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Kimberly Steinhauer, Ph.D. President, Estill Voice International Pittsburgh, PA

Hope and health to our Voice Foundation family during these special times. Treat yourself to a welcomed escape as you read each article by our incredible authors. In fact, you can also enjoy a vigorous vocal work-out if you sing this newsletter to your family!

on the stage in the clinic

Kim Steinhauer, Ph.D.

If a picture is worth a thousand words, then what is the conversion rate for the gesture? Our experts for this issue of our newsletter explore the theoretical implications and practical applications of voice and gesture on the stage and in the clinic. I work daily with hand signals that represent voice anatomy & physiology in my Estill Voice Training work, but I turned to our choral directors and therapists for deeper insights. Heather Rusiewicz and Erin Roberts both highlight cognitive load decreases and motor learning increases when incorporating gestures in voice and speech therapy. Jeremy Manternach and Caron Daley complement each other as they review pedagogical foundations of voice and gesture in choral settings. In "Tools for our Voice Box," Brian Winnie shares exercises incorporating action-oriented gestures. Now feel free to talk with your hands any time; finally, you can back up those gestures with science!

Letter from the Editor



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Gestures O C C Voice of the Conductor

As primarily a choral teacher-conductor, I approach singer gesture from two standpoints: (a) how can it make my choir sing more efficiently (and sound better) and (b) how can I evoke those same sounds nonverbally and quickly when speaking is not feasible (i.e., during live performance)?

When I'm working with individuals or choirs, I'm always focused on whether my chosen techniques have a scientific grounding. I tell my students, who are future music educators, that we should be wary of having a "bag of tricks." Instead, I want a toolbox full of evidence-based practices. This approach is not an assumption that one size fits all; every singer is different. But rather than relying on expert testimony – testimony that is perhaps contradicted by the expert in the studio down the street – we can lean on a bit of research and on some physiologically informed predicting.

"As I tell my conducting students: "I care about where your hands go, but I'm far more concerned with how they get there."

For example, Dr. Melissa Brunkan had singers sing a short melody while performing (a) low, circular arm movements (roughly the waist to sternum height), (b) high, circular arm movements (beside the head), or (c) no gesture (Brunkan, 2016). She found that participants tended to sing with improved pitch accuracy during the low arm circles (Brunkan, 2016). The singers also reported having more breath and improved breath use. These effects seemed to persist for a short time following the experimental procedures (Brunkan, 2017).

Based on these results and my own experiences, I tend to use lower physical gestures for myself and with my choristers. My opinion (subject to further research) is that gestures that remain below the shoulders will tend to evoke a feeling of low breath and energy rather than neck engagement or "reaching" for higher pitches. I also sense that higher gestures might lead to increased shoulder or neck tension, as those muscles may be involved in raising the arms. In addition, I look for gestures that include consistent motion rather than those that are abrupt or that stop. These gestures include some of the following:

- Low, circular arm movements, • generally moving up and out rather than down and in. -Holding both hands in front of the abdomen and brushing the fingertips of one hand across the palm of the other during repeated notes. The idea is to indicate breath energy and release at each onset rather than an "attack." I sometimes juxtapose this gesture with a chop to the palm of the hand and ask students to describe their experience.
- Holding the fingertips together with palms up in front of my body. Drop both hands down and toward the side during inhalation to imply a downward release during breathing. Rebound with the hands moving toward the initial position and upward at the initial onset to demonstrate breath energy.
- Alternate tapping the palm of each hand with the fingertips, followed by a buoyant upward, circular rebound. I particularly

use this gesture if I'm hearing a weighty sound.

• Similar to the palm tap, I sometimes encourage choristers to pretend they are juggling tissue paper or light scarves. My experience is that this tossing movement encourages a lightness when the choir sounds heavy.

Anecdotally, I've experienced good results with these gestures. But the gestures in isolation don't tell the full story for me. As I tell my conducting students: "I care about where your hands go, but I'm far more concerned with how they get there." When using such gestures, I carefully monitor the way the movement is occurring. If I perceive that my singers are moving with tension or that they are bound – perhaps because they are uncomfortable with the movement or because they have an internal focus of attention – I would predict their singing will be bound, even on a low gesture.

Once we've experimented with these gestures, my singers have a sense memory of how they felt. As a teacher-conductor, I then lean on the scores of studies that seem to indicate that human beings are hard-wired to imitate one another (see Hatfield, Cacioppo, & Rapson, 1994 and Iacoboni, 2008 for excellent summaries of many of these studies). There is also evidence that this imitation takes place in choral settings (Manternach, 2016). My goal is to use this tendency to my advantage by displaying the exact same gestures in my conducting. Because my students have experienced these gestures, my belief is that they consciously and unconsciously sing as if they were doing the gestures themselves.

