Appendix 1. Chart A — annotations

Chart A, which is the **map of the lingual anchors of consonant phoneme production** appears in the section *The Production of Phonemes*, not included here, where the process is described in more detail. The same chart is presented on page 3 along with brief annotations on its most important features.

Chart A is a mapping of the relative positions, in a resting state of their respective envelopes, of the **base** (or **germinal)** lingual articulating anchors of phonemes. The positions indicated are **not** those of fully articulated and phonated phonemes, but only of the lingual articulatory anchors—without any other tract shaping components. With the exception of /m/, /n/, as well as /g/ and its derivatives, only voiceless consonants are indicated.

Phoneme anchors are here arranged in a natural taxonomy that relates to their physio-mechanical sources and characteristics and shows their relationships to each other and to the speech tract.

See fig. 1.

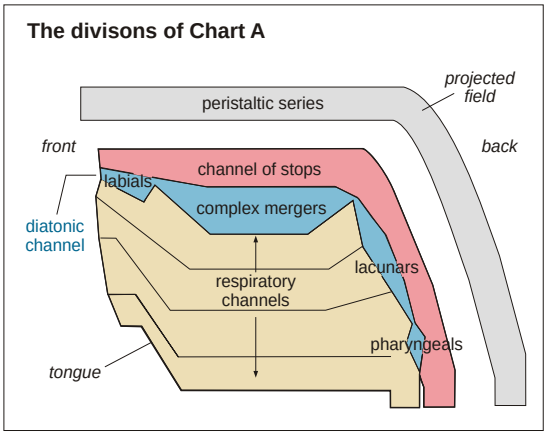


fig. 1

Chart A consists of **two** distinct parts: the band of the peristaltic series above and the lingual anchor field below. This field consists of the three sets of **channels** (or strings of consecutive envelopes) of the lingual germinal anchors:

1) the four respiratory phoneme (h, n, m, ayin) channels
2) the stop channel
3) the diatonic channel (continuous consonants)

- **a)** labials
- **b)** complex mergers (see note 4)
- **c)** lacunars (see note 5)
- **d)** pharyngeals

Definition of channels:

Each channel is an axial path through which germinal anchors of particular phonemes groups, namely respiratory, stop, and diatonic (i.e., complex, lacunar and pharyngeal) consonants move with minimal energy between their respective frontal, mid and back subanchor positions. **Diatonic** consonants are continuous sounds. *See fig. 2*

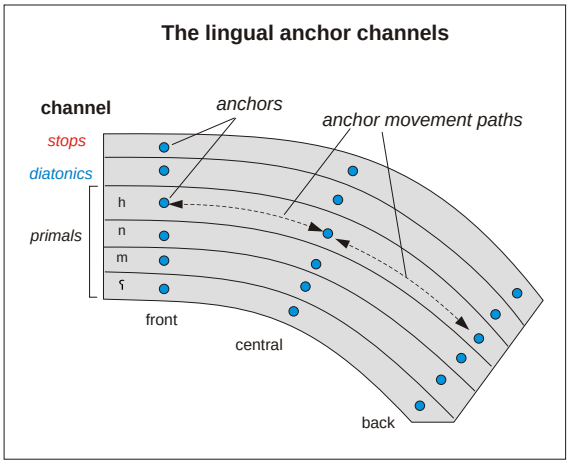


fig. 2

Note1. Respiratory phoneme anchors and tract envelopes

The anchors of the respiratory phonemes /h/, /n/,/ /m/, and /ʕ/ (ayin) possess relatively large envelopes due to the fact that they are parts of the flow of respiration, a basically open-tract function, in which speech, executing various tract modifications and constrictions, is only a momentary modulation.

