Tobias Scheer
Université de Nice
scheer@unice.fr

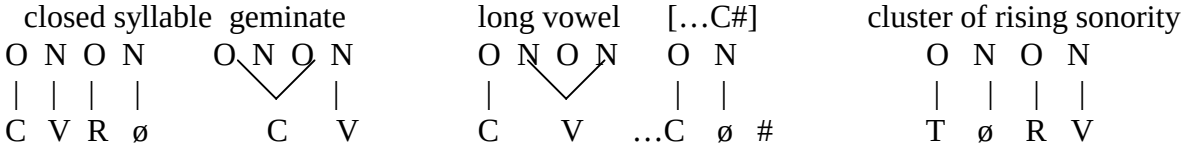
6th Central European Summer School
in Generative Grammar
Plovdiv, August 1999

Syllable Unstructure: CVCV

I. Theoretical devices

(1) a. CVCV
b. #=CV
c. Empty Category Principle (ECP)
d. lateral relations structuring the string: Government and Licensing

(2) CVCV: no Codas, no branching constituents (Lowenstamm 1996)



("T"=any obstruent, "R"=any sonorant)

(3) #=CV: the melodic beginning of words is preceded by an empty CV unit (Lowenstamm in press)

(4) ECP
a Nucleus may remain phonetically unexpressed iff it is
a. subject to Proper Government (PG)
b. enclosed within a domain of Infrasegmental Government (IG)
c. domain-final (parametrized)

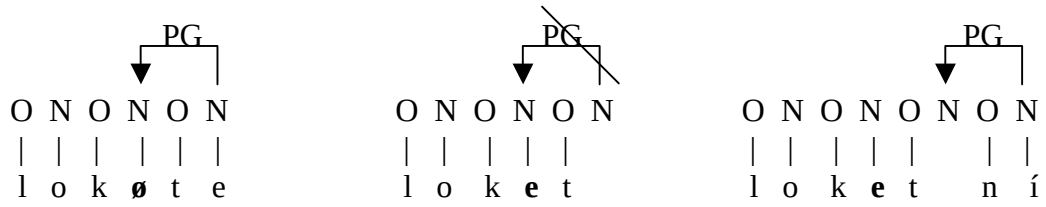
(5) other proposals regarding the satisfaction of the ECP
a. Magic Licensing (Kaye 1992), irrelevant in a CVCV grammar, and outside the circus.
b. Interonset Government (concurrent to IG) (Gussmann & Kaye 1993), Cyran & Gussmann (1998).

(6) (Proper) Government (PG)
is a dependency relation between two Nuclei, one being the head, the other its complement. The complement is inhibited in its melodic expression, cf. vowel-zero alternations.
Only contentful Nuclei may govern.
Targets of PG are lexically specified as such.

(7)	zero C__C-V	vowel C__C-ø	vowel C__C-CV	gloss
Moroccan Arabic	k**ɨ**t**ø**b-u	k**ø**t**ɨ**b-ø	k**ɨ**tt**ɨ**b-ø	write perf.act.3pl, 3sg, 3sg causative
German (optional elision)	inn**ø**r-e	inn**e**r-ø	inn**e**r-lich	inner+infl, inner, internal
Tangale (Chadic)	dob**ø**-go	dob**e**	dob**u**-n-go	called, call, called me
Somali (Cushitic)	nir**ø**g-o	nir**i**g-ø	nir**i**g-ta	young female camel pl, sg indef, sg def
Turkish	dev**ø**r-i	dev**i**r-ø	dev**i**r-den	transfer ACC, NOM, ABL
Slavic (e.g. Czech)	lok**ø**t-e	lok**e**t-ø	lok**e**t-ní	elbow GEN, NOM, adj.
Hungarian	maj**ø**m-on	maj**o**m-ø	maj**o**m-ra	monkey Superessive, NOM, Sublative

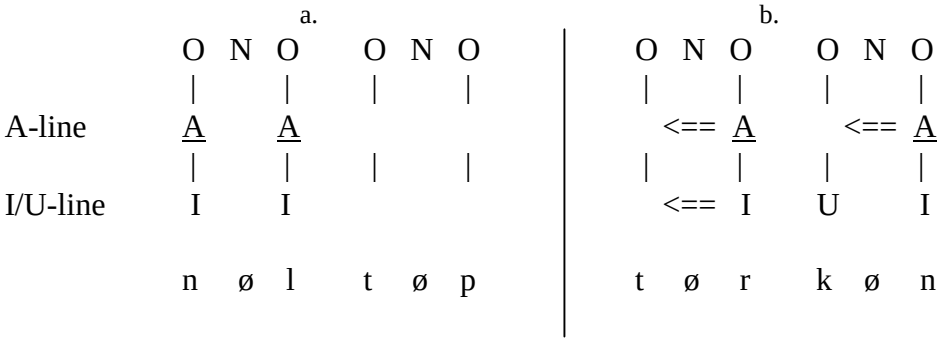
e.g. Slavic (Czech)

a. *lok**ø**t-e* GENsg b. *lok**e**t-ø* NOMsg c. *lok**e**t-ní* adj.

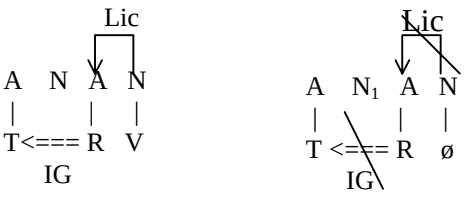


(8) Infrasegmental Government (IG)
is a dependency relation between primes pertaining to two different Onsets.
Two conditions on IG:

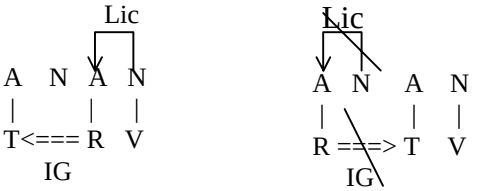
a. segmental: complexity (Harris 1990, 1994). Result: "sonority" is assigned no primitive status, it is a function of segmental complexity. Consequence: Sonorants are governors, Obstruents governees.
Iff a prime faces an empty position on an autosegmental tier defining Place, it may govern the empty slot. "<==" = IG



b. phonotactic: Government Licensing (Charette 1990,1991)
a consonant may establish a governing relation over another consonant only if it is licensed to do so by its own Nucelus.