Again, one size does not fit all. I encourage you to experiment with your singers and/or choristers to determine which gestures seem to evoke easy and efficient voicing.

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The Voice of the Clinical Scientist **Show of Hands:** Using Manual Mimicry Gestures in Speech and Voice Therapy

by Heather Leavy Rusiewicz, Ph.D., CCC-SLP

The use of gestures in speech and voice intervention is certainly not novel. Yet, often hand movements are implemented intuitively and without thought of the underlying mechanism of the utility of the coordination of the speech mechanism and hand movements. Indeed, there is more to using hand movements in therapy than intuition. Movement empowers learning and the coordination of movements can mutually affect the manual and speech systems, due in part to their shared neuroanatomical substrates. Thus, there is motivation to systematically reflect on the types of gestural cues that are implemented in speech and voice therapy. Choosing a hand shape that mirrors the movements of the speech mechanism and/or aligns

Phonetic	 Spatial Configuration Manner Timing Tension
Suprasegmental	•Rate of Speech •Prosodic Stress •Intonation
Voice	Vocal Quality Loudness Pitch Resonance

Figure 1. Speech characteristics mirrored by manual mimicry gestures.

with the perceptual features of the spoken signal (i.e., manual mimicry gestures) capitalizes on these key interactions of the speech and manual systems for clinical purposes. Manual mimicry gestures are hand movements that represent the desired speech goal in:

- The spatiotemporal configuration required for the accurate production of a segmental target (e.g., using the hand to mirror the articulators in space, time, and tension for /r/),
- The perceptual quality of a suprasegmental target (e.g., using the hand to represent a desired intonation contour)
- 3. The physiological and/or perceptual characteristics of a voice target (e.g., moving

the hands open and forward to cue key movements and sound quality for forward resonance) (Figure 1)

Gestural cues support the facilitation of more accurate production of speech sound targets. For instance, clinicians will trace their finger along their arm to mimic the spatiotemporal properties of /s/ (i.e., continuous airstream through a tight constriction) or release their fingers from a fist outward to mimic the spatiotemporal properties of /p/ (i.e., closure of the lips with a plosive burst in the initial position of syllables), etc. Suprasegmental hand gestures may include tapping out syllables and moving a finger or hand

slowly to reduce rate of speech. Other movements may include using large gesture movements to elicit increased volume, raising a hand cue with the aim to increase pitch, or moving a hand from low-to-high to map onto a prosodic stress pattern for a word like phonation. Less obvious speech targets, like vowels, can also be cued with manual mimicry gestures. For instance, the advanced position of the tongue can be mirrored with a hand movement that moves forward for /I/. If the hand is raised slightly and an additional amount of muscular tension is introduced, then /i/ is then cued. Manual mimicry gestures are employed in voice therapy as well.

Hand gestures can convey relaxation of the laryngeal system, increased breathiness for confidential voice, or the opening of the pharynx during yawn-sigh, as just a few examples.

There are a number of benefits of manual mimicry gestures (Figure 2). First, manual mimicry gestures tap into the well-established dynamic system theory's tenet of entrainment, or the coordination and mutual influence of the two systems. Second, gestures employed in therapy take advantage of the concept of embodiment, such that movement of a variety of forms can lead to an enhanced learning experience and greater retention.

Entrained	 Speech and hand movements are coordinated
Embodied	 Movement leads to improved learning/retention
Internal	Can self-cue in and out of the therapy context
Simplified	Simple cue reduces cognitive load
Flexible	Individual and target specific
Subtle	Made more unobtrusive when needed
Sequential	Dynamically spans across multiple speech units
Integrated	 Easily added to other therapy approaches





"Importantly, manual mimicry gestures encompass sequential movements in speech, like demonstrating the movement of a vowel into a consonant shape."

Gesture cues are also unique in the therapeutic context in that they are able to be generated by the client, and not just by the clinician. This allows for internal coordination and kinesthetic feedback for these entrained movements. Manual gestures are sometimes obvious (e.g., closing fingers together simultaneously with the production of /m/) and sometimes less so (e.g., pushing a clawed hand forward with the production of /[/) and may take some description for the client. Regardless, manual mimicry gestures reduce the amount of instruction and cognitive load necessary to cue speech and voice targets. Manual mimicry gestures are flexible and can be created by the clinician to parallel a given therapy objective. Additionally, they can

be faded, whether by lowering the hands to be out of view of a conversational partner or reducing the size of the gesture movement when produced by a client. Importantly, manual mimicry gestures encompass sequential movements in speech, like demonstrating the movement of a vowel into a consonant shape. Lastly and crucially, manual mimicry gestures can be incorporated into a plethora of therapy approaches such as multisensory therapy, visual biofeedback, and direct voice therapy approaches.

