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A representational theory of morphological information in phonology

I. The problem

(1) familiar treatments of morphological information:
the expression of morphological information is achieved

a.	by juncture-phonemes	american structuralism (e.g. Moulton 1947, Hockett 1955,1958): "#" is a phoneme that enjoys the same status as /p/, /a/ etc.
b.	by diacritics	e.g. SPE: "#", "=", "+"
c.	procedurally	Lexical Phonology: FIRST an a phonological rule applies, THEN an affix is added, or vice-versa

(2) it should be

a.	phonological	i.e. using ONLY objects that are known in phonology
b.	privative	contrasts are expressed through the presence vs. the absence of these objects, not through different values (plus vs. minus) thereof.

(3) why diacritics are odd

a. they are arbitrary
   1. in number:
      no theory can limit or predict their number, cf. Stanley (1973) with no less than 15 different boundary-diacritics for Navaho.
   2. in nature:
      "#" is just as good as "pink horse". Naming them X or Y does provide no insight into their identity.
   3. in effect:
      there is never a causal relation between a given boundary and an observed effect: "#" can trigger gemination, and it can inhibit gemination. No theory has even tried to propose that a given boundary has a predictable effect.

b. they are linguistic aliens
   1. nothing of the kind is known in phonology: they are no phoneme
      nothing of the kind is known in morphology: they are no morpheme
      nothing of the kind is known in syntax: they are no syntactic prime
      nothing of the kind is known in semantics: they are no semantic prime
   2. what they are
      the only statement a linguist can make is
      "I know that these objects are real, I don't know what they are made of. Until I know better, I have to name them in an arbitrary way."

3. epistemologically speaking,
   they enjoy the status of variables in scientific investigation: we have identified an object whose relevance is beyond any doubt. We will name it X until we know better. No science can afford to host X's and treat them on a par with objects whose identity is established.
   Hence, every linguist should be eager to discover the real identity of diacritics, and feel uneasy when implementing aliens within his theory.
   The general behaviour of phonologists is not in line with this statement. The legitimy of diacritics is never questioned.

(4) non-diacritical proposals
   a. boundary-phonemes
      "#" etc. obviously do not behave like /p/ etc.
   b. Lexical Phonology
      has eliminated diacritics from the theory, although this was not intended: diacritics are replaced by a procedural device, i.e. the Lexical and Postlexical Modules (but other diacritics remain: brackets).
      1. Lexical Phonology is "#", "+", "=" – free
      2. the effect of boundaries is achieved by the procedural device. Rules never appeal to boundaries. Instead, they apply at different Lexical Levels.
      3. the elimination of boundaries from the theory is a side-effect of the research-programme of Lexical Phonology. It does not feature among its intents.
      4. one sole kind of diacritics remains: the brackets that indicate the edges of morphemes. Lexical Phonology Rules may make reference to these brackets. In the treatment of derived environment effects, the existence of these brackets is crucial, e.g. Polish [gł**ó**d**]** – [[gło**d͡ź]** **[e**]] vs. [**de**sant] (Rubach & Booij 1984). Palatalization applies in the presence of a palatal agent only if the palatalizable consonant occurs before "]".

II. The proposal

(5) representational, privative and non-procedural alternative:
   a. morphology decides whether morphological information is projected into phonology or not.
   b. the Signifiant of any morphological information projected into phonology is truly phonological. Its Signifié is morphological.
   c. proposal for the phonological identity of "#" = "beginning of the word":
      CV, i.e. an empty Onset followed by an empty Nucleus (Lowenstamm 1999).
      Signifié: "beginning of the word"
      Signifiant: CV = **representational**
   d. hence, morphological information in phonology is **privative**:
      1. "the beginning of the word" is materialized by "CV" if it is projected into phonology.
      2. "the beginning of the word" is materialized by nothing if it is not projected into phonology.
   e. boundary-treatments cannot be privative: "#" IS the beginning of the word. There is no way to refer to "the beginning of the word" without referring to "#".

f. because this alternative uses truly phonological objects and is representational, it makes predictions as to the effect of the boundary proposed: there is a causal relation between the phonological identity of the boundary and the phonological effect observed.
   1. representational
      "the beginning of the word" has a stable cross-linguistic identity if it is projected into phonology: CV. Thus, the effect thereof is also stable and predictable.
   2. "#", "+", "="
      no prediction of any kind. In language X, "the beginning of the word" may be a "strong" boundary when prefixation occurs, in a language Y, it may be "weak". No contradiction, no prediction.
   3. Lexical Phonology
      prefixation may be a level-1 or a level-2 process, "the beginning of the word" has no stable cross-linguistic identity. Hence, no predictions ensue.

(6) example: French gliding Dell (1976:109)

√...i,u,y + V —> [√...ij, uw, yɥ V]			vs.	...i,u,y + √V... — > [i,u,y + V]	
lier		"tie"		bi-annuel	[biannyɛl]
liais	[lijɛ]	"I tied"		anti-existentiel	[ãntiɛgzistãsjɛl]
lions	[lijɔ̃]	"we tie"		archi-ondulé	[aχʃiɔ̃dyle]
lia	[lija]	"I tied" passé simple			

a. classical interpretation: "strong" vs. "weak" boundary.
b. Lexical Phonology-interpretation: suffixes are concatenated before phonology operates, but prefixes are joined after phonology is performed.
c. representational interpretation: morphology projects a CV between prefix and root, but does not project anything between root and suffix.
   "√ # suffix" = √ suffix
   vs.
   "prefix # √" = prefix CV √
   French gliding applies in intervocalic context. This statement is given a new meaning now: [i__a] is intervocalic in "lia", but not in "biannuel".

lia [lija] biannuel [bianyɛl]

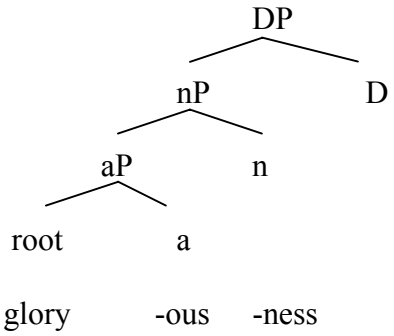
(7) how do we know whether a morphological boundary triggers or inhibits phonological processes?
   a. Lexical Phonology: we do not know.
   b. representational: if morphological information is projected into phonology, phonology decides how this object must be interpreted.
      1. if the phonological process at hand is a place-demander, e.g. gemination, then the presence of an empty CV will trigger this process.
      2. if on the other hand the process takes place in intervocalic contexts only, as is the case in the French example above, the presence of an empty CV will inhibit this process.
   c. ==> the representational alternative makes predictions that may be falsified where Lexical Phonology only records the facts observed.

