

SYLLABIC AND TRAPPED CONSONANTS (IN SLAVIC): DIFFERENT BUT STILL THE SAME

1. Introduction

- (1) purpose (this presentation is a short version of a chapter of Scheer forth)
- a. establish the intimate relationship between **syllabic** and **trapped** consonants.
 - b. thus, in the first place, introduce the animal "trapped consonant"; everybody knows what syllabic consonants are, but their trapped peers are most certainly unknown to people unfamiliar with Polish.
 - c. why is that so? Because Polish trapped consonants have been extensively studied by Rubach and others (literature under (9)), but under the heading "word-internal extrasyllabic consonants".
 - d. as far as I can see, trapped consonants have never been studied in the light of the evidence coming from their syllabic mates (and vice-versa).
 - e. this is what I intend to do: show that any attempt to discover the phonological identity of trapped consonants without looking at their syllabic mates must fail (and vice-versa).
 - f. thus, the following roadmap:
 1. preliminary exploration: trapped & syllabic: the same but yet different.
 2. presentation of the synchronic properties and behaviour of trapped consonants.
 3. contrastive behaviour of trapped and syllabic consonants across Slavic.
 4. working hypothesis gained on the faith of prefix vocalisation in Czech and Polish.
 5. diachronic confirmation: the genesis of trapped vs. syllabic consonants in Slavic.
 6. open question: the right periphery.
 - g. result:
 1. syllabic consonants branch on the preceding, trapped consonants on the following (empty) Nucleus.
 2. it is impossible to say anything about trapped consonants without considering syllabic consonants (and vice-versa).
- (2) syllabic and trapped consonants are akin
- a. it is frequent in Slavic that the same consonants in the same words are syllabic in one language, but trapped in another, see (3).
 - b. hence, diachronically speaking, the same primitive object has become either syllabic or trapped. How come? According to which rule? More on that soon.
 - c. only sonorants can be syllabic or trapped
(the reported Berber syllabic obstruents withstand this generalisation, see Dell & Elmedlaoui 1985)
 - d. on the surface, both syllabic and trapped consonants create CRC sequences ("R"=any sonorant)
which make the reputation of Czech, Polish and the like as heavily clustering languages.

- (3) trapped consonants in Polish
 a. lexically trapped (some examples)

	Common Slavic	Polish	Czech	gloss (Polish)	gloss (Czech)
CrC	trъvati	trwać	trvat	to last	to last
CrzC	dvъri grъmĕti brъnĕti chъbbъtъ trъstina	drzwi grzmieć brzmieć grzbiet trzcina	dveře hřmĕt brnĕt hřbet trstina	door to thunder sound back reed (plant)	door to thunder tickle back reed (plant)
CiC	klъn- plъv-	klnę plwocina	klnout arch plvat > plivat	I curse sputum	to curse to spit

- b. created by a vowel-zero alternation (list aims at exhaustivity)

Common Slavic	Polish		gloss
	NOMsg	GENsg	
krъvъ	krw	krwi	blood
brъvъ	brew	brwi	eyebrow
krъstъ	chrzest	chrztu	baptism
plъtъ	pleć	plci	sex
blъcha	pchła	pcheł	flea
slъza	łza < słza	łez	tear
česnъkъ	czosnek	czosnku	garlic
př-snъ	pierwiosnek	pierwiosnka	primroses
	piosnka piosenka	piosnek GENpl	song

2. Antipodal behaviour of syllabic and trapped consonants

- (4) hard facts I

syllabic consonants can bear stress, their trapped mates cannot

Polish has invariable penultimate stress, hence the trapped rhotic in trwać would be stressed if it could. In fact it is not: trwąć.

Czech syllabic consonants are regularly stressed if they stand in an appropriate position: trvat with stress on the rhotic etc.

- (5) hard facts II

syllabic consonants count in poetry, their trapped mates do not

if asked, a Czech native speaker will identify two peaks in trvat. And this is also how much this word counts for in Czech poetry.

if asked, a Polish native speaker will identify one peak in trwać. And this is also how much this word counts for in Polish poetry.

(6) hard facts III

- a. trapped consonants are transparent to voice assimilation. Put another way, their flanking consonants must always agree in voicing. *C_{avoiced}RC_{-avoiced} where R is trapped is ill-formed.

This is the critical fact that has made Rubach go the extrasyllabic way: the trapped consonant remains unparsed after syllabification, then voice assimilation takes place, and finally the extrasyllabic consonant is adjoined to some constituent. Note that this is also the evidence with which he runs OT into trouble, since it requires a two-level treatment: Derivational Optimality Theory (DOT) Rubach 1996,1997a), more recently joined by Kiparsky's Stratal OT (Kiparsky 2000), which is identical as far as I can see.

- b. illustration: word-final trapped consonants in Polish

"Polish has word-final devoicing, which applies 'through' the final trapped C"

	...TR#	...TR-V	spelling	gloss
1.	katr	kadr-a	kadr GENpl, NOMsg	staff
	bupr	bobr-a	bóbr NOMsg, GENsg	beaver
	zupr	zubr-a	żubr NOMsg, GENsg	bison
	mukw	mogw-a	mógł masc., fem.	could
2.	mjelisn	mjelizn-a	mielizn GENpl, NOMsg	shallow water
	mexapizism	mexapizmi	mechanizm NOMsg, NOMpl	mechanizm

- c. illustration: word-internal trapped consonants in Polish

"Polish progressive devoicing goes 'through' internal trapped consonants"

			spelling	gloss
1.			trfać	to last
2.			plfać	to spit
3.	kref	krf-i	krev-ni	krew NOMsg, krwi GENsg,
			krewny	blood, relative
4.	bréf	brv-i	brew NOMsg, brwi GENsg	eyebrow
5.	jętrka	jęndrek	Jędrka GENsg, Jędrak NOMsg	Andy dim

- d. syllabic consonants are not transparent to voice: Czech

Czech obstruents devoice word-finally

(e.g. *holub* [hɔlup] vs. *holuba* [hɔluba] "pigeon NOMsg, GENsg")

1. word-finally

	...TR#	...TR-V	spelling	gloss
	bɔbr̩	bɔbr̩-a	bobr NOMsg, GENsg	beaver
	zubr̩	zubr̩-a	žubr NOMsg, GENsg	bison
	mɔhl̩	mɔhl̩-a	mohl masc., fem.	could

2. word-internally

	tr̩vat		trvat	to last
	kr̩ve		krve GENsg	blood

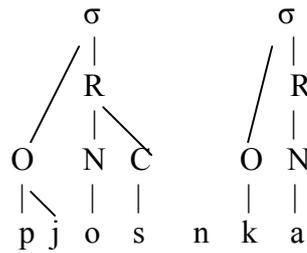
(7) summary I
syllabic and trapped consonants really look like the reverse of one another

	syllabic consonants	trapped consonants
count in verse	yes	no
may be stressed	yes	no
are transparent to voicing	no	yes

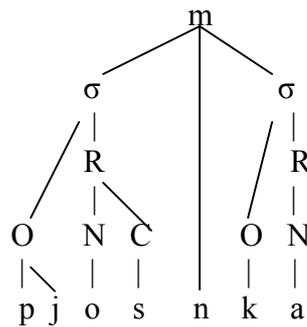
3. Common approaches to syllabic and trapped consonants