c. consequence: progressive IG is ruled out



(9) Lateral relations that structure the string

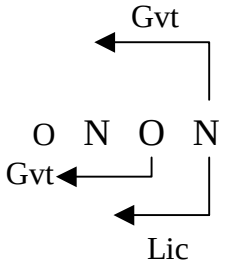
What vowels can do

a vowel may govern another vowel: PG PG O N O N O N l o k ø t e	a vowel may license another vowel ?
a vowel may govern a consonant: yes Gvt O N O N C V C V effect: cf. The Coda Mirror	a vowel may license a consonant: IG Lic A N A N T<=== R V IG

What consonants can do

a consonant may govern another consonant: IG Lic A N A N T<=== R V IG	a consonant may license another consonant ?
a consonant may govern a vowel NO	a consonant may licence a vowel NO

summary



(10) effects
  a. Government inhibits segmental expression, cf. vowel-zero alternations.
  b. Licensing comforts segmental expression.

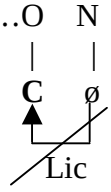
(11) Some references
  a. General background: Government Phonology
     Kaye et al. (1985,1990), Kaye (1989,1990), Charette (1991), Harris (1990,1994), Gussmann & Harris (1998).
  b. CVCV
     Lowenstamm (1996), Ségéral & Scheer (ms), Scheer (1996,1997,1998a,b,1999a,b), Larsen (1998), Heo (1994).
  c. #=CV
     Lowenstamm (in press), Ségéral & Scheer (ms), Scheer (1999a,b).
  d. Empty Category Principle (ECP) and Proper Government
     Kaye et al. (1990), Kaye (1990), Charette (1990,1991), Rowicka (1999), Scheer (1998a,b).
  e. lateral relations structuring the string: Government and Licensing
     Government: cf. ECP.
     Licensing: McCarthy (1979), Goldsmith (1990), Itô & Mester (1993), Kaye (1990), Charette (1990,1991), Harris (1994,1997), Ségéral & Scheer (ms).

II. What does it buy us ?

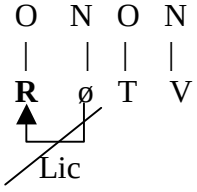
  a. the "weakness" of Codas is explained, not just stated.
  b. non-circular explanation for *#RT.
  c. Closed syllable shortening.
  d. unified theory of vowel-zero alternations.
  e. a theory of Lenition and Fortition: The Coda Mirror.
  f. unified theory of Government: Gvt domains are head-final only.
  g. Compensatory Lengthening.
  h. explanation of unnatural disjunctive contexts: {#__, stress}: English aspirated stops, Verner's Law.
  i. French schwa.
  j. Czech r-ř.

(12) Why are Codas "weak" (defective system of oppositions, defective segmental inventory etc.) ?
CVCV grammar: "Coda" = "consonant occurring before an empty Nucelus"

a. word-final: […**C**#]



b. before a (heterosyllabic) consonant: […**R**TV…]



Codas are weak **because** they fail to be licensed.

(13) Why is #RT ruled out ?

the usual treatment of *#RT is circular:

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.

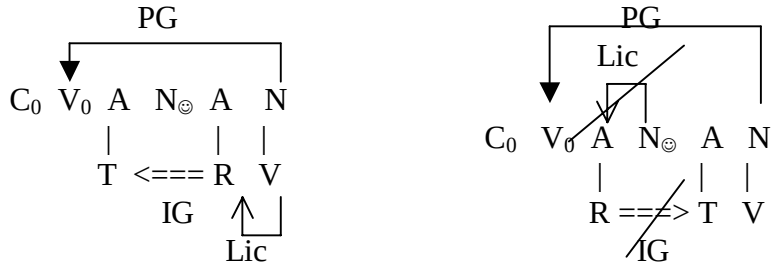
e. summary

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.

f. *#RT falls out naturally in a CVCV grammar. The explanation is non-circular because the set of observations it relies on is different from the facts it is supposed to explain: no device presented under I. has to do with word-initial clusters (Scheer 1999a).

C_0 V_0 = initial CV = "#"

a. well formed structure: [#tra…] b. ill formed structure: [#rta…]



(14) closed syllable shortening

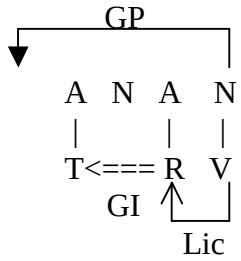
VVC-V	VC-ø	VC-CV		
ʔa-quul-u	qul	ta-qul-na	Cl. Arabic	"say 1sg, imper, 2pl fem"
meraak-ɪ	merak	merak-tan	Turkish	"law NOMsg, poss., NOMpl"
kraav-a	kraf	kraf-ka	Czech	"cow NOMsg, GENpl, dim."

VVCV	VC-ø	VVTRV	VRTV	Italian[1]
faato	Si	piigro	parko	"destiny, ski, lazy, park"

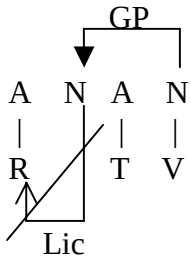
[1] Long vowels of the paradigm shown occur only under stress. The phenomenon therefore is called Tonic Lengthening. As stress is irrelevant for the demonstration, it will not be considered. See Larsen (1998) for discussion.

(15) a. SPE-rule — non-CVCV, non-explanatory
b. why should vowels be short in closed syllables ?
==> Prosodic Government (Kaye & Lowenstamm 1985) — non-CVCV, explanatory
c. Coda-Licensing (Kaye 1990): Closed Syllable Shortening occurs before an empty Nucleus. — CVCV, non-explanatory
d. Larsen (1998) — CVCV, explanatory

open syllable: PG reaches the Nucleus preceding the cluster, no governing duty



closed syllable: PG must govern the Nucleus separating R and T, and therefore can never reach to the left of the cluster



(16) Italian: Larsen (1998)
Tonic Lengthening, Raddoppiamento Sintattico, definite article
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.

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"

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
1. il / __C...

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

vs.

2. il / __TR...

