

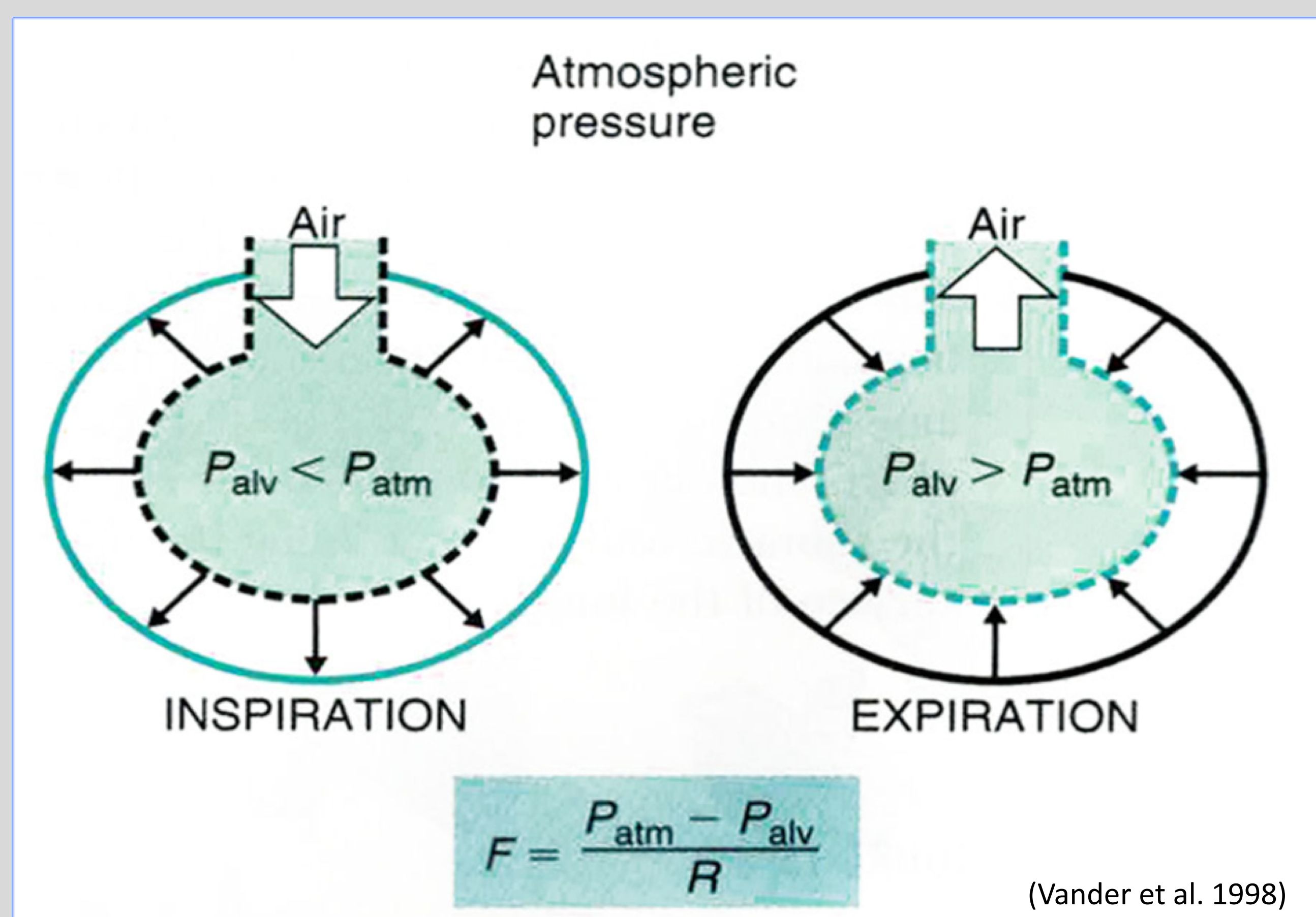
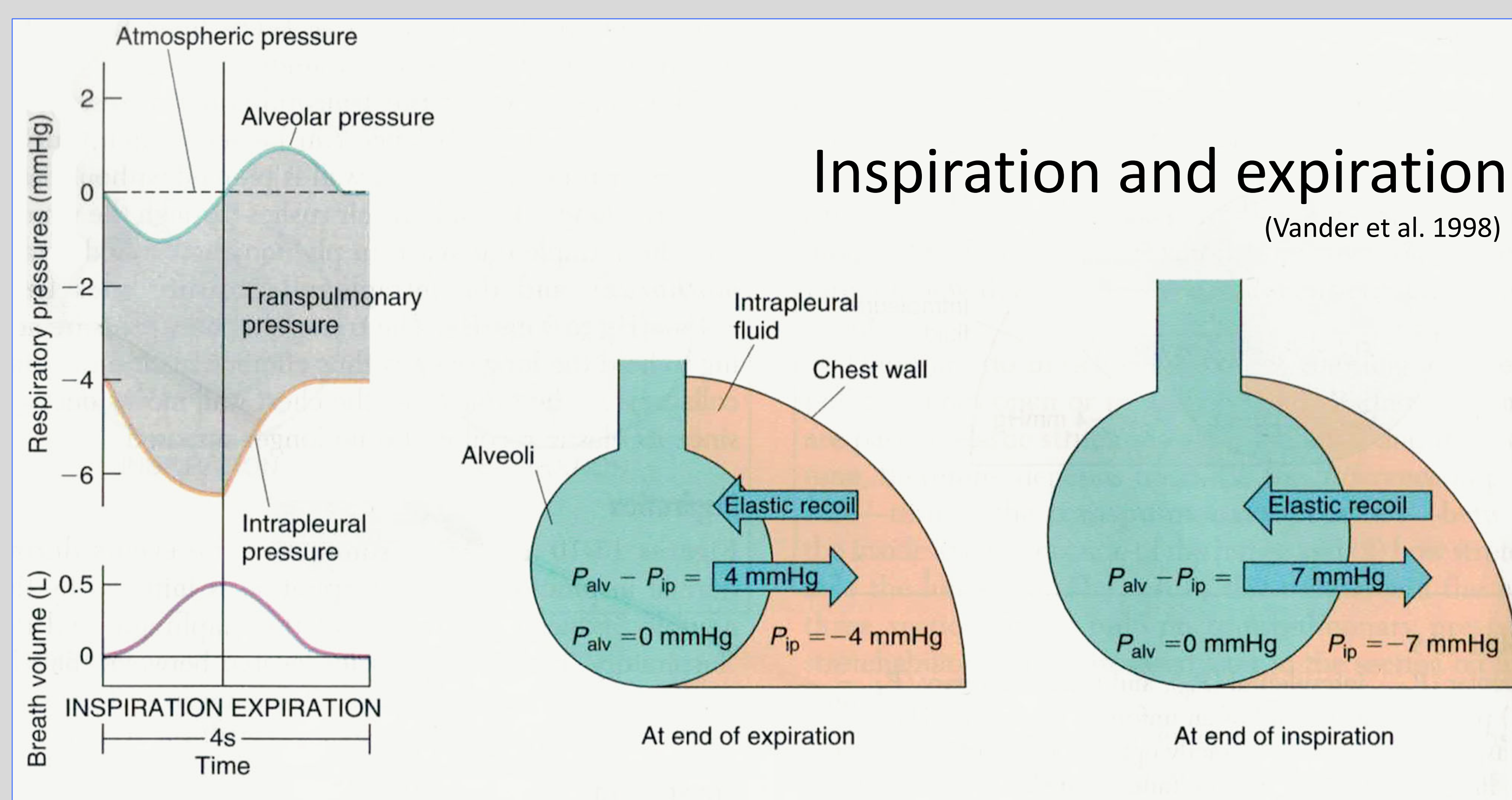
RESPIRATION IN SPEECH: CONTROL, GLOBAL AND LOCAL EFFECTS