- (8) common treatment of syllabic consonants since SPE
- literal implementation of the 19th century insight that "syllabic consonants are consonants in vocalic function":
 - since syllabic consonants behave like vowels, they ARE vowels, i.e. they are consonants because of their melody, and vowels because they sit in a Nucleus. (SPE, especially the shift from [±voc] to [±syll], Clements 1990:293ss, Hall 2000:215ss, Kenstowicz 1994:255s, Blevins 1995).
 - this implies constant resyllabification when a consonant is or is not syllabic according to what follows: English bott[ɫ]e – blottl-ing, Czech vít[r̩] – větr-u "wind NOMsg, GENpl" etc.
==> no way to do that in Government Phonology
 - it must be wrong if basic autosegmental principles are taken seriously: consonanthood and vowelhood is not decided by some inherent property of the segment, but rather depends on the syllabic constituent to which a melodic expression is associated. E.g., a melody specified as front, high and unrounded will show up as a [j] if attached to an Onset, but as an [i] when belonging to a Nucleus. Hence, it is impossible for a melody solely associated to a Nucleus to appear as a consonant.
- (9) common treatment of trapped consonants:
Bethin (1984), Rubach & Booij (1987,1990a,b), Rubach (1996,1997a,b), Gussmann (1992)
- they are extrasyllabic, i.e. underparsed by the syllabification algorithm because they are unsyllabifiable, and later integrated into the prosodic hierarchy (different versions as to where they are adjoined to: a syllabic constituent, the phonological word etc.).
 - basic argument: their transparency in voice assimilations.
 - problem: the expressive power of extrasyllabicity, with some reason, is constrained by the Peripherality Condition (e.g. Roca 1994:213, Spencer 1996:246), which says that
Extrametrical elements must be peripheral in their domain.
This is supposed to rule over all extra-X items: extrametrical, extrasyllabic, extrapedal etc.
On the extrasyllabic account, Polish seems to be the only language where extrametrical items occur word-internally.

- (10) classical interpretation (J. Rubach): trapped consonants are extrasyllabic
 a. final trapped consonants b. internal trapped consonants



- (11) surface representation of trapped consonants
 a. final trapped consonants b. internal trapped consonants



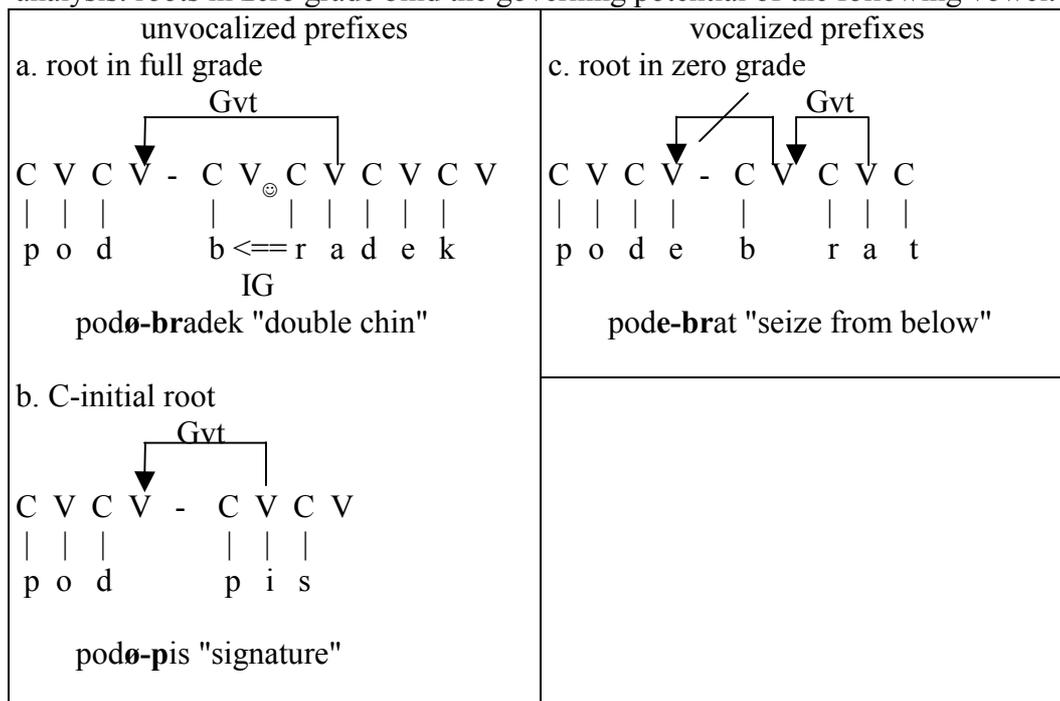
4. New evidence: vocalisation of prefixes (Czech, Polish)

Czech

- (12) vocalisation of Czech prefixes
 #CV-stems never provoke vocalised prefixes
 #CC-stems may or may not provoke vocalised prefixes. They do iff the stem-initial cluster is broken up by a vowel in some related grammatical form, i.e. iff the root occurs in zero grade. (Scheer 1996,1997,1999)

$\sqrt{C_1C_2}$ -	root provoking vocalized prefixes two forms of the same root		root provoking non-vocalized prefixes no occurrence of $\sqrt{C_1VC_2}$
	$/\sqrt{C_1\emptyset C_2}/$	$/\sqrt{C_1VC_2}/$	
\sqrt{BR} -	ode-brat pf	od-bírat ipf	bez-bradý
\sqrt{DR} -	roze-drat inf	roz-deru 1sg	roz-drobit
\sqrt{HR} -	přede-hra noun NOMsg	her noun GENpl	od-hrabit
\sqrt{HN} -	ode-hnat pf	od-hánět ipf	roz-hněvat
\sqrt{PR} -	ode-prat inf	od-peru 1sg	vz-pruha
\sqrt{SN} -	beze-sný adj	sen noun NOMsg	pod-sněžník
$\sqrt{ŠL}$ -	vze-šlý adj	šel past active part.	roz-šlapat
\sqrt{ZD} -	pode-zdít inf	zed' noun NOMsg	od-zdola
\sqrt{DN} -	beze-dný adj	den noun GENpl	—

- (13) analysis: roots in zero grade bind the governing potential of the following vowel.



- (14) syllabic consonants always provoke unvocalised prefixes
hence, they pattern with #CV stems, NOT with #CC stems.

roz-drtit	to crush	od-vlhnout	to remove because of humidity
roz-drbat	to scratch to pieces	od-frknout	to snort
roz-mrhat	to waste	od-chrchlat	to clear one's throat
roz-trhat	to tear up	od-krvit	to cause hypoxemia
roz-trpčit	to embitter	od-mrštit	to reject
roz-vrstvit	to pile up	od-škrtat	to cross out
roz-vrzat	to make wobbly	pod-hrnout	to gather up (dress)
roz-vrtat	to drill to pieces	pod-vrh	forgery
roz-vlnit	to churn up (sea)	před-prseň	parapet
		před-krm	starter (dish)

Polish

- (15) literature on the vocalisation of Polish prefixes includes
Laskowski (1975:34ss), Gussmann (1980a:42s,81s,1980b:148ss), Rubach (1984:186ss), Rubach & Booij (1984:17ss), Szpyra (1992b), Pawelec (1989), Rowicka (1999a:267ss,1999b).