As you read this, you likely will identify numerous ways you have implemented hand gestures that represent the physiological and perceptual aspects of your treatment targets. As you continue to use gesture cues, consider being intentional in creating hand shapes that mirror speech in some way. Explain this connection to your client and encourage them to self-cue to tap into principles of embodiment and entrainment. Be flexible in how they are produced and creative in conceptualizing manual mimicry gestures that might help facilitate challenging phonetic, suprasegmental, and voice objectives.

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The Voice of the Conductor **Finding Kinesthesia:** Introducing movement-based learning in the voice studio and choral rehearsal

by Caron Daley, D.M.A.

Embodied pedagogies have become prevalent and popular in the teaching of singing. Body movement techniques appear as early as the 1960s in the vocal pedagogical literature, with authors such as Wilhelm Ehmann inciting voice teachers and conductors to approach singing as "dancing on the spot".¹ The roots of movement instruction can be traced back to important pedagogues of the early 20th century, such as Émile Jacques-Dalcroze, Rudolf von Laban, and Frederick Matthias Alexander.

Kinesthetic learning in singing instruction is a natural fit. The singing instrument is the human body, and as such, singers must learn to coordinate their various body parts to facilitate a healthy and expressive voice. Body movement helps singers to interface more directly with their instrument to develop a firsthand, or somatic awareness. Movement

1 Wilhelm Ehmann, *Choral Directing* (Augsburg Fortress Publishing, 1968), 78. techniques also provide greater access to the music, helping singers to physicalize concepts related to musicianship and musicality.

People often ask me, "How do I get started with using body movement or gestures in the voice/choral setting?" Perhaps movement was not a part of your own musical training? Or, perhaps you have experimented with movement, only to find that some students have a natural affinity for it, while others seem less familiar or comfortable. Depending on your setting, perhaps there are physical space limitations that seem too restrictive for movement.

The good news is that movement-based instruction is adaptable to all levels and ages and can be tailored to the parameters of your studio or classroom space. Movement activities can be incorporated in incremental steps, and in partnership with other instructional techniques. Through time, movement can become a vital part of your classroom or studio pedagogical vocabulary.

Hand and arm gestures

An essential starting point for body movement is the use of hand and arm gestures. For most students, hands and arm movements are easy and non-threatening. They can be done in-place and do not require locomotion. They can also be easily demonstrated by the voice teacher or conductor, and completed during instruction, while also singing. Here are some practical suggestions of hand and arm gestures, including their relative pedagogical intents:

• Use hands to mimic the movements of the vocal tract, such as raising the soft palate (an arching hand), or the forward and back movement of the tongue for various vowels. In this way, the hand acts as a spatiotemporal analogue to the vocal tract and helps singers feel and visualize what is happening inside.



• Use hands to show the contour of the melody with a pitch ladder. This type of gesture aids in concretizing the distance between notes. When the pitches repeat, the hand gestures serve to energize the breath to keep notes in tune.

• Use arms and a pointed finger to draw the musical line. Singers can "paint" freely in arches and circles, or "point" in a straight line. These types of gestures show melodic contour and direction.

Whole-body Movement and Movement in Space

A next step for incorporating movement is to invite the whole body to engage in gross-motor movements, such as twisting, turning, bending, stepping, or jumping. These types of actions coordinate the various parts of the singing instrument, and help singers develop awareness of the body in space. When using these types of movements, be sensitive to singer's mobility and histories of injury. Here are some examples of whole-body movement for the voice studio and choral rehearsal:

- Bend the knees before an upward leap to facilitate easier access to a high note. This type of movement releases body tension and reduces mental anxiety.
- While sitting, lean forward at the waist as the phrase expands and backward as the phrase recedes. This technique may be particularly effective in the choral setting, where simultaneous movements serve to heighten ensemble cohesion.

• Step the pulse while singing the music. Walking while singing develops sense of musical flow. It also helps with rhythmic precision as singers align their surface rhythms with the stepped pulse. Be sure to walk in the character of the music!