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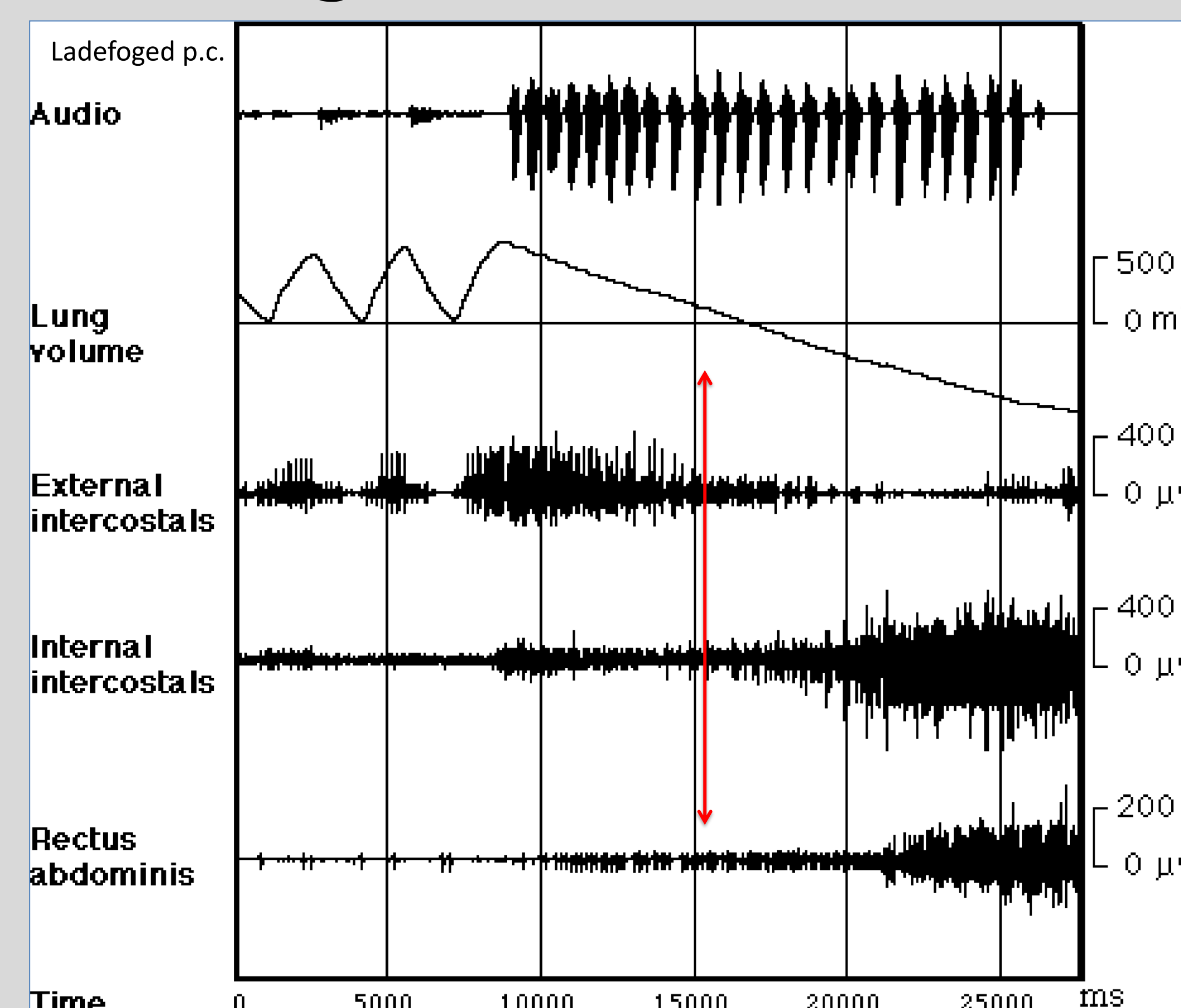