Note 2: Respiratory phonemes

Respiratory (RSP) phonemes, while inherent in the tract, are themselves hierarchically ranked. ayin is the highest ranked and from it, with increasing levels of energy in the framework, the anchor/envelopes of m, n, h, and ayin are reached. h is the anchor of oral respiration. /Ayin/ appears most active at the lowest energy levels of respiration, such the preliminary state of sleep. *Note:* Underscoring indicates base/germinal phoneme anchors.) *See fig. 3.*

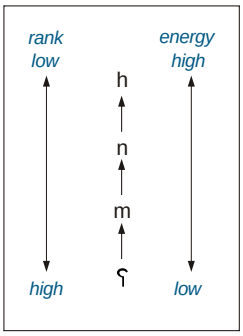


fig. 3

Note 3: the m anchor

The phoneme /m/ is traditionally identified as a labial, but fundamentally, in the anchor-matrix system, it is an innate lingual respiratory phoneme, and its labial closure aspect is only a part of the total antagonist subframe directed against that of the primary lingual anchor of /m/.

Note 4: Simple and complex mergers

Mergers of two respiratory (RSP) phonemes are **simple** mergers. When a RSP consonant merges with the product of a simple merger the result is a **complex** merger. *See fig. 4.*

merger element anchors	*merger product anchors*
RSP + RSP	simple mergers
RSP + stop	complex mergers

fig. 4

Note 5: Lacunars

The **lacunars** are located in the gap along the dorsum of the tract, at the entrance into the nasopharynx, encircled by the velo-pharyngeal sphincter. This gap, or lacuna, leading into the naso-pharynx, breaks the dorsal continuity of the tract, and making consonantal target constrictions relatively inefficient in this region, allows efficient production only of quasi-consonants, i.e., of **semivowels** and **liquids**. *See fig. 5*

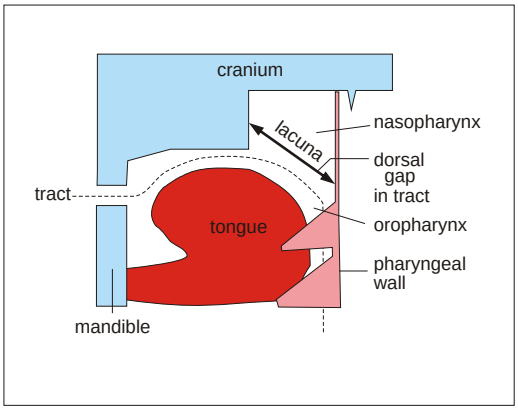


fig. 5

Note 6: Voiceless consonants

Only the **voiceless** consonants are indicated as voicing is regularly accomplished by the additional merger of voiceless phonemes with n (and m for labials).

Note 7: Metaperistaltic series

The **(meta)peristaltic** series on top of the diagram depicts consonants lined up as a sequence of open, partly open and closed tract gatings. The top row is that of full stops and apertures, while limited apertures, that is, the traditional nasals, semivowels and liquids form the lower row. See Appendix 3 for details.

This linear mapping of germinal lingual anchors, also shown in **Chart A**, allows us to extract a peristaltic sequence in which consonants line up in a **wave** pattern of full closures, semi-closures/apertures and (full) apertures. See *The essentials of speech mechanics/Appendix: Metaperistaltic series of phonemes* and *Ontogeny of phoneme production/Appendix 2/Linear derviation of...*

