Some problems in representing and organizing phonological primes

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A theory of phonological primes should:

1) account for all and only the inventory of contrastive sounds in the world's languages

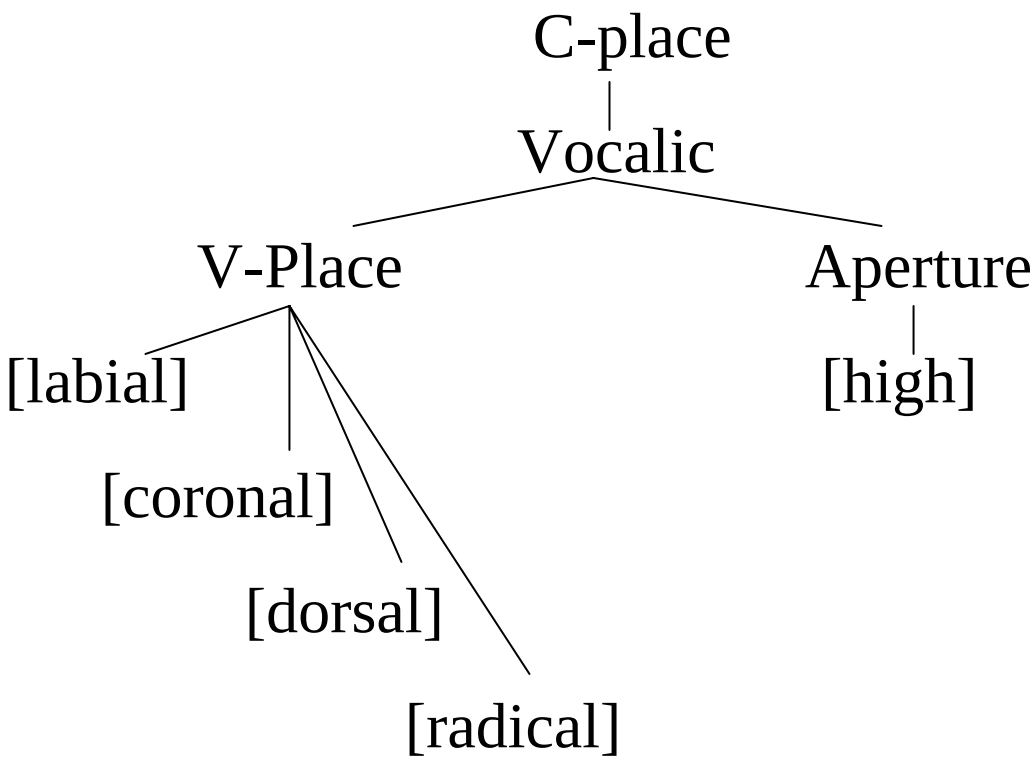
2) account in a natural manner for all and only the phonological processes found in the world's languages

3) be well-motivated articulatorily and/or acoustically

Vowel-place theory (Clements 1993)

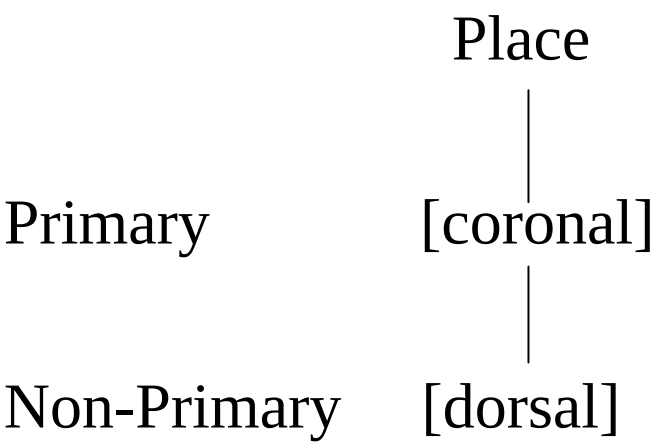
- Place is defined by a unified set of articulators for both vowels and consonants:
- -labial : lip constriction in C; rounding in V
- -coronal : constriction of front part of tongue in C; front V
- -dorsal : constriction at back of tongue in C; back V
- -radical : constriction in lower pharynx in C; low V

