WHAT HAPPENS WHEN SONORANTS BRANCH ON NUCLEI

(1) purpose
   a. the basic autosegmental architecture makes simple predictions:
      1. if there are empty Onsets, there must be empty Nuclei as well
      2. if there are empty Onsets word-initially (liaison, epenthesis etc.), they must also exist word-internally
      3. hence there must be empty Nuclei word-internally as well
      4. if vowels can branch on neighbouring empty Onsets, there must be Onsets that branch on neighbouring empty Nuclei
   b. goal: to test the generative power of the autosegmental mechanism in detail
   c. hence:
      1. what kind of configurations where Onsets branch on Nuclei are exactly predicted to exist?
      2. what is the empirical reality of these objects?

I. Background

(2) CVCV and its location in the phonological playground

   a. phonological theories today
      Saussurians: Langue exists
gerativists
      anti-Saussurians
      neo-behaviourists
      - usage-based, exemplarists
      - much of the acquisition literature
      - some phoneticians
      anti-representationists
      OT: Grounded Phon
      mainly phonetics
      representationists
      - Government Phon.
      - some OT

   b. anti-Saussurians and neo-behaviourists: there is no Langue, there is no grammar
   c. Saussurians and generativists: Langue and grammar exist
      1. anti-representationists: Grounded Constraints, phoneticism
         - constraints have exclusively non-phonological content: they are phonetic, functional, psycho-linguistic etc.
         => grammar/ Langue = ranking
         - the only thing that is phonological is the management of typology: constraints are ranked on a language-specific and unpredictable basis.
2. representationists
- representations exist and are autonomous
- they are NOT the result of any computation ("emergence of...")
- they contribute an arbitral award independent from computation (from constraints)
- ==> grammar is not just computation
  like biology, chemistry and physics, linguistics is structure AND computation

d. in-betweens
- between anti-Saussurians and Saussurians
  Blevins (2004): is there some synchronic on-line computation left or not?
- between anti-representationalists and representationalists
  Hale & Reiss (2000,2003): there are representations, but only above the skeleton (syllable structure). All segmental stuff is only phonetics (misperception during the acquisitional process) (representations here are substance abuse).

(3) the Lateral Project
a. the defining property of Government Phonology, the idea that it has contributed to phonological theory since its very beginning, is the introduction of the lateral perspective:

| hierarchical relations between segments (= syllable structure) are the result of lateral relations (Government and Licensing), rather than of arboreal structure |
| ===> lateralisation of structure and causality |
| empty Nuclei are a byproduct of this move |

b. lateralisation of structure
example: the Coda.
If you want to know whether you are a Coda or an Onset,
1. classical view: look up. It depends on the constituent in the arboreal structure that you are attached to.
   ==> a Coda consonant is a consonant that is dominated by the constituent Coda.

<table>
<thead>
<tr>
<th>internal Coda</th>
<th>final Coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>N C O N</td>
<td>N C</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>V R T V</td>
<td>V C #</td>
</tr>
</tbody>
</table>
2. lateral view: **look left/ right**. It depends on what occurs to your left and to your right.

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a Coda consonant is a consonant that occurs before an empty Nucleus.

<table>
<thead>
<tr>
<th>Internal Coda</th>
<th>Final Coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>V C V C V</td>
<td>V C V #</td>
</tr>
<tr>
<td>V R T V</td>
<td>V C</td>
</tr>
</tbody>
</table>

---

c. lateralisation of causality

example: the Coda.

Why are Coda consonants weak / prone to lenition?

1. classical view: **no answer**.

2. lateral view: because it is unlicensed and ungoverned, empty Nuclei are laterally disabled.

<table>
<thead>
<tr>
<th>Internal Coda</th>
<th>Final Coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>G v t</td>
<td>G v t</td>
</tr>
<tr>
<td>V C V C V</td>
<td>V C V #</td>
</tr>
<tr>
<td>V R T V</td>
<td>V C</td>
</tr>
</tbody>
</table>

---

d. Standard GP has run out of breath half way

it is a hybrid model where arboreal structure cohabitates with lateral relations.

