

The Laryngeal Articulator Model and the pharyngeal origins of human speech

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A new model of the vocal tract: the Laryngeal Articulator Model

The Laryngeal Articulator Model is a novel phonetic remapping of the vocal tract and the foundation for a revised theory of voice quality. The vocal folds, ventricular folds, aryepiglottic folds, epilaryngeal tube, and larynx height generate multiple periodic vibrations and complex modifications of lower-vocal-tract resonances, accounting for a broad range of contrastive auditory qualities in the languages of the world. Instrumental phonetic images illustrate states of the larynx, phonation types, and linguistic realizations from many language families.

iPA Phonetics: multimodal iOS application for phonetics instruction and practice

iPA Phonetics is an iOS application based on the Laryngeal Articulator Model that illustrates voice qualities, vowel qualities, and consonant production with video/audio of articulations in the oral vocal tract and laryngoscopic video/audio and ultrasound images of the laryngeal vocal tract. The Consonant Chart is an expanded version of the 2005 IPA chart (Esling 2010); the replay speed of consonant and vowel sounds can be controlled; and random consonants and vowels can be generated for recognition practice. This self-contained app for Apple iOS mobile electronic devices gives users the ability to access and compare phonetic symbols and sounds together with detailed articulatory production correlates. The app is free on the Apple Store, intended to introduce the general public as well as specialized users of IPA symbolization, via iPad/iPhone technology, to the auditory inventory of possible speech sounds of the languages of the world and to how each sound is physically articulated.

The pharyngeal origins of human speech

The Laryngeal Articulator Model has implications for theories of sound change and speech acquisition. The 'laryngeal articulator' is the mechanism that infants first control as they test their phonetic production through the first months of life. In infant vocalizations, laryngeal quality is primal, speech 'originates in the pharynx,' and manners of articulation spread from the pharynx in a progression of production that parallels and complements infants' ability to discriminate speech-sound categories perceptually. Includes audio data of infant vocalizations in the first year of life and how these primary sounds are (auto)generated by infants using their laryngeal articulatory mechanism, engaging in phonetic play to alternate contrasting phonetic elements dynamically, and developing oral articulations on the foundation of earlier laryngeal manners of articulation.

Some useful references:

- Esling, John H. (1996). Pharyngeal consonants and the aryepiglottic sphincter. *Journal of the International Phonetic Association*, 26, 65-88.

- Esling, John H. (2005). There are no back vowels: The laryngeal articulator model. *Canadian Journal of Linguistics*, 50, 13-44.
- Edmondson, Jerold A., & Esling, John H. (2006). The valves of the throat and their functioning in tone, vocal register, and stress: laryngoscopic case studies. *Phonology*, 23(2), 157-191.
- Esling, John H. (2010). Phonetic notation. In William J. Hardcastle, John Laver & Fiona E. Gibbon (Eds.), *The Handbook of Phonetic Sciences*, 2nd ed. (pp. 678-702). Oxford: Wiley-Blackwell.
- Edmondson, Jerold A., Padayodi, Cécile M., Hassan, Zeki Majeed, & Esling, John H. (2007). The laryngeal articulator: Source and resonator. In J. Trouvain & W.J. Barry (Eds.), *Proceedings of the 16th International Congress of Phonetic Sciences*, vol. 3 (pp. 2065-2068). Saarbrücken: Universität des Saarlandes.
- Benner, Allison, Grenon, Izabelle, Esling, John H. (2007). Infants' phonetic acquisition of voice quality parameters in the first year of life. In J. Trouvain & W.J. Barry (Eds.), *Proceedings of the 16th International Congress of Phonetic Sciences*, vol. 3 (pp. 2073-2076). Saarbrücken: Universität des Saarlandes.
- Moisik, Scott R. (2013). *The Epilarynx in Speech*. Doctoral dissertation, University of Victoria, Victoria, British Columbia, Canada.