

Velar/coronal asymmetry in phonemic patterns and historical change: a unified account

Joaquim Brandão de Carvalho¹ & Ali Tifrit²

(¹UMR 7023 – Université Paris 8, ²LLing – Université de Nantes)

The three major classes of consonants as regards the place of articulation – labials, coronals and dorsals – exhibit asymmetrical behaviour both in phonemic inventories (§ 1) and in historical changes (§ 2). It will be argued that both facts receive a straightforward and unified account (i) by replacing the features [velar/dorsal] and [coronal] with elements characterised by resonant cavity and aperture, and (ii) by assuming that these elements are hierarchically ordered, so that pharyngeal elements dominate oral and nasal elements (§ 3).

1 (Velar) dorsals, (anterior) coronals and labials show a decreasing capacity to interact with the three basic vowel elements: I (front), A (low-/RTRness) and U (rounded). For example, velar assimilation before front vowels is universal; coronal or labial palatalization is not (Hardcastle & Hewlett 1999). In a language without phonological rising diphthongs like Portuguese, the only cases of stable [wV] sequences are those associated with velars: *quando*, *guarda*, etc. (Câmara Jr. 1970: 56). Generally speaking, while velars are easily coarticulated with I, A and U, coronals readily interact with I and A only, and labials with U.

Not surprisingly, this affects the shape of phonemic inventories. Let us assume that dorso-palatals, labio-velars and uvulars are composed as in (1).

- (1) a. /k/ + I = /c/
b. /k/ + U = /k^w/
c. /k/ + A = /q/

We will make the hypotheses in (2) on the typology of such consonants.

- (2) In a given system,
a. if there is only one type of labialized consonant, it is a labio-velar;
b. if there is only one type of 'emphatic' consonant, it is a uvular.

In other words, the existence of /k^w/ or /q/ in a given language does not imply that of U- or A-based *correlations* respectively for all places of articulation, that is /p^w, t^w.../ or /p^ç, t^ç.../, whereas the reverse is supposed to be true. While waiting for the confrontation of these predictions with the highest possible number of languages, it will be shown that they are supported by the 'borderline' case of Kabardian.

2 As noted by Trigo (1988: 53), nasal codas are typically homorganic to a following consonant if there is one, but, if there is none, then coronal and velar nasals alternate according to the language or dialect, as if both coronals and velars were 'default' places. Moreover, as shown by the Spanish data under (3) (Lapesa 1967: 319, 416), it is the coronal (cf. Latin *pane*) that may shift to a velar.

- (3) a. ca[mp]o 'field' b. pa[n], pa[ŋ] 'bread'
ca[nt]o 'I sing'
ba[ŋk]o 'bank'

This shift parallels several similar changes concerning not only codas but also onsets – e.g., [r] > [R] (> [ʀ]) in French, German, some Dutch and Portuguese, as well as [l] > [ɭ] (> /w/) in Polish and Old Portuguese –, and not only sonorants but also any consonant – e.g. /t/ > /k/ in Hawaiian, Leuangiua (Polynesian), Chipewyan and Apache (Athapaskan), among others (Rice 1996: 527-528). We have no knowledge of spontaneous velar to coronal changes.

3 If coronals are presumed to be placeless (cf. Paradis & Prunet 1991, 1994: 101, Kean 1975, Mohanan 1993, Hume 1996 and Wilson 2001), then there is all the more reason to think that this is particularly true for velars, especially as: (i) they are the most vowel-friendly consonants within phonemic systems, as if they had more empty place where the vocalic elements can fit in ; (ii) velar to coronal changes seem unattested, as if coronal to velar shifts resulted from feature loss. Assuming, however, that there are good reasons to think that both coronals and velars are underspecified, how can they contrast if both are placeless?

We propose that there is a velar/pharyngeal relation within consonants which patterns with the one between the high/ATR vowel [ɯ] and the low/RTR vowel [ɑ] in element theory. From this perspective, 'velarity' is nothing but an element **K** containing the features {spread pharynx} and opposed to an element **ʕ** representing {constricted pharynx}. It will be seen: (i) how this is supported by widespread phenomena, from German to Bantu and Austronesian languages; (ii) how this allows to characterise the whole set of attested contrasts among 'back' consonants, from dorso-palatals to pharyngeals/epiglottals, in the world languages.

Thereby, also, coronality becomes the sole basic lingual gesture within the oral cavity. Hence, no articulator-based feature is required for coronals either, as they result from the default articulation of the tongue in the superior cavities (SC): 'coronality' (**T**) is simply {constricted SC}, opposed to {spread SC} = 'nasality' (**N**). Only labials require a specified articulator.

Let us assume a hierarchical structure where **T** and **N** are dominated by the pharyngeal elements **K** and **ʕ**: both velars and coronals contain **K**; in addition, coronals have **T**; coronals and velars are, thus, in a privative opposition. Hence, (a) lacking supra-pharyngeal elements, velars are the most 'colourable' segments, as they have place to host the oral elements **I** or **U**; (b) **T** may be deleted while **K** is preserved, while the reverse is false: therefore, coronals may shift to velars, while the reverse is unattested. Finally, a paradox is explained: coronals and velars are both 'placeless' and contrastive.

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- Avery, P. & Rice, K. (1989). Segment structure and coronal underspecification. *Phonology*, 6, 179-200.
- Câmara Jr., J. Mattoso (1970). *Estrutura da língua portuguesa*. Petrópolis: Vozes.
- Clements G. N. (2001). Representational economy in constraint-based phonology. In Hall T. A. (ed.), *Distinctive feature theory*. Berlin: Mouton de Gruyter, 71-146.
- Hardcastle, W. J. & Hewlett, N. (eds.) (1999). *Coarticulation: theory, data and techniques*. Cambridge: Cambridge University Press.
- Harris, J. (1990). Segmental complexity and phonological government. *Phonology*, 7, 255-300.
- Hume, E. (1996). Coronal consonant, front vowel parallels in Maltese. *Natural language and linguistic theory*, 14, 163-203.
- Kaye, J., Lowenstamm, J. & Vergnaud, J.-R. (1985). The internal structure of phonological elements: a theory of charm and government. *Phonology yearbook*, 2, 305-328.
- (1990). Constituent structure and government in phonology. *Phonology*, 7, 193-231.
- Kean, M.-L. (1975). *The theory of markedness in generative grammar*. Doctoral diss., MIT.
- Lapesa, R. (1967). *Dialectología española*. Madrid: Gredos.
- Mohanan, K. P. (1993). Fields of attraction in phonology. In Goldsmith J. (ed.), *The last phonological rule*. Chicago: University of Chicago Press, 61-116.
- Paradis, C. & Prunet, J.-F. (eds.) (1991). *The special status of coronals: internal and external evidence*. San Diego: Academic Press.
- (1994). A reanalysis of velar transparency cases. *Linguistic review*, 11, 101-140.
- Rice, K. (1996). Default variability: the coronal-velar relationship. *Natural language and linguistic theory*, 14, 493-543.
- Trigo, L. (1988). *On the phonological behavior and derivation of nasal glides*. Doctoral diss., MIT.
- Wilson, C. (2001). Consonant cluster neutralization and targeted constraints. *Phonology*, 18, 147-197.