(8) occurring empirical situations
the concatenation of two morphemes M_1 and M_2 may
   a. block a phonological process that involves heteromorphemic segments and takes place in case these segments are monomorphemic, or belong to a different couple of morphemes.
   b. be a condition on the existence of a phonological process that involves heteromorphemic segments and does not take place in case these segments are monomorphemic, or belong to a different couple of morphemes.
   c. play no role in phonological matters: the string behaves as if there were no morphological boundary.

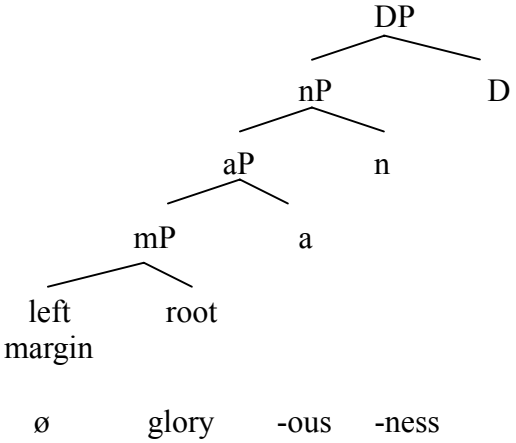
(9) summary of the three implementations

	Lexical Phonology	representational	Kaye (1995)
a morphological boundary blocks a phonological process	Lexical Module the phonological rule applies at level X, while the affixation of the relevant morphemes takes place at level X+n.	presence of a CV the phonological process at stake needs adjacence	analytic domain not specified
a morphological boundary triggers a phonological process	Lexical Module Derived Environment Effect the phonological rule is sensitive to bracketing and applies at level X. Affixation of the triggering morphemes takes place at level X+n, and Bracket Erasure is performed at the end of each level.	presence of CV the phonological process at stake needs extra skeletal space	Analytic domain not specified
a morphological boundary has no effect on phonology	Postlexical Module	absence of CV	non-analytic domain

(10) seen from above:
morphological representation of the DP in Distributed Morphology
(e.g. Halle & Marantz 1993)



(11) possible amendement thereof



III. What can make you believe in empty Nuclei?

(12) basic pattern of Slavic vowel-zero alternations

	C__C-V	C__C-ø	C__C-CV	gloss
Czech	lok**ø**t-e	lok**e**t-ø	lok**e**t-ní	"elbow" GENsg, NOMsg, adj.
Polish	woj**ø**n-a	woj**e**n-ø	woj**e**n-ny	"war" NOMsg, GENpl, adj.

etc.

(13) naive analysis thereof
- a. alternation-sites are mute in open syllables
  alternation-sites are vocalized in closed syllables
- b. their vocalization is a consequence of syllable structure: the immediate trigger is the presence of a Coda in the same syllable.
- c. the presence or the absence of a following vowel has only an indirect incidence on their vocalization.

(14) however

	open syllable		closed syllable		
	zero vowel				
	C__C-V	C__C-yer CV	C__C-ø	C__C-CV	gloss
Czech	dom-**ø**k-u	dom-**e**č-ek-ø	dom**e**k-ø	dom-**e**č-øk-u	house dim.GENsg, double dim. NOMsg, dim. NOMsg, double dim. GENsg
Slovak	kríd-**ø**l-o	kríd-**e**l-iec-ø	kríd-**e**l-ø	kríd-**e**l-øc-e	wing dim.NOMsg, double dim. GENpl, dim. GENpl, double dim. NOMsg
Polish	buł-**ø**k-a	buł-**e**cz-ek-ø	buł-**e**k-ø	buł-**e**cz-øk-a	bread row dim. NOMsg, double dim. GENpl, dim. GENpl, double dim. NOMsg
Serbo-Croatian	vrab-**ø**c-a	vrab-**a**c-a	vrab-**a**c-ø		sparrow GENsg, GENpl, NOMsg

(15) generalisation

a. alternation-sites are vocalized in open syllables iff the following vowel alternates with zero itself.
b. vowels that alternate with zero are called yers in Slavic for historical reasons.
c. hence, zero occurs in closed syllables and before yers.
d. theory is called to be able to refer to this disjunctive context in a uniform fashion. The closed-syllable analysis is contrary to fact.
e. hence, generalisation of the yer-context (leaving aside the debate on insertion-deletion, as well as the question of the fate of yers that never appear on the surface (stray erasure, erasure by rule etc.)):
alternation-sites are vocalized iff followed by a yer in the next syllable.
ь,ъ —> e,o / __C_0 {ь,ъ}
Havlíkovo pravidlo 1889 (Havlík 1889), Lower: Lightner (1965), Rubach (1984), etc.
f. price to pay: underlying yers have to be postulated where they never appear on the surface.

Underlying yers (Y) occur	possible motivation by	example
morpheme-initially		
adj. /-Yn/: /lokYt-Yn-í/ —> loket-øn-í	alternation	nemoc-n-ý – nemoc-en-ø
dim. /-Yk/: /dom-Yk-u/ —> dom-øk-u		dom-ek
etc.		
word-finally		
GENpl /kříd-Yl-Y/ —> křídel	there was	< krid-el-ъ
NOMsg /básYn-Y/ —> báseň	always a	< ba-snь
NOMsg /dYn-Y/ —> den	historical yer	< dьnь

g. triggering yers are either historically real, or show in alternations.
Alternating yers are not always historically real:
feminine i-stems
NOMsg píse<u>ň</u>-<u>ø</u> - GENsg písn-ě < NOMsg psl *pě-sn<u>\</u>
NOMsg báse<u>ň</u>-<u>ø</u> - GENsg básn-ě < NOMsg psl *ba-sn<u>\</u> < IE *bhā
etc.
h. thus, the synchronically underlying object "yer" = /Y/ is an abstract theoretical vowel, not a diachronic reality.

