

3. +e Roots are always open.

-e Roots are always closed by a third consonant.

C ₂ is stem-final			C ₂ is part of the stem-initial cluster	
[C ₁ C ₂ -]	=/C ₁ __C ₂ /		=/C ₁ C ₂ __/	
BR-	ode-B__R-at	vs.	bez-BRaD-ý	
DR-	roze-D__R-at	vs.	roz-DRoB-it	
HR-	přede-H__R-a	vs.	od-HRaB-at	
HN-	ode-H__N-at	vs.	roz-HNěV-at	
PR-	ode-P__R-at	vs.	vz-PRuH-a	
SN-	beze-S__N-ý	vs.	pod-SNěž-ník	
ŠL-	vze-Š__L-ý	vs.	roz-ŠLaP-at	
ZD-	pode-Z__D-ít	vs.	od-ZDoL-a	
DN-	beze-D__N-ý		-	

4. /CCvC/ ==> +e

/CøC/ ==> -e

the grammar may detect this difference only if it is encoded in the lexicon.

- (4) Internal Structure of segments: vowels, KLV 1985
 - a. monovalency
 - b. head-operator relation
 - c. matrix calculus
 - d. interpretational autonomy, Harris 1994, Harris & Lindsey 1995
 - e. phonology <--> phonetics
 - f. representation of ATR

II. The 1990 Model

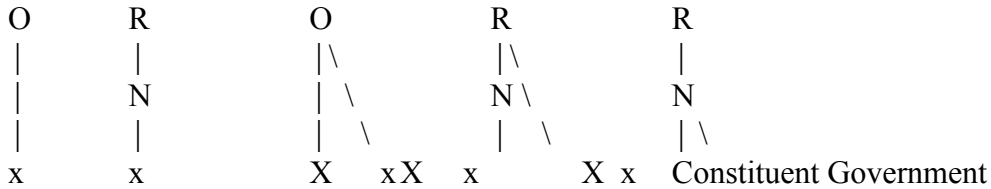
- (5) Charm
 - a. physiological foundation: cavity maximisation
 - b. incompatibility of [a] and ATR, cf. ATR-harmonic systems
- (6) Charm-based syllabification: KLV 1990
 - a. consonantal Charm is negative, its vectors are L⁻ and H⁻
 - b. charmed segments are governors, charmless segments are governees.
 - c. hierarchical realtions between adjacent consonants: homorganic NC, maximal inventory of consonants in simplex Onsets and in the first part of branching Onsets, restricted inventory in Codas and in the second part of branching Onsets. Therefore:
 - simplex Onsets and the first part of branching Onsets are "strong" = governors
 - Codas and the second part of branching Onsets are "weak" = governees
 - d. syllabification is a consequence of governing relations holding between consonants

e. strict directionality

- 1. within a constituent, Government is head-initial Constituent Government
- 2. among constituents, government is Head-final Interconstituent Government

f. strict adjacency: governor and governee must pertain to adjacent skeletal slots

g. exhaustive inventory of syllabic constituents (X=heads)



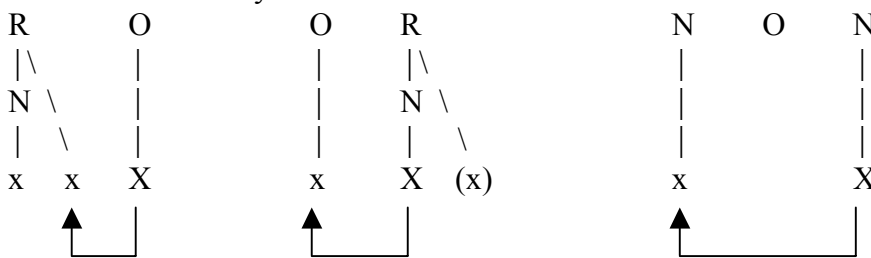
h. all syllabic constituents are binary, ternary structures are ruled out:

[X x x] and [x x X] violate Adjacency, [x X x] violates directionality.

i. the Coda is deprived of its status as a syllabic constituent. Its x-slot is directly adjoined to the Rhyme (postnuclear rhymal complement).

- 1. O, N and R are universally present in all languages, the Coda is not.
- 2. all constituents are governing domains, the Coda is not: if it were, e.g. [rp] in *carp* Strict Directionality requires its head to be the [r], but [r] cannot govern [p], cf. Charm and branching Onsets.
- 3. all other constituents govern: O governs "Coda", N governs its O. Only the Coda would never govern anything.

j. exhaustive inventory of domains of Interconstituent Government



k. Empty Category Principle ECP: a Nucleus may be uninterpreted if it is properly governed.

l. Proper Government PG

- 1. PG is a form of internuclear Government
- 2. the governor may not itself be governed
- 3. PG cannot apply over a governing domain

m. illustration: vowel - zero alternations

	zero	vowel	vowel	gloss
	CeC-V	CeC-∅	CeC-CV	
Moroccan Arabic	kItøb-u	køtIb-∅	kIttIb-∅	they have written, he has written, he has caused to write
German (optional elision)	innø̃r-e	inner-∅	inner-lich	inner+infl, inner, internal
Tangale (Chadic)	dobø̃-go	dobe	dobu-n-go	called, call, called me
Somali (Cushitic)	nirø̃g-o	nirig-∅	nirig-ta	young female camel pl, sg indef, sg def
Turkish	devø̃r-i	devir-∅	devir-den	transfer ACC, NOM, ABL
Slavic (e.g. Czech)	lokø̃t-e	loket-∅	loket-ní	elbow GEN, NOM, adj.
Hungarian	majø̃m-on	majom-∅	majom-ra	monkey Superessive, NOM, Sublative

