

When Less is More

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How many times have we shouted, “More, more, give me more!” when we really want more quality and projection, not more windy effort or strained yells? Unfortunately, when we ask for more, the student gives more of what he or she logically considers ‘vocal effort’ – and that’s not always effective effort.

We want projection and energy from the group, not wasted effort. There ought to be a formula for that – like $E=mc^2$. Hmm... if energy were projection, and mass were air pressure, and that square of the constant could be the space that resonates... Well, it’s not an exact analogy, but a good formula to remember for getting more from your choir is: **projection = breath control + resonance (squared)**!

We all know that good breathing technique is an essential ingredient in good tone and projection – what we sometimes fail to remember is that to a young student, the step after “take a big breath” would, of course be “then push that big breath out with all your might!” When the real secret to breath control is in the control of the exhaling breath. It’s not even so important that a singer takes in as much air as possible – in fact taking in more than you can control will result in an uncontrolled exhale. And the real secret to projection involves more than just breath control – it is very much tied in to resonance. But first, let’s review what’s involved in controlling the exhaling breath.

Breath Control

It’s helpful to look first at what is considered incorrect breathing, and at why that hinders performance. Take a big breath and hold it as you continue to read. Now check yourself: Have your chest and shoulders risen? Is your gut sucked in, as a drill sergeant might demand? Is your chest beginning to ache?

Now exhale. If you answered “yes” to the questions above, you are breathing incorrectly. Any lifting of the chest during inhalation, or feeling of pressure in the chest or throat, is a sure sign that you are breathing incorrectly.

Perhaps you noticed that when you use the muscles of the upper chest to inhale, the only way to keep the air inside your lungs is to keep your throat closed. The upper chest muscles, including the muscles of the ribs, and the shoulder and clavicle muscles, are incapable of controlling the exhaling breath.

There are three forces that work against holding the air inside: **gravity**; **elasticity**; and **torque**. Gravity works as a force opposing the action of the muscles by pulling down at the raised ribs and collarbone. The elasticity of the lung tissue itself is a force that works against holding up the ribs. Finally, torque is an opposing force because the ribs are lifted in such a way that there is a twisting of the ribs which adds a considerable force against holding them up.

So, when you inhale using the muscles of the upper chest, a lot of air will be exhaled on the first few notes you sing – unless you close the throat and

control the exhaling air that way. But this would put the vocal apparatus under a lot of pressure, and result not only in vocal fatigue, but also in a less than optimal tone. A whining or yelling tone might be the result of trying to control the breath with the throat muscles.

Can you see why breathing with the chest is not only inefficient, but also can be harmful to the vocal folds? What is needed is a steady, solid stream of air, not *more*, but *less* than most people think! To achieve this, the flow of air must be controlled from someplace beneath the vocal folds. Because the chest muscles can't provide control during exhalation, we must look even further down – to the bottom of the lungs. There we find the **diaphragm** muscle.

People often refer to the upper abdomen, or even the belly, as the “diaphragm.” In reality, the diaphragm is an internal muscle that stretches horizontally, separating the chest cavity from the abdominal cavity. It is a dome-shaped muscle that connects to the bottom of the lungs. When this muscle contracts, the dome becomes flattened, pulling the lungs downward, and providing more space in the lungs that the air rushes in to fill. Simply creating that space in the chest cavity draws the air in like a vacuum. At the same time, the stomach and other organs that are beneath the diaphragm are pushed forward, out to the sides a bit and a little to the back. There is the feeling that the area between the chest and waist has filled with air, as if you have inflated an inner tube around your midriff.

The diaphragm meets resistance when it has pushed the abdominal organs as far as they can go. This is the critical moment. It isn't enough to use the diaphragm merely for inhalation. If there is to be controlled exhalation, the diaphragm must continue to hold against the counter pressure of the abdominal wall. It's easier to let go of the diaphragm once it reaches this limit, but that will only cause more pressure at the vocal folds than inhaling with the chest.

In order to maintain a supported, steady stream of air past the vocal folds during singing, you'll need to keep the feeling of outward expansion for as long as possible. It is true that the diaphragm will slowly rise (relaxing back to its dome shape), no matter how much control you have over it, because the lungs and diaphragm are connected. But it's not necessary to push the air out by forcing the diaphragm up against the lungs. Less air is needed to pass the vocal folds for a good tone than most people realize. The air that remains in the lungs is what provides the support.

You say, “This is great to know, but can we expect our young choir members to get all this?” Well, maybe not in so many words. Here's where visualizations are handy. As long as *you* understand the concept behind the visualization, you'll be able to communicate a lot about proper breathing to singers of any age.