- (16) regular vowel-zero alternations in Polish prefixes only in related pf-ipf pairs
- | prefix | perfective
= √CC- | imperfective
= √CVC | |
|---------|----------------------|------------------------|---------------|
| z(e)- | ze-rwać | z-rywać | to tear off |
| | ze-drzeć | z-dzierać | to tear off |
| | ze-brać | z-bierać | to gather |
| od(e) | ode-mknać | od-mykać | to open |
| | ode-tchnąć | od-dychać | to breathe |
| | ode-zwać | od-zywać | to speak |
| | ode-przeć | od-pierać | to beat off |
| | ode-słać | od-syłać | to send back |
| ob(e)- | obe-schnąć | ob-sychać | to dry |
| w(e)- | we-ssać | w-sysać | to suck in |
| | we-trzeć | w-cierać | to rub in |
| pod(e)- | pode-żreć | pod-żerać | to eat up |
| | pode-słać | pod-syłać | to send |
| roz(e)- | roze-rwać | roz-rywać | to tear apart |
- (17) Outside of this specific morphological category, vocalised prefixes hardly ever occur. But a lot of unexpected non-vocalizations do occur.
- a. before expressed alternating vowels
- | | | |
|-------------|------------|----------------------------------|
| pod-pieniek | pień, pnia | honey fungus, trunk NOMsg, GENsg |
| pod-szewka | szew, szwu | lining, stitch NOMsg, GENsg |
| bez-senny | sen, snu | sleepless, dream NOMsg, GENsg |
| bez-denny | dno, den | bottom, bottom NOMsg, GENpl |
- b. before unexpressed alternating vowels
- | | | |
|-------------|--------------|------------------------------------|
| od-wszyć | wesz, wszy | de-louse, louse NOMsg, GENsg |
| od-pchlić | pchła, pcheł | de-flea, flea NOMsg, GENpl |
| bez-cłowy | cło, ceł | duty-free, duty NOMsg, GENpl |
| nad-dniówka | dzień, dnia | extra day's work, day NOMsg, GENsg |
| w-śnić się | sen, snu | start dreaming, dream NOMsg, GENsg |
| roz-łzawić | łza, łez | draw tears, tears NOMsg, GENpl |
- (18) a. hence, there is morphology at work here: the prefix-boundary, outside the pf-ipf paradigm, is "strong", i.e. does not allow the root-vowel to "see" the prefix.
b. whatever the descriptive device (e.g. Government Phonology domains [[odø]wszyć] vs. [ode-mknać], autonomy of prefixes, ...),
c. non-valuation is ambiguous: it can be due to either phonology or morphology; vocalisation is unambiguous: it stems from phonology alone, morphology plays no role for sure.

- (19) influence of trapped consonants on prefixes (the list aims at exhaustivity)
conclusion: trapped consonants provoke vocalised prefixes.

a. vocalized prefix

root

drg-	roze-drgać (się)	roze-drgany	become vibrating, id. adj
brn-	roze-brnać		to flounder (pf)
brzm-	ode-brzmieć		to echo back
grzm-	ode-grzmieć		to echo (thunder)

b. unvocalized prefix

trw-	roz-trwonić		to squander (pf)
trw-	roz-trwaniać		to squander (ipf)
trw-	z-trwożyć się	s-trwożyć	to become fearful (pf), id.
brzm-	roz-brzmieć	roz-brzmiewać	start to sound (pf), id. (ipf)
krzt-	od-krztusić	od-krztuszać	to cough up (pf), id. (ipf)
płc-	bez-płciowy		sexless, boring
krew	roz-krwawić	roz-krwawiać	to cause to bleed (pf), id. (ipf)
		bez-krwawy	bloodless (with no casualties)
		bez-krwisty	bloodless (e.g. meet)
		s-krwawić	to stain with blood (pf)

- (20) summary II

syllabic and trapped consonants really look like the reverse of one another

	syllabic consonants	trapped consonants
count in verse	yes	no
may be stressed	yes	no
are transparent to voicing	no	yes
preceding alternation sites are	unvocalised	vocalised

5. What kind of animal is a syllabic consonant ?

- (21) framework used for the following analysis: CVCV

CVCV (Lowenstamm 1996, Scheer 1999, forth, Szigetvári 1999) is an outgrowth of Government Phonology (Kaye et al. 1990, Harris 1994 etc.).

- a. syllabic constituency boils down to a strict consecution of non-branching Onsets and non-branching Nuclei

closed syllable	geminate	long vowel	[...C#]	"branching Onset"
O N O N	O N O N	O N O N	...O N	O N O N
	/ /	/ /		
C V R ø	C V	C V	C ø	T ø R V

- b. the Empty Category Principle

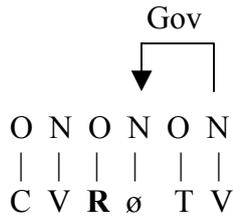
CVCV multiplies empty categories, and namely empty Nuclei. An empty Nucleus may exist only if it is governed (there is more to it, but that's enough for now).

- c. instead of being translated into the familiar arborescence, syllabic generalisations are described by two lateral relations:

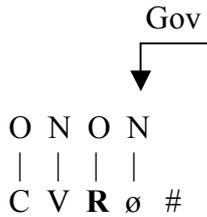
1. Government (destructive)
2. Licensing (supporting)

example: a consonant occurs in a Coda iff it is followed by a governed empty Nucleus (R = any sonorant, T = any obstruent)

internal Coda (boldfaced)



final Coda (boldfaced)



- (22) alternative idea to "syllabic consonants sit in Nuclei":
- a. as all other consonants, they belong to an Onset ==> consonantal phonetics
 - b. in addition, they branch on a Nucleus ==> vocalic phonology
 - c. no resyllabification: the sonorant branches on a neighbouring Nucleus if it is syllabic (*bottle*) vs. does not branch if it is non-syllabic (*bottling*).
- on this analysis, there are two options:
 left-branching right-branching

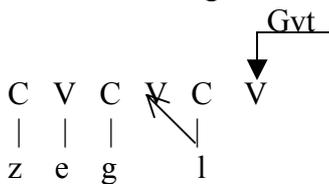


Right-branching structures are argued for by Yoshida (1990), Rowicka (1999a:261ss), Blaho (2001), Afuta (2002), Rennison (1999b:333ss).
 Left-branching structures are supported by Harris (1994:224s), Hall (1992:35s), Wiese (1986,1996) and Toft (forth).

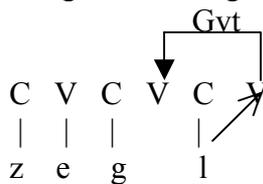
- (23) What are the arguments?
- the typical Germanic alternation between syllabic CR# (*bottle*, Segl) and non-syllabic CR-V# (*bottling*, Segler) versions of the same consonant seems to allow for both interpretations.

German Segel [zeegl] "sail", English bottle

a. left-branching

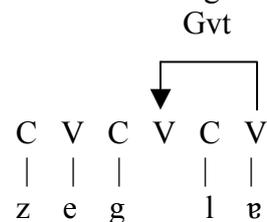


b. right-branching alternative

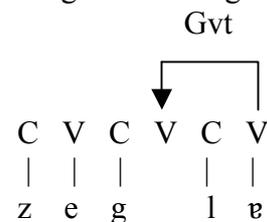


German Segler [zeegl̩] "sailor", English bottling

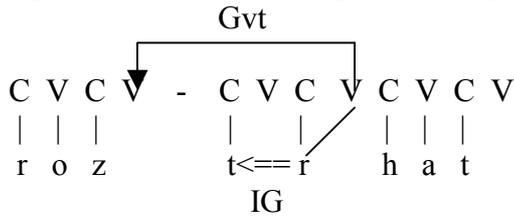
a. left-branching



b. right-branching alternative



- (27) right-branching structure plus Infrasegmental Government



rozø-trhat "to tear up"

this solution suffers from the existence of \sqrt{CC} clusters that do not qualify for a domain of Infrasegmental Government (i.e. a "branching Onset"):

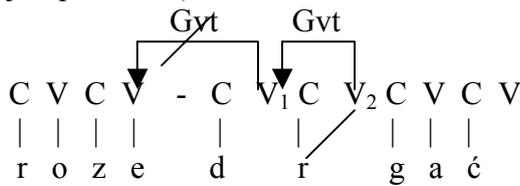
roz-mrhat "to waste"

od-mrštit "to reject"

- (28) what kind of animal is a syéabic consonant?
 ==> clear sympathy for a left-branching structure.