(16) consequences
a. vowel-zero alternations are not triggered by the presence or absence of a consonant in a given syllable (Coda-analysis), but by an intervocalic communication.
b. we face a relation between two yers.

(17) however, this distributional pattern extends beyond vowel-zero alternations

	open syllable		closed syllable		gloss
	C__C-V	C__C-yer	C__C-ø	C__C-CV	
Czech VV-V	ž**á**b-a	ž**a**bek-ø	ž**a**b-ø	ž**a**b-øk-a	frog NOMsg, dim. GENpl, GENpl, dim. NOMsg
	j**á**dr-o	j**a**der-ní	j**a**der-ø		stone (of a fruit) NOMsg, nuclear, GENpl
Czech ů-o	n**o**ž-e	n**ů**ž-ek-ø	n**ů**ž-ø	n**ů**ž-øk-y	knife GENsg, scissors (=dim.) GENpl, knife NOMsg, scissors NOMpl
Polish ó-o	kr**o**v-a	kr**ó**v-ek-ø	kr**ó**v-ø	kr**ó**v-øk-a	cow NOMsg, dim. GENpl, GENpl, dim. NOMsg
Polish ą-ę	z**ę**b-a	z**ą**b-ek	z**ą**b-ø	z**ą**b-øk-u	tooth GENpl, dim. NOMsg, NOMsg, dim. GENsg

(18) hence
a. vowels behave alike in closed syllables and in open syllables iff the following vowel is a yer.
Or: vowels in open syllables that occur before yers behave like if they stood in closed syllables.
b. if the identity of this distribution with the one known from vowel-zero alternations is not accidental, the generalisation in order must be as follows:
1. vocalic alternations in Slavic languages are triggered by yers.
2. triggering yers are abstract vowels that occur overtly after Onsets, and underlyingly after Codas and in word-final position.
3. target-vowels may be yers themselves (vowel-zeor alternations), but may be regular vowels as well.
4. The generalisation may not be achieved using the yer-vocalisation rule (15)e. It is of more general intervocalic nature.
5. triggering and alternating yers are not the same.

(19) however, this distributional pattern extends beyond Slavic
French [ɛ] – schwa alternation

closed syllable	open syllable		
ɛC#	ɛCə	əCV	
mɔχs**ɛ**l	mɔχs**ɛ**ləmã	mɔχs**ə**lɔ̃, mɔχs**ə**le	1) je, tu, il, ils morcèle(s)(nt), 2) morcèlement, 3) nous morcelons, 4) inf./ part./ vous morceler/ -é/ -ez
ap**ɛ**l	ap**ɛ**ləra	ap**ə**le	j'appelle, appellera, appellation
ãsɔχs**ɛ**l	ãsɔχs**ɛ**ləmã	ãsɔχs**ə**le	j'ensorcèle etc., ensorcèlement, ensorceler etc.
aχs**ɛ**l	aχs**ɛ**ləmã	aχs**ə**le	je harcèle etc., harcèlement, harceler etc.
aʃ**ɛ**v	aʃ**ɛ**vəmã	aʃ**ə**ve	j'achève etc., achèvement, achever etc.
s**ɛ**vʁ	s**ɛ**vʁəʁa	s**ə**vʁe	elle sèvre, sèvrera, sevrer, sevrage
		s**ə**vʁaʒ	

(20) French ATR-alternations of mid vowels

	closed syllable	open syllable __Cə	open syllable __CV	
e	f**ɛ**t	s**ɛ**ləʁi	f**e**te	je fête, céleri, fêter
	p**ɛ**ʁdy	b**ɛ**təʁav	p**e**ʁiʁ	perdu, betterave, périr
	səʁ**ɛ**n	sər**ɛ**nəmã	seʁ**e**nite	sereine, sereinement, sérénité
o	k**ɔ**d	m**ɔ**kəʁi	k**o**de	code, moquerie, coder
	r**ɔ**z	r**ɔ**zəʁɛ	r**o**zje	rose, roseraie, rosier
	s**ɔ**bʁ	s**ɔ**bʁəmã	s**o**brijete	sobre, sobrement, sobriété
ø	øʁ**œ**z	ør**œ**zəmã	ap**ø**ʁe	heureuse, heureusement, apeuré
	œvʁ	b**œ**vəʁi	**ø**vre	œuvre, beuverie, œuvrer
	ʒ**œ**n	v**œ**ləri	ʒ**ø**nɛs	jeune, veulerie, jeunesse

(21) Romance diphthongisation of latin short tonic [e,o] in Italian

	__CV		__CCV		__CV if V=reduced since latin	
é	sedet	siede	fésta	fésta	hédera	édera
	fele	fiele				
	petra	pietra				
ó	novum	nuovo	córpus	córpo	móbilis	móbile
	*morit	muore			pópulus	pópolo
	*potet	puo				

Latin "internal apophony":
the distribution of penults in proparoxytons is reduced to [i,u]:
facilis vs. difficilis latin doublets: opt**i**mus, opt**u**mus
fr. f**a**cile – diff**i**cile
b**a**rbe – imb**e**rbe
ch**a**ste – inc**e**ste
ami – enn**e**mi

(22) generalisation
a. +ATR and schwa occur in open syllables
b. -ATR and [ɛ] occur in closed syllables AND in open syllables if the following vowel is a schwa.
Or:
-ATR and [ɛ] occur in closed syllables AND in open syllables if the following vowel is alternating with zero itself.