- (7) Coda Licensing, Kaye 1990
- a. closed syllable shortening
- | | | | | |
|-----------|-------|-----------|------------|---------------------------|
| VVC-V | VC-∅ | VC-CV | | |
| ?a-quul-u | qul | ta-qul-na | Cl. Arabic | "say 1sg, imper, 2pl fem" |
| meraak-I | merak | merak-tan | Turkish | "law NOMsg, poss., NOMpl" |
| kraav-a | kraf | kraf-ka | Czech | "cow NOMsg, GENpl, dim." |
- b. Prosodic Government, Kaye&Lowenstamm 1985: superheavy Rhymes are excluded by virtue of c command relations holding within constituents.
- c. if so, their exclusion should be universal. But several languages exhibit closed slyyable shortening while exhibiting superheavy Rhymes:
- | | | | | |
|--------------------------|------|-----|-------|-------------------------|
| 1. English | keep | vs. | kept | |
| 2. Quebec French | veer | vs. | vert | "green masc, fem" |
| 3. Wolof (West Atlantic) | roof | vs. | roppi | "put in, take out" |
| | teer | vs. | teddi | "start/ stop a vehicle" |
- d. all counter-examples challenging the universality of Prosodic Government are word-final.
- e. if the vowel shortens because a consonant is incorporated into its Rhyme, all C-C clusters are expected to be well-formed domains of Interconstituent Government. This however is not the case:
- | | | | | |
|----------|-------|-----------|------------|--------------------|
| Turkish | | | | |
| POSS | NOM | ABL | NOM pl | |
| meraak-I | merak | merak-tan | merak-lar | [kt] ok, [kl] bad |
| sevaab-I | sevap | sevaptan | sevap-lar | [pt] ok, [pl] bad |
| usuulj-y | usulj | usulj-den | usulj-ljer | [ljɔ] ok, [ljɔ] ok |
- ==> theory predicts that the first part of the bad sequences does not belong to the preceding Rhyme. Thus, "closed syllable shortening" has nothing to do with closed syllables.
- f. interaction of vowel-zero alternations and "closed syllable shortening"
- Yawelmani
1. C-final stems
- | | | |
|---------|---------|---------|
| saap-it | sap-hin | sap-nit |
| goob-it | gob-hin | gob-nit |
2. V-final stems
- | | | |
|--------|-----------|-----------|
| pana-t | panaa-hin | panaa-nit |
| ?ile-t | ?ilee-hin | ?ilee-nit |
3. CC-final stems with vowel-zero alternation
- | | | |
|----------|------------|-----------|
| ?amil-al | ?aamil-taw | ?aamil-ka |
| moxl-ol | mooxil-taw | mooxil-ka |
- zero provokes shortening of the preceding vowel. The Projection Principle prohibits resyllabification in such cases. Zeros occurring in vowel-zero alternations have a syllabic identity, i.e. an Empty Nucleus. Thus, the consonant preceding the zero pertains to the Onset of the Empty Nucleus hosting the zero. It does not close the preceding syllable. Again, the shortening of the vowel has nothing to do with closed syllable shortening.
- g. rather, shortening takes place before an Empty Nucleus
- h. this explains the lack of phonotactic constraints on the cluster following the shortened vowel, cf.
- Turkish:
- the two consonants belong to independent Onsets.
- i. if (g) is correct, then all [-C]-final words in Turkish and Yawelmani must be followed by an empty Nucleus. Hence, word-final consonants reside in an Onset, i.e. the Onset of the Final Empty Nucleus.
- ==> Coda Licensing Principle: Post-nuclear rhymal positions must be licensed by a following Onset
- j. the contrast of superheavy Rhymes existing in __#, but absent word-internally falls out naturally (keep vs.

b. Autosegmental Licensing or a-licensing

defines the amount of melodic content that may be associated to constituents. It sanctions melodic material (phonological primes).

c. Licensing Inheritance

the a-licensing power of a given constituent is a function of its p-licensing status. A p-licensed constituent has less a-licensing power than a constituent escaping p-licensing. Every constituent intervening on a licensing path transmits only a part of the a-licensing power transmitted.

d. application: under Coda-Licensing, the disjunctive context {__#, __.C} has no uniform description

in

form of a single constituent. Hence, what about the broad range of phenomena occurring in this context? Cf. devoicing, lenition, deaspiration,...

1. lenition

__.C		__#		V__V
Spanish: s->h				
costa ->kohta		después	-> dehpuéh	
Caribbean Spanish: r,l -> j				
revolver -> revojvej		papel	-> papej	
carta -> cajta		algo	-> ajgo	
Brazilian Portuguese: l -> w				
salga -> sawga		sal	-> saw	saleiro
falta -> fawta		papel	-> papew	papelão
Serbo-Croatian: l -> o				
čitaoc-a GENsg		bio		čitalac, bila
English: r -> zero				
card		car		rain, carry

2. depalatalisation (L,N=palatal lateral, palatal nasal)

Spanish				
beldad		doncel		beLo, donceLa
rencilla		desdén		reNir, desdeNar

3. devoicing

German				
lesbar		Bad, Tag, Haus		lesen, Bäder, Tage, Häuser

e. word-initial Coda-consonants and word-final consonants share the fact that their constituents

receive

their a-licensing power indirectly: "Codas" via the following Onset, which in turn is p-licensed by its Nucleus, ...C# via the following final empty Nucleus, which in turn is p-licensed by parametric licensing of FENs.

f. intervocalic phenomena

1. voicing: American English

pity -> pidy

2. tapping: English t -> R (R=flap)

pity -> piDy

3. deletion: English h->zero

ve'hicular vs. 've(h)icle
pro'hibit vs. pro(h)i'bition

4. spirantisation: Spanish, Tiberian Hebrew,...

la banca vs. banca
la Demora vs. demora
la Gana vs. gana

g. foot-internal Onsets of left-headed feet are in the same situation as consonants in $__\text{.C}$ and $__\#$. In [O1 N1 O2 N2], the Head N1 p-licenses N2, which in turn p-licenses O2. By contrast, O1 is directly p-licensed by the Head N1.

h. thus, consonants in $\{__\text{.C}, __\#, \text{'CV}__\text{V}\}$ are treated on a par. They are predicted to exhibit the same phenomena.

i. Licensing Inheritance not only provides a uniform description of the three lenition-sites, but it also says WHY these sites should favour lenition rather than any other context.

j. problems

1. no lenition normally occurs before word-internal empty Nuclei (=under PG), although these are predicted to trigger transmit the same a-licensing power as word-final empty Nuclei.
2. the kind of lenition-phenomena observed intervocalically (=Foot-internal) is much different from the one occurring in "Coda"-positions. Thus, all three contexts should not conform to the same theoretical status.
3. the argument for intervocalic contexts holds only for left-headed feet. In a language exhibiting right-headed feet, lenition is predicted foot-(=word-)initially, but not foot-(word-)internally. This configuration can hardly be observed in any language.
4. all three contexts are indirectly p-licensed. But the factors intervening in the licensing path are quite different: p-licensing transits via an Onset in $__\text{.C}$, but via a Nucleus in 'CV $__\text{V}$ and $__\#$. The ultimate source of licensing are Nuclei in $__\text{.C}$ and 'CV $__\text{V}$, but parametric licensing of FEN in $__\#$. Should these different theoretical configurations yield identical empirical results?

(10) casting doubt on Charm

a. existence of nasal [a]

b. A⁺ and ATR⁺ repel each other, but which are the empirical consequences of the alleged attraction of {H⁻,L⁻} and {A⁺,N⁺,ATR⁺}?

c. which is the evidence for choosing L and H as vectors of consonantal Charm rather than any other Elements?

d. choosing H and L is a hidden way of capturing the traditional [-son] feature. Consonantal Charm carried by H and L is a different formulation of [+son].

e. like charmed Elements are supposed to repel each other. Indeed, L⁻ and H⁻ do never combine, but this is a simple physiological fact achieved anyway: vocal chords cannot simultaneously be stiff and slack.

f. doubt has been cast on the existence of an independent ATR Element. If ATR is expressed by other means, the foundations of Charm are dismissed.

(11) Complexity-driven syllabification instead of Charm-driven syllabification, Harris 1990

a. the more phonological primes a segment is made of, the more complex it is.

b. in order for a governing relation to hold, the governee may not be more complex than the governor.

c. traditional way of encoding the sonority hierarchy into segmental structure: features such as [+son], [+cons] etc. This is circular: 1. observation that [r] is a sonorant, 2. introduction of [+son] into its internal structure, 3. why is [r] a sonorant and occupies the corresponding place within the string? Because it bears [+son].

d. this kind of feature is ruled out anyway if all primes are independently pronounceable.

e. Charm is but a hidden [+son]. It doesn't depend on any idiosyncratic property of the segments. By contrast, Complexity is calculated on the basis of ALL primes that contribute to the articulation of a segment. It is thus a function of every segment's idiosyncratic make-up. It can be controlled and falsified by segmental alternations.

f. hence, in order to know which segment may govern which other segment, the internal structure of consonants is crucial. It is achieved on the basis of considerations that are totally independent from syllabic structure, that is segmental alternations. Unlike [+son]- and Charm-based syllabification, this approach is not circular.

