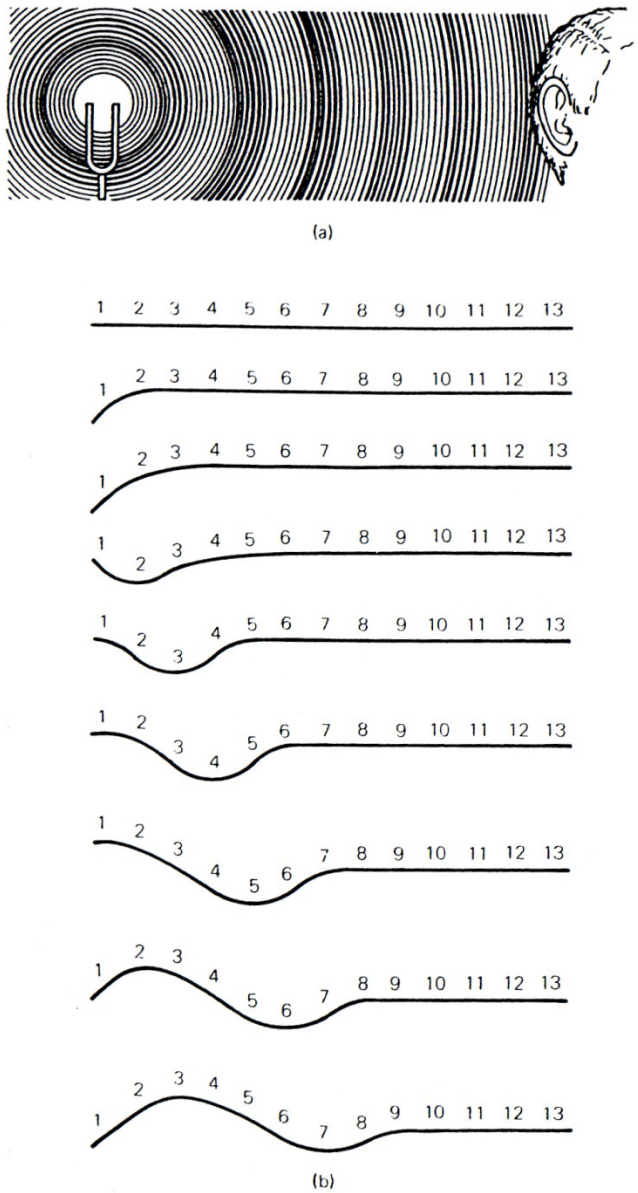

FIGURE 7.2.1 Propagation of a sound wave: (a) longitudinal; (b) transverse

Vrste nihanja

1. Preprosto harmonično nihanje:

- Nihala (slika 7.3.1)
- Odmik glede na čas – sinusna krivulja (7.3.2)
- Čisti zven
- Nihaj, amplituda, frekvenca

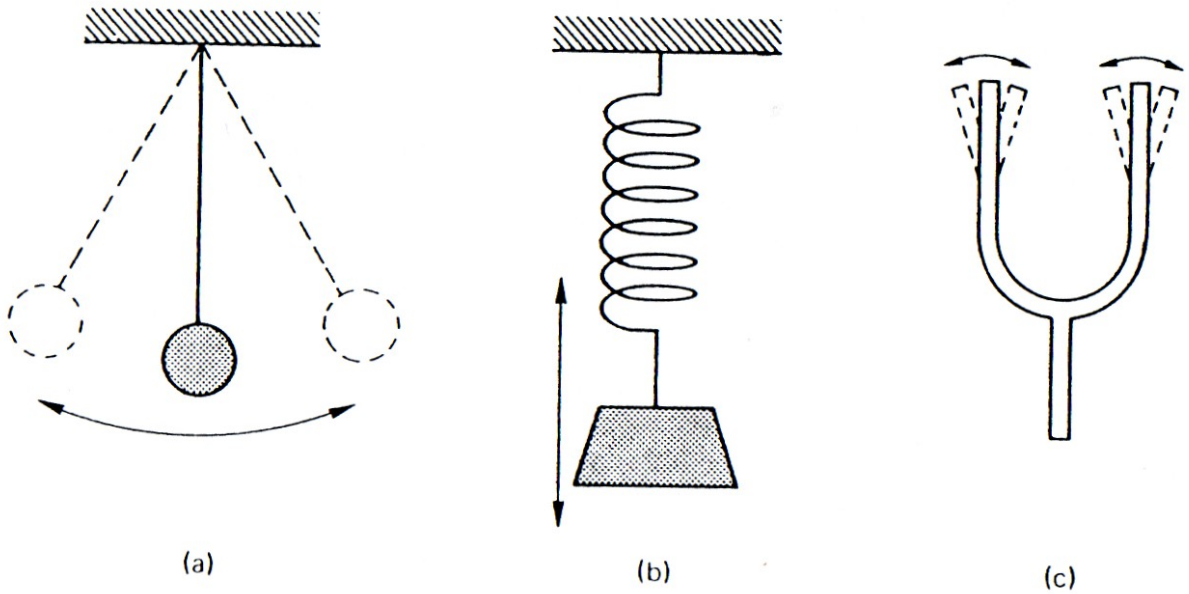

FIGURE 7.3.1 Simple vibrating systems: (a) pendulum; (b) spring-mass; (c) tuning fork