(23) hence, if all this is not accidental

a. there must be yers in French underlying representations:

	open syllable		closed syllable	
	no yer	yer after Codas, present in [ ]	word-finally	yer after Codas, absent in [ ]
	C__C-V	C__C-YCV	C__C-Y	C__C-YCV
Slavic	kr**o**v-a	kr**ó**v-Yk-Y	kr**ó**v-Y	kr**ó**v-Yk-a
French	se**ʁ****ɛ**nite	sər**ɛ**nYmã	sə**ʁ****ɛ**n-Y	sər**ɛ**nYmã
		[sər**ɛ**nəmã]		[sər**ɛ**nømã]

b. there are no yers in French. What kind of vocalic object could be common to both Slavic and French ?

c. the generalisation must be formulated as a rule of intervocalic communication.

(24) what about this ?

a. we said that triggering yers are "abstract vowels that do not appear on the surface". What is an "abstract vowel" in autosegmental representations?
It is an empty Nucleus: Anderson (1981), Spencer (1986), Kaye et al. (1990), Kaye (1990), Scheer (1998a,b).

b. we said that the relevant generalisation must be formulated as an intervocalic communication. What is an "intervocalic communication" if the vowels concerned are "abstract vowels" in the sense of a) ?
It is not intervocalic, but internuclear.

(25) welcome to Government Phonology

a. triggering yer = empty Nucleus

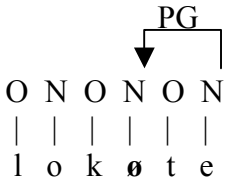
b. the internuclear relation at stake = Proper Government (PG)

c. syllabic structure is present in underlying representations.

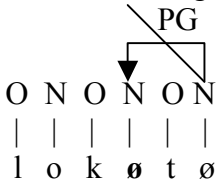
d. application to vowel-zero alternations:
the phonological Empty Category Principle (Kaye et al. 1990)

1. an empty Nucleus may remain phonetically unexpressed iff it is properly governed or domain-final.
2. a Nucleus that is properly governed may not act as a governor.
3. empty Nuclei that escape PG must be phonetically expressed. They are subject to epenthesis.

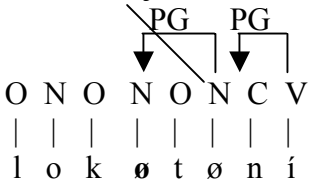
lokø**t**-e GENsg



loke**t**-ø NOMsg



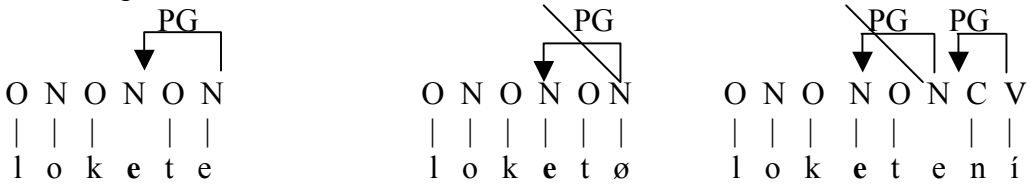
loke**t-n**í adj.



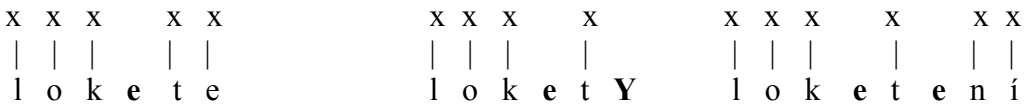
e. later on (Scheer 1997,1998c), d3) was abandoned in favour of an analysis where alternating vowels are underlyingly present, for the reasons that are described e.g. in Rubach (1993:135ff).
   1. alternating vowels are underlyingly unattached to their Nuclei: they are floating.
   2. non-alternating vowels are underlyingly attached to their Nuclei.
   3. floating vowels whose Nucleus is not sentenced to muteness because it is properly governed attach to this Nucleus and become audible.
   4. this move is exactly parallel to the one taking the linear analysis of Lightner (1965) to an autosegmental level: Kenstowicz & Rubach (1987), Rubach (1986). The only difference is structure-preservation: non-phonetic yers are deleted or subject to stray-erasure under the latter analysis, they are present at any level under the former. The latter does not recognize empty Nuclei, the former does.

   underlying representation in CVCV:

   surface representation in CVCV:



   underlying representation according to
   Kenstowicz & Rubach (1987), Rubach (1986):



(26) welcome to CVCV
   a. non-Slavic evidence enforces to look for an identity of the alleged "abstract vowels" that is different from "yers" and shared by all languages.
   b. genuine Government Phonology-claim (Kaye 1990):
      words that are phonetically C-final end in fact in an empty Nucleus.
      word-final consonants are not Codas, but the Onset of a syllable whose Nucleus is empty.
   c. CVCV says (Lowenstamm 1996, Scheer 1998a,b, Ségéral & Scheer forth):
      the two consonants that are commonly analyzed as a Coda-Onset sequence do pertain to two different Onsets which are separated by an empty Nucleus.
      There are no Codas.

d. the postulated empty Nuclei instantiate exactly the position of triggering yers.

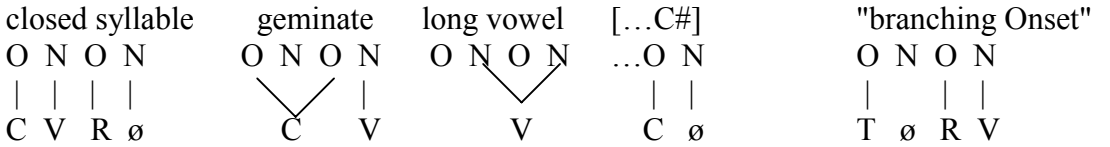
	open syllable		closed syllable	
	no yer C__C-V	yer after Codas, present in [ ] C__C-YCV	word-finally C__C-Y	yer after Codas, absent in [ ] C__C-YCV
Slavic	kr**o**v-a	kr**ó**v-Yk-Y	kr**ó**v-Y	kr**ó**v-Yk-a
French	se**ʁ****ɛ**nite	sər**ɛ**nYmã [sər**ɛ**nəmã]	sə**ʁ****ɛ**n-Y	sər**ɛ**nYmã [sər**ɛ**nømã]

e. The Coda Mirror (Ségéral & Scheer forth):
phenomena other than vowel-zero alternations are driven by Proper Government.
==> "strength" vs. "weakness" of Consonants, vowel-length.