III. Internal Structure of Consonants

(12) Harris 1990, 1994, Harris & Lindsey 1995

a. Elemental inventory

Place		Manner	
I - palatality	[I]	? - constriction	[?]
U - labiality	[U]	h - noise	[h]
A - absent in consonants		L - slack vocal chords	---
v - velarity	---	H - stiff vocal chords	---
R - coronality	[r]	N - nasality	---

b. Places of articulation

bilab	lab-dent	interdent	alv	pal	postpal	vel	uvul	phar	glott
<u>?</u> ,U	<u>h</u> ,U	<u>R</u> ,h	<u>R</u>	<u>I</u>	<u>h</u> ,I	<u>v</u>	<u>h</u> ,A	<u>A</u> ,h	<u>?</u> <u>h</u>

c. Manner

Glides	---
Liquids	?
Nasals	? + N
Fricatives	h
Stops	h + ?

d. some consonants (initial Elements are Heads)

t - R,?,h,H	c - I,?,h,H	? - ?	
p - ?,U,h,H	d - R,?,h,L	k - v,?,h,H	h - h
f - h,U,H	s - h,R,H		
th - R,h,H			
m - ?,U,N	l - ?,R		
n - R,?,N	r - R		
nj - I,N			

(13) problems

a. Head-operator relation: why should bilabials and Liquids be especially constricted?

b. R

1. literature against R: Broadbent 1991, Backley 1993, Brockhaus 1994, Scheer 1996.
2. any theory should recur to the same set of Place-primaries when defining vowels and consonants, Clements 1993, Smith 1988, Carvalho&Klein 1996, Weijer 1994, Cyran 1994, Harris&Lindsey 1995 (sic). R is unknown in Nuclei, A in Onsets.
3. prediction: there is no interaction between coronal consonants and vowels: combinations of R and {I,U} are not defined.

c. prediction: velar consonants never influence on vowels: the cold vowel may not be spread.

d. heavy overgeneration, mainly because anything may be the Head of an expression: e.g. ?,R - R,U - U,R - v,R - v,I - L,R - H,U - N,I,...

- (14) alternative proposals: e.g. Weijer 1994, Cyran 1994, Rennison in press, Scheer 1996, in press.
- (15) principles in response of (13), Scheer 1996, in press
- one-to-one correspondance between phonological representations and their phonetic manifestation.
 - like any other linguistic expression, segmental expressions are asymmetrical. The Head contributes more to the phonetic result than the Operator(s).
 - the set of primes defining Place is identical for vowels and consonants.
 - no R.
 - only universal primes, that is Place-definers, head segmental expressions.
- (16) velarity and roundness are two distinct phonological objects
- back unrounded vowels. KLV 1985: back high -round +ATR= ATR, mid +ATR = v,ATR,A. Back unrounded -ATR vowels are predicted not to exist phonologically.
 - both I,U and U,I = [y]?
 - KLV 1985: U is present in front rounded vowels. I and U don't combine in languages lacking front rounded vowels. Prediction: languages exhibiting front rounded vowels, thus where I and U combine, possess a higher number of consonants than languages lacking front rounded vowels. The opposite is true.
 - interactions of U=[u,w] and velar consonants

1. in Fular², [w] regularly alternates with [g]. Consider for example the different forms of the stem *wor* "masculine" when connected to the various adjectival nominal class-suffixes.

class		class		class	
1	gor-ba	9	gor-gal	18	gor- koj
2	wor-de	10	gor-gel	20	wor- be
3	gor-di	11	gor-gol	21	gor- de
4	wor-du	13	gor-ki	22	gor- di
5	gor-ga	15	gor-ko	23	gor-ko
8	gor-gu				

2. broken plural formation in Moroccan Arabic

in the variety of Moroccan Arabic described by Ettajani (prep), only velar and uvular consonants tolerate a labial secondary articulation: [k^w, w, q^w] exist, whereas *[s^w, D^w] etc. do not occur. This distribution is transparent in broken plural formation where a [w] tries to parachute on the first root-consonant (data and analysis by Ettajani):

sing broken plural (Z=voiced postalv., X=voicelss uvul., I=high schwa)

labial secondary articulation possible

kbir	k ^w bar	"tall"
χubza	χ ^w bazi	"bread"
χurza	χ ^w razi	"node"
kursi	k ^w rasi	"chair"
qamiʒa	q ^w amiʒ	"shirt"

labial secondary articulation impossible

²West-Atlantic language spoken in Guinea. Data from Klingheneben (1941:17).

smin	sman	*s ^w man	"fat"
silla	slali	*s ^w lali	"basket"
Drif	Draf	*D ^w raf	"nice"

3. short [u] in Ge'ez (Classical Ethiopic):

in Ge'ez (cf. Ségéral 1995:155ss), short high peripheral vowels do not exist. Only a short [u] can be observed in nominal morphology iff it is preceded or followed by a velar or uvular consonant [k,g,q,x].

4. Czech vocative

in Czech, three vocative-allomorphs occur with consonant-final masculine nouns: *-i* iff the last consonant of the stem is palatal, *-u* iff it is velar, and *-e* elsewhere.

	nominative	vocative	(N=palatal n, D=voiced pal. stop, R=palatal r, S=sh)
-i / C _{pal} __	kuuʁ	kɔʁ-i	"horse"
	tɔmaaS	tɔmaaf-i	"Thomas"
	lhaař	lhaař-i	"liar"
	zlɔʃej	zlɔʃej-i	"thief"
	slɛc	slɛʃ-i	"herring"
-u / C _{vel} __	hɔx	hɔx-u	"boy"
	gɔnk	gɔng-u	"gong"
	zdeʃnek	zdeʃnk-u	first name
	ptaak	ptaak-u	"bird"
-e / elsewhere	pes	ps-ε	"dog"
	dɔktɔr	dɔktɔr-ε	"doctor"
	hɔlup	hɔlub-ε	"pigeon"
	hrat	hrad-ε	"castle"
	ʃɛf	ʃv-ε	"seam"

e. reason for 1. (a), 2. v=velarity, 3. absence of U from velars: indissociability of velarity and roundness in U. Any articulation U participates in is predicted to be rounded. ==> U has to be absent from velars and back unrounded vowels.

f. two distinct vectors for velarity and roundness/ labiality:

U - velarity

B - roundness/ labiality

g. consequences: front rounded vowels are a combination of I and B, not of I and U. (b) and (c) are without substance.

(17) [t,d] are nothing

a. they are NEVER the result of a phonological process.

b. markedness

1. unmarked within coronals, coronals being unmarked among consonants.

2. unmarkedness = consequence of the absence of Place-definers: Underspecification Theory, cold

vowel

in KLV 1985.

