” *Choral Journal* 49, no. 5 (2008): 34-41; Ingo R. Titze, “Phonation Into a Straw as a Voice Building Exercise,” *Journal of Singing* 57, no. 1 (2000): 27-28; Duane Cottrell, “Building Vocal Strength with Sustained Tone Warm-ups,” *Choral Journal* 56, no. 2 (2015): 73-79; and Ingo R. Titze, “Vocal Warm-ups: What Do they Accomplish?” *The Journal of the Acoustical Society of America* 107, no. 5 (2000): 2864.

⁸ Matthew Hoch and Mary J. Sandage, “Exercise Science Principles and the Vocal Warm-up: Implications for Singing Voice Pedagogy,” *Journal of Voice* 32, no.1 (2018): 79-84.

⁹ Monica McHenry, Jim Johnson, and Brianne Foshea, “The Effect of Specific Versus Combined Warm-up Strategies on the Voice,” *Journal of Voice* 23, no. 5 (2009): 572-576.

¹⁰ Keith Saxon and Samuel Berry, “Vocal Exercise Physiology: Same Principles, New Training Paradigms,” *Journal of Singing* 66, no. 1 (2009): 51-57.

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¹² Frauke Haasemann and James M. Jordan, *Group Vocal Technique* (Chapel Hill, NC: Hinshaw Music, 1991), 155.

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REDEFINING THE CHORAL WARM-UP

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- ²¹ For more information on just intonation see *Per-Gunnar Alldahl, Choral Intonation*. Translated by Robert Carroll (Stockholm: Gehrmanns Musikförlag, 2008); and William A. Mathiew, *Harmonic Experience: Tonal Harmony from Its Natural Origins to Its Modern Expression* (Rochester: Inner Traditions International, 1997).
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- ²³ "Repeated listening and study of [exemplary recordings] can educate and inform biases regarding vocal tone and production, and that newfound information can be brought to bear on sounds during rehearsals." James Jordan, *Evoking Sound: The Choral Conductor's Aural Tutor; Training the Ear to Diagnose Vocal Problems* (Chicago: GIA Publications, 2006), 37-38.
- ²⁴ Scott McCoy, *Your Voice: An Inside View* (Delaware, OH: Inside View Press, 2012), 1-15.
- ²⁵ Richard Miller, *The Structure of Singing: System and Art in Vocal Technique* (New York: Schirmer Books, 1996), 61; and Leon Thurman and Graham Welch, "Singing Various Musical Genres with Stylistic Authenticity: Vocal Efficiency, Vocal Conditioning, and Voice Qualities," in *Bodymind & Voice: Foundations of Voice Education* (Minneapolis: The Voice Care Network, 2000), 519.
- ²⁶ Edwin Gordon, *Space Audiation* (Chicago IL: GIA Publications, 2015), 10.
- ²⁷ Arnie Cox, *Music & Embodied Cognition: Listening, Moving, Feeling, Thinking* (Bloomington: Indiana University Press, 2016), 28-32.
- ²⁸ In Marci Rosenberg's essay, "Staple Pantry Ingredients: Applying Exercise Physiology Principles When Training the Vocal Athlete" in *The Voice Teacher's Cookbook: Creative Recipes for Teachers of Singing* (Delray Beach: Meredith Music Publications, 2018), 102-104, she refers to semi-vocal occluded vocal tract exercises as any narrowing above the level of the vocal folds which can provide back pressure and reduce the compression of the vocal fold closure leading to more efficient vibration.
- ²⁹ For more ideas and information on gestures that can connect to phonation see Geoffrey Boers's essay, "No Utensils Allowed: Using Your Hands to Discover *Appoggio*" in *The Voice Teacher's Cookbook*, 7-10.
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- ³¹ Steinhauer et al., *The Estill Voice Model*, 39-41.
- ³² Estill, *Estill Voice Training Level One: Figures for Voice Control*.
- ³³ For more example exercises exploring breath, onset, and resonance see Brian J. Winnie's, "Contemporary Vocal in the Choral Rehearsal: Exploratory Strategies for Learning" (D.M.A. diss., University of Washington, 2014).
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- ³⁷ *Ibid.*, 101.
- ³⁸ This one-on-one model has been developed and adapted from my educational work with Geoffrey Boers, Director of Choirs at the University of Washington, and Richard Nace, retired choral teacher and conductor.