

The Physiological Basis of Voice Production*

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Abstract

The voice is the result of the interaction between different systems, all of them originally evolved to perform vital functions – primarily breathing and swallowing. The respiratory system is at the basis of the phonatory function, since it sends an air flow to the larynx – the organ primarily responsible for defending the airways from food aspiration during swallowing – and sets the vocal cords into vibration when they are adducted, producing the fundamental frequency (F0) of the voice. The diffusion of this aerial vibration to the resonance cavities (pharynx, oral cavity, nose) – whose phylogenetically oldest functions are breathing and swallowing – allows the voice to become a harmonious sound. Compared to the mammals that preceded them in evolution, humans, having assumed the upright position and therefore having a more angled skull base, have the larynx in a lower position. If this has made the swallowing function more complex, it has, however, allowed a very refined modulation of the resonances, with the possibility of articulating language.

Keywords: voice; phonation; larynx; vocal fold; vocal resonance.

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