- Height features segregated under a separate Aperture node


C-place
Vocalic
V-Place
Aperture
[labial]
[high]
[coronal]
[dorsal]
[radical]

[Labial]-only theory (Selkirk, 1993; Watson, 2002)

- Four place features : [labial], [coronal], [dorsal], [guttural]
- No dual primary place : if multiple articulations, one is always primary, the other dependent
- e.g. /ʃ/ is:



Radical Articulator Theory (Halle, Vaux & Wolfe, 2000)

- 6 articulators: Lips, Tongue Blade, Tongue Body, Soft Palate, Tongue Root, Larynx; dominate terminal features that also include a designated articulator feature for each articulator:
- e.g. Tongue Body dominates [±high], [±low], [±back] *and* a unary articulator feature [dorsal]
- Each terminal feature, including articulator features, can spread independently; however rules cannot refer to features dominated by different articulators (*spread [+high] and [+nasal])

Government Phonology (Scheer, 1999, 2001)

- The monovalent primes are called "elements", originally conceived to be independently interpretable; the resonance elements are identical for C and V
- In "classical" GP, four resonance elements: A (openness in V / RTR in C) , I (palatality), U (velarity) and @ (the "cold" vowel, "relaxed tongue position")
- In Scheer's view, a fifth element is needed B (labiality in V / roundness in C)

Government Phonology

- Segments can be made up of one or more elements, of which one is the head, the other(s) operator(s)
- Each element is on a tier of its own, apart from I and U that share the same tier; e.g. (heads underlined):

I	I	I		U	U	
	A	A	A		A	A
		B		B	B	
			@			
/i/	/e/	/ø/	/ə/	/u/	/o/	/a/

Classical Arabic verbal ablaut (e.g. McCarthy, 1991)

- Perfective and imperfective verb stems alternate in vowel quality, e.g.:

  katab / yaktub "write" ḍarab / yaḍrib "beat"

  ʃarib / yaʃrab "drink" faʕal / yafʕal "do"

  balud / yablud "be stupid"

- Note that all logical combinations are not attested : *u-a, *i-i, *i-u, *u-i
- Perf. -i- can only give imperf. -a-, perf. -u- only imperf. -u; however perf. -a- appears unpredictable

Ablaut behaviour of perfect -a-

- It has long be noticed that the -a- -a- ablaut grade is entirely phonologically conditioned: i.e. if C2 or C3 belong to the set /ʔ, ħ, ʕ, ħ, ʁ, χ/

  According to McCarthy 411/ 436 verbs in this ablaut grade have a guttural in C2 or C3 (95%)

  In my own sample (from Haywood & Nahmad, 1965), 73/73 (100%)
- However, McCarthy adds "Membership in classes -a- -u- and -a- -i- is entirely unpredictable". (199, p 207)

A morphophonological theory of ablaut path (Guerssel & Lowenstamm, 1996)

- It is a well-known fact that grades -a- -u- / -a- -i- include mostly transitive verbs, whereas -i- -a- refers mostly to middle voice or transient states and -u- -u- to purely stative verbs; the fit is far from perfect, however;
- Let us assume an ablaut path of the form -i- > -a- > -u-;

  we obtain the three following grades:

  grade 1 : -i- -a-

  grade 2 : -a- -u-

  grade 3 : -u- -u-

A morphophonological theory of ablaut path 2

- In the case of -a- -i-, we see that the imperfective vowel /i/ represents the entry point of the ablaut path; we would thus expect a grade of the form -ø- -i- (call it the null grade)
- Arabic is a templatic language and an empty nucleus is impossible in the perfective template $C_1V_1C_2V_2C_3$; the putatively empty nucleus (V_2) will be filled by the only available vowel, i.e. -a- (from V_1)

A morphophonological theory of ablaut path 3

- The complete table is thus
- Null-grade: -a- -i- (variant -a- -a- if C_2 or C_3 guttural)
- Grade 1: -i- -a-
- Grade 2: -a- -u-
- Grade 3: -u- -u-

- *This is important, because phonological debates about feature spreading in modern Arabic dialects do not take into account these morphological patterns (inherited)*