3. articulation: unmarkedness corresponds to the tongue body in relaxation.

c. [t,d] are typically epenthetic

1. French

/a il dit/ > a-t-il dit "he has said"

/verra on/ > verra-**t**-on "we will see"

2. French

epenthetic [t]

/esquimau + age/ > esquimautage

/glouglou + er/ > glouglouter

/bijou + ier/ > bijoutier

/indigo + ier/ > indigotier

/tableau + in/ > tableautin

/cacao + ière/ > cacaotière

epenthetic [d]

/Marivaux + er/ > marivauder

3. Middle-High-German (MHG) > New High German (NHG)

MHG	NHG		MHG	NHG	
a. after [n]			c. after [s]		
iergen	irgend	"any"	ackes	Axt	"ax"
ieman	jemand	"somebody"	obez	Obst	"fruit"
wîlen	weiland	"long ago"	sus	sonst	"otherwise"
vollen	vollends	"completely"	bâbes	Papst	"pope"
totzen	Dutzend	"dozen"	d. after /X/		
sinvluot	Sintflut	"Flood"	habech	Habicht	"hawk"
allenhalben	allenthalben	"everywhere"	dornach	Dornacht	city
wësenlîch	wesentlich	"important"	e. after [g] (rare)		
b. after [r]			bredige	Predigt	"sermon"
anderhalp	anderthalp	"one and a half"	f. after [f]		
			werf	Werft	"shipyard"
			saf	Saft	"juice"

(18) Distribution of A in Obstruents

a. correspondence Fricatives - Stops (P=phi, th,dh=interdental, ch,j=palatal, S,Z=postalv, Q=gamma)

1. Fricatives	Stops
ϕ,β	p,b
f,v	---
θ,ð	---
s,z	t,d
ś,ź	---
ç,ʝ	c,ɟ
ʃ,ʒ	---
x,ɣ	k,g
χ,ʁ	q,G

b. phonetic reflect: Fricatives possessing Stops are mate, Fricatives lacking Stops are strident.

c. typical affricates are candidates to fill the "holes": [pf], [ts,dz], [tʃ,dʒ], [tʃ,dʒ], [kX]: their second part are

all and only the Fricatives for which simplex Stops are missing. Filling in the affricates according to this criterion provokes two mismatches: 1. [ts,dz] are supposed to face [s,z], but this place is already taken by [t,d], 2. there is no affricate with a second interdental part. Both problems are solved when considering [t,d] to be the Stops related to [th,dh]. Segmental alternations confirm this move, cf. below.

d. spirantisation accompanied by a change of Place

1. Grimm's Law

Latin and Greek forms witness the Indo-European state of affairs (Gothic spelling $b=[th]$).

a. spirantisation³

IE >	Germ>Got	Lat/ Gr	Got	
p, p ^h	f	f	pater	fadar "father"
	v	b	septem	si u n "seven"
b ^h	v	b	f <u>er</u> o	bairan "carry"
t, t ^h	th	th	tr <u>e</u> s	* <u>þ</u> reis "three"
	ð	d	pat <u>e</u> r	fada <u>r</u> "father"
d ^h	ð	d	Gr dyra	da <u>r</u> "gate"
k, k ^h	X	h	co <u>r</u> nu	* <u>h</u> aurn "horn"
	R	g	Gr dakry	* <u>t</u> agr "tear"
g ^h	R	g	ho <u>s</u> tis	gasts "stranger"

b. devoicing

b	p	p	(s)lub <u>r</u> icus	*sli <u>u</u> pan "sneak"
g	k	k	ego	ik "I"
d	t	t	edo	it <u>a</u> n "eat"

c. the following three correspondences characterizing Grimm's Law can thus be established for the oldest record of Germanic (see e.g. Collinge 1985:63ss):

IE	Got
STOP +voice, -asp	STOP -voice, -asp
STOP +voice, +asp	STOP +voice, -asp
STOP -voice, ±asp	[FRIC -voice, STOP +voice] -asp

d. in the light of various secondary processes such as the Second Consonant Shift and using arguments of comparative studies across the Germanic language family, the following correspondences are commonly reconstructed for (unrecorded) Common Germanic:

IE	Common Germanic
STOP +voice, -asp	STOP -voice, -asp
STOP +voice, +asp	FRIC ±voice
STOP -voice, ±asp	FRIC ±voice

e. According to classical interpretation (e.g. Paul *et al.* 1989:113), the chronology of events is as follows: in a first step, IE non-aspirated unvoiced stops develop aspiration: IE p, t, k > Germ p^h, t^h, k^h. Then, all aspirated stops, voiced or not, become fricatives: IE p^h, b^h, t^h, d^h, k^h, g^h > Germ f/v, θ/ð, χ/ʁ⁴. The IE non-aspirated stops that are left remain non-aspirated AND stops, but they devoice: IE b, d, g > Germ p, t, k.

³Spirantisation occurs in any context except sC-clusters (Got sp, sk, st) and ht, ft (e.g. Lat stella, OHG sterno) and IE [pt, kt] (e.g. Lat captus, noctis, Got haft, nahts (OHG naht > NHG Nacht)). Cf. Paul *et al.* (1989:113s).

⁴There is debate on the status of labials, cf. Braune & Ebbinghaus (1981:49), Jelinek (1892), Paul *et al.* (1989:113s, 124). The voicing of resulting fricatives is controlled by Verner's Law: iff the fricative is followed by a voiced articulation (=vowel, sonorant, voiced Obstruent) and the preceding vowel it is unstressed in IE, then the fricative is voiced. Otherwise, it is unvoiced (see e.g. Paul *et al.* 1989:123s for illustration).

f. summary: only aspirated stops spirantise.

	non-aspirated		aspirated	
	voiced	unvoiced	unvoiced	voiced
inventory of IE stops	b, d, g	p, t, k	p ^h , t ^h , k ^h	b ^h , d ^h , g ^h
Germanic	↓	↘	↓	↓
Grimm's Law	p, t, k		↘ ↙ f/v, th/ð, X/R	

2. Bavarian (cf. Saussure's Law in IE), Schwarz 1950,57

standard German	Bavarian
behüte dich	bøhiat di > b ^h üet di > pfiat di
Behälter	Pfalter "Fischteich"

3. conclusion: aspiration triggers spirantisation accompanied by a change in the Place of articulation.

e. spirantisation with invariant Place

1. Spanish

a. fricatives occur after vowels (G=gamma, N=velar nasal)

la β a ka	<i>la banca</i>	"the bank"
la ð emora	<i>la demora</i>	"the delay"
la Ga n a	<i>la gana</i>	"the desire"

b. stops occur elsewhere

word-initially		
b a ka	<i>banca</i>	"bank"
d emora	<i>demora</i>	"delay"
g ana	<i>gana</i>	"desire"
after consonants		
a mbos	<i>ambos</i>	"both"
o nda	<i>onda</i>	"wave"
a ldea	<i>aldea</i>	"village"
te n go	<i>tengo</i>	"I have"

2. Tiberian Hebrew (P=bilabial voiceless fricative, G=gamma, th=interdental voiceless fr.)

root	perfective	imperfective	alternation(s)	
zkr	zaaxar	yi-zkor	x-k	"remember"
kpr	kaaφar	yi-xpor	k-x, φ-p	"cover"
bdl	baaðal	yi-βdal	b-β, ð-d	"separate"
pth	paaθah	yi-φtah	p-φ, θ-t	"open"
pgf	paayaf	yi-φgof	p-φ, γ-g	"meet"

f. summary

aspiration triggers spirantisation AND alternation of the Place of articulation
 vocalic contexts trigger spirantisation AND NO alternation of the Place of articulation

g. aspiration is a glottal activity. The prime responsible for articulations in this region is A. Hence, A is likely

to participate in aspiration.