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

3. lo / __sC...		4. lo / __/CC/ and [j]		
lo studio	"the study"	lo zio	ttsio	"the uncle"
lo sbaglio	"the error"	lo zero	ddzero	"the zero"
lo sporco	"the dirty (one)"	lo gnomo	ɲɲomo	"the gnome"
		lo sci	ʃʃi	"the ski"

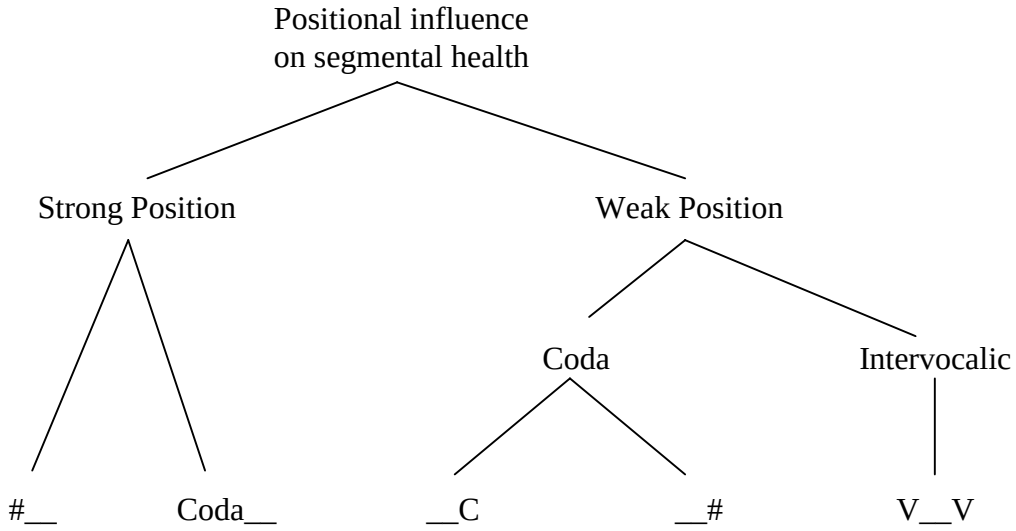
[sc] behaves like a geminate in Italian: its palatalised form is [ʃʃ], e.g. uscita, fresco - fresci

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
s,ɲ,t͡s,d͡z	yes	no	no	lo	yes
RT	no	no	---	---	yes
CiCi	no	no	---	---	yes

(17) The Coda Mirror Ségéral & Scheer (ms), alternative view Dienes & Szigetvári (ms)

Lenition and Fortition: Partition of the string



Lenition

(18) Latin obstruents > French

	a. #__		b. Coda__		c. Coda __C		c. Coda __#		d. V__V	
p	**p**orta	**p**orte	ta**p**a	tau**p**e	ru**p**ta	route	lu**p**(u)	[lu]	ri**p**a	ri**v**e
b	**b**ene	**b**ien	he**b**a	her**b**e	cu**b**(i)tu	coude	u**b**(i)	où	fa**b**a	fè**v**e
t	**t**ela	**t**oile	can**t**are	chan**t**er	pla**t**(a)nu	plane	mari**t**(u)	mari	vi**t**a	vie
d	**d**ente	**d**ent	ar**d**ore	ar**d**eur	a**d**veni**r**e	avenir	nu**d**(u)	nu	co**d**a	queue
k	**c**or	**c**œur	ran**c**ore	ran**c**œur	fa**c**ta	faite	*vera**c**(u)	vrai	lactu**c**a	laitue
g	**g**ula	**g**ueule	an**g**ustia	an**g**oisse	ri**g**(i)du	raide			*a**g**ustu	août
f	**f**ame	**f**aim	in**f**ernu	en**f**er	ste**ph**(a)nu	Etienne			de**f**oris	dehors
s	**s**erpente	**s**erpent	ver**s**are	ver**s**er	mu**s**ca	mouche	no**s**	[nu]	ca**us**a	cho**s**e [z]

(19) Latin sonorants > Ibero-Romance

	a. #__		b. Coda__		c. Coda __C		c. Coda __#		d. V__V	
n	**n**octe	**n**ojtə	cor**n**u	koɾ**n**u	te**n**(e)ru	teⁿ(ru	pa**n**(e)	pɐ̃(w(	lu**n**a	luɐ
	as(i)**n**u	aʒ**n**u	u**n**da	nⁿ(cɐ	no**n**	nɐ̃(w(				
	an**n**u	ɐ**n**u			ration(e)	rɐzɐ̃(w(				
l	**l**una	**l**uɐ	ga**ll**u	ga**l**u	ca**l**(i)du	ka**ɫ**du	me**l**	mɛ**ɫ**	vo**l**are	voaɾ
					sa**l**vare	sa**ɫ**vaɾ	ta**l**(e)	ta**ɫ**		
r	**r**ota	**r**ɔðə	ten(e)**r**u	te(**r**u	po**r**ta	pɔ**ɾ**ta	ma**r**(e)	ma**ɾ**	ca**r**u	ka**ɾ**u
			is**r**ael	iʒ**r**aɛɬ						
			car**r**u	ka**r**u						

(20) Somali stops (voiced)

	a. #__	b. Coda__		c. Coda __C	c. Coda __#	d. V__V	
	sg indef	1°sg		sg def	sg indef	pl	gloss
b	**b**eer						field
	gar**b**-o	pl		gara**bˀ**-ta	gara**bˀ**		shoulder
				da**bˀ**-ka	da**bˀ**	da**β**-abˀ	fire
d	**d**ile						killer
	hebˀ**d**-aj	he became tame		heβe**dˀ**-ka	heβe**dˀ**		tame animal
				gee**dˀ**-ka	gee**dˀ**	gee**ð**-adˀ	tree
g	**g**af						error
	nir**g**-o	pl		niri**gˀ**-ta	niri**gˀ**		young fem camel
				ɖe**gˀ**-ta	ɖe**gˀ**	ɖe**ɣ**-o	ear

Somali stops (voiceless)

	a. #__	b. Coda__	c. Coda __C	c. Coda __#	d. V__V	
	sg indef	1° sg	1° pl	imperative 2°sg	sg def	gloss
t	**t**uugˀ				/mindi-ta/ = [mindi-ða]	thief knife
	gun**t**-aa		gunu**dˀ**-naa	gunu**dˀ** !		tie a knot
	sun**t**-aa		suma**dˀ**-naa	suma**dˀ** !		brand
k	**k**al				/kursi-ka/ = [kursi-ɣa]	pestle chair
	ar**k**-aa		ara**gˀ**-naa	ara**gˀ** !		see
	dur**k**-aa		duru**gˀ**-naa	duru**gˀ** !		move