6. Trapped consonants are right-branchers

- (29) Polish: trapped consonants provoke vocalised prefixes
 hence, the first Nucleus of the root V_1 must be unable to govern. Why? Because it is governed itself. By whom? The only possible candidate is V_2 ([a] would have to jump over V_2).

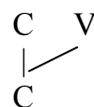


roze-drgać "to set vibrating"

- (30) summary:
 syllabic consonants branch on the preceding Nucleus
 e.g. Czech trvat "to last" trapped consonants branch on the following consonant
 e.g. Polish trwać "to last"

syllabic consonant

trapped consonant



7. Diachronic confirmation

(31) it is a well established fact, but which needs intricate demonstration, that

- | |
|--|
| a. syllabic consonants were preceded by a yer in Common Slavic. |
| b. trapped consonants were followed by a yer in Common Slavic. |
- c. C̣RC > syllabic CṚC
CṚC > trapped CRC
- d. yers "ь", "ѣ" were schwas that faded away in late Common Slavic.
- e. see the detail in the appendix to this handout.

8. What about the voice-transparency of trapped consonants ?

(32) if trapped consonants are not extrasyllabic as held by Rubach and others, why are they transparent to voicing ?

- a. a fact which usually goes unmentioned: Polish trapped consonants are voiceless themselves. Or rather, there is some variation among speakers. Voiceless pronunciations are very common:
final: kadr [kat̚r̥], bóbr [bup̚r̥], żubr [ʒup̚r̥]
internal: trwać [tr̥fat̚ɕ], krwi [kr̥fi]
- b. in non-trapped position, sonorants are always voiced in Polish.
- c. hence, there is no "final devoicing through the sonorant", but there is simply a final cluster of voiced obstruents that undergoes devoicing.
- d. ==> trapped consonants are obstruents.
why does the fact of being trapped cause the demotion from a sonorant to an obstruent? Good question.
- e. but we know that the demotion to obstruents is the common fate of sonorants to which "something has been done": the modification of their place for instance demotes them to an obstruent:
German, Norwegian, French "r" = [χ,ʁ]
Czech palatalized [r] is [ř,ř̥], i.e. with a voiced and voiceless variant.
Polish palatalized [r] is [ʃ,ʒ] ("rz")
- f. identical pattern in Romansch, a Romance language spoken in Switzerland and Italy. Montreuil (1999:541ss) reports on the synchronic devoicing of trapped sonorants and preceding obstruents:
- | | | |
|-------------|-------------|--------|
| 1. masc. | fem. | |
| fr̥ekt | fr̥egd̥ə | cold |
| dik̚r̥ | digr̥ə | hard |
| pok̚r̥ | pogr̥ə | farmer |
| 2. singular | collective | |
| iχ̥ p̥ek̚r̥ | l̥ə p̥egr̥ə | pear |
| 3. noun | diminutive | |
| pok̚r̥ | pogr̥ɛt | farmer |
- g. hence, sonorants are not transparent, they are obstruents when trapped. And as such, they undergo and transmit voicing as all other obstruents. Obstruent clusters agree in voicing like everywhere else in the language.

9. The troublesome right periphery

(33) consonant clusters following syllabic consonants in Czech

a. __RT, __TT	b. __RTR	c. __TR	d. __C-e/øC	
			__C-eC	__C-øC-V
brnkat cvrnat drčet hrnčíř mrzký vlhký srdce umrlčí	brnknout natrpklý trpknout uprchlík	vrchní brblat nazrzlý přiblblý zamlklý blbnout drhnout drsný mlžný trhnout trpnost výtržník ztvrdnout	blbec čtvrtek cvrček držeb hrnec krtek mrkev mrtev srnec vrstev zrnek hrdel prken	blbce čtvrtku cvrčku držba hrnce krtka mrkve mrtvý srnce vrstva zrnka hrdlo prkno

(34) there are way too many orphan empty Nuclei

a. (33)a: CṚT-TV

vlhký "humid"

b. (33)b: CṚT-TRV

trpknout "become bitter"

c. (33)c: CṚT-RV

za-mklý "taciturn"

d. (33)d: CṚC-eC

blbec "idiot NOMsg"

CṚC-øC-V

blbce "idiot GENsg"

10. Conclusion

(35) desiderata for the representation of syllabic and trapped consonants

	syllabic consonants	trapped consonants
count in verse	yes	no
may be stressed	yes	no
dispense Government	yes	no
synchrony and diachrony: alternate with sequences of non-syllabic/ non-trapped consonants plus a	preceding vowel	following vowel
flanking consonants always agree in their voice value	no	yes
phonetic correlate	syllabicity	demotion to an obstruent
tolerate the existence of governed empty Nuclei on their righthand side	yes	?
the distribution of following consonant clusters is	identical to the one observed after vowels	?

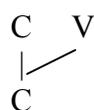
(36) summary

- any theory addressing the phonological identity of syllabic and / or trapped consonants must accommodate the puzzle under (35).
- there is no way to even talk about syllabic consonants without mentioning their trapped mates. The pervasive antipodal behaviour of both objects discredit any isolated treatment in advance.
- proposing an identity for syllabic consonants makes immediate predictions on the trapped side, which must be somehow "the reverse". And vice-versa.
- my best (while imperfect) guess is

syllabic consonant



trapped consonant



this is wrong and/ or incomplete and should be taken as the starting point for further investigation, rather than as a firm result.

e. questions remaining

- what about the heavy clustering at the right periphery of syllabic consonants ?
- why are trapped consonants invisible for stress and poetry ?
- is Polish the only language in the world that has trapped consonants?

The answer is no for sure: I am pretty sure that the word-initial monster-clusters in Georgian are produced by trapped consonants (which are reported to be transparent to voicing). Only do people usually make no difference between trapped and syllabic consonants, hence the Georgian funny sonorants are taken to be syllabic most of the time.

Appendix

Detail of the diachronic situation creating trapped and syllabic consonants in Slavic

(37) it is a well established fact, but which needs intricate demonstration, that

- a. syllabic consonants were **preceded** by a yer in Common Slavic.
 b. trapped consonants were **followed** by a yer in Common Slavic.

- c. C_ьRC > syllabic CRC
 CR_ьC > trapped CRC
 d. yers "ь", "ъ" were schwas that faded away in late Common Slavic.
 e. the demonstration is space- and timeconsuming. It is not available in diachronic grammars (where bits and pieces are reported in unrelated locations) because nobody is interested in the comparison of trapped and syllabic consonants.

Relevant literature:

1. genesis of syllabic consonants: Stieber (1979:33ss,54ss), Rospond (1979:94ss), Długosz-Kurczabowa & Dubisz (1993:84ss), Nahtigal (1961:111ss), Panzer (1991:296ss), Carlton (1991:151ss,249s), Vondrák (1924:180ss), Vaillant (1950:173ss), Meillet (1934:73ss), Mikkola (1913II:200ss), Mann (1957:54).
2. prediction of the timbre of Polish prevocalised roots (Equation 2 (39)): Stieber (1973:23s,42ss,1979:54ss), Długosz-Kurczabowa & Dubisz (1993:84ss), Rospond (1979:94ss), Nahtigal (1961:111ss), Carlton (1991:249s), Vondrák (1924:183ss), Mikkola (1913:201s), Wijk (1949-50:44s).