2

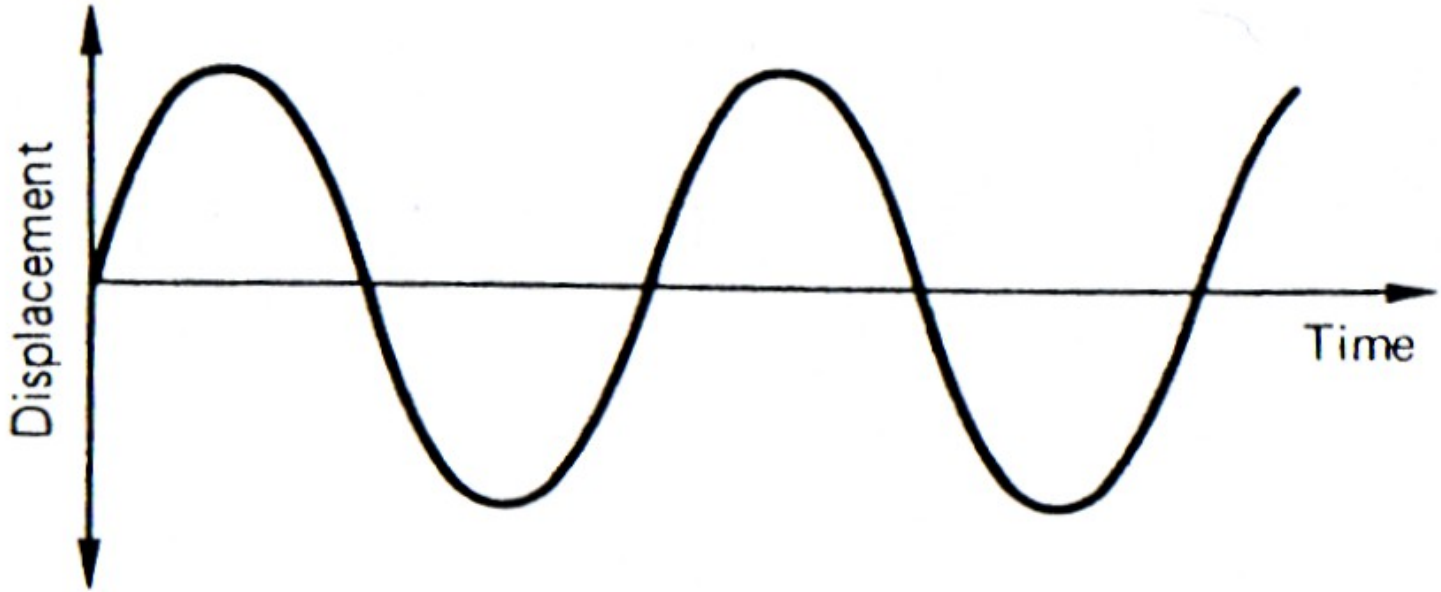

FIGURE 7.3.2 Simple vibration waveform

2. Kompleksna nihanja

A) periodični toni; vsota sinusnih nihanj (7.4.1)