(21) Tiberian Hebrew

		qal = simple		
root	pattern	pf. 3m sg $C_1aaC_2aC_3$	ipf 3 m pl yi-$C_1C_2əC_3$-uu	imperative 2f $C_1iC_2C_3$-ii	
√bSr		**b**aaSar	yi-**β**Sər-uu	**b**iSr-ii	"cut off"
√ʃbr		ʃaa**β**ar	yi-ʃ**b**ər-uu	ʃi**β**r-ii	"break"
√ktb		kaaθa**β**	yi-**β**təb-uu	kiθ**b**-ii	"write"

(22) High German Consonant Shift

	a. #__		b. Coda__		c. Coda __C	c. Coda __#		d. V__V	
p	**p**ath	**Pf**ad	car**p**	Kar**pf**en		shee**p**	Scha**f**	po**p**e	Pfa**ff**e
t	**t**en	**y**dgm	sal**t**	Sal**z**		tha**t**	da**s**	ha**t**e	ha**ss**en
k	**c**orn	**k͡χ**orn	than**k**	dan**k͡χ**e		strea**k**	Stri**ch**	ma**k**e	ma**ch**en

Fortition

(23) IE [j] > Greek

a. # __[2] *__j__ug- > **d͡z**ug-on "yoke" (Lat ***i****ugum*, Skr ***y****ugám*, Got ***j****uk*)

*__j__e(s)- > **d͡z**e-oo "boil" (Skr *yásati*, Ohg ***j****esan*)

b. C __

C_{lab} p *klep-**j**oo > klep**t**oo "steal"

b [no clear example]

C_{cor}[3] t *melit-**j**a > melit**t**a "bee"

d *od-**j**oo > o**d͡z**oo "smell of"

C_{vel} k *kaaruk-**j**o > keerut**t**oo "proclaim"

g *stig-**j**oo > sti**d͡z**oo "sting"

(24) Latin [j] > French

	a. #__		b. Coda__		c. Coda __C	c. Coda __#		d. V__V	
j	**j**o̲cu	**ʒ**ø	sa̲p**j**am	sa**ʃ**		ma̲**j**(u)	mɛ	ra̲**j**a	ʁɛ
	jura̲re	**ʒ**yʁe	ru̲b**j**u	ʁu**ʒ**ə				je**j**u̲nu	ʒœn

(25) Cypriot Greek

a. #__	b. Coda__ underlying	b. Coda__ surface	c. Coda __C	c. Coda __#	d. V__V
jatria	teri-azo	ter**k**-azo			lo**j**azo
jerakos	vari-ume	var**k**-ume			a**j**azin
	napi-o	naf**c**-o			
	e-pia-s-en	ef**c**a-s-en			
	vaθi-s (m)	vaθ**c**-a (f)			
	plati-s (m)	plaθ**c**-a (f)			
	not-ia	noθ-**c**a			

[2] In some cases, initial IE [j] is represented by Greek [h] as in Gr *heepar*, Lat *jecur*, Skr *yákr̲-t* "liver". Whether Greek shows [d͡z] or [h] in place of IE initial [j] is not predictable. This unclear situation has classically been acknowledged, see for instance Grammont (1948:93), Lejeune (1955:§152), Beekes (1995:143). However, it does not challenge the strengthening observed.

[3] The forms given are those of Attic. In some dialects, the same words show [-ss-], of which Lejeune (1955:§86) provides a survey. For discussion of (unexplained) [-ty-/-θy-] > [-s-] in some Attic words, see Lejeune (1955:§83).

(26) French consonantal epenthesis

Latin		French		
c<u>a</u>m(e)ra	>	ʃã**b**rə	chambre	"room"
sim(u)l<u>a</u>re	>	sã**b**le	sembler	"seem"
*<u>e</u>ss(e)re	>	ɛ(s)**t**rə	être	"be"
c<u>i</u>n(e)re	>	sã**d**rə	cendre	"ash"
l<u>a</u>z(a)ru	>	la**d**rə	ladre	"leprous (mod. miserly)"
sp<u>i</u>n(u)la	>	epɛ**g**lə	épingle	"pin"

Vocalic Face of the Coda Mirror

(27) Sievers's Law
Gothic

	"light" roots		vs.	"heavy" roots	
	√VC-	√VV-		√VVC-	√VCC
2sg pres	nas-j-is	stoo-j-is		sook-ij-is	sand-ij-is
3sg, 2pl pres	nas-j-iþ	stoo-j-iþ		sook-ij-iþ	sand-ij-iþ
	"save"	"keep"		"search"	"send"

Vedic
s-jaam, dvaa / …V # __

s-ijaam, duvaa / { …VC # __ ; …VV # __ ; initial in a line }

Generalisation

a. Sievers's Law
= vowel-zero alternation
after {C,#} plus C

[ø j] / VC __
[i j] / { # ; C } C __

b. vowel-zero alternations
before C plus {C,#}

zero / __CV
vowel / __ { # ; C } C

(28) Descriptive Adequacy

a. consonants stand in the Coda Mirror iff they occur **AFTER** an empty Nucleus

word-initial: [#**C**V…]

```
[C  V]  O  N…
    |   |  |
    ø   C  V
```

after a (heterosyllabic) consonant: […R**T**V…]

```
O  N  O  N
|  |  |  |
R  ø  T  V
```

b. consonants stand in Codas iff they occur **BEFORE** an empty Nucleus

word-final: […**C**#]	before a (heterosyllabic) consonant: […**R**TV…]
…O N #	O N O N
| |	| | | |
C ø	**R** ø T V

(29) Challenge due to the Mirror-effect

	structural description		segmental effect		syllabic analysis
Coda	__{#,C}	=	weakness	=	before empty Nuclei
	vs.		vs.		vs.
Coda Mirror	{#,C}__	=	strength	=	after empty Nuclei