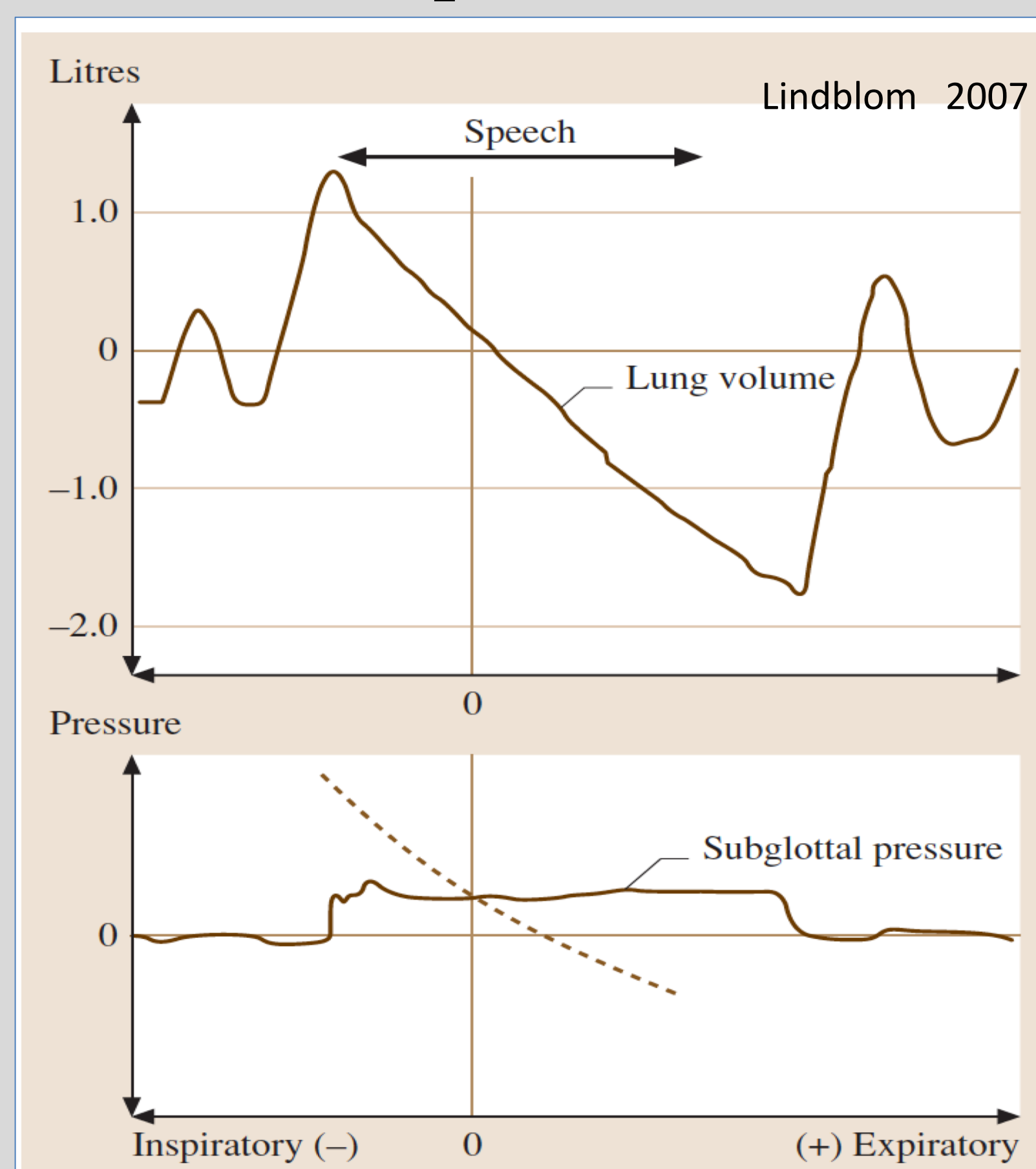
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1. Background