Ablaut in eastern Arabic dialects 1

- The original system has been maintained in all eastern Arabic dialects, albeit with more phonological and semantic restructuring:
- In Cairene (Holes, 1995) grade 3 has more or less been absorbed by grade 1 and so have a number of the null-grade verbs on mostly semantic grounds (evidence is not good for grade 2); as may be expected a number of grade 2 verbs have gone over to the null grade on account of opacity (-a- in the perf. in both cases)

Ablaut in eastern Arabic dialects 2

- In Bahraini (Sunni variety; Holes, 1995), the system has almost entirely broken down, there are no distinct grades in the perf. (-a- being the default vowel), and the distinctions in the imperf. are based on phonological criteria (-a- gutturals, -i- non-gutturals) and some semantic remnants (stative and middle verbs tend to have -a- even without gutturals):

  yiṭlaʕ "go up" (guttural), yaʁsil "wash" (plain), yigdar "be able" (stative)

More phonological conditioning

- We thus see that in all modern eastern varieties of Arabic, the guttural consonants influence the ablaut patterns. In two other varieties, Yemeni (Qafisheh, 1999) and Baghdadi (Woodhead & Beene, 1967), ablaut patterns are also distorted by other consonant types
- In Yemeni, null-grade verbs with C2 or C3 belonging to the set / ṭ, ṣ, ẓ/ or with C1 belonging to this set and C2 or C3 being [labial], have -u- instead of -i- in the imperf. Null-grade verbs with guttural C2 or C3 are not affected.

Yemeni rounding

gaṣad / yugs5ud "intend" < qaṣada / yaqṣidu

ðalam / yuðlum "oppress" < ðalama / yaðlimu

- But

kasar / yiksir "break" < kasara / yaksiru

ʕazam / yiʕzim "invite" < ʕazama / yaʕzimu

- And

ṭabaʕ / yiṭbaʕ "print" < ṭabaʕa / yaṭbaʕu

Baghdadi rounding

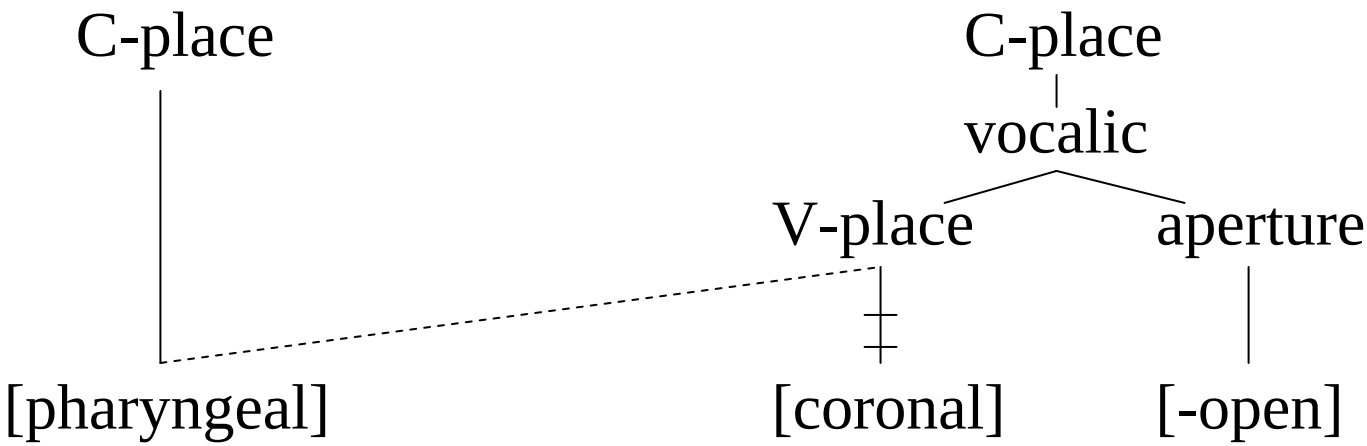
- Partly same conditioning as in Yemeni : rounding is caused by emphatics in C2 or C3 (13 examples, 2 counter examples), emphatics in C1 with labials in C2 or C3 (5 examples, no counter-example), and apparently gutturals in C1 with labials in C2 or C3 (5 examples, but 3 counter-examples)
- (McCarthy (1991, p. 220) on a similar rounding process in Palestinian Arabic: "But there are many additional complications.") Indeed ! And they are morphological...