•osnovna frekvenca (ton), harmonični toni

•harmonični toni so večkratniki osnovnega tona

•barva: frekvence, amplitude

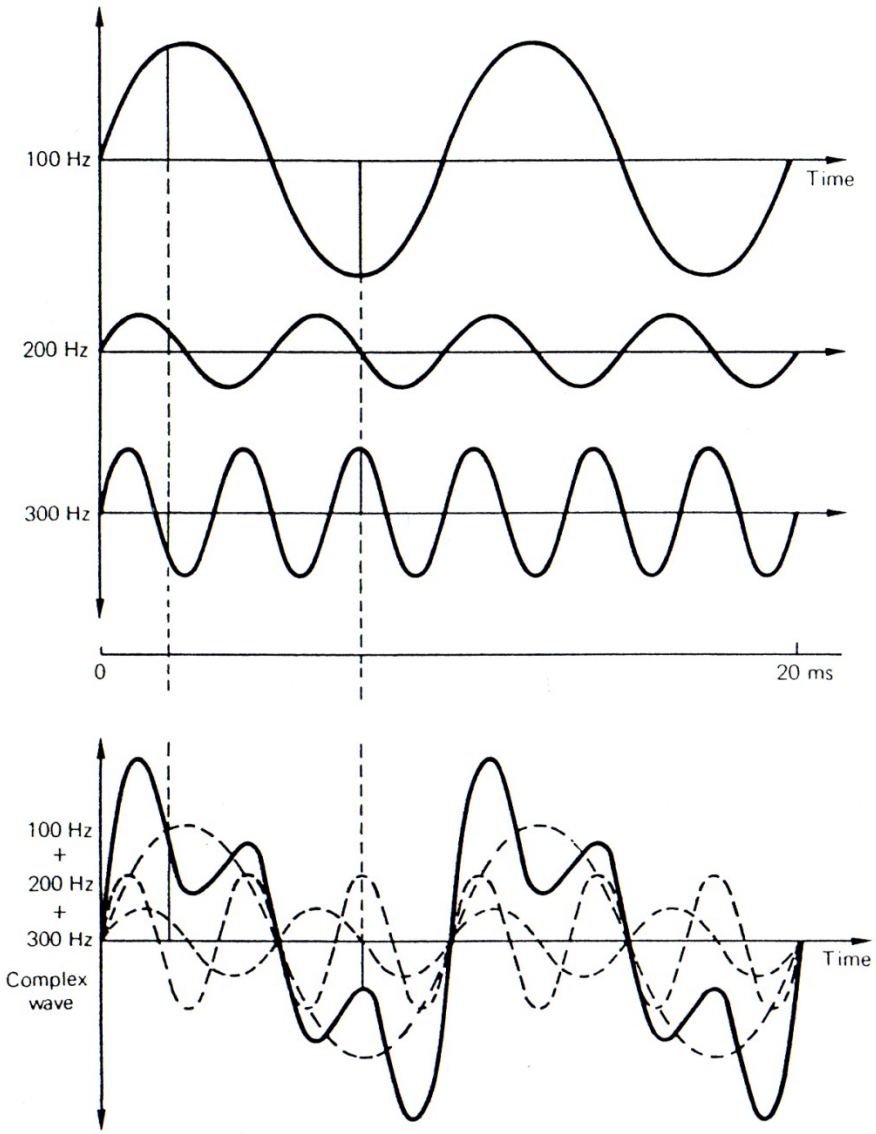

FIGURE 7.4.1 Complex wave with three sinusoidal components (100 Hz, 200 Hz, 300 Hz)
Adapted from: Ladefoged 1962, p. 35.

B) Aperiodični toni

- frekvence niso večkratniki osnovne frekvence
- Šum (7.4.3)

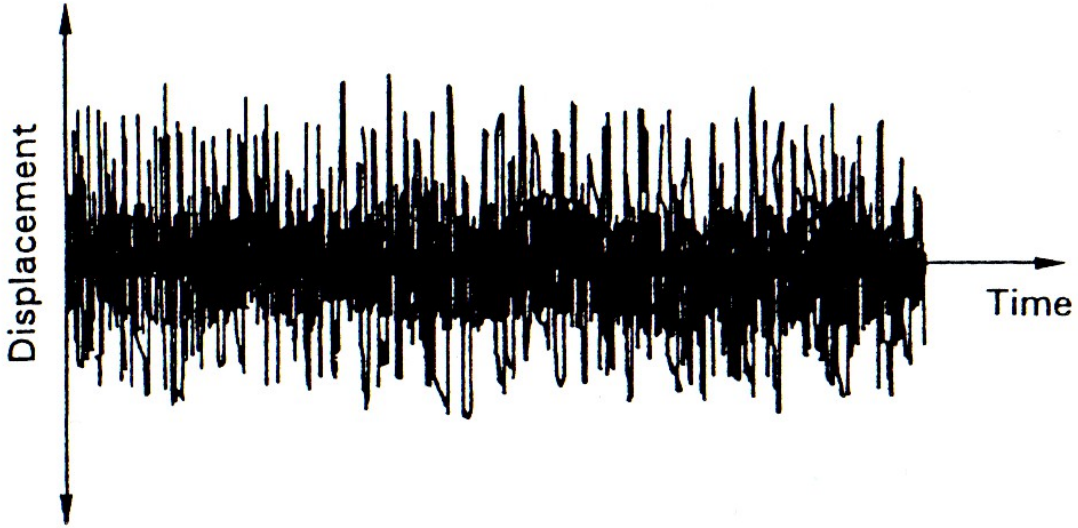

FIGURE 7.4.3 Noise waveshape

Govorna akustika

- Kompleksnost govornih glasov
- Akustični model govora (7.10.1)
- Model govorne cevi (2.2.1)