Partner or Group Movement

Lastly, invite singers to engage in partner or group movements. These types of physical games and choreographies help singers to gain awareness of other voices and parts. They are particularly useful in singing choral music, chamber music, or opera. Here are some examples:

Stand in a circle while singing and make direct eye contact with other singers. When the music makes a crescendo, enlarge the circle by stepping backwards. When the music makes a diminuendo, step toward the circle. Sing facing a partner. Facing a partner invites singers to breathe together, sense the music together, and sing as one instrument.

Develop an improvised choreography to accompany the music. Choreographies invite the group to make decisions about the music and to distill a musical interpretation.

Movement is a natural and enjoyable part of life. In vocal study, it can be harnessed as a powerful nonverbal tool. For those who may be new to these techniques, I encourage you to take a movement class, such as Dalcroze Eurhythmics, or an Alexander Technique or Body Mapping lesson. As you begin to use movement, or continue to use it, take special note of the singers' experiences. How are they feeling while moving? How is the movement changing the sound? These questions will guide your instruction and animate your time spent with students. Most of all, enjoy! The body was made for movement, and the voice is a magnificent manifestation of the body's movement capabilities.



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The Voice of the Therapist Why Gestures Work in Voice Therapy

Ask any voice client: voice therapy is hard work. Speech-language pathologists, in many cases, are essentially asking clients to change the way they have practiced speaking their entire lives, and that is not an easy habit to break. There is increasing evidence, though, that the use of varied methods of cueing, particularly gesturing, can make acquiring a new vocal quality easier for clients.

To understand why gesture is often helpful in voice therapy, let's first discuss current motor learning theory and its application to voice. On a basic level, motor learning can be split into two major groups – implicit and explicit. Implicit learning occurs unconsciously, typically when an individual is aware of the desired end goal but is not instructed on how to achieve it. In voice therapy, speech-language pathologists facilitate implicit learning through modeling a vocal quality for clients to mimic. Explicit learning, however, requires conscious analysis, and is often facilitated by specific instruction regarding how to complete a task, like telling a client to raise or lower their larynx. Though this categorization of learning types may seem dichotomous, current motor learning theory suggests that implicit and explicit learning strategies are most effective when integrated together, ultimately improving accuracy in performance, accelerating learning, and enhancing generalization (See Tellis, 2018 for a detailed description of a voice therapy approach applying this theory).

Within these types of motor learning, gesture has been thought of as inherently implicit in nature, as it often provides novel information that is not being expressed verbally. Gesture can be used to cue explicitly as well, though, by pairing an explicit instruction with a specific movement. In voice, this could mean pairing a gesture with a motion of a structure in the vocal tract. Current motor learning research suggests that using gesture to help explicitly cue voice clients in this manner may improve learning in several ways, one of which is through reducing the cognitive load.

Cognitive load is a measure of the amount of working memory resources required to complete a task and is typically increased during the completion of new or

"As most instruction in voice occurs verbally or through modeling, the use of gesture introduces an additional learning modality, a tool that cognitive psychologists have shown to improve the efficacy of instruction".

complex tasks. Research suggests, however, that if a gesture is taught alongside explicit instruction, it becomes representative of the desired motor movement itself. allowing clinicians to fade verbal prompts in favor of gestures. This decrease in verbal instruction helps reduce the amount of working memory required from our clients. In addition, due to the decrease in cognitive load, clinicians may even be able to cue their clients more frequently through gesture without clients requiring more processing time, increasing the productivity of sessions.

Gesture can also improve learning due to its visual and tactile nature. As most instruction in voice occurs verbally or through modeling, the use of gesture introduces an additional learning modality, a tool that cognitive psychologists have shown to improve the efficacy of instruction. In addition, gestures can even provide meaningful spatial information about a motor skill. This is particularly true in voice, where gestures can represent movement of structures within the vocal tract that cannot be seen. These gestures can be combined with imagined sensation to create motor imagery, a kind of mental practice that has

been shown to facilitate motor learning. Another form of 'mental practice' that is supported by motor learning research, action observation, can also be completed using gesture. Action observation requires learners to watch another individual complete the desired motor skill and has been shown to activate the same regions of the brain as if the individual were completing the task themselves. As such, when gestures mimic the physiologic movements of the vocal tract, watching a clinician gesture becomes a way to prime clients for improvement, even when they are not actively practicing. Clients learn gestures themselves, too, and in gesturing, are able to facilitate their own productions. These gestures become symbolic representations of movements that are occurring internally, providing helpful feedback to voice clients.

