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How Well Does Speech Exercise the Larynx?

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HUMANS LEARN TO VOCALIZE primarily by hearing speech, except in early development when "mommy-talk" is more in the form of pitch glides, giggle, laughter, or coos. When the articulatory component of speech begins to assume a greater role than the prosody component in speech development, vocalization can begin to lose some of the multidimensional aspects of vocal play. Chanting, singing, or meditative vocalization can reverse this trend, but is not a regular activity for many people. Animals communicate well with nonspeech vocalization. Given that their messages are generally not encoded in vowels and consonants, but in variations of pitch, rhythm, periodicity, and spectral content, it could be argued that their laryngeal (or in the case of birds, syringeal) capabilities are exercised better than those of many humans.

One inherent problem with vocalization in a speech context alone is that low fundamental frequency is desirable for clarity of the *articulatory* component of speech. For this reason, speech occupies a small region in the lower half of a Voice Range Profile (Figure 1), leaving little or no exercise for laryngeal muscles in much of the physiologic range for many people. This "crowding" of vocalization into a small range, with limited variety, may contribute to an overall vocal limitation, and perhaps to some vocal fatigue and voice disorders.

Speech provides lots of exercise in glottal valving—adduction and abduction. Research has shown that school teachers, for example, adduct and abduct their vocal folds between 10,000 and 20,000 times a day. Thus, the adductory and abductory muscles, namely the lateral cricoarytenoid, the interarytenoid, the posterior cricoarytenoid (and to some degree the thyroarytenoid muscles) get plenty of short burst activity. The cricothyroid muscles are perhaps the most poorly exercised. Intonation in speech (the melody in a sentence) does allow for increases and decreases in cricothyroid activity, but only over a fraction of its possible range. If we assume a two-octave physiologic pitch range for an average human, speech rarely accesses the second (higher) octave. As far as vocal fold length is concerned, speech usually involves a shortening of the vocal folds (from the nonspeech resting position) rather than an elongation.

Register imbalance is another problem. A balanced (mixed) registration is the default for some fortunate individuals who were exposed to mixed register in speech as a model early in life, but many others seem to have adopted a more aggressive, TA-dominated registration in speech.

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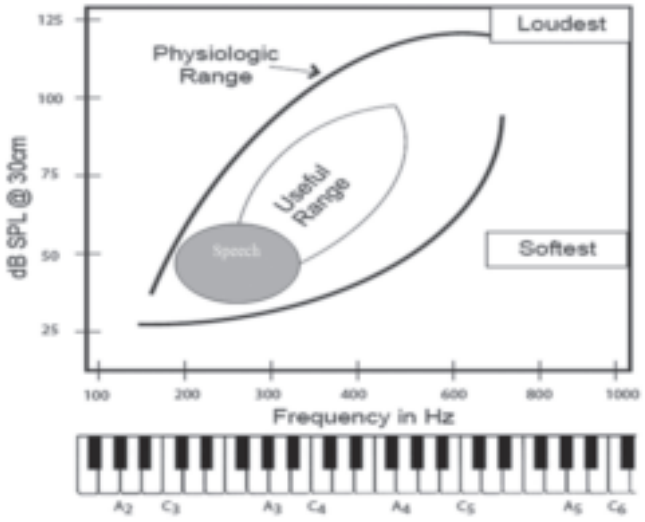

Figure 1. **Speech area in a Voice Range Profile.**

So, what can be done to balance the heavy dose of speech-related activity in the larynx? For people whose vocalization gravitates to pressed voice, hard voice onset, vocal fry, or labored chest registration in daily speech, it seems reasonable that lots of high-pitched vocalization can counteract this tendency. The motto should be: *stretch and unpress the vocal folds often!* But stretching must be done with a semioccluded vocal tract (a straw, tube, lip trill, etc.), so that "unpressing" always goes along with "stretching." A few minutes several times a day seems to make a big difference. Furthermore, singing or chanting in mixed register for half an hour to an hour a day would appear to provide a resetting of the laryngeal musculature (personal experience, no hard science yet to support the claim).