- Breathing is essential to man's ability to speak. The respiratory bellows provide the power to the vocal apparatus. Expiration in speech often continues until lung volume decreases below functional residual capacity.
- Speakers appear to achieve a compromise between ventilatory and speech demands on flow rates. How?

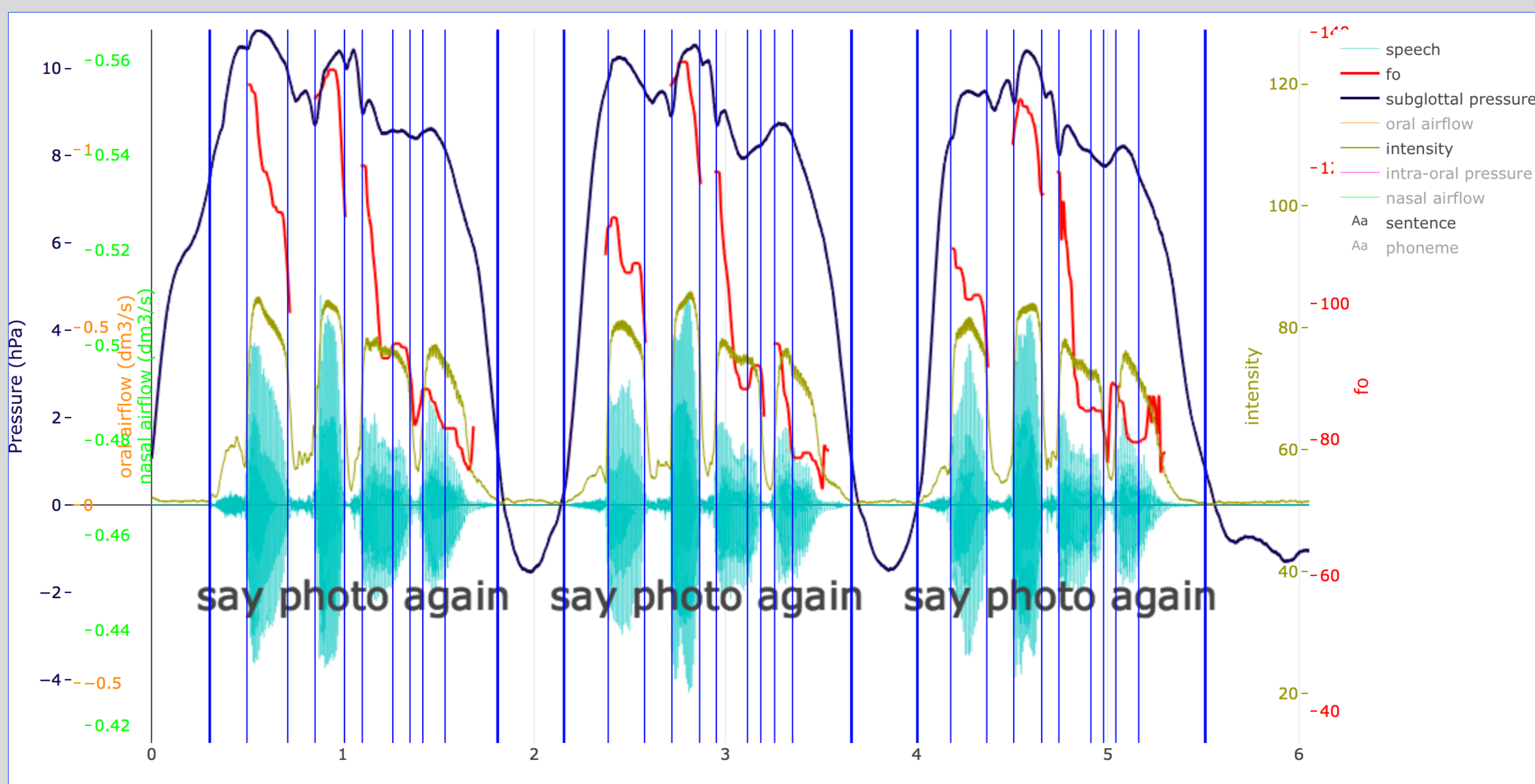


How is the relative constancy of P_s achieved despite the continual change of relaxation forces?



2. Control

During speech an extra 6/10 hPa must be sustained above atmospheric pressure to provide the energy to speak. This is in addition to the ventilatory demands. How is it controlled? By which neuromuscular mechanisms?



What is role of the spinal and cranial nerves?

The external and internal intercostals muscles are the most important to regulate P_s . Not the diaphragm.