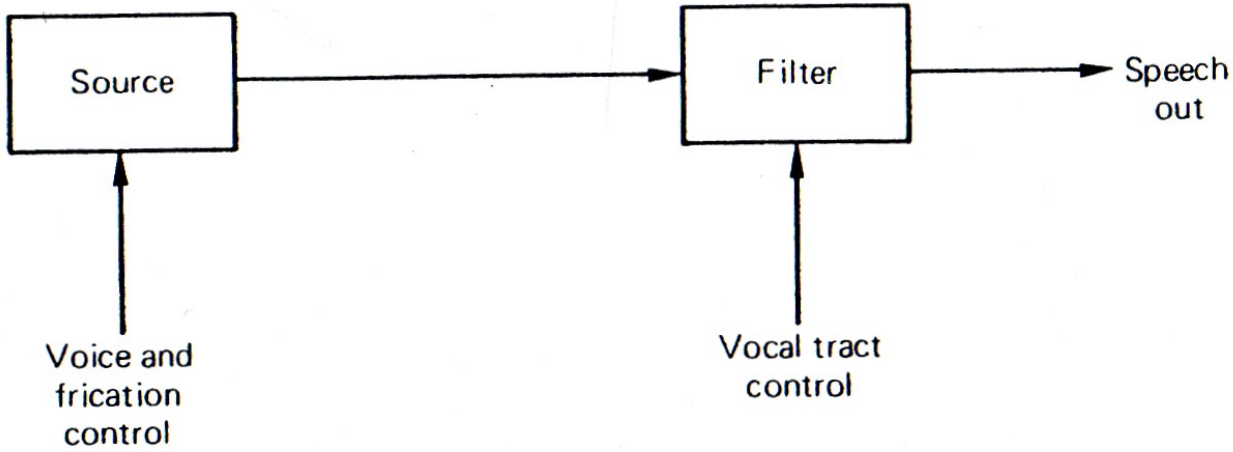

FIGURE 7.10.1 Source and filter model of speech production

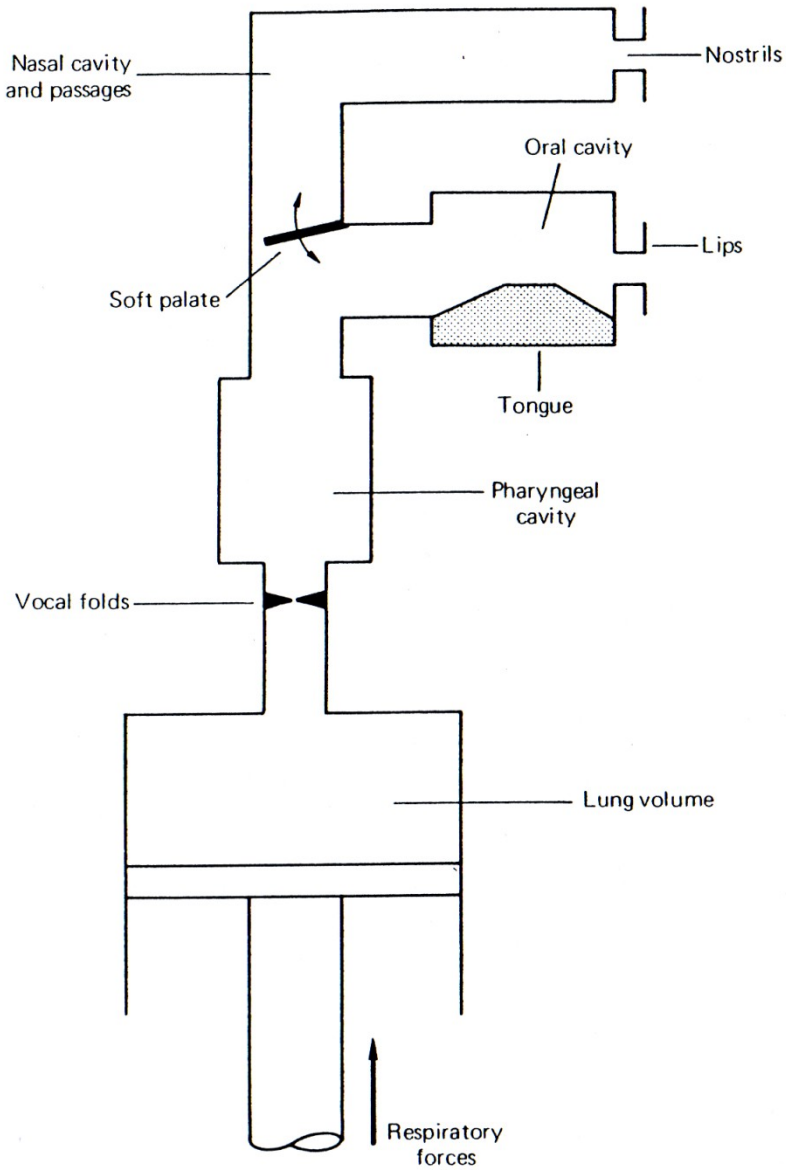

FIGURE 2.2.1 Functional model of the vocal tract

Viri zvoka pri govoru

1. Fonacija

- Periodično nihanje glasilk (6.6.1), periodični glasovi
- Osnovna frekvenca
- Glasnost
- Odvisnost frekvence od mase, dolžine, napetosti