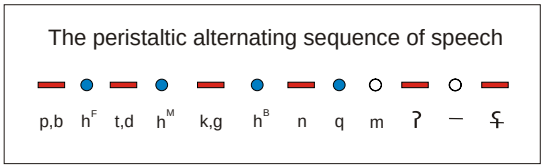
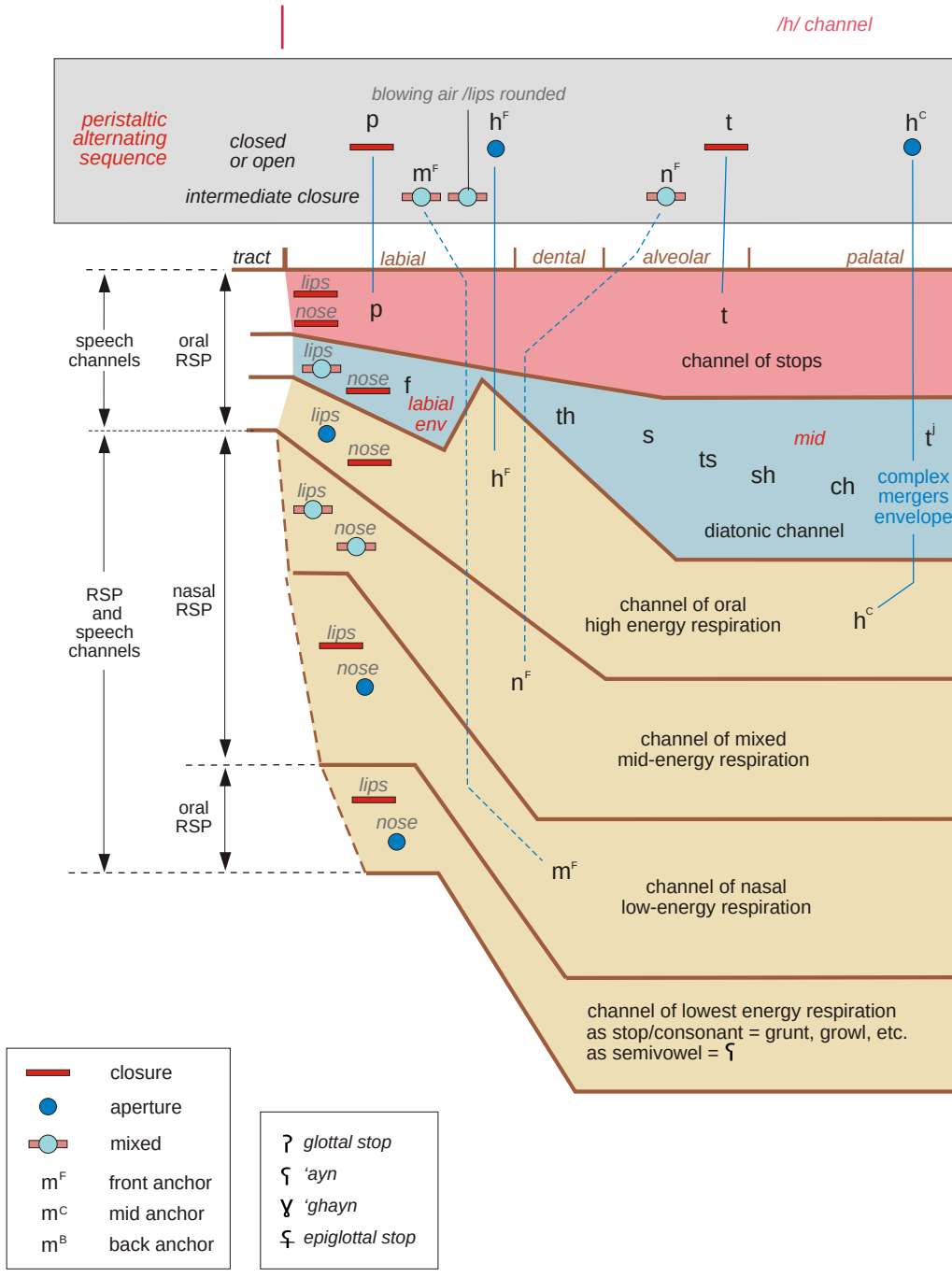


fig. 6

Chart A

The map of the lingual an



achors of consonant production

This 2-page spread is offered only for viewing as it omits the middle region when printed. The rotated chart on next page is printable.

