



Science for Singers

A SERIES OF VOICE RESEARCH COLUMNS BY INGO R. TITZE, PhD

Warm-Up Exercises

Most vocalists have a warm-up routine. Rarely does a voice respond instantly after prolonged silence, sleep, or days of rest. Not only does the instrument need to be primed, but the player needs to be recalibrated to the instrument.

Observing singers in their warm-up routines, it appears that there is an underlying system embedded in the many existing variations. A primary objective is to obtain, as quickly as possible, a uniform vocal quality over a wide pitch range. The gifted vocalist spends the bulk of warm-up and training time in refining and grooming vocal quality, whereas the less gifted vocalist struggles to establish a useful pitch range.

Part of the problem with a limited pitch range may be in the inability to vary vocal fold length adequately. The cricothyroid space is very narrow in some larynges, leaving little freedom to rotate the cricoid cartilage toward the thyroid cartilage. Increased muscular effort does not necessarily solve the problem. Once the cartilages are basically in contact, little can be done to stretch the vocal ligament. The vocalist then resorts to external pull on the thyroid cartilage to elongate the vocal folds. This requires delicate coordination among various muscles. The attempt is to assist the oblique portion of the cricothyroid muscle in creating a slippage of the cricothyroid joint. The result is often a gently rising of the larynx with rising pitch.

An alternate approach to increasing vocal fold length is to resort to thyroarytenoid contraction. This is effective for low to medium high pitches, but there is a physiologic limit to the active muscular stress that can be produced by thyroarytenoid contraction. Heavy use of thyroarytenoid muscle contraction tends to produce a powerful voice, but generally limits the pitch range.

Optimal vocalization is based on flexibility and control rather than brute force. If singers are like athletes, then they are like those athletes who rely heavily on precision and range of movement (gymnasts, figure-skaters, dancers) rather than on peak muscle strength. Warm-up time is spent in stretching joints, tendons, ligaments, and muscles. Cyclic stretching and releasing promotes cell and fiber growth and strengthens all tissue, whether muscular or connective. A vocalist can engage in laryngeal and respiratory stretching exercises by gliding over a large range of pitches and intensities. Arpeggios, scales, and glissandos have been designed for this purpose (e.g. Concone's Thirty Daily Exercises). As in any skilled motor task, exercises are specifically designed to increase accuracy of targeting, stability of posturing, speed of transitions, and dynamic range. Applied to vocal pitch, accuracy of targeting is practiced by attacking notes at various pitches; stability of posturing is practiced by long, sustained notes; speed of transition is practiced by rapid scales or arpeggios; and range is extended by jumping quickly between high and low notes.

Another part of warming up is to separate (in function) the larynx from the articulators. Phonation and articulation need to be independent, to a large degree, if constant vocal quality is to be maintained over phrases or sentences. Heavy use of consonant-vowel alterations, rapidly executed on scales or arpeg-

gios, facilitates this independence during warm-up. Vocalesees that incorporate nonsense syllables, moving from single consonants to consonant clusters, are therefore a logical extension of the more primitive vowel vocalesees.

The final phase of warm-up is singing loud. This is sensible only when the entire range of pitch and vocal quality is intact. It has been observed (informally) by this author that premature execution of loud phrases in the medium pitch range is detrimental to achieving vocal balance. The hierarchy seems to be: first a wide pitch range of soft to medium loud voice, then a full control over voice quality, and finally a full range of loudness.

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