2. Frikacija

- Aperiodični glasovi

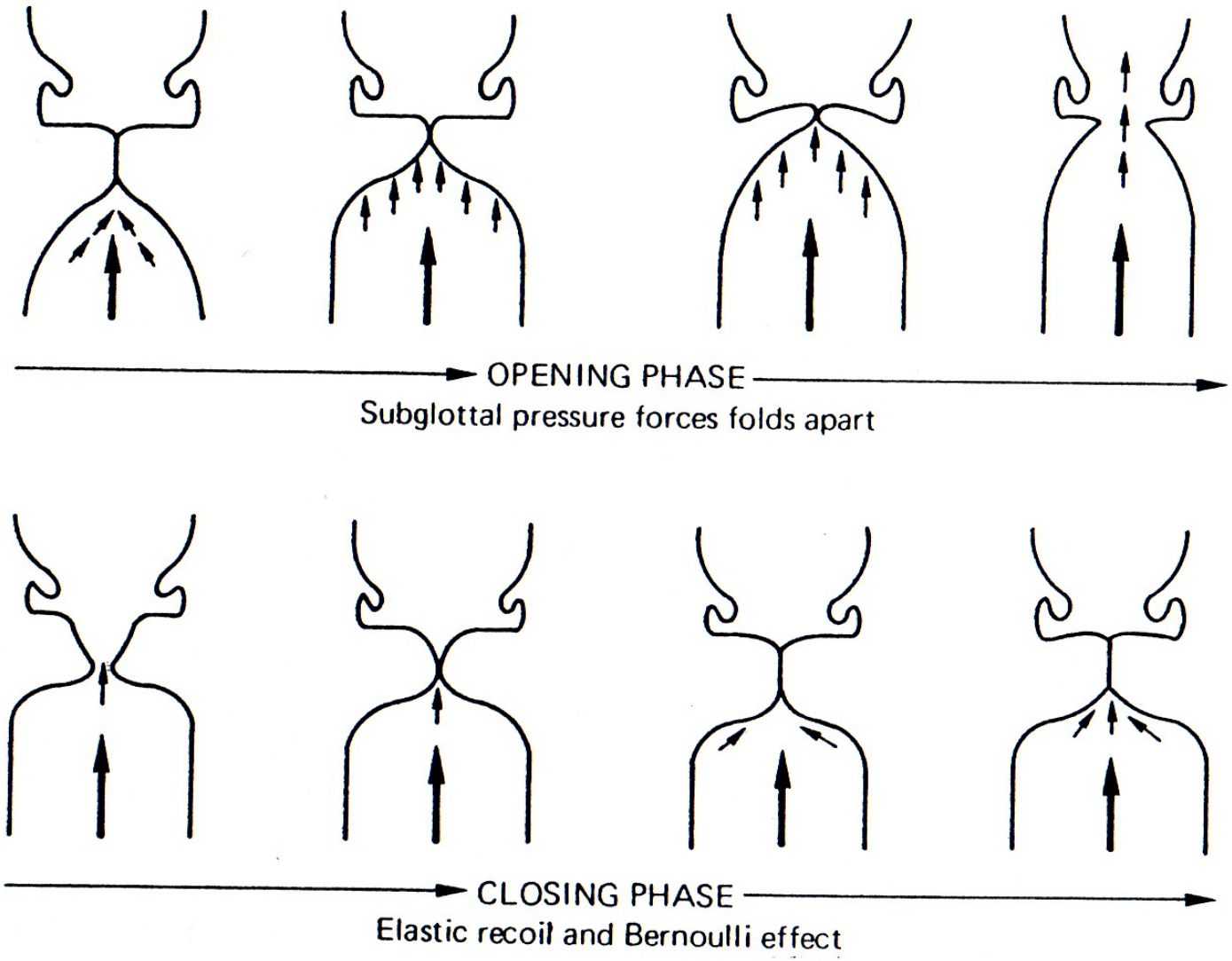

FIGURE 6.6.1 Vibratory cycle of the vocal folds
Adapted from: Schneiderman 1984, p. 76.

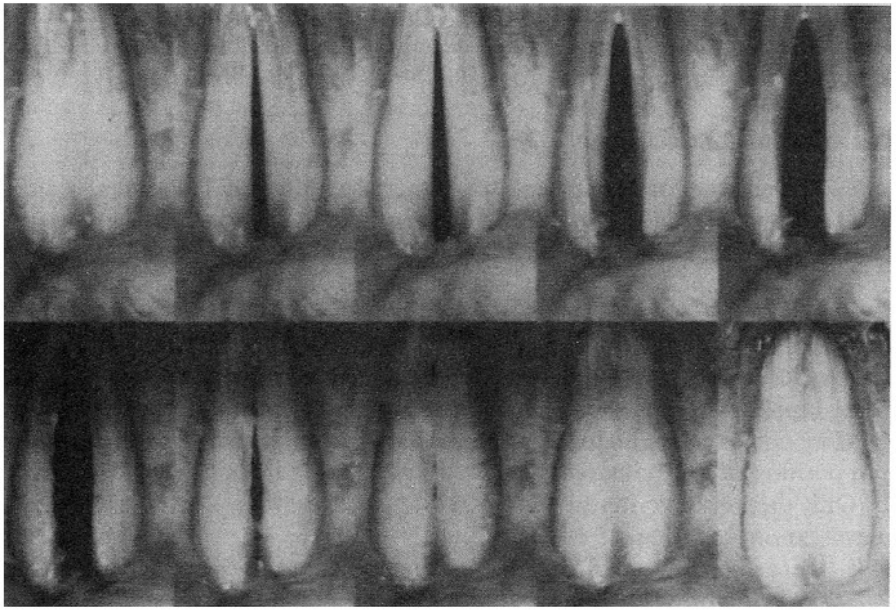

Fig. 10.11. A series of video frames of vocal-fold movement during a normal glottal cycle. Note that the opening is asymmetric, with the glottis more widely open at the bottom than at the top. During whispering, the glottis is even more open than during normal speaking (rightmost in top row), and it is even more open during forced inhalation. (From [504], photo by Debra K. Klein. The University of Iowa Hospitals and Clinics. Used with permission)