IV. Missing pieces for CVCV

(27) missing piece for CVCV all over the place: branching Onsets

a. syllable structure burns down to a strict consecution of non-branching Onsets and non-branching Nuclei. There are no Codas and no branching constituents.
"T" = any obstruent, "R" = any sonorant

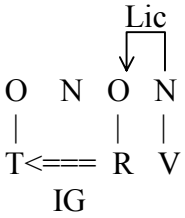


(28) basic generalisations I
open vs. closed syllable
if a "yer" = empty Nucleus separates a "Coda" from the following Nucleus, the syllabic constituent "Coda" may not be used in order to refer to Closed-Syllable phenomena.
How is this most basic of all phonological opposition achieved in CVCV ?

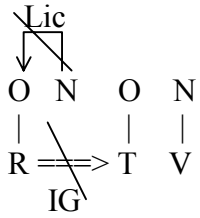
a. consonants may interact. C_1 may govern C_2 iff
   1. it is more complex than C_2 — Harris (1990)
   2. it is licensed by its Nucleus = Government Licensing — Charette (1990,1991)
   3. the relation established by C_1 over C_2 is called Infrasegmental Government (IG) — Scheer (1996,1998b,c, 2000)
   4. a Nucleus enclosed by a domain of IG is phonetically absent
      hence, a Nucleus is inaudible iff
      - it is struck by PG
      - it is enclosed within a domain of IG
   5. Sonorants are more complex than Obstruents. — Scheer (1996, 1998b)
      Sonorants are governors, Obstruents are governees

b. one consequence:
progressive IG is ruled out because only Rs are governors, and in a $C_1øC_2V$ sequence, only C_2's Nucleus is filled. Only audible Nuclei are licensors. Thus, C_1 will always fail to be licensed.

regressive IG

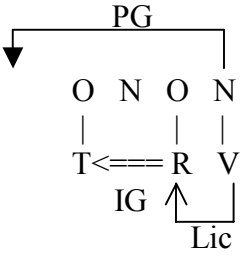


progressive IG is ruled out

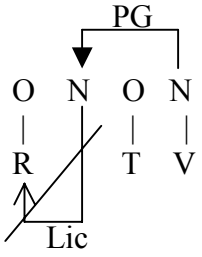


c. another consequence:
1. the empty Nucleus enclosed within a TøRV cluster does need no care from V because it is enclosed within a domain of IG.
2. the empty Nucleus enclosed within a RøTV cluster requests PG from V since it will never be able to satisfy the ECP through IG.
3. hence, in the case of TøRV, but not in RøTV sequences, the PG coming from V can reach beyond the entire cluster.

PG can reach beyond TR because it does not have to take care of the empty Nucleus

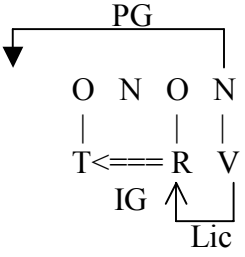


PG cannot reach beyond RT because it must take care of the empty Nucleus

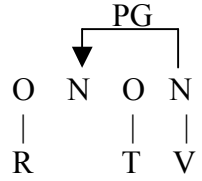


(29) basic generalisations II
a Consonant in a "Coda" is a Consonant that occurs before an empty Nucleus that is properly governed.

T occurs before an empty Nucleus which is not properly governed
==> T does not "belong to a Coda"



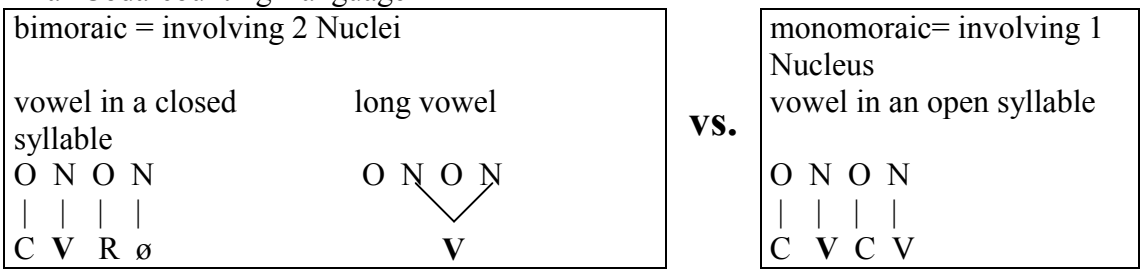
R occurs before an empty Nucleus which is properly governed
==> R "belongs to a Coda"



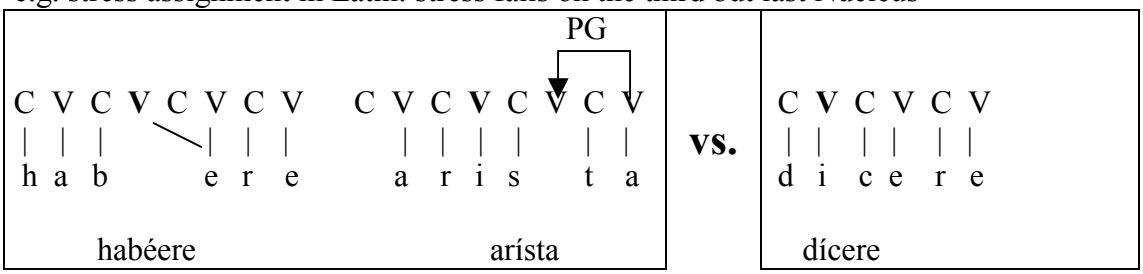
(30) basic generalisations III
morae do not exist, consonants NEVER count

a. basic argument in favour of morae:
you cannot get the equivalence VV = VC in syllabic terms

b. this equivalence is straightforward in CVCV
in a "Coda-counting" language



e.g. stress assignment in Latin: stress falls on the third but last Nucleus



c. "Codas count" is an optical illusion: you do not count Codas, but the empty Nuclei that follow them.
Uniformisation: prosody does not sometimes count vowels alone, and sometimes vowels and certain consonants. Only Nuclei count.

d. the parameter is not
"Coda-counting" vs. "languages that do not count Codas"
but
"languages that count empty Nuclei" vs. "languages that count only filled Nuclei"

e. the **observation** that Onsets, as opposed to Codas, never count receives an **explanation**:
only Nuclei count. Codas occur before (properly governed) empty Nuclei, Onsets never do.
No such explanation available in Moraic Theory.