An additional benefit in applying gesture to voice is its ability to facilitate generalization. Once the meaning of specific gestures has been established through voice therapy sessions, clinicians can begin to fade verbal feedback in favor of gestural feedback, allowing clients to proceed through speaking tasks without auditory interruptions or pauses to process verbal feedback. A single gesture can be coded to represent an entire motor movement, delivering sentences worth of information in a concise way that is often more easily processed. Gestures can often be quite subtle, too, allowing for easier transference of practice to other settings and setting clients up for success.

Though acquiring a new voice quality requires hard work, the addition of gestural cues can make learning easier for our clients.



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Gesturing Toward Our Vocal Goals Tools for your Voice Box

by Brian J. Winnie, D.M.A.

Gestures are a form of non-verbal communication involving movements of the body, especially movements of the upper body such as hands and arms, and often occur in conjunction with speech. Gesturing has been shown to have an effect on learning outcomes and is an integral part of the choral artform. Research suggests gesturing, along with speech, can reduce the cognitive load of working memory during learning of a new task (Ping & Goldin-Meadow, 2010). Additionally, research in choral conducting suggests gestures and gesturing can impact a singer's overall vocal quality, intonation, facial expressions, shoulder movement, and extrinsic muscles of the head and neck (Grady, 2014; Manternach, 2016, & Brunkan, 2016). As research continues to find connection between gesture and voicing, or singing, it may benefit singing teachers to develop a gestural vocabulary for themselves and their students.

Although there are numerous gesture categories, this article will focus on building a gestural vocabulary of iconic gestures. These are gestures that can represent an object, structure, relationship, or action. For example, we can use gesture to represent the length of a human larynx by the amount of distance between the index finger and thumb (index finger parallel and above the thumb). All iconic gestures can be considered actions because they involve movement of the body, however, action-oriented iconic gestures might be the most beneficial when connected gesture with the singing voice. If we go back to the larynx example, we can now showcase an action-oriented gesture by first, representing the structural length of the larynx between the index finger and thumb, followed by representing the movement of the larynx up and down by moving the entire hand (while maintaining the index finger and thumb position). These can be thought of as gestures that represent the action of the anatomical structure.

Let's explore additional action-oriented gestures representing the the extrinsic intercostal muscles of the rib cage and a smooth (simultaneous) onset of the true vocal folds. These structures have bilateral symmetry, therefore, using two hands might better imitate the anatomy and movement of those structures. Have your students "gesture with you" when performing the following actions. Although further research is needed, gesturing with your students may help activate the mirror neuron system, thereby encouraging stronger learning acquisition / recall with gesture.

Exercise 1:

- 1. Find a neutral starting position with forearms bent at the elbow joint, parallel to the floor, with palms facing one another (as seen in fig. 1).
- 2. From the neutral position, practice simultaneously rotating the forearms and hands (pronating inward with palms parallel to the floor and supinating outward with palms facing upward).
- 3. From the neutral position, practice circling each hand from the wrist joint while maintaining the position of the forearms parallel to the floor.
- 4. From the neutral position, slowly expand the space between the palms by now moving from the shoulder joint (if you felt the should move upward, you moved from the sternoclavicular joint instead). Connect this sensation to the feeling of the extrinsic intercostal muscles expanding the ribcage in all directions, while inhaling quietly through the nose (your ribs are now metaphorically between your hands).

- 5. Once you feel this connection, start in neutral position and expand the space between the hands, while slowly pronating the hand from the elbow joint. You may also feel a very slight bend from the wrist joint.
- As you complete this exercise, try it at various effort (energy) levels and tempi. Feel resistance in the movement, via gentle muscle contraction.

Exercise 2:

- Sing the vowel [i] on the pitch C3 (lower voices) or C4 (higher voices), focusing on a smooth (simultaneously onset).
- 2. From the neutral position, practice the pronation of the forearms and hands again, via the elbow joint.
- 3. Next, perform small simultaneous circling gestures, away from the midline of the body with both hands as if you are tracing the outline of



a circle (counterclockwise with right hand and clockwise with left hand). Some find it beneficial to place focus on the pinky fingers as the hands trace circles, while still remembering to keep your fingers lightly together. The movement is from the wrist joint and the subtle pronation of the elbow joint.

4. From neutral position, each time you make the circling gestures, add step 1 (sing an [i]

vowel with a smooth onset). The gestural connection is to the smooth action of the true vocal folds activating with airflow simultaneously.

When building a gestural vocabulary, remember to keep your focus on gestures that can represent the action of the muscles that move the structure. How do they move? How can a gesture closely represent that action? For advanced version of these two exercises, try sequencing a breath gesture, as in exercise one, followed by an onset gesture in exercise two. Also, try each of exercise at varying tempi and resistance (effort or energy needed to sustain movement or contraction of certain muscles).

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