

Towards a physiological definition of different accents in French

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The main subject of my work is to validate Vaissière's Hypothesis (2002, 2004) concerning perception of effort in speech. The author distinguishes between different degrees of effort and relies them to different lexical accents. Her hypothesis is that these different accents may be related to rather independent extra activity at the 3 different levels of the vocal apparatus, namely sub-glottic, glottic, and supra-glottic level.

My thesis is thus a simultaneous physiological investigation of these three levels for French, realized in the following way :

- the sub-glottic level was investigated with the help of intra-oral pressure, which is a reliable equivalent of sub-glottic pressure during the production of bi-labial plosives (Hertegard, Hans).
- The glottic level was investigated through Electro-Glotto-Graphy. Main emphasis was put on the glottic level in this work, and the parameters calculated from the EGG signal were systematically validated by the use of high speed cinematography.
- The supraglottic level was simply evaluated thanks to video-camera, so as to measure the opening of the jaw. This was done simply by measuring distance between target points placed at specific points (chin + glasses). Acoustic measurements. Other investigations of the supra-glottic activity could be performed such as lip area.

Preliminary results show that the different levels may actually bear a different weight according to the different linguistic accents acknowledged by the literature. Another aim of this work is to show evidence of compensation phenomena between these 3 different levels of the vocal apparatus, and more specifically the glottic level. A series of acoustic measurements were conducted so as to rely the physiological measurements to the acoustic realization. The final point of this will be the validation of perception of this extra-activity at the different levels, thanks to the quasi-articulatory synthesizer HL synthesis (Sensimetrics).

My related interests for this summer school are the following :

- Several algorithms were written in Matlab for analysis purpose
- Relation between physiology / acoustics / perception
- Modelisation of speech taking into account the different levels of the vocal apparatus, including compensation phenomena.
- Modelisation of larynx with visual evidence of vocal folds movement