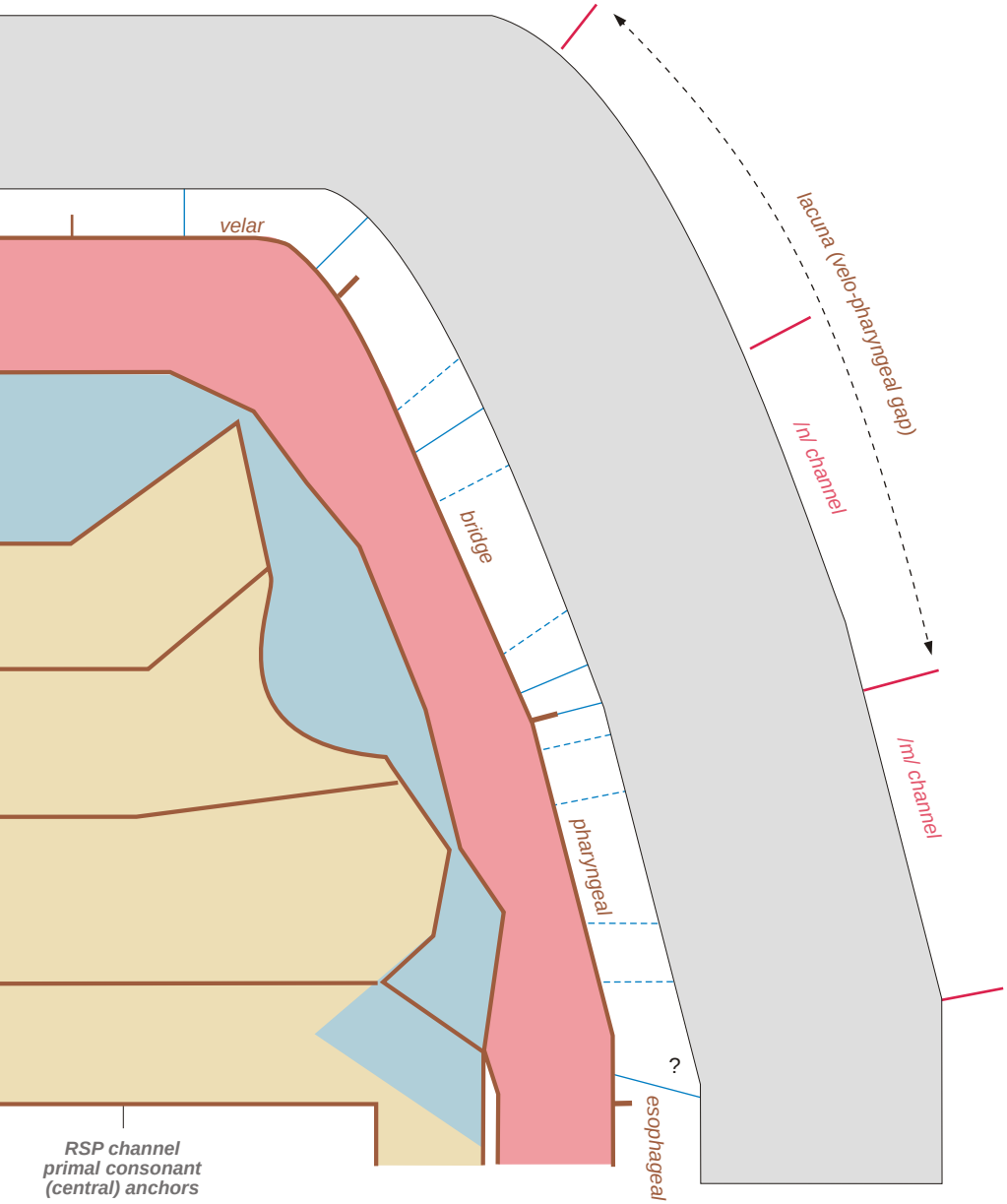
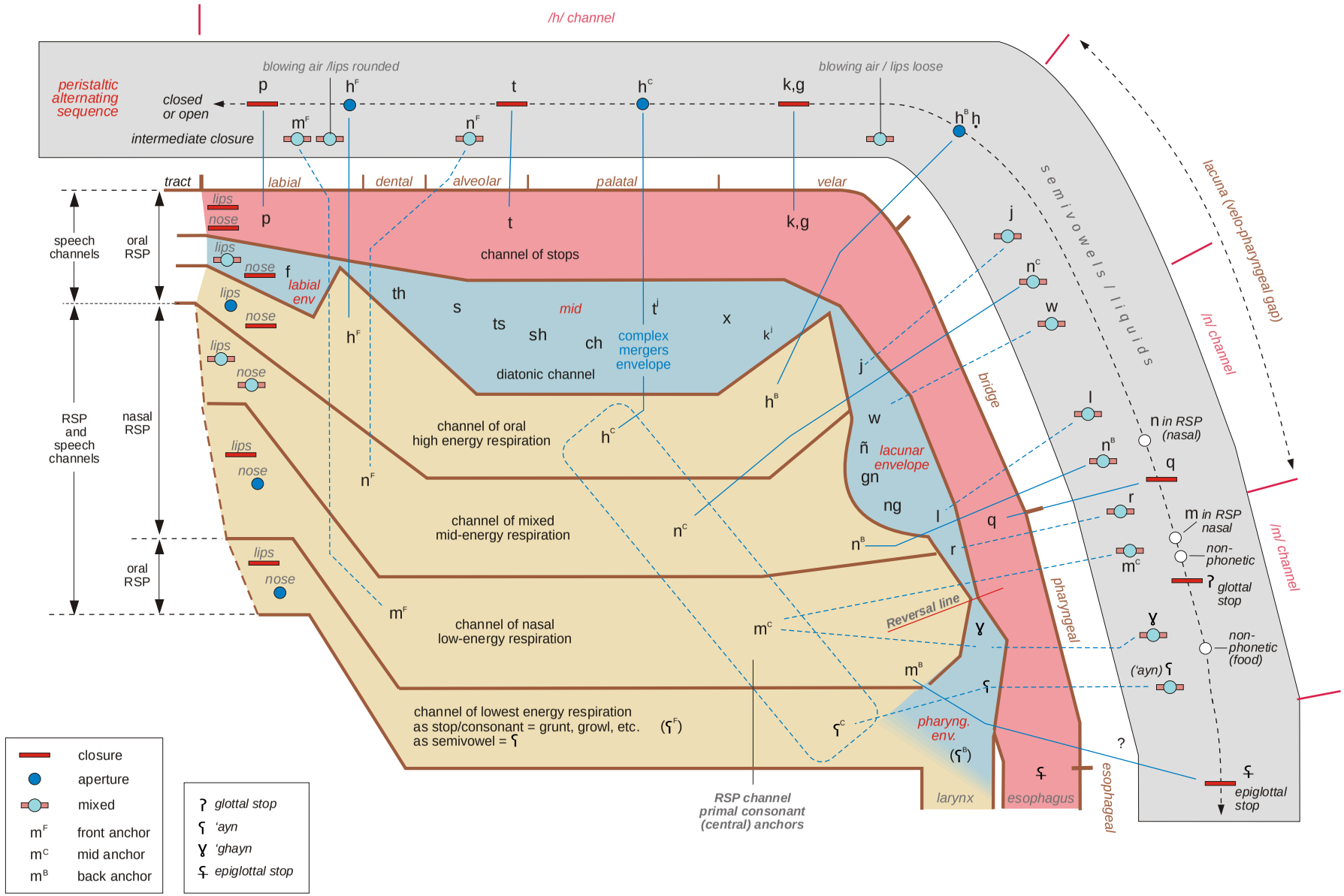