Visualizations

The inner tube around the midriff makes a good visualization: Imagine that the inner tube is holding up the note – once that inner tube loses its air, the note

is going to sink! So, keep the inner tube full of air, and you won't find yourself struggling to stay afloat.

Another visualization that is helpful is to imagine that the sound hole of a guitar exists in your upper abdomen, and that the sound must be projected outward from there rather than upward and out of your mouth.

You can also visualize that your diaphragm is compressing a spring and you want to maintain that pressure holding it down so it won't spring up and out of control.

Exercises

To build strength and control of the diaphragm, use the following exercises:

Exercise 1: Hissing

1. Inhale deeply
2. Exhale slowly and steadily on a "ss" syllable. Control the exhaling rate by pushing downward with your diaphragm (keeping the outward expansion) – not by tightening your throat or clenching your teeth.
3. Time the exhalation and keep a record of how long you can make it last on a single breath. Each day, try to top the previous day's score. This will help you build muscle strength and control.

Exercise 2: Panting

1. Inhale as deeply and quickly as you can – making sure your chest does not rise.
2. Exhale immediately and completely, making sure your chest does not collapse.
3. Immediately repeat steps one and two – but only five or six times. Too many of these panting exercises in a row will make you dizzy. Use your fingers at your upper abdomen to make sure it's going out on the inhale and in on the exhale.

Now what was that formula again? Projection = breath control + resonance – ah, resonance! What exactly is resonance?

Resonance

Resonance is what happens when something vibrates in sympathy with a vibrating source, amplifying the range of frequencies that the resonator is tuned to. When your vocal folds vibrate, they are producing not only the fundamental frequency, which is the pitch that you hear, but also a whole spectrum of overtones. Normally we don't hear these overtones as separate pitches; their amplitude is much lower than that of the fundamental. What we do hear is how

they influence the tone. When the resonator is tuned to higher frequencies, we hear a more treble tone quality. When it's tuned to lower frequencies, we hear a deeper quality. The resonator of the voice is essentially the vocal tract. That's the tube that starts at the vocal folds and ends at the lips. There are several muscles in this area, including the tongue, and we can shape and "tune" the resonator to produce not only different tones but also different vowel sounds. To produce the most vibrant, full range tone, the back of the throat needs to be open and firm: the soft palate should be raised; the back of the tongue should be lowered; and the walls of the throat should be expanded. Here, more is more! We're usually so timid about opening our oral cavities (remember "cover your mouth when you yawn!" and "don't chew with your mouth open!"), so be willing to open more than what feels "natural."

Since the size, shape, and firmness of the vocal resonators are adjustable, we can manipulate the muscles of the upper throat and mouth to create a full, ringing tone quality. This added resonance is more crucial to projection than the air pressure itself. It's the reinforcement of a range of frequencies between 2800 and 3200 Hz that helps an opera singer to be heard over the orchestra. The effort here is to open spaces in the vocal tract until you hear the ringing quality – it's a startling difference (my students' eyes usually pop out when it happens – "that was *me?*") and adds not only the richness and beauty, but also the added benefit of *volume*.

Visualizations

Picture your head as a speaker cabinet, with bass speakers located in the back the throat, mid range speakers in the center of your mouth, and "tweeters" in the area created by lifting your soft palate.

To open the back of the throat, imagine that you are swallowing an orange – or I should say, imagine that you are capable of, and are in fact swallowing an orange.

Exercises

The Soft Palate Lift

Step1: Stand in front of a mirror and sing Ahhh on a comfortable pitch.

Can you see the back of your throat?

Step 2: With your mouth still open, gasp as if you had just been startled. Watch the mirror to see what happens in your throat. Typically, the soft palate will lift, and you should be able to see more of the back of your throat.

(Note: If a gasp doesn't get your soft palate to lift, try yawning instead.)

Step 3: Sing Ahhh with your mouth and throat in the same relationship you saw when you gasped. Try to keep your soft palate lifted for the entire length of the note.

The Spotlight

Step1: Sing a note in the middle of your range. As you sustain the note, open the back of your throat and "aim" the note toward the back of your head.

Imagine that you are beaming a spotlight – in the form of your voice – to that area. Open more and more until the tone becomes very dark and full and bassy.

Step 2: Sing the same note, beginning with your throat fully opened. Start to lift the soft palate, aiming the spotlight up inside the back of your head more and more, until your tone becomes rich and bright. You should experience a “ringing” sensation.

Step 3: This step will require ample breath support, so prepare with a good inhalation. Sing the same note once more, beginning with the vocal “posture” you had at the end of Step 2. Begin to aim the spotlight forward (you can think “place forward”) more and more, until you start to hear a more treble, nasal quality in your voice.

Now practice moving your tone slowly from bass to treble, listening for the subtle changes during each increment. Then practice all three steps, on a single note. Feel the spotlight panning from back to front as you listen to the tone go from dark to bright.