x
/ \ [C^h]
C A

h. A is responsible for the shift in the Place of articulation

1. bilabial + A = labio-dental
2. dental + A = interdental
3. velar + A = uvular

i. general summary

1. stops incorporating A as in Grimm's law spirantise because
2. some Places of articulation lack stops because

A and ? are incompatible within a given phonological expression

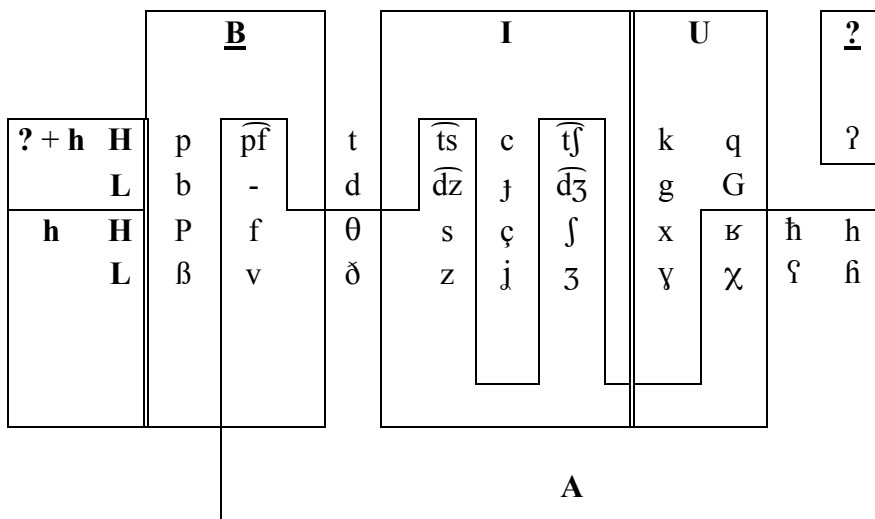
3. this is plausible: A and ? represent opposite properties: maximal aperture vs. maximal closure. They represent the two segments that are maximally distant on the sonority scale: [a] vs. [ʔ].
4. incorporation of A (=aspiration) into the segmental structure of the Stop expells ?, which is either completely lost (Grimm's Law) or retained in a contour structure, i.e. the result is an affricate. E.g. typical diachronic spirantisation

Stop > Affricate > Fricative

e.g. French affrication before [a]:

Lat gamba, carru > Gallo-Romance dʒâmb, tʃar > French ʒâb, ʃar "leg, tank"

(19) internal structure of Obstruents (P=phi, th=interdental voiceless fric., D=palatal voiced stop, J=voiced palatal fric., S,Z=postalv. fric., R=voiced uvular fric., H,9=voiceless and voiced pharyngeal fric., g'=voiced velar fric., h'=voiced glottal fric.)



(20) sonorants

a. [r] contains A: German

1. [r] > [ʁ] / V__#	foʊʁ	<i>vor</i>	"before"
	nuʁ	<i>nur</i>	"only"
	hɔʁɔʁ	<i>Horror</i>	"horror"
	mawʁ	<i>Mauer</i>	"wall"
	bæʁ	<i>Bär</i>	"bear"
	biʁ	<i>Bier</i>	"beer"
	leeʁ	<i>leer</i>	"empty"
	fɔjʁ	<i>Feuer</i>	"fire"
2. [r] > [ʁ] / V__C	luʁç	<i>Lurch</i>	"amphibian"
	gebɪʁge	<i>Gebirge</i>	"mountain"
	lɔʁt	<i>Lord</i>	"Lord"
3. [r] > [a] / a__ {C,#}	baat	<i>Bart</i>	"beard"
	baaʃ	<i>Barsch</i>	"perch"
	faat	<i>Fahrt</i>	"trip"
	gaa	<i>gar</i>	"done, cooked"
4. [r] > [R] / C__	dʁaj, *dʁaj	<i>drei</i>	"three"
	gʁajs, *gʁajs	<i>Greis</i>	"old man"
	pʁajs, *pʁajs	<i>Preis</i>	"price"
5. [r] > [R] / V__V	pɪʁaat	<i>Pirat</i>	"pirate"
	kaʁaat	<i>Karat</i>	"carat"
	oʊʁaan	<i>Oran</i>	Algerian city

b. [r] contains I

1. Southern Dutch (Rotterdam, Leiden) r > j / __ {C,#}			
standard Dutch	Southern Dutch		
daar	daaj	<i>daar</i>	"over there"
kaart	kaajt	<i>kaart</i>	"card"
stoort	stoojt	<i>stoort</i>	"disturb 2sg.pres"
karnen	kajnen	<i>karnen</i>	"make buttermilk"
verpt	vejpt	<i>werpt</i>	"throw 3sg.pres"
2. Caribbean Spanish: r > j / __ {C,#}			
standard Spanish	Caribbean Spanish		
revol <u>v</u> er	revo <u>j</u> ve <u>j</u>		"revolver"
karta	kajta		"card"
papel	papej		"paper"
algo	ajgo		"something"

c. [l,n] contain I

German: [χ] and [ç] are in complementary distribution. [ç] occurs after front vowels, [χ] after [a,o,u]:

1. [χ] after [u,o,a]	[ç] after [y,ø,i,e]	
absence of I	presence of I	
buuχ	byyçə	"book sg/pl"
kɔχ	kœçin	"cook masc/fem"
baχ	bɛçə	"creek sg/pl"
	iç	"I"
2.	milç	"milk"
	manç	"some"

d. [l] contains I

1. Italian: lat l > j in branching Onsets

Latin	Italian	vs.	Italian
p platea	piazza "place"		V__C altro "other"
vulg plovere	piovere "rain"		volta "vault"
b germ *blank	bianco "white"		V__V tavolo "table"
vulg blastemaare	biasimare "blame"		volere "want"
f floorem	fiore "flower"	#__	linea "line"
flamma	fiamma "flame"		
k claudere	chiudere "close"		
clavus	chiodo "nail"		
g vulg glacia	ghiaccio "ice"		
glandem	ghianda "glans"		

2. Salzburg German: [l] in Codas palatalises (and labialises) the preceding vowel, Rennison 1978

alternation	standard German	Salzburg German (E=schwa)
i-ü	Filter	vüttE
	wilder	ßüüdE
e-ö	selten	zöttE
	Feld	vööd
a-oj	Schalter	ZojttE
	Wald	ßoojd
o-oj	poltern	bojttEn
	Gold	goojd
u-uj	Schulter	ZujttE
	Schuld	Zuujd
	Mehl	möövs. mehlig meelik

e. Nasals contain A

1. German: nasals lower high vowels. MHG high vowels followed by a (geminated) Nasal regularly surface as mid vowels in NHG.