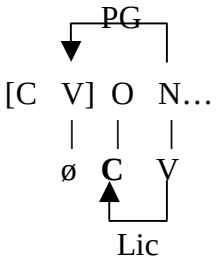
(30) Logical possibilities

Licensing	Government	gloss	segmental health according to predictions
+	–	Coda Mirror	splendid
	+	V__V	unfavourable
–	–	Coda	unfavourable
	+	*impossible*	---

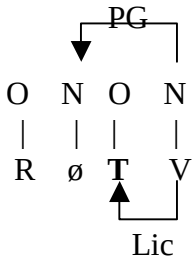
(31) Explanatory adequacy

ungoverned but licensed: Coda Mirror

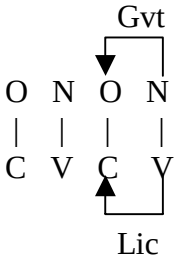
a. word-initial: [#**C**V…]



b. after a (heterosyllabic) consonant: […R**T**V…]

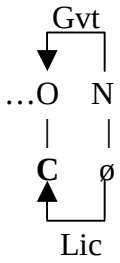


governed and licensed: […V**C**V…]

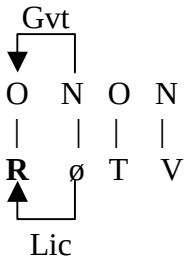


ungoverned and unlicensed: Coda

a. word-final: […**C**#]



b. before a (heterosyllabic) consonant: […**R**TV…]



(32) Coda and Intervocalic consonants are both lenition sites, but they do not lenite alike

process affecting a segment because of its position in a string	Coda	V__V
devoicing	typical	highly improbable
deaspiration (C^h-->C)	typical	highly improbable
velarisation (l,n-->ɬ,ŋ)	typical	highly improbable
s-debuccalisation (s-->h)	typical	highly improbable
liquid gliding (r,l-->j)	typical	highly improbable
depalatalisation (ɲ-->n)	typical	highly improbable
l-vocalisation (ɬ-->w/o)	typical	highly improbable
r-vocalisation/ loss ([kaad] "card")	typical	highly improbable
$[NC]_{hom}$: homorganisation of nasals	typical	highly improbable
spirantisation (b,d,g-->β,ðɣ)	highly improbable	typical
voicing (t-->d)	highly improbable	typical

(33) 31 logically possible combinations of contexts

nb		#__	Coda__	Coda __#	Coda __C	V__V	name	predictions made by The Coda Mirror
1	single contexts	x					half Strong Position	ok
2			x				half Strong Position	ok
3				x			half Coda	ok
4					x		half Coda	ok
5						x	Intervocalic	ok
6	pairs	x	x				Strong Position	ok
7		x		x				*
8		x			x			*
9		x				x		*
10			x	x				*
11			x		x			*
12			x			x		*
13				x	x		Coda	ok
14				x		x	half Coda + Intervoc	ok
15					x	x	half Coda + Intervoc	ok
16	triplets	x	x	x				*
17		x	x		x			*
18		x	x			x		*
19		x		x	x			*
20		x		x		x		*
21		x			x	x		*
22			x	x	x			*
23			x	x		x		*
24			x		x	x		*
25				x	x	x	Coda + V__V	ok
26	quadriplets	x	x	x	x			*
27		x	x	x		x		*
28		x	x		x	x		*
29		x		x	x	x		*
30			x	x	x	x		*
31	quintuplets	x	x	x	x	x	spontaneous sound shift	

Disjunctive contexts: {#__, __Vstress}

(34) English aspirated stops

aspirated stops occur word-initially and before a stressed vowel

#__	__Vstress	compare	#s__
p^{h}ut	polit^{h}ician	p^{h}olitics, p^{h}olítical	string
p^{h}rint	prot^{h}ést (verb)	p^{h}rótest (noun)	split
t^{h}ip	rep^{h}éat	repet^{h}ítion	scanty
t^{h}rick	c^{h}onc^{h}órd (verb)	c^{h}óncord	stand
c^{h}at			start
c^{h}rime			

analysis: stress provides a [C V], which is inserted before the stressed CV, and on which the consonant spreads. Aspirated consonants are geminates. Aspiration is blocked by #s+C because the C of the initial [C V]=# is not accessible. Difference between the [C V] provided by stress and the initial [C V]: both have an empty V, but the C is also empty in former, but not in the latter case.

(35) Grimm's Law

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

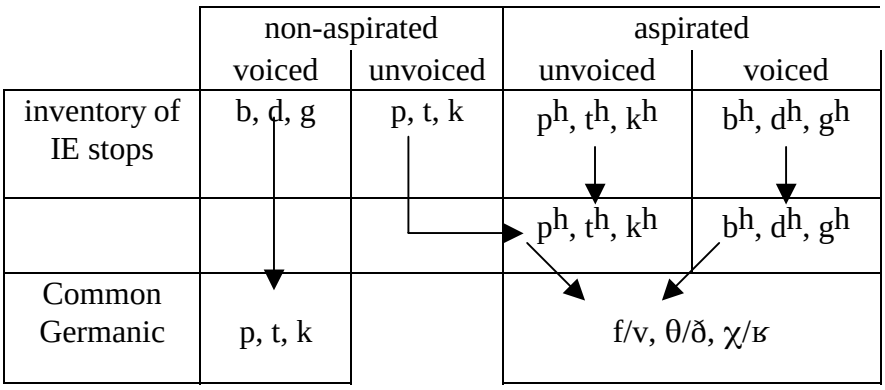
a. Spirantisation[4]

IE >	CG	> Got	Lat./Gr.	Goth.	
p,p^{h}	f	f	p̲ater	f̲adar	‘father’
	v	b	sep̲tem	si b̲un	‘seven’
b^{h}	v	b	fero	bairan	‘carry’
t,t^{h}	θ	θ	t̲res	*þ̲reis	‘three’
	ð	d	pa t̲er	fa d̲ar	‘father’
d^{h}	ð	d	Gr. δ̲bká	d̲aur	‘gate’
k,k^{h}	χ	h	c̲ornu	*h̲aurn	‘horn’
	ʁ	g	Gr. δVχkïí	*tag̲r	‘tear’
g^{h}	ʁ	g	h̲ostis	g̲asts	‘stranger’

b. Devoicing

b	p	p	(s)lubricus	*sliupan	‘sneak’
g	k	k	ego	ik	‘I’
d	t	t	edo	itan	‘eat’

[4] Spirantisation occurs in any context except sC-clusters (Got sp,sk,st) and ht,ft (e.g. Lat st̲ella, OHG st̲ërno) and IE [pt̲,kt̲] (e.g. Lat capt̲us, noct̲is, Got haft̲, naht̲s (OHG naht̲ > NHG Nacht̲)). Cf. Paul *et al.* (1989:113f). Abbreviations used in this article are IE Indo-European, CG Common Germanic, OHG Old High German, MHG Middle High German, NHG New High German, Lat Latin, Gr Greek.