V. Initial consonant clusters

(31) typological situation among the world's languages

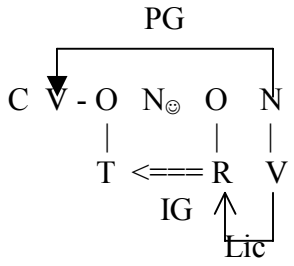
a. #TR-only language
#TR exist, #RT does not exist
e.g. German, English etc.

b. anything goes
#TR and #RT exist
e.g. Slavic, Moroccan, Algerian Arabic, Berber

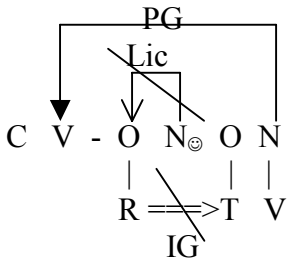
c. #RT-only language
#RT exist, #TR does not exist
no language of that kind on record

(32) hence, if "#" = CV, then

#TRV is well formed
because the ECP of the initial V is satisfied



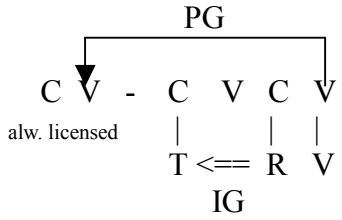
#RT is ill-formed
because the ECP of the initial V is not satisfied.

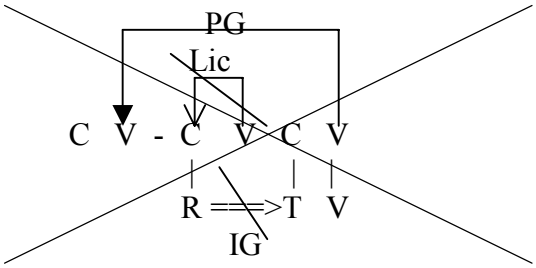


there is a direct causal relation between the presence of the initial CV and the impossibility of #RT-clusters.
If the initial CV is absent, no such restriction obtains: initial clusters are predicted to be free.

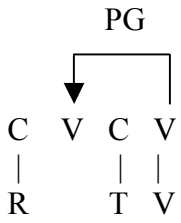
(33) the initial CV is present in #TR-only languages
the initial CV is absent in anything-goes languages

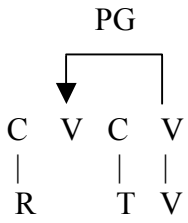
a. initial cluster in a #TR-only language





b. initial clusters in an anything-goes language





(34) benefits

a. one single parameter derives the entire empirical picture:
presence of the initial CV ==> #TR-only languages **privative**
absence of the initial CV ==> anything-goes language
b. if the initial CV is present, the absence of #RT is predicted.
c. if the initial CV is absent, any #CC is predicted to be able to occur.
d. the absence of #RT-only languages is predicted.

5.1. Bielorussian: word-boundaries play (almost) no role

(35) Bielorussian /v/

/v/	[v] /	V__V	korova	"vache NOMsg"
		#__V	vada	"eau"
		Coda__	barva	"coloration"
	[w] / Coda =	__C	korowka	"petite vache"
		__#	korow	"vache GENpl"
	[u] / #__C		udava	"veuve"

(36)
a. taja **w**dava "cette veuve"
brat **u**davy "le frère de la veuve"
b. taja **v**ada "cette eau"
brat **v**ady "le frère de l'eau"

(37)

/v/ next to word-boundary		word-internal /v/	result			
…C # __C	=	#__C	[u]	brat **u**davy	=	**u**dava
…C # __V	=	Coda__	[v]	brat **v**ady	=	bar**v**a
…V # __C	=	Coda	[w]	taja **w**davy	=	koro**w**, koro**w**ka
…V # __V	=	V__V, #__V	[v]	taja **v**ada	=	koro**v**a

(38) generalisation
a. utterances are headed by a CV-unit.
b. within utterances, no CV-units are distributed.

(39)

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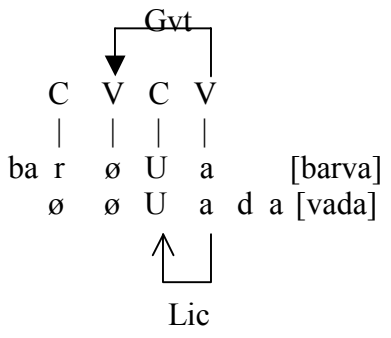
<td>/v/ following empty Nuclei
 
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 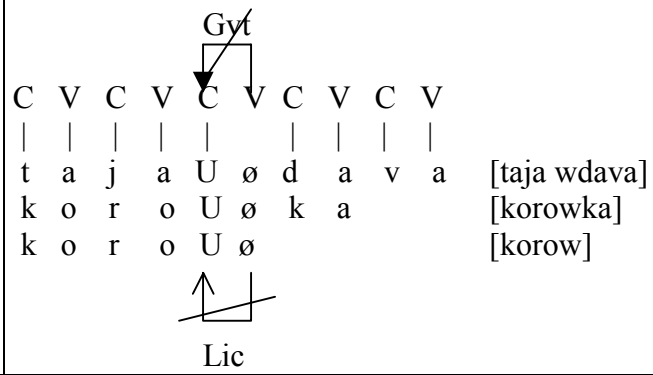
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 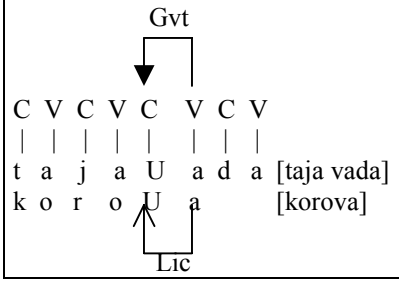
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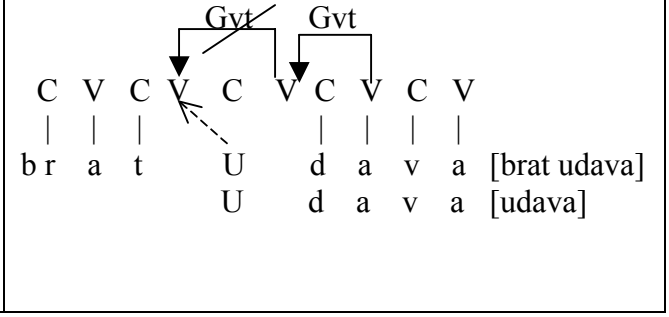
<td>/v/ within two empty Nuclei
 