Pharyngealization vs. Dorsalization (and Rounding !)

- We need to explain the working of both processes
- Let's see how the various theories address them.

Pharyngealization in VPT

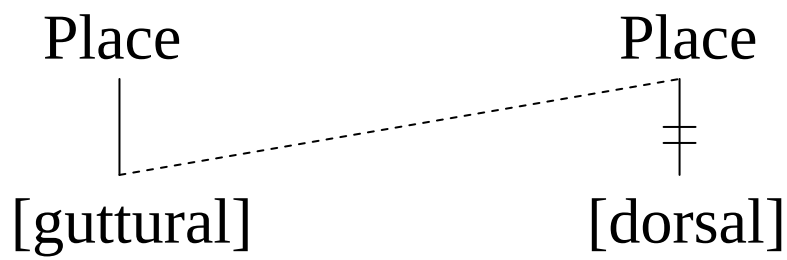
- We must go from [-open] [coronal] to [+open][pharyngeal]



A Redundancy rule is needed to turn [-open] into [+open]

Pharyngealization
Watson

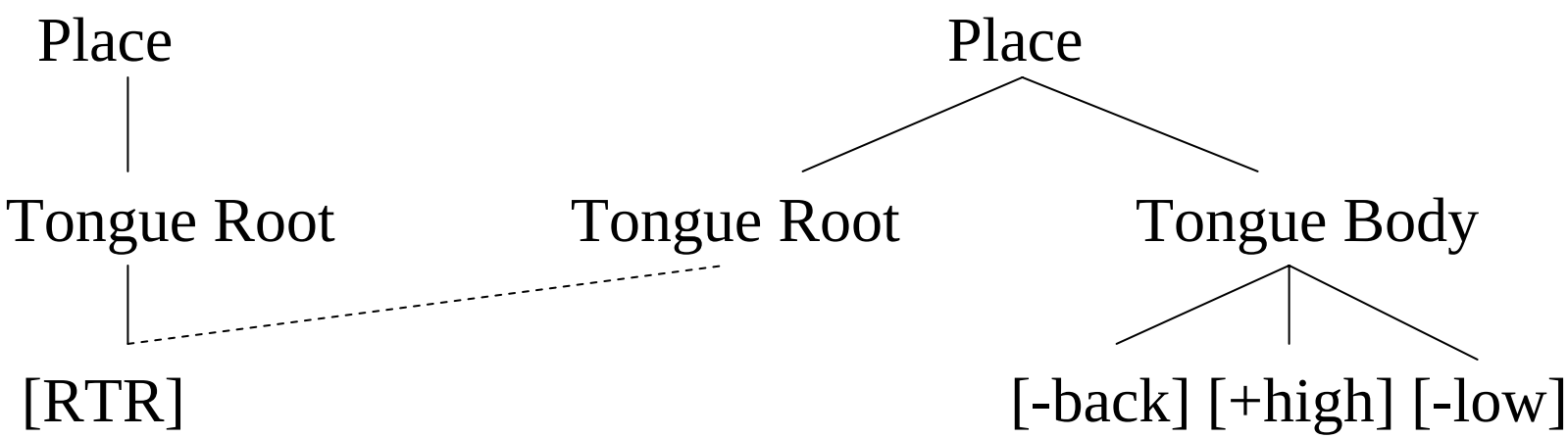
- We must go from [son] [cont] [dorsal] to [son] [cont] [guttural]



Very easy !

Pharyngealization
Halle et al. (RAT)