(38) **Equation 1**

Czech √CRC- = Polish √CRC-

	Common Slavic	Polish	Czech	gloss (Polish)	gloss (Czech)
CrC	trъvati	trwać	trvat	last	last
CrzC	dvъri grъmĕti brъnĕti chrgъbъtъ trъstina	drzwi grzmieć brzmieć grzbiet trzcina	dveře hřmĕt brnět hřbet trstina	door to thunder sound back reed (plant)	door to thunder tickle back reed (plant)
CiC	slъza klnъ- plъvъ- blъcha	łza < słza klnę plwocina pchła	slza klnout arch plvat > plivat old Cz blcha > blecha	tear I curse sputum flea	tear curse spit flea

(39) **Equation 2**

Czech $\sqrt{C\dot{R}C}$ - = Polish \sqrt{CVRC} -³

Polish reaction	Common Slavic	Czech	Polish	Czech gloss	Polish gloss
CaRC: 34	гѣr-dlo гѣr-ть ръrсть сьr-na	hrdlo hrst prst srna	gardło garść parst sarna	throat (cupped) hand finger roe	throat (cupped) hand roe
CieRC: 16	ръrsi сьrръ	prsa srp	pierś sierp	breast sickle	breast sickle
ČiRC: 4	вѣlkъ	vlk	wilk	wolf	wolf
CeRC: 6	вѣlna сьrdь-ce ръlnъ	vlna srđce plný	welna serce pełny	wool heart full	wool heart full

Total: 60

(40) conclusion

- a. can it be predicted whether the Polish response to a Czech syllabic consonant is a vocalized or a trapped sonorant ?

YES:

Polish trapped CRC < following yer CR_YC

Czech $\sqrt{C\dot{R}C}$ - = Polish $\sqrt{C\dot{R}C}$ -

Polish prevocalised CVRC < preceding yer

Czech $\sqrt{C\dot{R}C}$ - = Polish \sqrt{CVRC} -

- b. ==> trapped consonants come from postvocalised CRVC structures

confirmation of their rightbranching structure.

- c. 1. questions:

why does Czech not reproduce the Common Slavic opposition $\text{t}\dot{\text{r}}\text{t}$ vs. $\text{tr}\dot{\text{t}}$ in the way Polish does ? Both origins are merged and appear as syllabic consonants

2. how is the Common Slavic opposition between $\text{t}\dot{\text{r}}\text{t}$ and $\text{tr}\dot{\text{t}}$ established ?

(41) question 2:

the ultimate origin of the words whose sonorants are prevocalized in Polish but syllabic in Czech (hence instantiating the equation $\text{pol } CVRC = \text{cz } C\dot{R}C$ (39)) is undisputed: the sonorants in question were syllabic in Indo-European (IE). This follows from the fact that the words in which they are found instantiate the IE equation which identifies IE syllabic sonorants (i.e. the zero-grade of roots). The following table provides some illustration for IE syllabic r (see for example Meillet 1937:118ss, Szemerényi 1990:47ss, Panzer 1991:296ss).

equations establishing IE r

skr r	gr ar, ra	lat or, ur	germ ur	lit ir, ur	CS ѣr, ѣr	pol Vr	cz r
mṛtam	kardia	mors cordis	got maúrpr got háirto	mirtis širdis	сьmьrть сьrdьce	śmierć serce	smrt srđce

³ With one exception that does not bear on the generalization, i.e. CluC- vocalizations such as in pol $\text{t}\dot{\text{r}}\text{stý} = \text{cz } \text{t}\dot{\text{r}}\text{stý} = \text{slk } \text{t}\dot{\text{r}}\text{stý}$ "thick".

(42) problem

- a. comparatism and Baltic indeed identify a vowel **before** the sonorant.
- b. but the Common Slavic state of affairs is not witnessed by direct recordings. Only Old Church Slavonic (OCS) provides written testimony. And as a matter of fact, OCS texts consistently show the yer after the liquid.
- c. there is a well-known candidate for explaining the OCS occurrence of the yer "on the wrong side" of the liquid:

Slavic **liquid metathesis** (e.g. Panzer 1991:291ss, Nahtigal 1961:108, Carlton 1991:144ss).

Compare for example

non-Slavic	OCS
germ Berg	brěgь
germ Milch	mlěko
lat hortus	gradь
lit galva	glava

- d. therefore, the general picture is as follows:

evolution of IE syllabic liquids in Slavic⁴

IE ɾ, ʎ > balt-slav ir, ur, il, ul > CS ьг, ьг, ьл, ьл > OCS гь, гь, ль, ль

(43) there are strong indications, however, that <гь, гь, ль, ль> in OCS script do not represent a CV-sequence.

- a. it is not infrequent to observe that the yer misses altogether (Vondrák 1924:181) in the texts
- b. the scriptors consistently mismatched both yers: CS ь regularly appears in OCS texts as <ь>, and vice-versa (Wijk 1949-50).
- c. therefore, the general interpretation is that OCS <гь, гь, ль, ль> is simply a way to transcribe syllabic consonants: [ɾ', ɾ, ʎ', ʎ] (where ɾ' and ʎ' are palatalized versions of ɾ, ʎ) were the actual objects present in OCS (Rospond 1979:94, Vondrák 1924:181, Carlton 1991:152, Wijk 1949-50).
- d. under this analysis, there was no metathesis of yer-liquid clusters. Common Slavic СьRC, СьRC sequences simply lost their yer, giving birth to syllabic consonants that kept the memory of the original front vs. back opposition carried by the yers: СьRC > CR'С with a palatalized syllabic liquid, against СьRC > CRС where the syllabic consonant is not palatalized.

- e. hence

evolution of IE syllabic liquids in Slavic

IE ɾ, ʎ > balt-slav ir, ur, il, ul > CS ьг, ьг, ьл, ьл > OCS ɾ', ɾ, ʎ', ʎ

⁴ This is the picture that is most widely accepted for the reasons discussed. For instance, Stieber (1973:17,1979:35), Wijk (1931), Arumaa (1964:151ss), Vondrák (1924:180s,420s), Carlton (1991:151ss), Vaillant (1950:173ss), Schenker (1995:94) adhere. However, another view is expressed by Pedersen (1905:340), Rospond (1979:95) and Długosz-Kurczabowa & Dubisz (1993:84s) who hold that syllabic consonants did not vocalize in Common Slavic. Instead, the IE syllabic consonants were inherited as such by CS, and only later developments led to pre- or post-vocalized liquids.

(44) but there is yet another reason why OCS <гъ, гь, ъь, ъь> from CS ъг, ъг, ъл, ъл could not possibly represent a CV-sequence:

if they did, they would not be any different from the original CS гъ, гь, ъь, ъь > OCS <гъ, гь, ъь, ъь>.

- a. this is contrary to fact: CS тьрт and трьт show contrasting reflexes all over Western and Eastern Slavic languages, e.g. Wijk (1931:59), Vondrák (1924:181), Stieber (1979:56s), Vaillant (1950:173ss), Panzer (1991:297).
- b. we already know one such case, that is the Polish opposition between vocalized CVRC (39) vs. trapped CRC (38) sonorants.
- c. both inner-Slavic and Baltic comparatism allows to tell CS тьрт from CS трьт without ambiguity.

