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LARYNGEAL AERODYNAMICS AND THE CONTROL OF PROSODIC PHENOMENA IN SPEECH

The control mechanisms for fundamental frequency and intensity in speech are not completely understood, witness the recent debate on the relative importance of laryngeal and respiratory factors in the regulation of fundamental frequency. Most of the evidence presented in that debate suggests that laryngeal mechanisms are more important for  $F_0$  control but at the same time different sensitivity of the larynx to aerodynamic variations at different  $F_0$  levels is an open possibility. Current views on intensity control imply both active variations in subglottal pressure and variations in glottal resistance.

The Swedish word accents provide suitable material for studies of prosodic control in speech. An earlier investigation of subglottal pressure during the production of words with different word accents suggested differences in respiratory activity for the two accents. These differences appeared, furthermore, to depend on the dialect of the speaker and were tentatively related to the variations in fundamental frequency manifesting the accent distinction.

The present paper presents some preliminary results of a more comprehensive study of laryngeal aerodynamics and the control of fundamental frequency and intensity in speech.

Recordings of air pressure below and above the glottis were made using a miniature transducer system with two pressure sensors placed in a flexible catheter which was introduced through the nose and placed in the respiratory tract with one sensor below and the other above the vocal folds. Air flow was recorded simultaneously using a standard Fleisch pneumotach system. The pressure drop across the glottis and the transglottal air flow were used for calculations of glottal resistance.

Preliminary results show a close agreement between fundamental frequency and glottal resistance, i.e. glottal resistance increases with increasing fundamental frequency. The variations in subglottal pressure associated with the accent distinction were largely reproducible from the earlier investigation.