MHA	NHA	
sunne	Sonne	"sun"
sumer	Sommer	"summer"
kumen	kommen	"come"
münech	Mönch	"monk"
sun	Sohn	"son"
künek	König	"king"
gewunnen	gewonnen	"won"
geswummen	geschwommen	"swum"

2. vowels are nasalised before a nasal consonant and {C,#}
 - a. Common Slavic. ==> no high nasal vowels in Polish.
 - b. French. ==> no high nasal vowels in French. fin vs. fine, brun vs. brune.

f. [r], [l] and [n] are variants of the same phonological object

Several genetically non-related languages present alternations of [r], [l] and [n] without apparent segmental conditioning.

1. Chaha (Ethio-Semitic language): [r] and [n] are allophones, [n] occurring word-initially and before obstruents, [r] elsewhere.

	preterite	present	jussive	root	
1sg	nädäf-x ^w im	ä-rädif	ni-ndif	Rdf	"card (wool)"
1sg	näk ^y äm-x ^w im	ä-räk ^y im	ni-räkim	Rk ^y m	"ride (horse)"

2. Corean: [l] and [r] are allophones. [r] is found intervocalically, whereas [l] occurs word-finally and in consonantal environments (U=rounded high schwa)

aR "know"

/aR + ta/	-->	aal-ta	citation form
/aR + Upnita/	-->	ar-upnita	politeness form
/aR + Uo/	-->	ar-uo	exhortative form
/aR + a/	-->	ar-a	declarative form

[l]/[r] have a third allophonic variant word-initially, that is [n] (but not every Corean [n] is an allophone of [l]/[r]):

Rak

/o + Rak/	-->	o-rak	"diversion"
/ø + Rak/	-->	nak	"pleasure"
/Rak + won/	-->	nak-won	"paradise"

3. MHG: numerous doublets of the same word involving [l] and [r] (cf. Paul *et al.* 1989:144).

[r]	[l]	NHG	
Herke	Helche	<i>Helke</i>	female first name
smieren	smielen	-	"smile"
prior	priol	<i>Prior</i>	"prior"
murmern	murmeln	<i>murmeln</i>	"murmur"
Canterbury	Candelberc	<i>Canterbury</i>	Canterbury
marmor	marmel	<i>Marmor</i>	"marble"
marter	martel	<i>Marter</i>	"torture"
mörter	mörtel	<i>Mörtel</i>	"mortar"
turter	turtel	<i>Turteltaube</i>	"turtledove"
môrber	mûlber	<i>Maulbeere</i>	"mulberry"

MHA dörper "farmer" > dörpel > törpel > NHG Tölpel "dolt"

g. Summary: internal structure of Nasals and Liquids

1. [r] is **A**-headed (German, English)

I contributes to the articulation of [r] (Spanish, Dutch)

[l], [n] and [r] have the same melodic identity (Chaha, Corean, MHG)

[l,n] contain **I** (German, Italian, Salzburg German)

Nasals contain **A** (MHG > NHG, French and Slavic nasal vowels)

2. Liquids are **A**-headed

3. Nasals contain **A** and **N**

4. internal structures (first named Elements are Heads, L=velar l, nj=palatal nasal, ng=velar nasal)

r - A,I,T	m - B,A,N	ng - A,U,N
l - A,I	n - A,I,N	N - U,A,N
L - A,U	nj - I,A,N	

h. sonority

a. Harris' 1990 system has no specific sonority-prime, but sonority is calculated exclusively through h/?,
i.e.

exclusively consonantal primes. There is no apparent connection between vocalic and consonantal sonority.

b. sonority is a function of three parameters: 1. the constituent it pertains to, 2. presence of consonantal Elements, 3. the role played by A. No separate sonority-prime.

segment	Nucleus/Onset	h/?	role of A
a	N	-	head
e,o	N	-	operator
i,u	N	-	absent
Liquids	O	-	head
Nasals	O	-	head/operator
Glides	O	-	absent
s,z	O	h	head
gutturals	O	h	head/operator
fricatives	O	h	operator/absent
stops	O	h and ?	absent

(21) result

a. sonorants are more complex than Onstruents as far as Place Elements are concerned.

b. complexity-calculus according to Harris 1990 with these internal structures makes wrong predictions as to

what is a possible branching Onset etc.

IV. CVCV

(22) the proposal, Lowenstamm 1996, in press

a. syllable structure is a strict consecution of non-branching Onsets and non-branching Nuclei.

b. the phonological identity of "#" is an empty CV. Words begin with an empty CV subject to the ECP.

(23) some arguments

a. Lowenstamm 1996

b. complexity-based syllabification is blocked with segmental identities of the kind shown in III.

c. vowel-zero alternations

d. the usual treatment of word-initial clusters is circular.

(24) vowel-zero alternations, Scheer 1997, 1998a,b

a. the statement "intervening governing domains block PG" is but an observation. It doesn't explain the phenomenon. CVCV offers an explanation.

- b. CVCV dispenses with CG, ICG and Government Licensing. PG alone drives all alternations.
- c. it unifies Government: PG doesn't sometimes apply and sometimes is blocked, it always applies.
- d. the statement quoted in (a) is empirically falsified:

	zero	vowel	vowel	gloss
	CeC-V	CeC-∅	CeC-CV	
Moroccan Arabic	kitøb-u	køtib-∅	kittib-∅	they have written, he has written, he has caused to write
German (optional elision)	innør-e	inner-∅	inner-lich	inner+infl, inner, internal
Tangale (Chadic)	dobø-go	dobe	dobu-n-go	called, call, called me
Somalii (Cushitic)	nirøg-o	nirig-∅	nirig-ta	young female camel pl, sg indef, sg def
Turkish	devør-i	devir-∅	devir-den	transfer ACC, NOM, ABL
Slavic (e.g. Czech)	lokøt-e	loket-∅	loket-ní	elbow GEN, NOM, adj.
Hungarian	majøm-on	majom-∅	majom-ra	monkey Superessive, NOM, Sublative

BUT

Czech prefixes	podø-kova	---	podø-bradek	horseshoe, double chin
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- e. Czech prefixes is the only case where the two consonants intervening between governor and governee are monomorphemic.
- f. ==> the reason for their special behaviour must be found in the special relation contracted by the intervening CC. Monomorphematicity = tight relation.
- g. running PG in a CVCV framework enforces properly governable vowels to be lexically present:
 1. Czech bezN1-bN2radý [bezø-bradii]
 - French sN1cN2ret [sekre]
 if PG applied exclusively to empty Nuclei, N2 would have to PG N1 and would thus have to receive phonoetic content, yielding *bezø-beradý, *søkeret.
 2. targets of PG are lexically specified as such.
 3. the epenthesis-approach breaks down when facing languages with more than one alternating vowel in identical phonotactic conditions: Eastern Slavic, e.g. Russian den vs. son.
 4. assuming CVCV, PG exclusively applies to lexically filled Nuclei.
 - a. Nuclei that are sites of a vowel-zero alternation (formerly viewed as empty Nuclei). Only reason for their phonetic absence: PG.
 - b. real empty Nuclei that never appear on the surface. Reasons for their inaudibility: PG or IG.
- (25) the usual treatment of *#RT is circular (TR=any sequence of rising sonority, RT=any sequence of falling sonority)
 - a. words cannot begin with a Coda. Thus, the context "word-initial" corresponds to "Onset" on the syllabic level.
 - b. in languages of the IE type, CCs are not free word-initially, but both ...TR... and ...RT... occur word internally. This distribution matches that of syllabic constituents: "only Onsets in #__" vs. "both Onsets and Codas word-internally". Thus, syllabic structure is responsible for the observed restrictions.
 - c. the sonority value for each segment can be established independently. Word-initially, i.e. within a branching Onset, sonority must increase.

d. #RT clusters do not exist because their sonority is falling. Hence, they cannot hold within a branching Onset. They cannot be interpreted as a Coda-Onset sequence either because there are no word-initial Codas.

e. summary

1. observation: "sonority always increases within #CCs"
2. syllabic interpretation: "TR = branching Onset"
3. explanation: there are no #RT because sonority must increase within branching Onsets.

