

# Aeorodynamic and myoeslastic forces

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## Aerodynamic and Myoelastic Forces 1

Aerodynamic and Myoelastic forces in the generation of the Glottal pulse.

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Communication is absolutely necessary for human beings and animals. This is attained in terms of speech and sounds respectively. The process of producing different sounds to communicate different ideas is known as phonation. And this process is performed by vocal folds. “ this sound source is passed the vocal tract, consisting of the air channels between the vocal folds on the one end and the lips and the nostrils on the other end.... and speech is the result of the generation of the sounds by the vocal folds and the Conversion of this source sound to speech by the vocal tract”

[dissertations. ub. rug. nl.[2000]]

During this process involves the aerodynamic and myoelastic forces. “ The vibration of the vocal folds is driven by the aerodynamic phenomenon.

Driving air pressure from the lungs controls the openings of the folds and the Bernoulli effect controls the closing phase As the top of the folds is opening, the bottom is in the process of closing, and as soon as the top is closed the pressure build up begins to open the bottom. The vibration is then like a wave which travels from the bottom to the top of the vocal folds. Each vibration allows a brief puff of air to escape, producing an audible sound at the frequency of the opening this process is called voicing” [hyperphysics.

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phy-astr. gsu. edu. 2006] These forces are first explained by van den Berg [1958].

This force that acts in-between the air that travels from the bottom to the top of the vibratory cycle is called the myoelastic and aerodynamic forces. The process involved in the production of voice is an interaction of muscular and aerodynamic events. “ When

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the aerodynamic forces build up of air pressure below the vocal folds force the abducted folds open: Bernoulli effect aids the muscular forces in closing the vocal folds” [Codi 504. 2006].

“ The glottis is the opening in the larynx that exists anteriorly (to the front) between the vocal folds and posteriorly (to the back) between the arytenoid cartilages. The part of the glottis between the vocal folds is known as the membranous glottis and the part of the glottis between the arytenoid cartilages is known as the cartilaginous glottis” [Mannel 2005]

The function of the vocal folds in terms of closing and opening depends on the air pressure that is developed below and above the glottis. The glottal flow or glottal pulse remains zero when the phonation is in the closed phase, and the glottal pulse slowly increases during the opening phase of the phonation process. “ The nature of phonation is such that the glottal pulses occur as a series of pulses. The vibration involves the pulse rate of the glottis with the additional function of the myoelastic and the aerodynamic forces.

The combination of the elastic and the aerodynamic forces sets up as an <https://assignbuster.com/aerodynamic-and-myoeslastic-forces/>

oscillatory opening and closing of the glottis, causing what would otherwise be a steady air stream leaving lungs to be broken into a series of puffs of air many times per second ...The sound that results from these puffs is called as phonation.”[Sherman Fitch III 1986].

The myoelastic and aerodynamic force initiates the vibration of the vocal folds. This could be explained as “ when the vocal folds are appropriately positioned, the

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column of tracheal air creates an aerodynamic force as it passes through the narrowed glottis. This aerodynamic force initiates the vibrations of the tissues”. [Courey [2003] . The tissues need to be pliable or myoelastic in nature for the vibration to occur properly. If the tissues are not elastic in nature then the vibration will not be efficient and the phonation process will also be less productive.

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