The Electroglottograph

Based on the lecture - Filipa Lã

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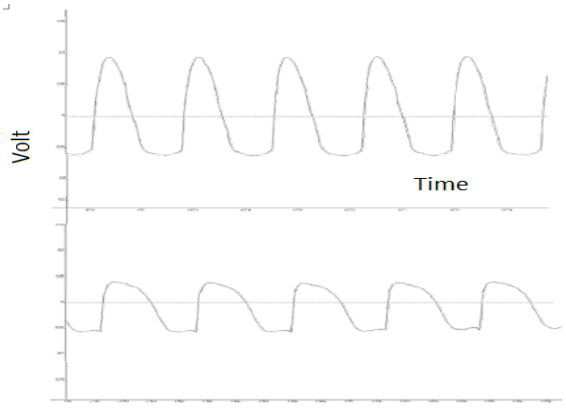
The intent of this article is to give a brief description and summary of the functions of the electroglottograph (EGG). The EGG was developed by Don Miller in conjunction with the software Voce Vista.

An electroglottograph consists of two electrodes, which are placed on the neck in the region of the thyroid cartilage. They serve to record and measure vocal lip movement by using an alternating current of approximately five volts between the two electrodes. When the vocal lips close, an electrical current is transferred from the EGG to the EGG-processor (connecting link), which sends the signal to the computer. No signal is sent when the vocal lips are open. The recorded vocal lip movement can then be viewed through the computer program Voce Vista. The X-axis shows time while the Y-axis depicts the vocal lip contact.

The electroglottogramm displays the opening- and closing-process of the vocal lips. This enables the student to better understand and visualize for example that the vocal lips open and close 440 times per second in order to produce an A^4/a^1. A closer analysis of the curve demonstrates the pitch and volume of the tone. Differences in the vocal lip closure in the different the registers can also be observed. The higher the pitch, the greater the Hertz frequency, therefore, the vocal lips close more often in a given period of time, showing the opening and closing phases as shorter and producing a narrower curve. The volume of the tone can be measured by the angle at which the curve falls: the higher the angle the louder the acoustic signal. Using Voce Vista, the so-called „closed quotient“ (CQ) can be calculated as a per cent value for the vocal lip closure. A CQ of 30% or less, for example, is considered breathy and a CQ of 70% or more is considered a pitch with too much pressure.



Register differences are also easily demonstrated by using the EGG. The resulting curves shown in the illustration depict the same pitch (e.g. D^4/d^1) sung first in chest register and then in the head register. Both curves show a fast vocal lip closure. However, the opening phase takes longer in the head register. One could conclude that the chest voice produces a better closure (higher amplitude), and thus a louder pitch (steeper angle).

It is not advisable to base any final conclusions upon the EGG data, since there are many factors which can influence the accuracy of the EGG measurements. Improper placement of the electrodes, for example, leads to faulty and misleading data. Nonetheless, the EGG, or rather the curve analysis can be a beneficial accompanying tool in voice training by giving students a better understanding of vocal function.

It is not possible to teach singing - or to learn it - using the EGG; it should rather be used as a helpful tool in understanding and visualizing the human voice.

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