(36) Verner's Law
regulates the voicing of the output of Grimm's Law. Classical formulation:

"Common Germanic fricatives that originate in Grimm's Law, as well as [s], are voiced iff the preceding vowel did not bear stress in IE" Paul et al. (1989:122s).

IE accent was free, and is recorded in Indo-Iranian (Sanskrit, Vedic etc.)
Missing piece of evidence: fricatives are always voiceless in #__.

position	IE	Germanic	Indo-Iranian preceding stress	Indo-Iranian following stress	compare with
initial	p	OE **f**oeder			
	t	Goth **þ**reis			Eng price
		Goth **þ**unnus		Skr tanúh	
		Goth **þ**reis		Skr trájah	Eng three
	k	Goth **h**aiha			Lat caecus
		Goth **h**und		Skr satám	Eng hundred
	k^w	OE **hv**aet			Lat quod, Eng what
	s	Goth **s**ibun			Eng seven
internal	p	OE hæ**f**od			Lat caput, Eng head
	t	OE brō**þ**ar	Ved bhrá**t**ar-		Eng brother
	k	OHG sve**h**ur	Skt śvá**ś**ura-		
	k	Goth taí**h**un	Gr δÝ**κ**α		Eng ten
	k^w	ON ul**f**r	Skt vṛ**k**a-		
	s	OE we**s**en			
	p	Goth si**b**un		Skt sa**p**tá-	Eng seven
	t	OE fæ**d**er		Ved pi**t**ár	Eng father
	t	Goth mo**d**ar		Skr ma**t**á	Eng mother
	t	Goth fi**d**wor		Skr ca**t**várah	Eng four
	t	Goth wa**d**i		Skr otúm	"bind"
	k	OE sve**g**er		Skt śvaṣ́rú	
	k	Goth ti**g**us		Gr δε**κ**Üò	
	k^w	Goth lei**hw**an			Lat lingere, Ger leihen
	k^w	ON yl**g**r		Skt vṛkí	
	s	OE ēa**r**e < *au**z**-			Lat auris

analysis: CG fricatives undergo lenition (voicing) everywhere but when they are able to geminate: in word-initial position (on the initial [C V]), and in post-stress position (on the [C V] provided by stress). Parameter: insertion of the stress-[C V] preceding or following the stressed vowel.

(37) consequence: morphology is an autonomous component of the grammar, in which decisions are made. However, it has no material expression of its own. The only way for morphology to be expressed is by phonology: a [C V].

In other words:	Signifié	of Morphology	= morphological
	Signifiant	of Morphology	= phonological

(38) French adverbial suffix –ment (Pagliano 1999)

a. grass – (ə) – ment	cf. gras
b. lucid – (ə) – ment	cf. lucide
c. goulu - ø - ment	cf. goulu
d. agréabl – e – ment	cf. agréable
e. sourd – (ə) – ment	cf. sourd
f. méch – a – ment	cf. méchant

Immunity of French schwa in #__ (Scheer 1999b)

(39) obligatory presence of a vowel in TR__, but not in RT__

-ien (Rizzolo 1999)

a. RT-jɛ̃	b. TR-ijɛ̃, *-jɛ̃
dunkerquien	calabrien
adverbien	hanovrien
brahmsien	sartrien
brechtien	zaratoustrien
marxien	zoroastrien
fitzgéraldien	
delphien	

…i-er

a. RT-je	b. TR-ije, *-je
remercier	approprier
morfier	oublier
ortier	multiplier
solfier	expatrier
calomnier	publier
	supplier

-ment

a. RT-(ə)mã	b. TR-əmã
vertement	agréablement
sourdement	aigrement
alertement	aimablement
balourdement	autrement
gaillardement	amplement
faiblardement	allègrement
fortement	confortablement
largement	favorablement

internal schwa

a. RT(ə)C	b. TRəC
marguerite	vendredi
forcené	édredon
farfelu	écrevisse
forgeron	engrenage
tourterelle	ableret
barbelé	fifrelin

(40) schwa may be omitted at the expense of losing the preceding Liquid

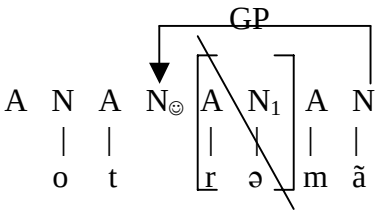
at a word boundary	within a word
un comptab(le) de gestion	aut(re)ment
un liv(re) d'art	agréab(le)ment
un minist(re) sans vergogne	aig(re)ment

(41) but never if [TRə] is initial

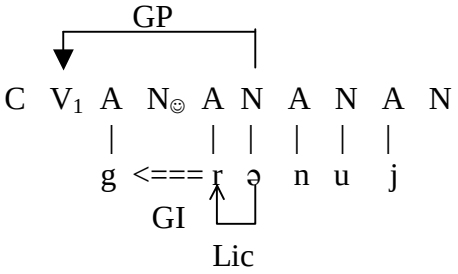
la grenouille la bredouille la grelot

la brebis	la bretelle	la grenade
le frelon	le breton	le preneur
je le fais crever	le brevet	la crevasse
le premier	la crevette	