Chart A

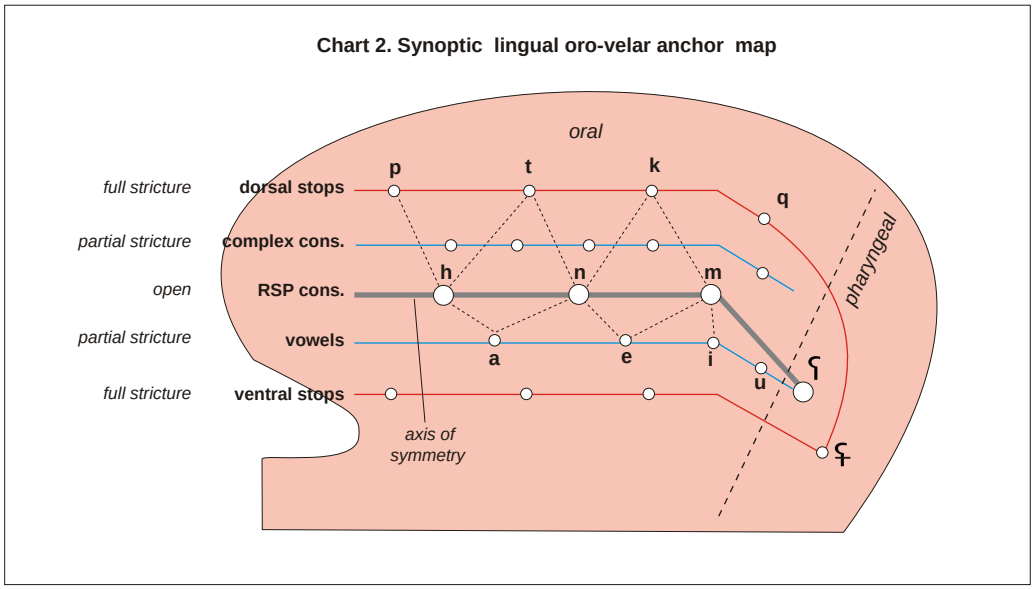
The map of the lingual anchors of consonant production