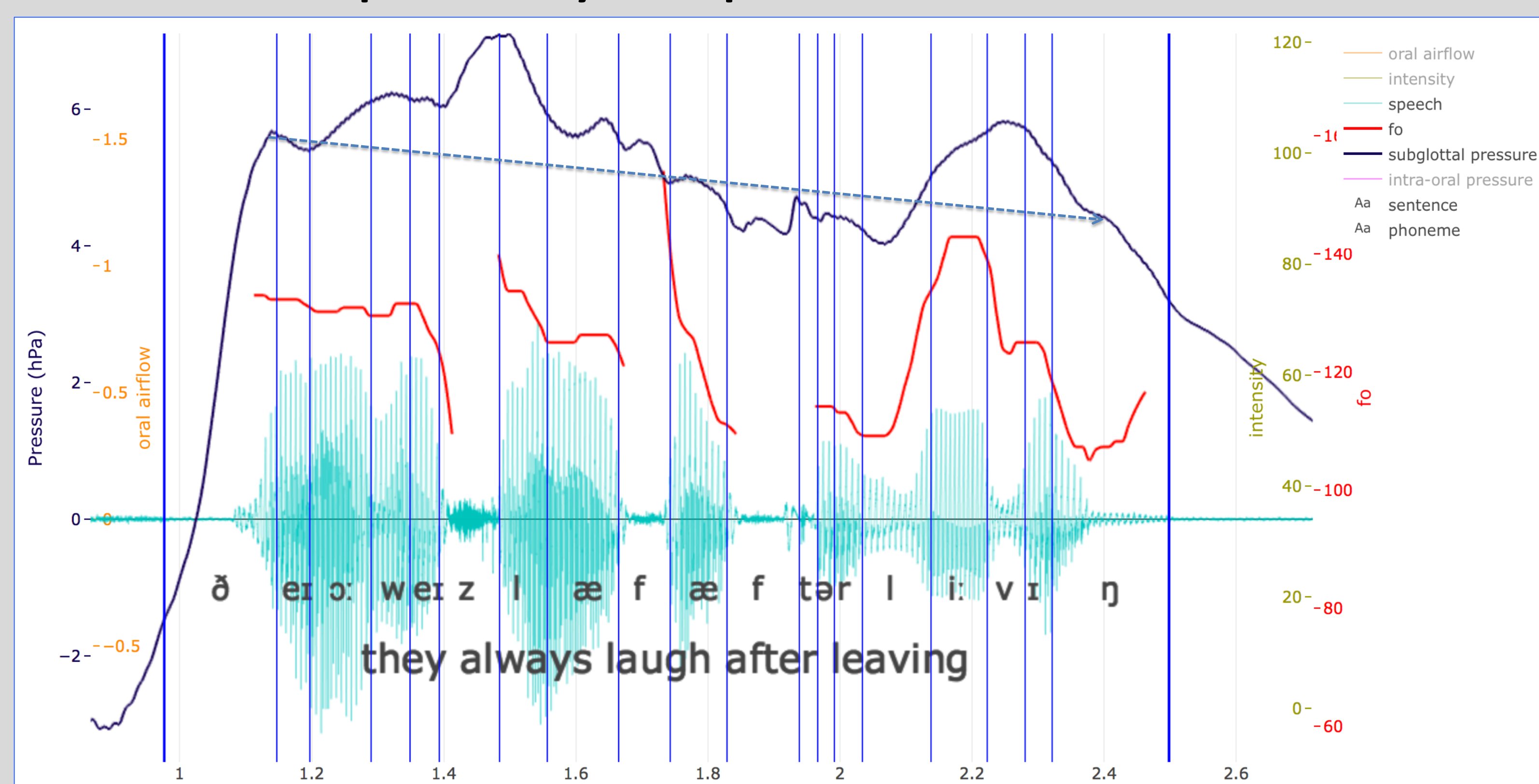
P_s is sustained by the expiratory muscles after the recoil of the lungs tissues.