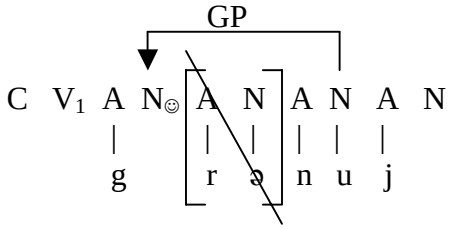
(42) aut"ment



(43) a. la grenouille



b. *la g"nouille



Compensatory Lengthening: IE Laryngeals

(44) Saussure's Laryngeal Theory
= Compensatory Lengthening due to the context-free fall of Laryngeals.
PIE $VH_xC >$ IE VVC
PIE $VH_x\# >$ IE VV# where H_x = any Laryngeal
Laryngeals are witnessed by:
a. the existence of IE long vowels in {C,#}
b. Anatolian scripts (discovered after Saussure's death)
c. alternating stems: $\sqrt{CVV-} < \sqrt{CVH_x-C\ldots}$
$\sqrt{CV-} < \sqrt{CVH_x-V\ldots}$

(45) IE Ablaut

	e	o	zero	
Greek	pél-omai	pól-os	é-pl-eto	become, axis
Greek	leip-ō	lé-loip-a	é-lip-on	leave (pres, pret, aor)
Goth	biud-a < beud	bauþ < boud	bud-um	bid (pres, prêt part.)
	ē	ō	ə	
Lat		dō-num	da-tus	gift, give part.
Lat		stā-re	sta-tus	stand inf, part.
Lat	sē-uī		sa-tus	sow perf, part.

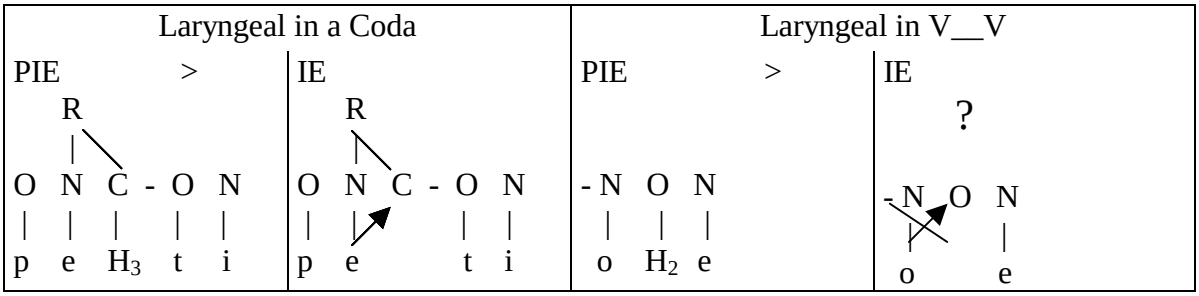
(46) H_x > ø / V__V

	√ + C	√ + V	
*√peH_3	inf athem *peH_3-ti > Skr pā-ti	redupl. them perf *pi-pH_3-e-ti > Skr pi-b-a-ti	drink, cf. slav. píti

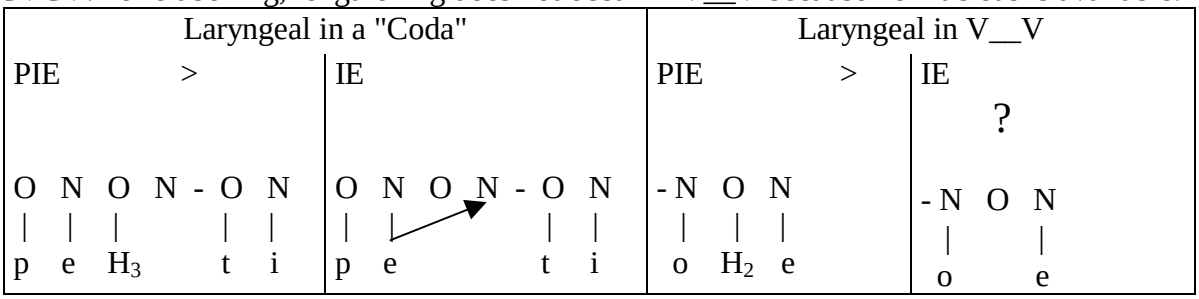
*√$pleH_1$-isto-	Gr pleistos		most

	Hittite	non-Anatolian	
*-o-H_2e	-ahha	-ō Gr pher-ō, Lat fer-o, Slav pek-u	1st sg

(47) Classical analysis: the vowel spreads on the position formerly occupied by the Laryngeal. Expense: relabelling a Coda as a Nuclus.



(48) CVCV: no relabelling, lengthening does not occur in V__V because no Nucleus is available.



(49) 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	zuuχ-te	zuuχ!	suchen, suchte, such!	"search, searched, search!"
zææ-en	zææ-te	zææ!	säen, säte, säe!	"sow, sowed, sow!"
buuχ	byyç- ä		Buch, Bücher	"book, books"

Somali (dh=retroflex d)

__C	__CC	
maalin	maalm-o	"day sg, pl"
keen, keen-aa	keen-taa	"bring inf, 1sg (habitude), 2sg (hab)"
	ʃaandh-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	t͡ʃiir-i	"small, clear NOMsg masc"
mal-aa	t͡ʃiir-a	"id. NOMsg fem"
mal-eemu	t͡ʃiir-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-tot͡ʃ-ka	za-taat͡ʃ-ka	"turn (dance), bend"
zaa-noʃ-ka	za-naaʃ-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 from

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

Czech: infinitives have at least two moras[6]

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		
?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."

Italian[7]

---

[5] The forms given illustrate the active perfective paradigm of sound triliteral roots.

[6] Only a handful of verbs such as *chvět se* "tremble", *pět* "sing" or *jet* "ride" disregard this generalization.

VVCV	VC-ø	VVTRV	VRTV	
faato	Si	piigro	parko	"destiny, ski, lazy, park"

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
kəlaßim, rəqaħim	"dogs, spices"
ha kkəlaßim	"the dogs"
haa rəqaħim	"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

PG

(50) Czech r-ř, Scheer (1998a)

a. [r] in word-final position in the Nominative of masculine nouns alternates with [ř] in Vocative forms of

the same words[8]:

NOM	VOC	
petr	petř-e	"Peter"
kmotr	kmotř-e	"godfather"
katr	katř-e	"(iron) bars, prison"
metr	metř-e	"meter"
kufr	kufř-e	"suitcase"
cvikr	cvikř-e	"monocle"
sachr	sachř-e	"Sacher, kind of cake"

---

[7]Long 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.