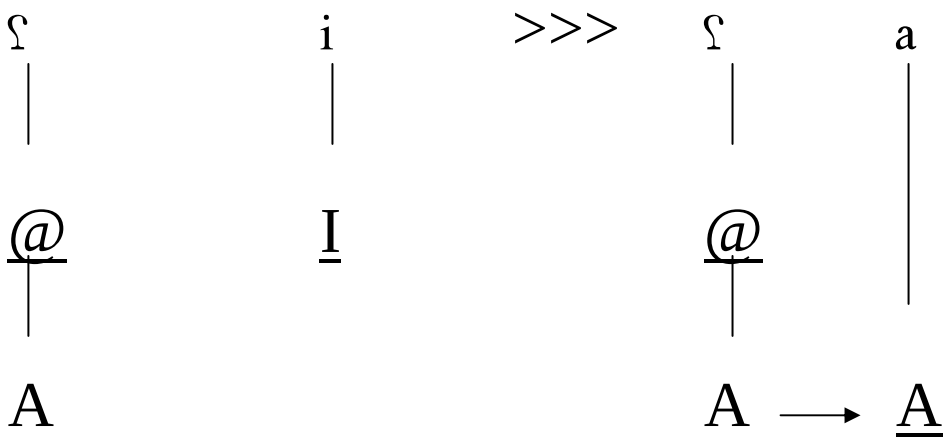
- We must go from [+high] [-back] [-low] to [-high] [+low]



I assume a "marking statement" *[RTR] [-low]

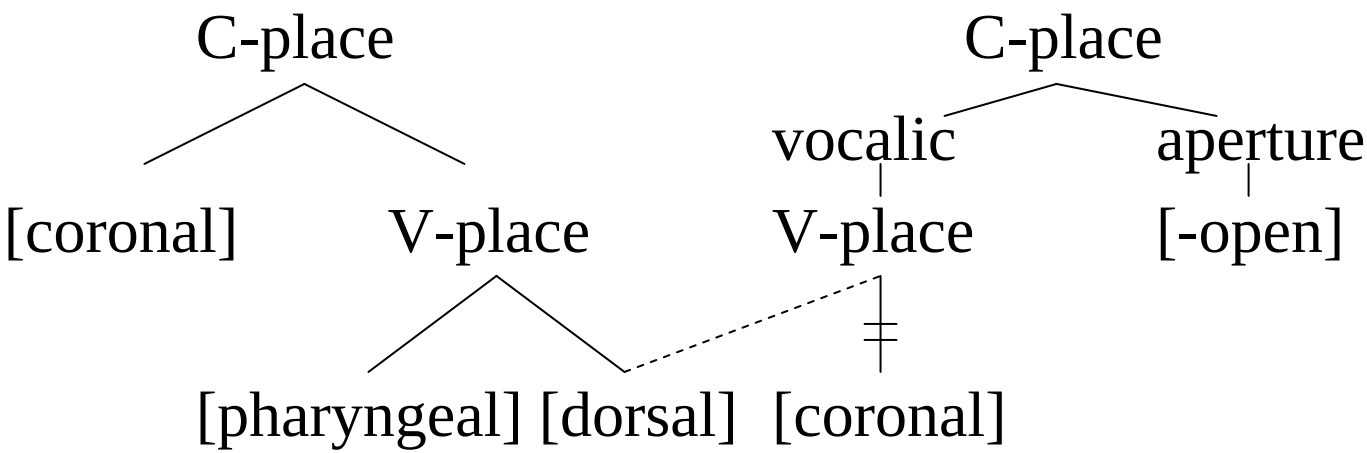
Pharyngealization in GP (they can't very well deal with it…)

- Guerssel & Lowenstamm, 1996, p. 5: "While we do not wish to engage in a full discussion of these data…there is a possible phonetic rationale for the phenomenon in terms of a lowering imposed by a guttural…"



Dorsalization in VPT

- We want to go from [-open] [coronal] to [-open] [dorsal][labial]



Redundancy rule: [dorsal] [-open] is also [labial]

Dorsalization a la Watson (it can't work)...

- We need to go from [son] [cont] [dorsal] (i) to [son] [cont] [labial] (u); but the emphatic trigger is [guttural] ! There is no way [labial] can appear

…and a la Halle (RAT)

- We need to go from [-back] [+high] [-low] to [+back] [+high] [-low]. Easy !
- But we still need a redundancy rule to supply [+round]...

…and GP ?

- In "classical" GP a la KLV (where U is both [back] and [round], it works fine

But Scheer who has two elements for back and roundness still needs the equivalent of a redundancy rule [in principle forbidden by the theory, no element can "fall from heaven"]

Conclusion

- On est pas sortis de l'auberge

OR

- There's another fine mess theory got us into