Synoptic map of the oro-velar lingual anchor channels

Chart A represents only the **consonant** channels of the oro-velar lingual anchor apparatus. **Chart B** is a more complete, or synoptic, diagram that includes the channels of the entire phonemic anchoral map of the tongue, including vowels. The semivowels, liquids visible on Chart A are not shown here as they are more complex.

CHART B



The channels

The channels are symmetrically distributed about the axis of the respiratory phoneme channel. **Stops** occupy the **highest** and **lowest** channels where the lingual dorsal and ventral surfaces produce tract closures by pressing, respectively, against the palate and oral floor, which consists of the hyo-mandibular geniohyoid and mylohyoid muscles.)

The **intermediate** channels situated **symmetrically** above and below the **respiratory** channel carry anchors that are mergers of the anchors of the respiratory and of the dorsal and ventral channels and they hold, respectively, the complex (diatonic, or continuous) consonants and the

The **respiratory** channel lies on the axial midline of the lingual anchor matrix.

Tract equalization in the channels

Lingual articulatory anchors are is constrictive in action their and require a balancing or compensating force to equalize the distortion of the tract caused by constriction, Cf. Glottoregulation. Thus, the action of any lingual anchor necessitates tract equalization. The differences in equalization are what distinguish the various channels.

a. Dorsal stops: the tongue anchor vertically constricts in primary action, and the tract expands in the secondary action of compensation. The primary linguo-platal constriction causes the response of velopharyngeal, nasal and laryngeal closures that are associated with stops. The heap formation by the tongue is not a function of the anchor, but of compensation by an adjacent segment. Thus, the lingual anchor of /t/ vertically compresses the tongue and the tract within its own segment, but causes the adjacent segment to elevate as the action proceeds to

complete the compensation. The tract expands before and after at the point of linguopalatal contact.

b. Complex (diatonic) consonants: These are the fricativex. sibiliants, etc. and are the mergers of stops and semivowels with respiratory consonants. Air flow is intermediate between maximal blockage and maximal flow.

b. Complex (diatonic) consonants: These are the fricatives, sibilants, semivowels, etc. and are products of the merging of the anchors of stops or semivowels with those of the respiratory consonants. Air flow volume is intermediate between maximal closure and maximal flow.

c. RSP consonants: These anchors reside in the **middle** channel and are fundamental controllers of tract diameter and are essential in all the functions of the upper visceral tract.

d. Vowels: These are symmetrical to the complex consonants but allow greater airflow as they are mergers of the respiratory anchors, which are not tract constrictors.

e. Ventral stops: These anchors are not used in speech and are created through the merger elements of vowels. Their phonetic role is in generating plosive sounds in grunts, laughter, cough, eructation, vomiting, etc., where the primary tract stricture and its control is not lingual but glottal and esophageal.

It may be noted that the front, central and back segments of the ventral floor that primarily anchor, respectively, the basic vowels, a/ɻ/i, however /u/, which may be considered a secondary vowel, is primarily anchored by the dorsal tract, including the velar muscles.

Lowering the mandible or tilting the head forward or backward and rounding the mouth are actions associated with drinking, and they generate the u anchor.

Cf. also: the tilting of the head by various mammals, especially canids, to emit an /u/-like sound.

CHART C

Chart C shows additional breakdown, according to degree of tract constriction, of the **intermediate** channels into subgroups of the complex anchors and the vowels: sibilant versus fricative consonants and open versus closed vowels.