[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 [ř] 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.

kopr	kopř-e	"dill"
svetr	svetř-e	"pullover"
kapr	kapř-e	"carp"
mesr	mesř-e	character from Brecht's *Beggar's opera*

b. conditions on this alternation

1. no alternation with [-Vr]-stems

NOM	VOC	*VOC	
doktor	doktor-e	*doktoř-e	"doctor"
ponor	ponor-e	*pomoř-e	"flottation line"
mramor	mramor-e	*mramoř-e	"marble"
boxér	boxér-e	*boxéř-e	"boxer"
potěr	potěr-e	*potěř-e	"spawn"
tatár	tatár-e	*tatář-e	"Tatar"

2. no alternation with non-palatal suffixes

NOM	GEN		DAT		
petr	petra	*petř-a	petr-ovi	*petř-ovi	"Peter"
kmotr	kmotra	*kmotř-a	kmotr-ovi	*kmotřovi	"godfather"
katr	katru	*katř-u	katr-u	*katř-u	"(iron) bars"
metr	metru	*metř-u	metr-u	*metř-u	"meter"
kufr	kufru	*kufř-u	kufr-u	*kufř-u	"suitcase"
cvikr	cvikru	*cvikř-u	cvikr-u	*cvikř-u	"monocle"
sachr	sachru	*sachř-u	sachr-u	*sachř-u	"Sacher"
mesr	mesra	*mesř-a	mesr-ovi	*mesř-ovi	character from Brecht's *Beggar's opera*

References

Charette, Monik 1990. Licence to govern. In: Phonology Yearbook 7.2, 233-253.

Charette, Monik 1991. Conditions on phonological government. Cambridge: CUP.

Dienes, Péter & Péter Szigetvári ms. Repartitioning the skeleton: VC phonology. Eötvös Loránd University, Budapest.

Goldsmith, John 1990. Autsegmental & Metrical Phonology. Oxford: Blackwell.

Gussmann, Edmund & Jonathan Kaye 1993. Polish Notes from a Dubrovnik Café. In: SOAS Working Papers in Linguistics and Phonetics 3, 427-462.

Gussmann, Edmund & Eugeniusz Cyran 1998. Polish consonantal sequences: a phonological testing ground. In: Cyran, Eugeniusz (ed): Structure and Interpretation, 127-138. Lublin: Pase.

Harris, John 1990. Segmental complexity and phonological government. In: Phonology Yearbook 7.2, 255-300.

Harris, John 1994. English sound structure. Oxford: Blackwell.

Harris, John 1997. Licensing Inheritance. In: Phonology Yearbook 14.3.

Harris, John & Edmund Gussmann 1998. Final Codas: why the West was wrong. In: Cyran, Eugeniusz (ed): Structure and Interpretation, 139-162. Lublin: Pase.

Heo, Yong 1994. Empty categories and Korean Phonology. Doctoral dissertation, School of Oriental & African Studies, London.

Itô, J., R.A. Mester 1993. Licensed segments and safe paths. Revue Canadienne de Linguistique **38**, 198-213.

Kaye, Jonathan 1989. Phonology: a cognitive view. London: Erlbaum.

Kaye, Jonathan 1990. 'Coda' licensing. In: Phonology Yearbook 7.2, 301-330.

Kaye, Jonathan 1992. Do you believe in magic? The story of s+C sequences. In: SOAS Working Papers in Linguistics and Phonetics 2, 293-313.

Kaye, Jonathan & Jean Lowenstamm 1985. Compensatory Lengthening in Tiberian Hebrew. In: Wetzels, L. & E. Sezer (eds). Studies in Compensatory Lengthening, 97-132. Dordrecht: Foris.

Kaye, Jonathan, Jean Lowenstamm, Jean-Roger Vergnaud 1985. The internal structure of phonological representations: a theory of Charm and Government. In: Phonology Yearbook 2, 305-328.

Kaye, Jonathan, Jean Lowenstamm, Jean-Roger Vergnaud 1990. Constituent structure and government in phonology. In: Phonology Yearbook 7.2, 193-231.

Larsen, Bergeton Uffe 1998. Vowel length, Raddoppiamento Sintattico and the selection of the definite article in Italian. In: Sauzet, Patrick (ed). Langues et Grammaire II-III, Phonologie, 87-102. Paris: Université Paris 8.

Lowenstamm, Jean 1996. CV as the only ayllable type. In: Durand, Jacques, Bernard Laks (eds). Current trends in Phonology: Models and Methods, 419-441. Salford, Manchester: ESRI.

Lowenstamm, Jean in press. The beginning of the word. In Rennison, John (ed): Syllables !? The Hague: HAG.

McCarthy, John 1979. Formal problems in Semitic phonology and morphology. Doctoral Dissertation, MIT. Published 1985, New York: Garland.

Pagliano, Claudine 1999. Formation des adverbes en –ment en français. M.A. dissertation, Université de Nice.

Paul, Hermann, Peter Wiehl, Siegfried Grosse 1989. Mittelhochdeutsche Grammatik. Tübingen: Niemeyer, 23th edition.

Rizzolo, Olivier 1999. La formation des adjectifs dérivés en –ien en français. M.A. thesis, Université de Nice.

Rowicka, Grażyna 1999. On Ghost Vowels. A Strict CV Approach. Doctoral Dissertation, Leiden University.

Scheer, Tobias 1996. Une théorie de l'interaction directe entre consonnes. Doctoral dissertation, Université Paris 7.

Scheer, Tobias 1997. Vowel-zero alternations and their support for a theory of consonantal interaction. In: Bertinetto, P.M., L. Gaeta, G. Jetchev, D. Michals (eds): Certamen Phonologicum III, 67-88. Torino: Rosenberg & Sellier.

Scheer, Tobias 1998a. A unified model of Proper Government. The Linguistic Review 15, 41-67.

Scheer, Tobias 1998b. Governing Domains are Head-Final. In: Cyran, Eugeniusz (ed): Structure and Interpretation, 261-285. Lublin: Pase.

Scheer, Tobias 1999a. A Theory of Consonantal Interaction. Folia Linguistica 32, 201-237.

Scheer, Tobias 1999b. Aspects de l'alternance schwa-zéro à la lumière de "CVCV". Recherches Linguistiques de Vincennes 28, 87-114.

Ségéral, Philippe & Tobias Scheer ms. The Coda Mirror. Université Paris 7 & Université de Nice.