(26) Infrasegmental Government (consonantal interaction), Scheer 1996,97, in press

a. word-initial restrictions resort to two different questions:

SYNTAGMATIC restrictions

#CCs that occur or not depending on the syntagmatic order of their members: #tr is ok, but #rt out. In clusters of this type, the consonants always contrast in sonority.

b. SEGMENTAL/ PARADIGMATIC restrictions

There are also CCs of non-contrasting sonority that do not occur word-initially: e.g. *#lr, rl, nl, ln, tp. In these cases, the syntagmatic order of the members is indifferent: they are unattested in any order.

c. in response to (b):

Infrasegmental Government (IG)

iff an phonological prime faces an empty position on a given autosegmental line, it may govern this position.

d. illustration (□=empty position, L=velar lateral), details cf. Scheer 1996

1. interaction possible

I/U	p	r	t	r	U	k	l	f	r	
	□	<====I	□	<====I		I		□	<====I	
A	□	<====A	□	<====A		□	<====A		A	A

2. interaction impossible

I/U	n	r	s	r	U	L	r	t	p	
	I	<====I	I	<====I		I		□	<====□	
A	A	<====A	A	<====A		A	<====A		□	□

e. inversion of the KLV model of consonantal relations:

	Sonorants	Obstruents
KLV	governees	governors
IG	governors	governees

f. in response to (a):

1. Government Licensing applies to IG: a consonant may govern another consonant infrasegmentally iff

it

is licensed to do so by its Nucleus.

2. the first vowel of a word must govern the initial empty Nucleus. Hence, it cannot be held responsible for the inaudibility of the empty Nucleus flanked by the consonants of a initial cluster #CC.

3. in case of a #TRV cluster, R is licensed by V and thus may govern T, the structure is well-formed.

4. by contrast, R in a *#RT cluster is not licensed to govern T because its Nucleus is empty.

g. conditions on IG

1. time: the more time two consonants spend next to each other, the more likely they interact.

2. morphology: heteromorphemic consonants do not interact because they do not cohabitate in the lexicon.

3. Afro-Asiatic languages: no interaction at all because consonants never cohabitate with their constituents in the lexicon. Consequence: anything is possible in #__.

h. list of operations satisfying the ECP

1. PG
2. licensing of Final Empty Nuclei
3. Infrasegmental Government

i. expression of the fundamental TR vs. RT contrast:
in a CCV cluster,

1. V has no governing duty in TRV cases because the empty Nucleus between T and R is cared of by IG.
2. V must govern this empty Nucleus in RTV cases because R and T may not interact.

j. Branching Onsets and domains of IG are different

empty Nuclei never appear on the surface, but do play a crucial role in the phonology.

1. French: both well-formed [sekre] and [søcre] secret.
2. the existence of an empty Nucleus within word-initial clusters is crucial for the demonstration in (f).

k. strict directionality and strict locality are stipulations that don't follow from anything. They can be dispensed with.

(27) Alternative proposal: Gussmann & Kaye 1993, Gussmann & Cyran 1998

a. device of consonantal interaction over an Empty Nucleus accounting for the inaudibility of this Nucleus is needed whether CVCV is assumed or not:

Polish

NOMsg

mgl-a

pchl-a

GENpl

mgjel

pchel

"mist"

"flea"

b. two consecutive empty Nuclei (N) under any analysis:

1. mgNl-a, evidenced by vowel-zero alternation
2. mNgl-a, [mg] is not a well-formed branching Onset

c. Interonset Government (IO)

in [mN₁gN₂l-a], [a] properly governs N₁, [g] governs [l] and thereby satisfies the ECP for N₂.

(28) comparison

a. IO can be head-final as well as head-initial. No principled way to prefer one over the other.

b. Government Licensing does not help to account for initial #CCs: in #TRV clusters, T is licensed by V

in

order to govern R, i.e. licensing over R. In #*RT clusters, there is no way to exclude T from being licensed.

c. according to (27c), PG applies over a domain of IO. Thus, the statement "intervening governing

domains

block PG", that is the foundation of non-CVCV accounts of vowel-zero alternations, cannot be maintained. What, then, about vowel-zero alternations?

d. (27c) violates strict directionality.

(29) Governing domains are head-final, Scheer 1998b

a. PG is head-final, Constituent Government can be dispensed with.

b. vowel length

either long vowels never alternate

German

zuuχ-en

zææ-en

zuuχ-te

zææ-tə

zuuχ!

zææ!

suchen, suchte, such!

säen, säte, säe!

"search, searched, search!"

"sow, sowed, sow!"

buuχ	byyç-ø	Buch, Bücher	"book, books"
Somali			
<u> </u> C	<u> </u> CC		
maalin	maalm-o	"day sg, pl"	
keen, keen-aa	keen-taa	"bring inf, 1sg (habitude), 2sg (hab)"	
	ʃaand-o	"sieve, strainer indef."	
	eeddo, aabbe	"paternal aunt, father"	

or they do alternate. In this case, the alternation may be conditioned by

1. an overall constant weight of a given morphological structure

Slovak: *[..VV..]root-[VV..]suffix, result [..VV..]root-[V..]suffix,

..V..-VV..

..VV..-V..

mal-ii $\widehat{tʃiir}$ -i "small, clear NOMsg masc"

mal-aa $\widehat{tʃiir}$ -a "id. NOMsg fem"

mal-eemu $\widehat{tʃiir}$ -emu "id. DATsg masc"

par-aam luuk-am "steam, meadow DATpl"

par-aax luuk-ax "id. LOCpl"

pros-iim xvaal-im "ask, praise 1st sg present"

Czech: *[..VV]prefix-[..VV..]root

..VV- ..V..

..V- ..VV..

zaa-tot $\widehat{ʃ}$ -ka za-taat $\widehat{ʃ}$ -ka "turn (dance), bend"

zaa-no $\widehat{ʃ}$ -ka za-naa $\widehat{ʃ}$ -ka "change (gym), registration"

zaa-suf-ka za-hraat-ka "socket, little garden"

2. a specific grammatical category

Classical Arabic: the first vowel of a verb is long in its reciprocal form

Form ⁵	"wear"	"write"	
I	labis	katab	semantically unmarked
III	laabas	kaatab	reciprocal
VII	nlabas	nkatab	inchoative
III	kattab		causative/ intensive

Czech: infinitives have at least two moras⁶

inf	1st sg pres	past active participle	prefixed inf
kraas-t	krad-u	kradl	"steal"
ruus-t	rost-u	rostl	"grow"
krii-t	kri-j-u	kril	"cover"
staa-t se	stan-e se	stal se	"become"
znaa-t		znal	"know"
		po-znat	"recognize"
dlii-t		dlel	"stay"
praa-t	per-u	pral	"wash"

3. lateral relations between segments may cause an alternation commonly referred to as closed syllable shortening

VVC-V VC-ø VC-CV

⁵The forms given illustrate the active perfective paradigm of sound trilateral roots.