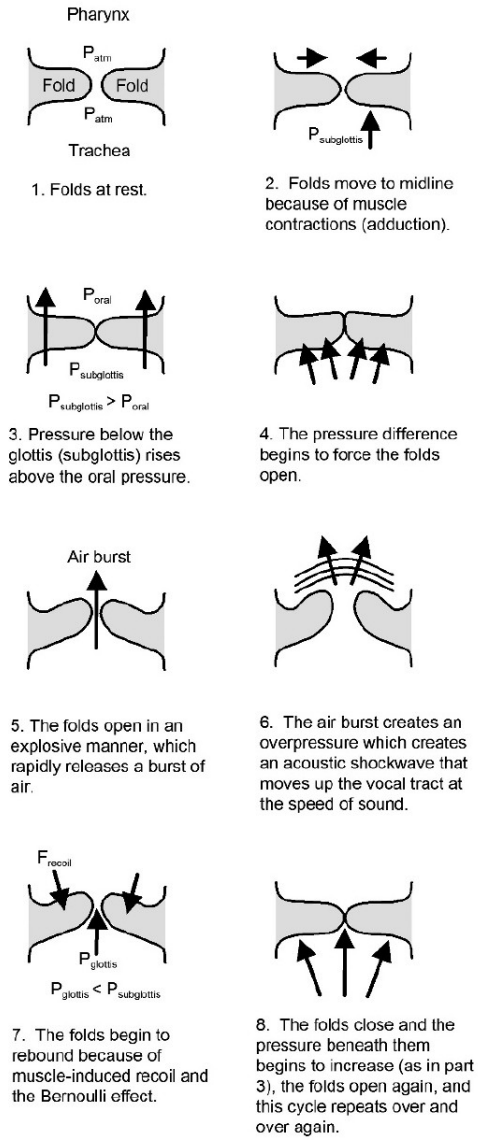

Fig. 10.12. The sequential stages of glottal vibration. (Based on [460])

Govorna cev pri samoglasnikih

- Filter, resonator
- Resonanca (prosto in vsiljeno nihanje)
- Primer za polglasnik (7.13.1), 500, 1500, 2500, 3500 Hz
- Vrhovi energije: formanti (7.13.5), (8.5)
- Razpoznavanje samoglasnika

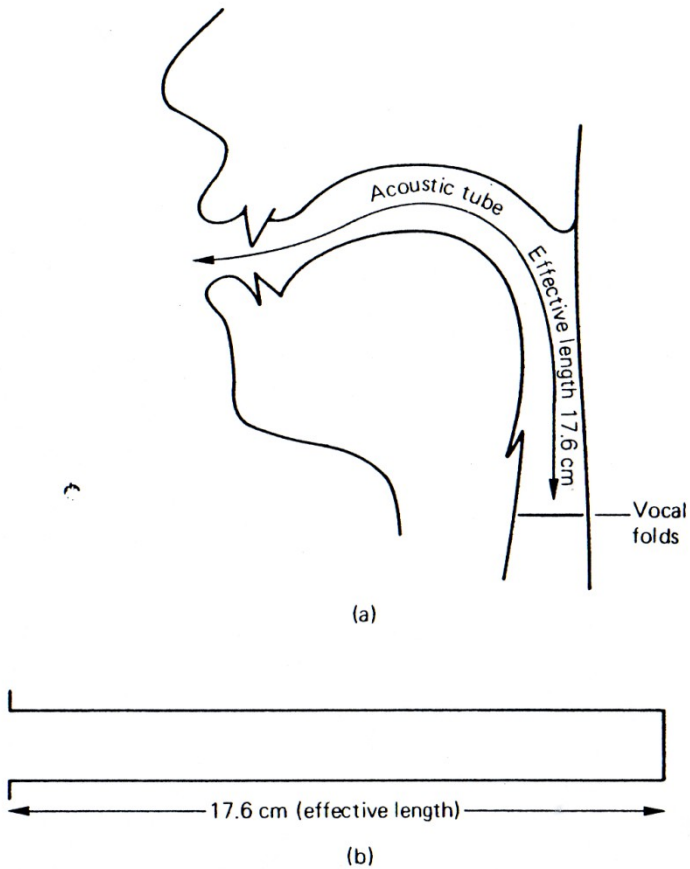

FIGURE 7.13.1 Resonator configuration for the central vowel [ɜ]: (a) actual vocal tract; (b) simple tube equivalent to (a)