(45) CS CRъC = consistently **postvocalised** in Baltic and Eastern Slavic
trapped in Polish: Baltic CRi/uC = ESl CRE/oC = Czech CŕC = Polish CRC

	other IE	Baltic (lith)	Common Slavic	Estern Slavic (rus)	Polish	Czech
CrC	skr dhruva, lat durua		тгъvati	ukr tryvaty	trwać	trvat
		kraujas	кгъvъ	krov', krovì	krew, krwi	krev, krve
CrzC	skr dvaaras	dvaras	дvьгì	dver'	drzwi	dveře
	germ Gram, gr khromos	grumentì	ггъmëti	gremet'	grzmiëć	hřmët
	lat fremo, germ Bremse, skr bhramaras		бгъnëti	ukr brenity	brzmiëć	brnët
			чгъbьbъ	chrebet	grzbiet	hřbet
		trušis	тгъstina	trostina	trzcina	trstina
< germ krist		кгъstъ	krest, kresta	chrzest, chrztu	křest, křtu	
CIC	germ schlucken	žliukti	slъza	sleza	łza < slza	slza
			кльп-	kljanu	klnę	klnout
	lat glutire		глъtati	glotaf'	old p kłtać	hltat
			плъv-	plevat'	plwać	arch plvat > plivat
	skr plutas, gr plytos	latv pluts	плъbъ	plot', plotì	plëć, plci	pl't', plti
germ Floh	blusa	блъcha	blocha	pchła	old Cz blcha > blecha	

- (46) CS C̄RC = consistently **prevocalised** in Baltic and Eastern Slavic
vocalized in Polish: Baltic Ci/uRC = ESi Ce/oRC = Czech C̄RC = Polish CVRC⁵

other IE	Baltic (lith)	Common Slavic	Eastern Slavic (rus)	Polish	Czech
lat gurgulio, germ Gurgel	gurklis	гѣr-dlo	gorlo	gardło	hrdlo
gr a-gortos	gurste	гѣrt-ть	gorstʹ	garść	hrst
skr p̄r̄štiš, oiran paršti, germ Fürst	pirštas	р̄r̄stь	arch perst	parst	prst
lat cervus, gr keras, skr śiras	latv sirnas, oldpr sirvis, lit stirna	с̄r̄-na	serna	sarna	srna
skr paršu	piršis	р̄r̄si	persi	piers	prsa
lat sarpio, gr harpee,	latv sirpe	с̄r̄pь	serp	sierp	srp
skr vr̄kas, got wulfs, alb ulk	vilkas	в̄lkъ	volk	wilk	vlk
oiran varna, got wulla	vilna, oprus vilna	в̄lna	volna	welna	vlna
arm sirt, lat cordis, got herto, gr kardia	širdis	с̄r̄dь-се	serdce	serce	srdce
got fuls, skr purnas, but lat plenus, gr pleios	pilnas	р̄lnь	polnyi	pełny	plný

- (47) summary of the comparatistic situation

Polish vocalized vs. trapped consonants continue CS т̄rt vs. tr̄t

- | | | | | |
|---|-----------|--------|---------|------|
| | hence: CS | Baltic | ESi | Pol |
| a. Polish trapped sonorants, cf. (45) | CR̄/̄C | CRi/uC | CR̄e/oC | CRC |
| b. Polish vocalized sonorants, cf. (46) | C̄/̄RT | Ci/uRC | Ce/oRC | CVRC |

- (48) but what has happened to Czech (and Slovak) trapped consonants ?

- CS pre- and postvocalised sonorants have merged in Czech: they are both syllabic.
- CS tr̄t should produce trapped consonants as much as it does in Polish.
- crux:
 - Polish motivates a right-branching identity for trapped consonants, but is mute on the syllabic side: CS C̄RC > CVRC vs. CS CR̄C > trapped CRC.
 - Czech motivates a left-branching identity for syllabic consonants, but is mute on the trapped side:
CS C̄RC > syllabic C̄RC merged with CS CR̄C > syllabic C̄RC.
- the ideal language for the purpose of the demonstration would be one where CS C̄RC appear as syllabic consonants, against CS CR̄C giving trapped reflexes. In other words, a language where there is a synchronic opposition between syllabic and trapped consonants.

⁵ The consistent Eastern Slavic reflex Ce/oRC that, recall, corresponds to OCS CR̄/̄C also allows to firmly discard the view that the OCS situation is the result of regular Slavic metathesis (cf. the previous section), i.e. CS tr̄t > OCS tr̄t where the sequence <т̄> would really be pronounced CV. Were OCS tr̄t the result of metathesis, Eastern Slavic would have to come along in so-called pleophonia. This term refers to the regular Eastern Slavic output of the Slavic metathesis that bears a vowel on both sides of the sonorant. Compare for example the Russian reflex of the words quoted in the previous section in order to illustrate the metathesis: germ Berg, Milch, lat hortus, lit galva = OCS br̄gь, ml̄eko, gradь, glava = ru bereg, moloko, gorod, golova. If words such as OCS sr̄na were the result of metathesis, Russian should produce **serena*, which it does not: only *serna* is attested. Mareš (1956:457, 1965:23) makes the same point, and Wijk (1949-50:42) also provides a consistent evolution of CS tr̄t in Russian. This is further support in favour of the assumption made in most grammars according to which OCS tr̄t < CS tr̄t is but a way of transcribing syllabic sonorants.

e. this language exists: OLD CZECH.
Written testimony from Old Czech has been handed down since the second half of the 13th century A.D. For about hundred years, CrC clusters from CS tr̥rt do not count in poetry and thereby identify as trapped, whereas the reflexes of CS tr̥rt > OCz CrC weigh in versification. By the end of the 14th century, however, trapped CrC < CS tr̥rt start to count as well. Therefore, the evolution demonstrated in table (53) CS tr̥rt > trapped OCz trt > syllabic OCz, MCz tr̥t can be almost followed in real time.

(49) here are some examples of older sources. In all cases, the poetry obeys typical Old Czech Alexandrine verse, i.e. counting eight syllables.⁶ The change from trapped to syllabic consonants in Old Czech is studied in greater detail by Smetánka (1940), who provides much raw material, datation and counts for individual texts. The following examples have been collected by Lehr-Splawiński & Stieber (1957:97), Komárek (1962:128s).

older sources of Old Czech: r in trt < CS tr̥rt does not count

a. C__C within a root		CrC < tr̥rt	
1 2 3 4 5 6 7 8	we krwi jakžto vodě kalé	krwi < kr̥ve	AlxB. verse 3,18, late 13th, early 14th cent.
1 2 3 4 5 6 7 8	a z jich srdce krwe utočie	krwe < kr̥ve srdce < s̥rd̥ce	AlxV. verse 1517, late 13th, early 14th cent.
1 2 3 4 5 6 7 8	Mezi oči jemu plvali	plvati < pl̥vati	Hrad. 60s of the 14th century
b. C__C outside a root			
1 2 3 4 5 6 7 8	a ty zlaté jablko jmiechu	jablko < jabl̥ko	AlxV. late 13th, early 14th cent.
1 2 3 4 5 6 7 8	v cyprskéj zemi v dobrém slově	cyprský < cypr̥ský	Kat. early 14th century
c. C__#			
1 2 3 4 5 6 7 8	bratr Filotón, jenž boj bráše	bratr < bratr̥	AlxV. late 13th, early 14th cent.
1 2 3 4 5 6 7 8	vňuž by sě třásl svět i moře	třásl < tr̥sl̥	AlxH. late 13th, early 14th cent.
1 2 3 4 5 6 7 8	matko pro tvých sedm radostí	sedm < sedm̥	Hrad. 60s of the 14th century

Texts from the 15th century and younger systematically do count liquids in CrC < CS tr̥rt. On the other hand, CrC from CS tr̥rt have always contributed to metric weight since the earliest Old Czech sources until the present day. This is also evident from the second verse under (49)a where the liquid in the word "heart" srdce < CS s̥rd̥ce does count in presence of the metrical irrelevance of its mate in "blood GENsg" krwe < CS kr̥ve.