⁶Only a handful of verbs such as *chv t se* "tremble", *p t* "sing" or *jet* "ride" disregard this generalization.

?a-quul-u	qul	ta-qul-na	Cl. Arabic	"say 1sg, imper, 2pl fem"
meraak-I	merak	merak-tan	Turkish	"law NOMsg, poss., NOMpl"
kraav-a	kraf	kraf-ka	Czech	"cow NOMsg, GENpl, dim."

Italian⁷

VVCV	VC-∅	VVTRV	VRTV	
faato	ʃi	piigro	parko	"destiny, ski, lazy, park"

evolution: SPE-rule (non-explanatory, non-CVCV), Prosodic Government (explanatory, non-CVCV), Coda- Licensing (non-explanatory, CVCV), Larsen 1995 (explanatory, CVCV).

4. a short vowel may become long when an adjacent segment fails to be realized. This phenomenon called Compensatory Lengthening

Latin

*kasnus > kaanus	"gray"
*kosmis > koomis	"courteous"
*fideslia > fideelia	"pot"

Tiberian Hebrew

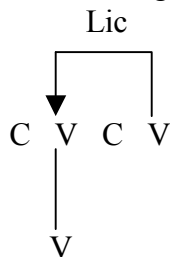
ha	definite article
kəlaβim, rəqahim	"dogs, spices"
ha kkəlaβim	"the dogs"
haa rəqahim	"the spices"

Chilungu

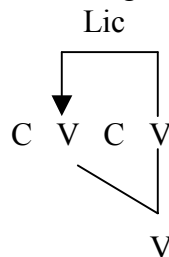
/ma-tama/ > matama	"cheeks"
/ka-koma/ > kakoma	"one who kills"
/ma-ino/ > miino	"eyes"
/ka-eleka/ > keeleka	"one who cooks"

c. conclusion on vowel-length:

lexical representation of an alternating long vowel



a non-alternating long vowel



(30) Italian Tonic Lengthening, Raddoppiamento Sintattico, definite article, Larsen 1995

a. Tonic Lengthening

1. data

VV	V	
fato	parco	"destiny, park"
pigro	pasta	" lazy, pasta"
fatto		"fact"

2. analysis: long vowels are short underlyingly. An extra CV is provided by stress. The CV provided by stress must be licensed by PG in order to constitute a well-formed target for the spreading of the preceding vowel.

⁷Long vowels of the paradigm shown occur only under stress. The phenomenon therefore is called Tonic Lengthening. As stress is irrelevant for the demonstration, it will not be considered. See Larsen (1995) for discussion.

b. Raddoppiamento Sintattico

1. data: in a ...V##C... sequence, C is geminated iff V is stressed and C is not [sC]

spelling	gemination	no gemination	
paltò pulito	paltò ppulito		"clean coat"
cittá triste	cittá ttriste		"sad city"
citta solare	cittá ssolare		"solar city"

vs.

paltò sporco	paltò sporco		"dirty coat"
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2. analysis: as before, gemination targets the extra CV provided by stress. The empty Nucleus enclosed by geminates must be properly governed.

3. vowels spread morpheme-internally, consonants spread over morpheme-boundaries.

c. selection of the definite article: il - lo (N=palatal nasal, S=postalv. voiceless fricative)

1. il / __C...

il parco	"the park"
il sole	"the sun"
il libro	"the book"

vs.

3. lo / __sC...

lo studio	"the study"
lo sbaglio	"the error"
lo sporco	"the dirty (one)"

2. il / __TR...

il treno	"the train"
il freddo	"the cold"
il plico	"the fold"

4. lo / __/CC/ and [j]

lo zio	t̃sio	"the uncle"
lo zero	dd̃zero	"the zero"
lo gnomo	ɲ̃nomo	"the gnome"
lo sci	ʃ̃fi	"the ski"

[sc] behaves like a geminate in Italian: its palatalised form is [ʃ̃], e.g. uscita, fresco - fresci

d. summary: a unified analysis, all three phenomena are a function of PG

	occurs in #__	Ton.Leng.	Rad.Sint.	selects	blocks PG
C	yes	yes	yes	il	no
TR	yes	yes	yes	il	no
sC	yes	no	no	lo	yes
ʃ̃,ɲ̃,t̃s̃,d̃z̃	yes	no	no	lo	yes
RT	no	no	---	---	yes
CiCi	no	no	---	---	yes

(32) Czech r-ř, Scheer 1998a

a. [r] in word-final position in the Nominative of masculine nouns alternates with [R] in Vocative forms of the same words⁸ (ř=postalveolar trill):

NOM	VOC	
petr̄	petř-e	"Peter"
kmotr̄	kmotř-e	"godfather"
katr̄	katř-e	"(iron) bars, prison"
metr̄	metř-e	"meter"
kufř̄	kufř-e	"suitcase"
cvikř̄	cvikř-e	"monocle"
sachř̄	sachř-e	"Sacher, kind of cake"
kopr̄	kopř-e	"dill"
svetr̄	svetř-e	"pullover"
kapř̄	kapř-e	"carp"
mesř̄	mesř-e	character from Brecht's <i>Beggar's opera</i>

b. conditions on this alternation

1. no alternation with [-Vr]-stems

NOM	VOC	*VOC	
doktor̄	doktor-e	*doktoř-e	"doctor"
ponor̄	ponor-e	*pomoř-e	"flotation line"
mramor̄	mramor-e	*mramoř-e	"marble"
boxér̄	boxér-e	*boxéř-e	"boxer"
potěr̄	potěr-e	*potěí-e	"spawn"
tatár̄	tatár-e	*tatář-e	"Tatar"

2. no alternation with non-palatal suffixes

NOM	GEN		DAT		
petr̄	petra	*petř-a	petr-ovi	*petř-ovi	"Peter"
kmotr̄	kmotra	*kmotř-a	kmotr-ovi	*kmotř-ovi	"godfather"
katr̄	katru	*katř-u	katr-u	*katř-u	"(iron) bars"
metr̄	metru	*metř-u	metr-u	*metř-u	"meter"
kufř̄	kufřu	*kufř-u	kufř-u	*kufř-u	"suitcase"
cvikř̄	cvikřu	*cvikř-u	cvikř-u	*cvikř-u	"monocle"
sachř̄	sachřu	*sachř-u	sachř-u	*sachř-u	"Sacher"
mesř̄	mesřa	*mesř-a	mesř-ovi	*mesř-ovi	character from <i>Brecht's Beggar's opera</i>

⁸ [r]-[ř] alternations are quite common in Czech. They occur elsewhere in the morphology and do not necessarily obey the distribution discussed below. On the other hand, there are configurations where [r]s do not alternate with [] although the segmental and syllabic conditions prevailing in the NOM-VOC contrast seem to be met. A full discussion of all these cases would go beyond the scope of this article. The NOM-VOC paradigm for various morphological and contextual reasons stands as a phenomenology of its own.

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