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(40) analysis so far

a. every orphan empty Nucleus (=ungoverend and not enclosed with an IG-domain) must receive a melodic identification.

b. Bielorussian distributes a CV-unit at the beginning of utterances, and only in this location.

c. identical sequences, whether word-internal or not, produce the same effect.

…C # __C = #__C
…C # __V = Coda__
…V # __C = Coda
…V # __V = V__V, #__V

(41) Bielorussian i-epenthesis

lew	"lion NOMsg"
ilva	"lion GENsg"
tam jość lew	"il y a un lion là-bas"
brat **i**lva	"le frère du lion"
malady lew	"jeune lion"
śastra lva	"la sœur du lion"

(42)

site of epenthesis in context		site of epenthesis in isolation	result			
…C # __C	=	#__C	epenthesis	brat **i**lva	=	**i**lva
…C # __V	=	Coda__	no epenthesis	tam jość lew	=	lew
…V # __C	=	—	no epenthesis	śastra lva	=	—
…V # __V	=	—	no epenthesis	malady lew	=	—

(43) summary

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 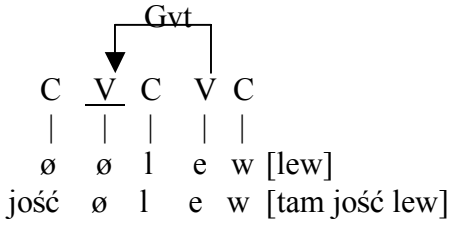
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 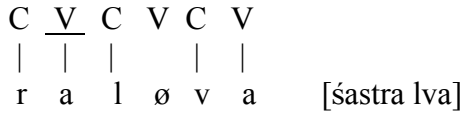
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 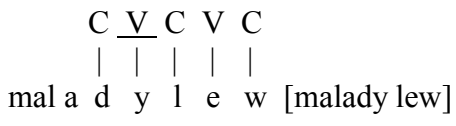
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 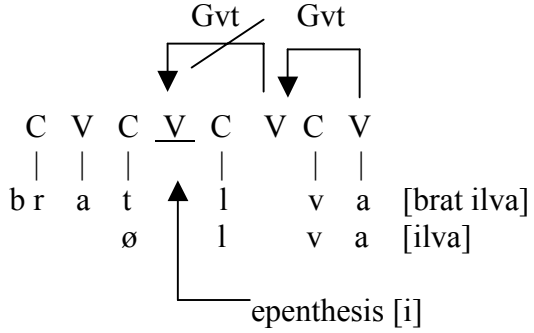
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5.2. Slavic vs. Moroccan Arabic

(44) #RT-sequences occur chiefly in two locations on the globe, within two groups of languages whose members share a clear genetic definition:
1. modern occidental Afro-Asiatic (Algerian, Tunesian, Moroccan Arabic, Berber)
2. Slavic
cf. the list of #RT-languages in Clements (1990)

Moroccan Arabic

(45) all logically possible combinations of #CC occur

$\#C_1C_2$	$\#C_2C_1$	
brɨd	rbɨT	refroidir, lier
Drɨb	rDa	frapper, accepter
glɨʕ	lga	retirer, trouver
bka	kbɨr	pleurer, grandir
nzɨl	zna	descendre, commettre l'adultère
dna	ndɨm	s'approcher, regretter
bqa	qbɨl	rester, accepter

(46) diachronic situation

Classical Arabic		Moroccan Arabic
VV	>	V
V	>	schwa

schwas alternate with zero as usual

(47) hence: domino-alternations

a. CøC ə C - ø
k ø t ɨ b - ø < katab-a "il a écrit" arabe

b. CəCøC - V
k ɨ t ø b - u < katab-uu "ils ont écrit" arabe

c. for all Arabic verbs in 3sg active perfective,

$\#C_1VC_2VC_3$-u > $\#C_1C_2ɨC_3$ Classical Arabic > Moroccan Arabic

(48) Slavic

a. do all logically possible #CC-clusters occur? Not at all. Slavic instantiates only a small subset of logically possible #RT-sequences.

b. Semitic: 50% of the lexicon is #TR, the other 50% is #RT
Slavic: there are 47 #RT-roots in the entire lexicon

c. is the diachronic situation the same?
yes, insofar as #RT < #RvT
no because only 2 out of 11 vowels became schwa and fell out: the yers
in Arabic, ALL short vowels became schwa and fell out

d. diachronic generalisation holding for both Slavic and Arabic:
1. there were no #RT-clusters in the ancient languages
2. all modern #RT-clusters are the result of a vowel-syncope
#RT < #RvT

(49) some examples
cf. the list of 47 Slavic roots in 14 Slavic languages at
http://www.unice.fr/dsl/rt/slavicRT.htm and Scheer (2000)
of which (50) is a summary

	Czech	Common Slavic	
NOMsg	GEN sg	(NOMsg)	
lev	lva	*l\vX	lion
den	dne	*d\n\	jour
sen	snu	*sXnX	rêve
rez	rzi	*rXdja	rouille
ret	rtu	*rXtX	lèvre
lež	lži	*lXg-	mensonge
lest	lsti	*l\st\	ruse
mest (GENpl)	msta (NOMsg)	*m\t-t\	vengeance

(50)