Body Resonance

Step 1: Sing a comfortable note, on any vowel.

Step 2: As you sustain the note, imagine that you want to send the note through your entire body, rather than out your mouth. (Loudness is not the goal.)

Step 3: Imagine that the sound is spinning inside you gaining intensity as you hold the note. Try this exercise with every vowel.

Projection

Now that we’ve looked at the two parts in the second side of the equation, let’s look at how it all adds up to projection. First of all, without adequate breath control, the tone will be breathy, or whiny or yelled – so proper control of the breath is essential to produce a steady stream of pressure at the vocal folds. Then, since the vocal folds produce a complex full spectrum sound, the resonators can serve to reinforce certain overtones to amplify those frequency ranges that will not only increase overall amplitude, but also increase projection. A clear, ringing tone will project better than a breathy, non-resonant tone, or a yelled tone. But both breath support and resonance is important – one without the other is still insufficient. The following visualizations and exercises will help put it all together so that breath control + resonance = projection.

Visualizations

Imagine that your instrument is a large rubber band that is held at one end at the upper abdomen, and the other at the soft palate. Stretch the rubber band by inhaling and lifting the soft palate at the same time. Keep that rubber band stretched while singing for the entire note.

In another visualization, the diaphragm is like a trampoline, and your head is an empty cavity – so bounce the note on the trampoline and see how high up in the head you can get the note to go.

Add to that one, a small hole in the top of your head – now when you bounce the note on the trampoline, have the note be so slender that it can easily slide right through the hole in the top of your head.

Exercises

Increasing Projection

Step 1: Sing a sustained note quietly and clearly, keeping the outward expansion around the midriff. Then make the resonator larger by opening your throat and lifting your soft palate.

Step 2: Sing the same note, and hold the resonator steady, and increase the feeling of outward expansion – it helps to hold your fingers at the upper abdomen and press outward against your fingers.

Step 3: Sing the same note again, and do both the increase in the feeling of outward expansion, and the opening of the throat and lifting of the soft palate.

Leaning Tower of Power

Step 1: Find a thick book or block of wood that's about 8 - 12" long, 4 – 6" wide, and an inch or inch and a half thick.

Step 2: Find a place where you can stand close to a wall.

Step 3: Place the width of the book at the upper abdomen so that the length of the book reaches the wall.

Step 4: Inhale deeply, and lean into the book so that the book is held up between your abdomen and the wall.

Step 5: Sing Ahhh, as you lean further into the wall, opening your throat and lifting your soft palate. Don't collapse prematurely into the wall – use your diaphragm muscle to hold your outward expansion.

Side bar: Using visualizations for other learning types

Visualizations by nature are geared for visual learners, but not everyone is a visual learner. To make the visualizations more assessable to auditory learners, speak slowly and with rhythm and cadence to describe it, and use and overdo sound effects whenever you can. For the kinesthetic learner, describe how it feels, ask them to move in specific ways to make it a physical "hands on" experience. For example, to accommodate all three modes, the inner tube visualization can be presented like this:

"Picture yourself in a warm lake in the afternoon sun, with a fully inflated inner tube around your waist. You're just kicking back and soaking in the warmth and feeling pretty secure with that nice firm inner tube." Then lean your head back, close your eyes, and sigh long and loud – over-exaggerate! "Can you feel that? Now what would happen if someone let the air out of the inner tube?"

Then act like your sinking. You might want to allow your students to make the connection with how breath control should feel, but ask them rather than assume they're getting the connection. If you need to spell it out for them: "Your inhaled breath is like an inner tube – you want to try to keep the feeling of expansion around your midriff as long as possible – or you're sunk!"

You could present the speaker cabinet visualization like this:

First draw a speaker cabinet (an upright rectangle) on the chalk board, with a bass speaker (a large circle taking up the bottom half of the rectangle), a mid-range speaker (another circle just above the bass speaker, but leaving the last quarter of the rectangle free), and the "tweeters" (which is a sideways rectangle at the top of the cabinet, with an X in the middle).

"This is a speaker cabinet – your head is the speaker cabinet for your voice." Point to the bass speaker, open the back of your throat to speak in the deepest possible tone and say, "Here's the bass speaker – that's this big space at the back of the throat." Then point to the mid-range speaker, speak in a more neutral tone and say, "Here's the mid-range speaker – which is the mouth area." Then point to the tweeter, and speak in a singing tone (with your soft palate lifted), "Here's the tweeter – it's the lifted soft palate." Be sure to exaggerate the differences. Then ask them to sing "ah" with you using only their bass speakers, then only their midrange speakers, then only their tweeters. Describe what it feels like to move those muscles. Have them yawn and feel the stretching of the muscles inside.