Kaye (1990), Kaye (1990), Harris (1994)

e. CVCCV takes the lateral idea to its logical end

- complete elimination of arboreal structure
- complete shift of the functional load from syllabic arborescence to lateral relations


f. what does CVCCV buy us?

for example

2. a clear and non-contradictory definition of Government and Licensing
3. - an explanation why Codas, but not Onsets, may be relevant for syllable weight
   - a unification of the objects that are counted by stress algorithms: only Nuclei
   Szigetvári & Scheer (2005)
4. an explanation why there is no recursion in phonology (Scheer (2004:§2), Neeleman & Koot in press):
   only syntax (and morphology) are concatenating modules - only they have the privilege of Merge and Phase. Phonology and semantics are interpretative modules and hence have no tree-building device: Chomsky (2002).
(4) extensions of the lateral idea from syllable structure to other areas of phonology I
   a. stress: this is automatic
economy: no additional arboreal or grid structure needed, CVCV plus Government plus Licensing do the job alone.
b. melody (area below the skeleton): probably nothing to be gained here. But: if Feature Geometry is an incarnation of arboreal structure (which is not obvious in the syntactic sense: no Merge, no binary branching etc.),
c. rhythm and eventual grid structure is non-linguistic
metrical poetry & eurythmy
   the grid is the result of a secondary mapping based on the primary syntax-morphology → phonology mapping (Hayes 1984,1989b, Nespor & Vogel 1986, Selkirk 1986).
"Grids are not strictly speaking a linguistic representation at all" (Hayes 1984:65).
   Rhythm on one hand and linguistic structure such as stress, interface and the like on the other belong to separate cognitive domains (Hayes 1984:69).

(5) extensions of the lateral idea from syllable structure to other areas of phonology II
Interface: elimination of arboreal structure (Prosodic Phonology) here as well

Direct Interface
Scheer (2005a,b,forth)
   a. diacritics won't do: # etc. are no linguistic objects - linguists use them in order to refer to a reality that they do not understand.
b. linguistic modules are different ontological spaces: they don't speak the same language (Jackendoff 1992, 2002 etc.). The gap is especially deep between syntax-morphology-semantics, which share fundamental vocabulary (person, number, gender, animate etc.) and phonology (labial, Onset etc. are unknown in the other modules).
c. hence:
   1. intermodular communication is only possible through a translator's office
   2. phonology understands only the phonological language
   3. any instruction that reaches phonology from higher modules must be formulated in truly phonological categories. Truly phonological categories are only those that exist in phonology anyway in absence of any issue related to the interface.
   4. thus SPE- diacritics and the Prosodic Hierarchy (phonological words etc.) do not qualify.
   5. every theory has its own truly phonological vocabulary.
   6. hence every phonological theory makes different predictions as to its behaviour at the interface. This is good and NEW: theories may be tested and run against one another by looking at their behaviour at the interface.
d. the founding case of Direct interface: the beginning of the word (Lowenstamm 1999):
   # = CV
   why do pink panthers always do the same things? (Scheer 2004:§87)
   1. restrictions on word-initial consonant clusters: either they exist (#TR-only languages) or they don't (anything-goes languages). But there is no language that imposes other restrictions, e.g. #RT-only. Hence either #__ is special, or it behaves just like internal locations.
   2. the strength of word-initial consonants may be special with respect to their internal peers: strong. Or it is not any different from the one of internal consonants.
3. stability of the first vowel of word, which may refuse to alternate with zero, or they alternate just like any internal vowel.

orphn  Gvt

C V - C V C V ill-formed

# C C V

e. these are all non-arbitrary properties of the beginning of the word, hence theory is called to be able to explain why they are the way they are, and not the reverse. In particular, theory ought to provide a single reason for the three phenomena quoted. The initial CV is such a reason:

1. languages that have it 1) are #TR-only, 2) have strong initial consonants and 3) stable first vowels
2. languages that don't have it 1) are anything-goes, 2) have weak initial consonants and 3) first vowels that may alternate.