⁶ Old Czech texts are identified according to settled abbreviations. Hrad. = Hradecký rukopis, collection of versified compositions from the 60s of the 14th century. Alx. = Alexandreida, epic poems on Alexander the Great dated end of 13th, beginning of 14th century, AlxV. is a fragment of a later copy thereof dated beginning 15th century, AlxB. and AlxH. are fragments of a later copy dated beginning 14th century. Kat = Katonovy mravní průpovědi, versified translation of the collection of aphorisms by Catonis Distich, dated beginning 14th century. All information on Old Czech texts given here is from Havránek (1968).

- (50) there is an OCz minimal pair syllabic vs. trapped consonant. This was identified by Trubetzkoy (1939:199), who consequently establishes a "correlation of syllabicity". Cf. Komárek (1962:82) and Liewehr (1933:94) on the minimal pair.

Old Czech minimal pair *držěti* "hold" vs. *držěti* "tremble, shake"

	syllabic "hold"	trapped "tremble, shake"
Common Slavic	držati	držati
Polish	dzierzyć	drzeć
Russian	deržat'	drožat'
Old Czech	držěti	držěti
Modern Czech	držet	—

- (51) illustration in verse

Old Czech *držěti* vs. *držěti*

- a. *držěti* = 3 syllables

1 2 3 4 5 6 7 8

to jmě drzal takým kmenem Kat. verse 24

- b. *držěti* = 2 syllables

1 2 3 4 5 6 7 8

všecko pohanstvo drzezalo Kat. verse 2803

- (52) summary

Western Slavic reflexes of Common Slavic *tr̥rt* and *tr̥t*

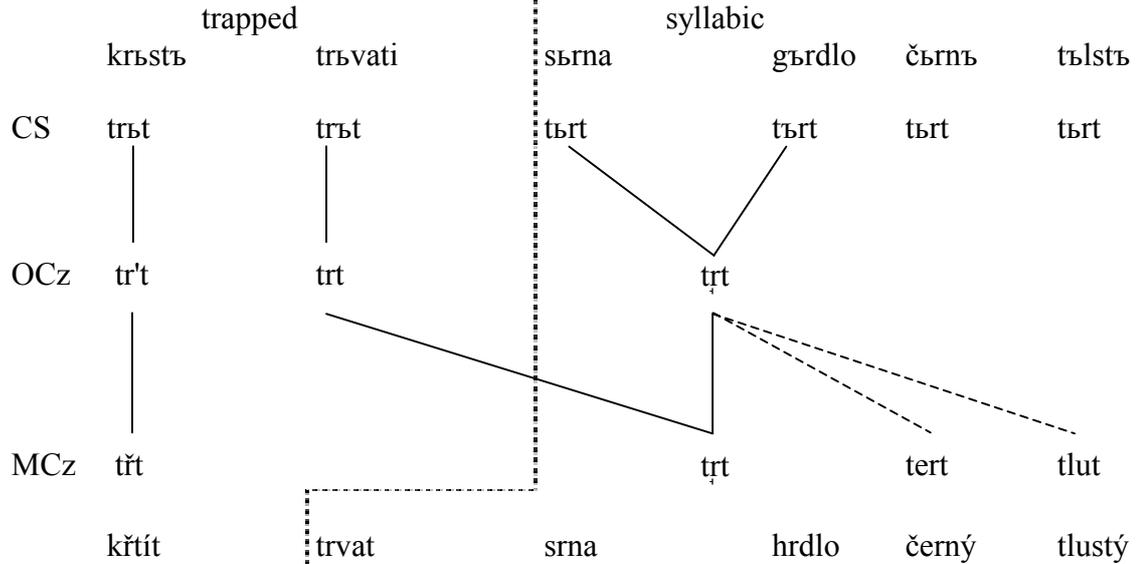
Common Slavic	<i>tr̥rt</i>	<i>tr̥t</i>	example
OCS	<i>tr̥rt</i>	<i>tr̥t</i> trapped (?)	<i>sr̥na - tr̥vati</i>
Old Czech	<i>tr̥rt</i> syllabic	<i>tr̥t</i> trapped	<i>sr̥na - tr̥vati</i>
Modern Czech, Slovak	<i>tr̥rt</i> syllabic	<i>tr̥t</i> syllabic	<i>sr̥na - tr̥vat</i>
Polish	<i>tʋrt</i> vocalized	<i>tr̥t</i> trapped	<i>sarna - trwać</i>

- (53) the Czech merger of syllabic and trapped consonants:

spontaneous sound shift OCz trapped > MCz syllabic consonants,

e.g. Trávníček (1935:57s, 111ss, 226ss), Lehr-Splawiński & Stieber (1957:97ss), Komárek (1962:60s, 82, 97ss, 127ss), Liewehr (1933:93s, 162s).

(54) evolution of Common Slavic trьt and trьt in Czech



References

Afuta, Peggy 2002. Representation of syllabic consonants and statement of a final site in yiddish., Poster at the 10th Manchester Phonology Meeting, 23-25 May 2002.

Arumaa, Peeter 1964. *Urslavische Grammatik. Band I: Einleitung, Lautlehre.* Heidelberg: Carl Winter.

Bell, Alan 1978. Syllabic Consonants. *Universals of Human Language*, Vol 2, edited by Joseph Greenberg, 153-201. Stanford: Stanford University Press.

Bethin, Christina 1984. Voicing assimilation in Polish. *International Journal of Slavic Linguistics and Poetics* 29, 17-32.

Blaho, Sylvia 2001. The representation of Slovak syllabic consonants in strict CV. *The Odd Yearbook* 6, 3-24.

Blevins, Juliette 1995. The Syllable in Phonological Theory. *The Handbook of Phonological Theory*, edited by Goldsmith John, 206-244. Oxford, Cambridge, Mass: Blackwell.

Carlton, Terence R. 1991. *Introduction to the phonological history of the Slavic languages.* Columbus, Ohio: Slavica.

Clements, George N. 1990. The role of the sonority cycle in core syllabification. *Papers in Laboratory Phonology I*, edited by J.Kingston & M.Beckmann, 283-333. Cambridge: Cambridge University Press.

Dell, François & Mohamed Elmedlaoui 1985. Syllabic consonants and syllabification in Imdlawn Tashlhiyt Berber. *Journal of African Languages and Linguistics* 7, 105-130.

Długosz-Kurczabowa, Krystyna & Stanisław Dubisz 1993. *Gramatyka historyczna języka polskiego. Pochodzenie języka polskiego, Fonetyka, Fonologia.* Warszawa: Wydawnictwa Uniwersytetu Warszawskiego.

Gussmann, Edmund 1980a. *Introduction to phonological analysis.* Warszawa: PWN.

Gussmann, Edmund 1980b. *Studies in Abstract Phonology.* Cambridge Mass.: MIT Press.

Gussmann, Edmund 1992. Resyllabification and delinking: The case of Polish voicing. *Linguistic Inquiry* 23, 29-56.

Hall, Tracy A. 1992. *Syllable Structure and Syllable-Related Processes in German.* Tübingen: Niemeyer.

Hall, Tracy A. 2000. *Phonologie. Eine Einführung.* Berlin & New York: de Gruyter.