		Common Slavic	#RT	gloss CS	modern example
j	1	j-\-dO	jd	walk 1sg	tch jdu
	2	j\go	jh	yoke	tch jho
	3	j\m	jm	seize	tch jmout
	4	\n-	jm	name	tch jméno
	5	j-es-m\	js	be 1sg	tch jsem
r	6	štrXbX	rb	fragment	s-cr rbina
	7	rXbadiga	rb	Herbaticum	cr rbadiga
	8	r\k	rc	say, imper 2sg	tch arch rci !
	9	uncertain	rč	hamster	s-cr rčak
	10	rXd	rd	go red, flush	tch rdít se
	11	str\ža	rd	core, essential	pol rdzeń
	12	gXr(t)+dusiti	rd	strangle, choke	tch rdousit
	13	rXdXky	rd	radish	s-cr rdakva
	14	rufijanX	rf	procurer, pimp	sle rfjan
	15	rusX	rs	yellow, blond	sle rsa
	16	rXta	rt	ice-skate	rus rta
	17	rXtXt\, rXtont\	rt	quicksilver	tch rtut'
	18	rXt\	rt	peak, point	tch rty (NOMpl)
	19	rXvati	rv	tear, rip, snatch	tch rvát
	20	rXjO	rv	dig	rva (GENsg)
	21	rjuti	řv	roar, scream	tch řvát
	22	rXž\	rž	rye	tch rži
	23	rXzati	rž	neigh, whinny	tch ržát
	24	drXg-	rž	tremble	h-sor ržeć
	25	rěz-	rž	cut	pol rżnąć

		Common Slavic	#RT	gloss CS	modern example
l	26	lXb-	lb	skull	tch lbi (GENsg)
	27	lXg-ati	lg	lie inf, 1sg	tch lhát
	28	l\g-	lg	light	tch lhostejný
	29	lXk	lk	mourn	tch lkát
	30	l\p-	lp	cling, stick	tch lpět
	31	l\sk-	ls	shine, twinkle	tch lštíti se
	32	l\st\	ls	cunning, ruse	tch lsti (GENsg)
	33	l\v\	lv	lion GENsg	tch lva (GENsg)
	34	sl\z	lz	tear	pol łza
	35	lXž-	lž	spoon	tch lžíce
m	36	mXd-lX	md	faint, weak	tch mdlý
	37	mXchX	mch	moss	tch dial mšina
	38	mXk	mk	sudden movement yielding an unforeseen result	pol mknąć
	39	m\t-t\	ms	revenge	tch msta
	40	mXstX	ms	must, fruit juice GENsg	tch arch mstu
	41	mXtX	mt	gym swing GENsg	tch arch mtu
	42	m\zda	mz	salary	tch mzda
	43	mXzg-	mz	spoil	rus mzgnut'
	44	m\ša < lat missa	mš	mass	tch mše
	45	mXšica	mš	greenfly, aphid	tch mšice
	46	m\chelX	mš	earnings, profit	rus mšelX
	47	m\g-	mg	fog	mhlavý

(52) numeric situation

#RT	nb of roots coming from #RvT		uncertain origin	
	< #RyerT	< #RvT		
#jC	4	1 (5 j-es-m\)		
#rC	15	4 (14 rufijan\ 15 rusX 21 rjuti 25 rez)	1 (9 s-cr rčak)	
#lC	10	0		
#mC	12	0		
	41	5	1	Total 47

(53) summary

a. Slavic is a true anything-goes language: grammar does impose no co-occurrence restrictions on initial clusters.
b. the fact that only a small subset of possible #RT-clusters occurs is due to a historical accident: only 2 out of 11 vowels fell out, and hence only2/11 of #C1VC2-sequences ended up as #C1øC2.
c. the numeric disproportion in Slavic (only 47 #RT-roots) is due to the same cause.

(54) if synchronic Slavic grammar does not impose any co-occurrence restriction on #CC-clusters, a prediction is made to the effect that #RT-sequences may freely enter the language. What could be the origin thereof?

a. Czech acronyms, but people usually vocalise them

ČVUT	České vysoké učení technické
LFUK	Lekařská Fakulta University Karlova
JČU	Jihočeská Universita
JSA	Jazyk symbolických adres
LFOP	Lidová Fronta pro Osvobození Palestiny
LSU	Liberální Sociální Unie
LŠU	Lidová Škola Umnění

b. what about acronyms in other Slavic languages?
c. Russian borrowings from Georgian without epenthetic vowel
data from Alexei Kochetov, pc
kh=[x], ch=[ʃ]
apart from #[mx], none of the initial clusters occurs occur in Russian native words

Mcyri	poem by Lermontov, and the corresponding character'
Mtacminda	mountain in Tbilisi
Mziuri	Georgian dance band
Mkhedrioni	Georgian paramilitary group
Mckheta	town in Georgia
rkaciteli	popular brand of wine
Rza	personal name (from Turkic/North Caucasian?)

VI. Conclusion

(55) general summary

a. phonology makes reference to all kinds of information: morphological, syntactic, (semantic).
But the only objetcs it makes reference to are of truly phonological nature. No diacritics, no extra-phonological objects.

b. the morphological component is autonomous and decides whether morphological information is available to phonology. If so, this information is projected onto phonology as a truly phonological object, e.g. of syllabic nature: CV.

c. morphological information in phonology is always PRIVATIVE: either an object X is projected onto phonology, or it is not (presence vs. absence of the initial CV). Under the usual diacritical approach, it is logically impossible to refer to the beginning of the word without referring to "#".

d. the parameter "initial CV present vs. absent" derives all and only the initial situations encountered cross-linguistically.

e. it does so without releasing ANY of the devices that have been established in order to account for #TR-only languages. No extrasyllabicity, exceptional Onsets etc.

f. prediction: if #RT-clusters of any kind and any number occur in a language, the phonology of this language does not impose any co-occurrence restrictions on initial clusters. Any #CC can freely enter such a language.

g. two major #RT-families: Slavic and Afro-Asiatic
the important difference in number and nature of occurring #RT-sequences is a consequence of the historical accident that made yers fall out. Slavic is the exception, Afro-Asiatic is the regular pattern.

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