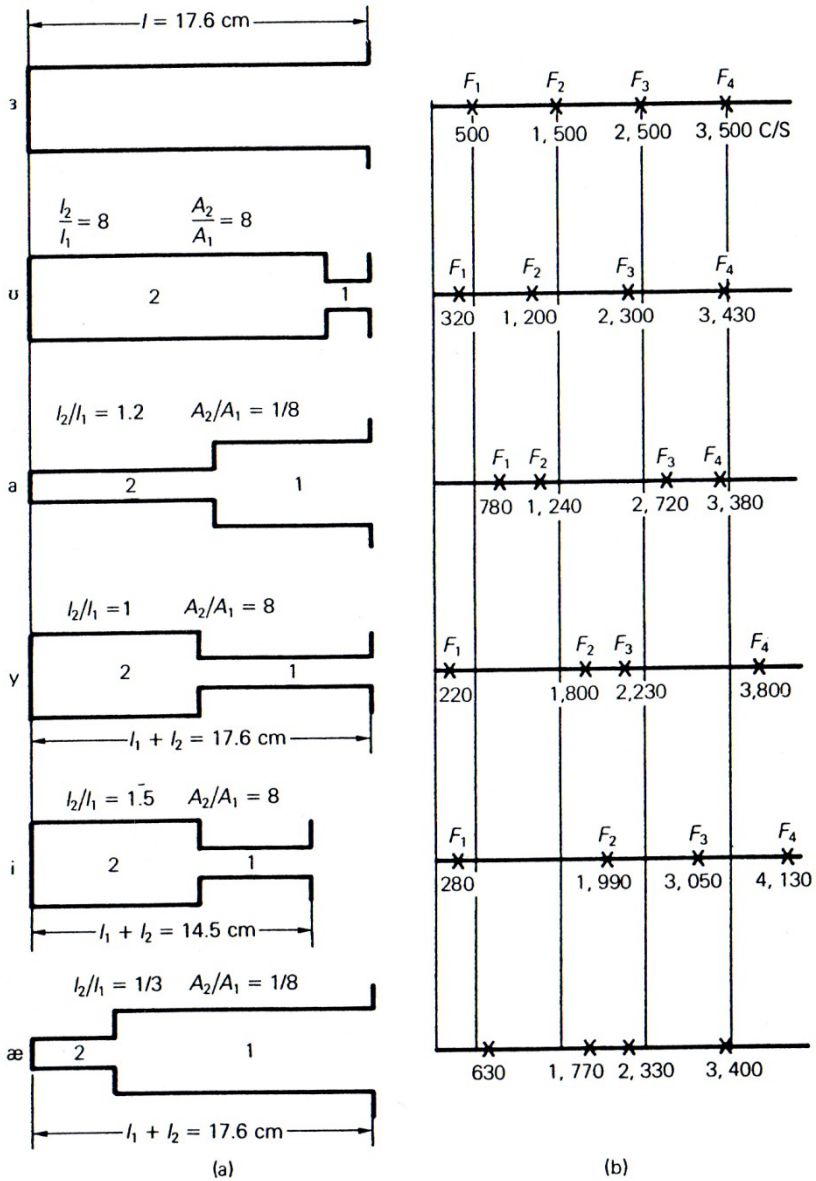

FIGURE 7.13.5 Two-tube resonators approximating the vocal tract for various vowels: (a) resonator dimensions; (b) formant pattern
Adapted from: Fant 1960, p. 66.