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

- Havránek, Bohuslav (ed) 1969. *Staročeský Slovník. Úvodní stati, soupis pramenů a zkratek.* Praha: Academia.
- Kaye, Jonathan, Jean Lowenstamm & Jean-Roger Vergnaud 1990. Constituent structure and government in phonology. *Phonology Yearbook* 7, 193-231.
- Kenstowicz, Michael 1994. *Phonology in Generative Grammar.* Cambridge MA, Oxford: Blackwell.
- Kiparsky, Paul 2000. Opacity and cyclicity. *The Linguistic Review* 17, 351-366.
- Komárek, Miroslav 1962. *Historická mluvnice Česká. Volume I: Hláskosloví.* Praha: SPN.
- Laskowski, Roman 1975. *Studia nad morfonologią współczesnego języka polskiego.* Wrocław, Warszawa, Kraków, Gdańsk: Wydawnictwo Polskiej Akademii Nauk.
- Lehr-Splawiński, Tadeusz & Zdzisław Stieber 1957. *Gramatyka Historyczna języka czeskiego.* Warszawa: PWN.
- Liewehr, Ferdinand 1933. *Einführung in die historische Grammatik der tschechischen Sprache. 1. Teil: Lautlehre, Erste Lieferung.* Brünn.
- Lowenstamm, Jean 1996. CV as the only syllable type. *Current trends in Phonology. Models and Methods*, edited by Jacques Durand & Bernard Laks, 419-441. Salford, Manchester: ESRI.
- Mann, Stuart 1957. *Czech historical grammar. Revised edition* Hamburg 1977: Buske.
- Mareš, František Václav 1956. Vznik slovanského fonologického systému a jeho vývoj do konce období slovanské jazykové jednoty. *Slavia* 25, 443-495.
- Mareš, František Václav 1965. *The Origin of the Slavic Phonological System and Its Development up to the End of Slavic Language Unity.* Ann Arbor: Department of Slavic Languages and Literatures.
- Meillet, Antoine 1934. *Le Slave Commun.* 2nd edition Paris: Champion.
- Meillet, Antoine 1937. *Introduction à l'étude comparative des langues indo-européennes.* 8th edition Paris: Hachette.
- Mikkola, J.J. 1913. *Urslavische Grammatik, 3 Vol.* Heidelberg: Winter.
- Montreuil, Jean-Pierre 1999. The Romansch syllable. *The syllable, Views and Facts*, edited by Harry van der Hulst & Nancy Ritter, 527-550. Berlin, New York: de Gruyter.
- Nahtigal, Rajko 1961. *Die Slavischen Sprachen. Abriß der vergleichenden Grammatik.* Wiesbaden: Harroassowitz.
- Panzer, Baldur 1991. *Die Slavischen Sprachen in Gegenwart und Geschichte. Sprachstrukturen und Verwandtschaft.* Frankfurt/ Main: Peter Lang.
- Pawelec, Przemysław 1989. Cyclic phonology and the inventory of morpheme-initial consonant clusters in Polish and English. *Anglica Wratislaviensia* 16, 35-63.
- Pedersen, Holger 1905. Die nasalpräsentia und der slavische akzent. *Zeitschrift für vergleichende Sprachforschung* 38, 297-425.
- Rennison, John 1999. Syllables in Western Koromfe. *The syllable, Views and Facts*, edited by Harry van der Hulst & Nancy Ritter, 311-347. Berlin, New York: de Gruyter.
- Roca, Iggy 1994. *Generative Phonology.* London: Routledge.
- Rospond, Stanisław 1979. *Gramatyka historyczna języka polskiego.* Warszawa: PWN.
- Rowicka, Grażyna 1999a. *On Ghost vowels. A Strict CV Approach.* Ph.D. dissertation, Leiden University.
- Rowicka, Grażyna 1999b. Prosodic optimality and prefixation in Polish. *The prosody-morphology interface*, edited by René Kager, Harry van der Hulst & W. Zonneveld, 367-389. Cambridge: Cambridge University Press.
- Rubach, Jerzy 1984. *Cyclic and Lexical Phonology: The Structure of Polish.* Dordrecht: Foris.
- Rubach, Jerzy 1996. Nonsyllabic Analysis of Voice Assimilation in Polish. *Linguistic Inquiry* 27, 69-110.

- Rubach, Jerzy 1997a. Extrasyllabic Consonants in Polish: Derivational Optimality Theory. *Derivations and Constraints in Phonology*, edited by Iggy Roca, 551-581. Oxford: Clarendon.
- Rubach, Jerzy 1997b. Polish Voice Assimilation in Optimality Theory. *Rivista di Linguistica* **9**, 291-342.
- Rubach, Jerzy & Geert Booij 1984. Morphological and prosodic domains in Lexical Phonology. *Phonology* **1**, 1-27.
- Rubach, Jerzy & Geert Booij 1987. Postcyclic versus Postlexical Rules in Lexical Phonology. *Linguistic Inquiry* **18**, 1-44.
- Rubach, Jerzy & Geert Booij 1990. Syllable structure assignment in Polish. *Phonology* **7**, 121-158.
- Scheer, Tobias 1996. Une théorie de l'interaction directe entre consonnes. Ph.D dissertation, Université Paris 7.
- Scheer, Tobias 1997. Vowel-zero alternations and their support for a theory of consonantal interaction. *Certamen Phonologicum III*, edited by P.M.Bertinetto, L. Gaeta, G. Jetchev & D. Michaels, 67-88. Torino: Rosenberg & Sellier.
- Scheer, Tobias 1999. A theory of consonantal interaction. *Folia Linguistica* **32**, 201-237. Downloadable at <http://www.unice.fr/dsl/tobias.htm>.
- Scheer, Tobias forth. CVCV : a Syntagmatic Theory of Phonology. On Locality, Morphology and Phonology in Phonology. Ms.
- Schenker, Alexander 1995. *The Dawn of Slavic. An Introduction to Slavic Philology*. New Haven & London: Yale University Press.
- Smetánka, Emil 1940. K vzniku m*, r*, l* z m, r, l v češtině. *Listy Filologické* **67**, 354-357.
- Spencer, Andrew 1996. *Phonology*. Oxford: Blackwell.
- Stieber, Zdzisław 1973. *A Historical Phonology of the Polish Language*. Heidelberg: Winter.
- Stieber, Zdzisław 1979. *Zarys gramatyki porównawczej języków słowiańskich*. Warszawa: PWN.
- Szemerényi 1990. *Einführung in die vergleichende Sprachwissenschaft*. Fourth edition Darmstadt: Wissenschaftliche Buchgesellschaft.
- Szigetvári, Péter 1999. VC Phonology: a theory of consonant lenition and phonotactics. Ph.D dissertation, Eötvös Loránd University, Budapest.
- Szpyra, Jolanta 1992. The phonology of Polish prefixation. *Phonological Investigations*, edited by Jacek Fisiak & Stanisław Puppel, 185-218. Amsterdam: Benjamins.
- Toft, Zoë forth. The phonetics and phonology of some syllabic consonants in Southern British English., To appear in the proceedings of the Conference on the Phonetics-Phonology Interface, Berlin ZAS October 2001.
- Trávníček, František 1935. *Historická mluvnice Československá*. Praha: Melantrich.
- Trubetzkoy 1939. *Principes de Phonologie*. French translation Paris 1986: Klincksieck.
- Vaillant, André 1950. *Grammaire comparée des langues slaves. Tome 1: Phonétique*. Paris & Lyon: Institut d'Etudes Slaves.
- Vondrák, Wenzel 1924. *Vergleichende Slavische Grammatik. Band I: Lautlehre und Stammbildungslehre*. 2. Auflage Göttingen: Vandenhoeck & Ruprecht.
- Wiese, Richard 1986. Nichtlineare Phonologie: Eine Fallstudie des Chinesischen. *Linguistische Berichte* **102**, 93-135.
- Wijk, Nicolaas van 1931. *Geschichte der altkirchenslavischen Sprache*. Berlin, Leipzig: de Gruyter.
- Wijk, Nicolaas van 1949-50. Les groupes u**r, i**r, u**l, i**l en slave commun et en russe. *Južnoslovenski Filolog* **18**, 39-47.
- Yoshida, Shohei 1990. A government-based analysis of the "mora" in Japanese. *Phonology* **7**, 331-351.