3. Global effects

ΔP_s = Loss due to the system's compliance

+ effects of $R_g = \frac{A}{U}$ and $R_o = \frac{A}{U}$

Extra inspiratory air puffs between sentences

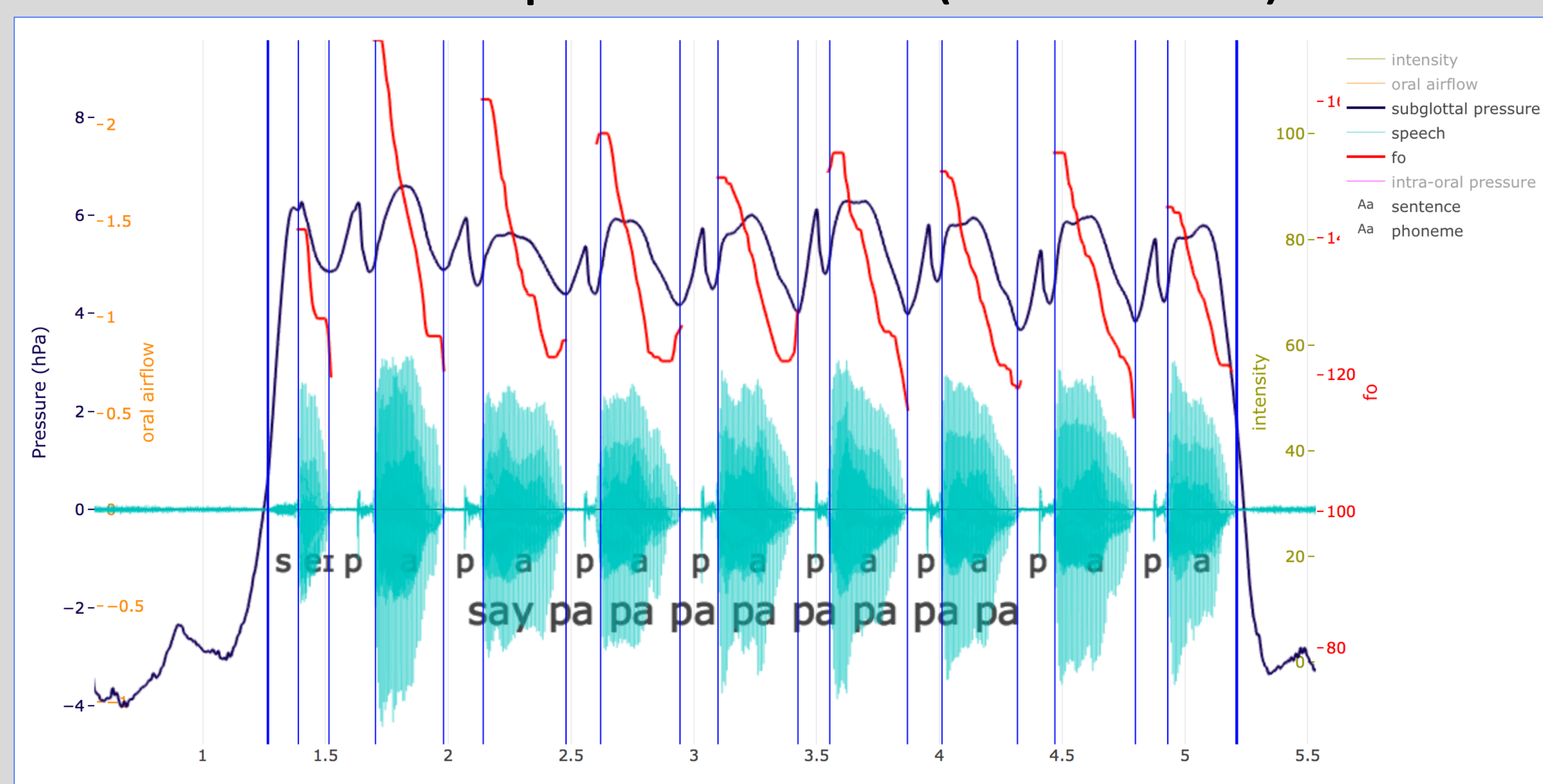


4. Local effects

Effects of $R_g = \frac{A}{U}$ (vowels) and $R_o = \frac{A}{U}$

(voiceless fricatives) $R_g + R_o$ (Voiced fricatives)

Lexical and emphatic stress (+ 1-2 hPa)



R_g is quickly adjusted and affects f_o and P_s that are regulated by \neq controls. P_s and f_o interact in complex ways.