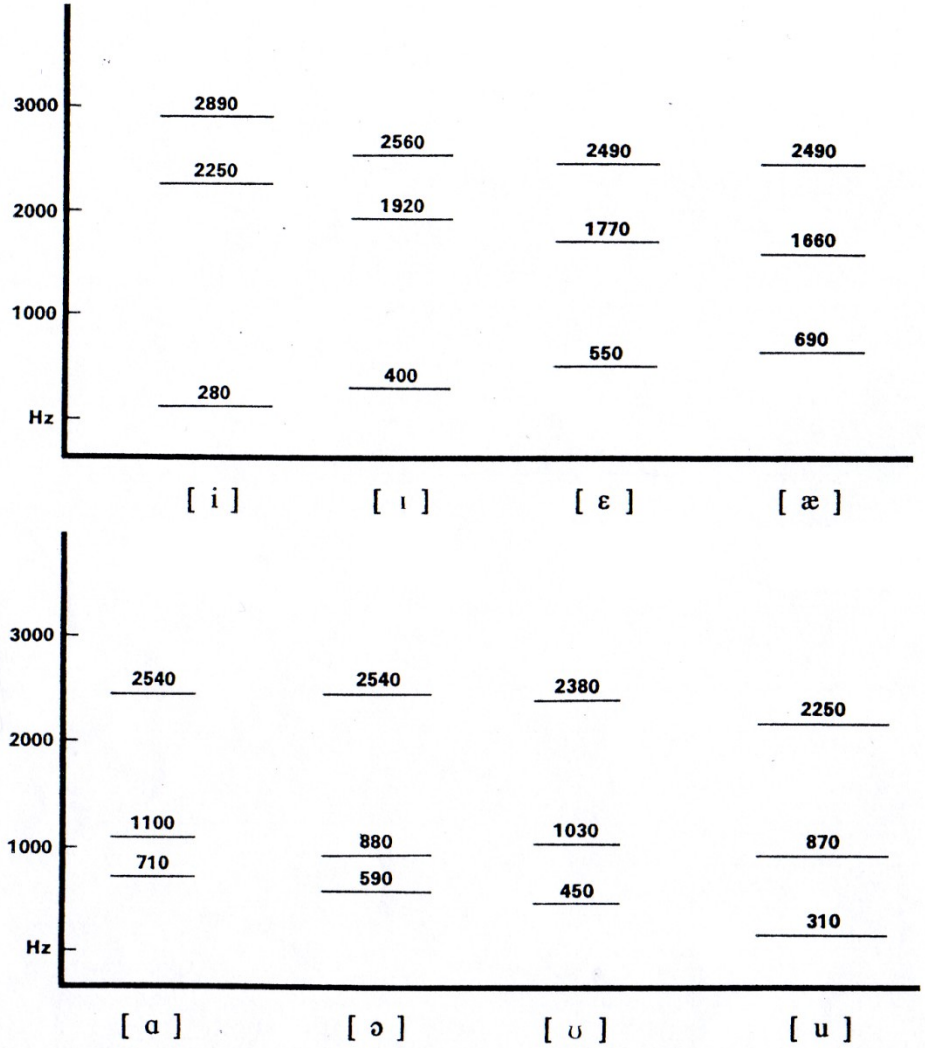

Figure 8.5 *The frequencies of the first three formants in eight American English vowels.*

Govorna cev pri soglasnikih

- Zožitve in zapore
- Šum-nezveneči, šum + zven-zveneči
- Šepet

Sonagram

- Spektrograf
- Sonagram: čas, frekvenca, amplituda, vidni formanti
- Samoglasniki (8.6)
- Medsebojni vpliv glasov

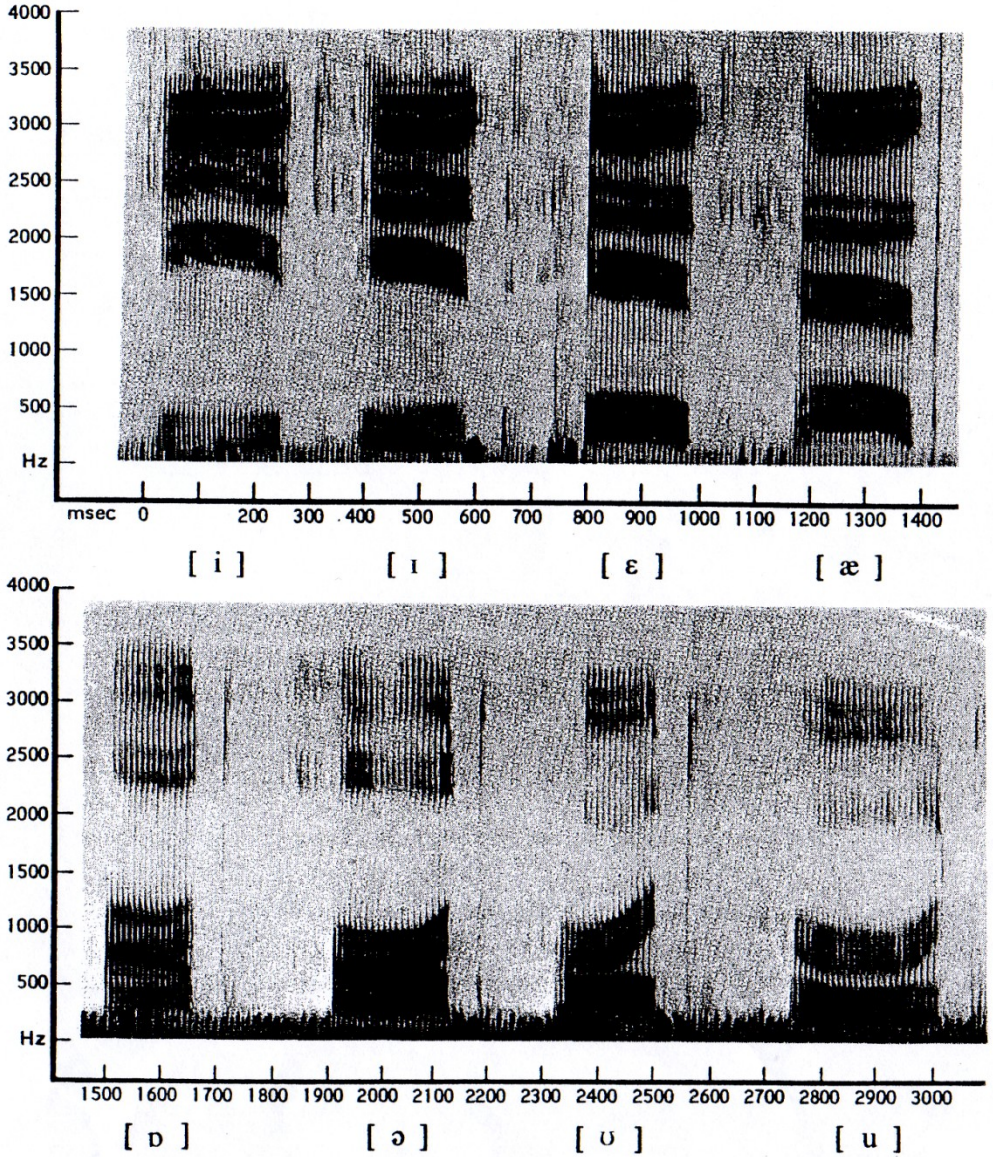

Figure 8.6 *A spectrogram of the words "heed, hid, head, had, hod, hawed, hood, who'd" as spoken in a British accent.*

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