===> non-trivial, strong and testable predictions

(6) summary

a. phonology is not a gluing device
b. hence there is no Merge and no trees
c. independently of the phonology-internal arguments in favour of the lateral perspective, the overall architecture calls for a non-arboreal alternative

Phonology is flat

II. Phonological hermaphrodites

(7) glides are vowels that branch on Onsets

a. since the 19th century, linguists know that glides - semi-vowels, cf. the "German" notation i - are vowels in a consonantal coat.
b. [i] and [j] are in fact the same object that is articulated either in vocalic or in consonantal fashion.
c. Saussure's Laryngeal Theory is entirely built on this insight:

leip-o e-loip-on
d. autosegmentalism offers a formal expression of this insight: at least since Kaye & Lowenstamm (1984), the following representation for a glide has become standard textbook material (e.g. Kenstowicz 1994:23, Carr 1993:59,194ss).

O N - O N

l i e [lije] Frenchlier "to tie" /li-e/ → [lije]

(8) if the basic autosegmental mechanism is correct - hence does not overgenerate - , then the following prediction is made:

Onsets can also branch on Nuclei.
All logically possible configurations must have an empirical incarnation.

hence this talk is just a very belated test of a straightforward prediction that was made by the perfectly consensual autosegmental architecture some 25 years ago.
this of course supposes the existence of empty Nuclei, and not just at the end of the word.

a. same reasoning as before (e.g. Szigetvári 1999,2001):

b. the basic idea of autosegmentalism is the existence of different tiers whose relations are NOT one-to-one. Hence one tier may be empty where another one is contentful.

c. therefore there are empty Onsets - everybody agrees on that.

d. but if there are empty Onsets, there must be empty Nuclei as well.

e. if there are empty Onsets word-initially, they must also exist elsewhere.

f. ==> if there are empty Nuclei word-finally, they must also exist elsewhere.

logically possible situations where an Onset branches on a Nucleus

a. assumption: only sonorants (henceforth R) can branch on Nuclei.

1. obvious motivation: their kinship with vowels in general and on the sonority scale, the fact that only sonorants participate in vocalic phenomena, cf. below.

2. only difficulty: some very rare reports of syllabic obstruents:
   - in Salish (Native American Northwest, e.g. Bagemihl 1991): evidence flawed and not serious
   - in Berber (Dell & Elmedlaoui 2002): more serious, to be sorted out [Scheer 2004:§§294,376]

b. list: exactly 8 cases are generated

<table>
<thead>
<tr>
<th>Object on the non-branching side</th>
<th>R object on the branching side</th>
<th>empirical identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CoRC</td>
<td>C V C V C C</td>
<td>Cz krk</td>
</tr>
<tr>
<td>2. CoR#</td>
<td>C</td>
<td>Cz Petr</td>
</tr>
<tr>
<td>3. #oRC</td>
<td>R C</td>
<td>S-Cr rvati</td>
</tr>
<tr>
<td>4. CRoC</td>
<td>C V C V C</td>
<td>Po trwać</td>
</tr>
<tr>
<td>5. CRo#</td>
<td>R</td>
<td>Po Piotr</td>
</tr>
<tr>
<td>6. #RoC</td>
<td>R</td>
<td>Po rtęć</td>
</tr>
<tr>
<td>7. CoRV</td>
<td>C V C V</td>
<td>branching Onset ?</td>
</tr>
<tr>
<td>8. VRoC</td>
<td>V C V C</td>
<td>1) weak post-Coda</td>
</tr>
<tr>
<td></td>
<td></td>
<td>consonants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) Weight-by-Position</td>
</tr>
<tr>
<td></td>
<td></td>
<td>only for sonorants</td>
</tr>
</tbody>
</table>
prime candidates for Onsets branching on Nuclei: syllabic consonants
Scheer (2004:§240, in press)
a. neogrammarians: "consonants in vocalic function"
b. their body is only consonantal, while their behaviour is only vocalic
c. hence the branching analysis:
   1. their physical properties stem from their roots in an Onset
   2. their behaviour is due to the vocalic essence they suck out of a Nucleus
d. why syllabic consonants do not sit in Nuclei
the classical representation is simplistic and cannot be true: accepting the basic autosegmental distinction between \[j\] and \[i\], vowelhood and consonanthood are determined by the constituent to which a melody belongs. Hence a chunk of melody associated to a Nucleus alone can never come out as a consonant.
The Nucleus-only analysis hast to satisfy the behaviour of syllabic consonants, but does not care for their body.
e. the branching idea enjoys growing popularity:

next question:
if syllabic consonants branch, do they branch to their left or to their right?
a. answer: they are left-branching

b. arguments
1. theory-unspecific
   - synchronically, syllabic consonants alternate with a VC sequence, never with a CV sequence:
     engl button, bottle etc. germ Segel, sagen etc.
   - diachronically, they always take over the syllabic function of a PRECEDING vowel, never of a following vowel:
     engl burden etc., cz ѦѦѦѦ
2. theory-specific
   - preceding sites of vowel-zero alternations are always unvocalised:
     cz roz- trhat "to tear up" etc.
     the non-vocalisation supposes that the following Nucleus is a good governor.
     This means that it must have phonetic content.

c. interesting prediction:
1. word-initial syllabic consonants such as in S-Cr are preceded by an empty Nucleus.
2. what kind of animal could this be? - The initial CV
3. in languages where the initial CV is not distributed, there could not be any word-initial syllabic consonants.
4. recall the three diagnostics for the presence/ absence of the initial CV
   - present if #TR-only, absent if anything-goes
   - present if first vowel cannot alternate with zero, absent if it can
   - preset if initial consonants are strong, absent if they are weak
5. Czech: no initial CV
   - anything-goes: lhát, rtut', lžíce etc.
   - first vowel alternates: pes - ps-a
6. diachronic movement ocz trapped > mod cz syllabic consonants
   - word-finally: bratrъ > bratr
   - word-medially: krъve > křve
   - but not word-initially: lhgati > lhát

(13) what, then, do right-branching consonants represent?
   a. answer: trapped consonants
   b. what is a trapped consonant?
      1. not a received descriptive category
      2. informal description: same distribution as syllabic consonants, but no syllabic effect: #RC, CRC, CR#
         compare po trwač - cz trvat "to last"
      3. often confused with syllabic consonants (Salish literature): "when there are too many consonants in a row, one must be syllabic".
      4. best known case: Polish called "extrasyllabic consonants" here in the pioneering work by J. Rubach (e.g. Rubach & Booij 1990, Rubach 1997).
         But also present in Georgian (Kartvelian) and Romansch (Romance)
   c. syllabic and trapped consonants are antagonistic objects: they show opposite behaviour in all respects.
      ==> we can only discover the phonological identity of syllabic and trapped consonants if we compare them - their study in isolation will not do.
   d. four diagnostics
      
      | syllabic | trapped | example              |
      |----------|---------|----------------------|
      | can bear stress | yes  | no       | po trwač - cz trvat |
      | is counted in poetry/ by natives | yes  | no       | po trwač - cz trvat |
      | transparent to voicing | no   | yes      | po trwač - cz trvat |
      | preceding alternation site is | unpolarised | vocalised | po roze-drgač (sieg) "to become vibrating" - cz roz-drtit "to crush"

e. "antagonistic" makes sense when applied at the representational level:
   syllabic = left-branching vs. trapped = right-branching
   
<table>
<thead>
<tr>
<th>syllabic</th>
<th>trapped</th>
</tr>
</thead>
<tbody>
<tr>
<td>V C</td>
<td>C V</td>
</tr>
<tr>
<td>consonant</td>
<td>consonant</td>
</tr>
<tr>
<td>R</td>
<td>R</td>
</tr>
</tbody>
</table>
f. this sorts out fine with the vocalisation of prefixes:
   trapped consonants in Polish provoke vocalised prefixes

   Gvt Gvt
   C  V  C  V  -  C  V  C  V  C  V
   r  o  z  e  d  r  g  a  ċ

   roze-drgać "to set vibrating"

g. diachronic confirmation
   Common Slavic trττ > Old Czech trapped trt vs.
   Common Slavic tττ > Old Czech syllabic ττ

   minimal pair:
   ocz syllabic držeti "to hold" (< CS dyržati, cf. pol dzierżyć, mcz držet)
   vs.
   ocz trapped držeti "to tremble" (< CS drţzati, cf. pol drţć, mcz extinct).

h. this interpretation of syllabic and trapped consonants is not without problems:
   1. it does not explain why trapped consonants are invisible for stress
   2. it faces words with too many consonants (hence too many empty Nuclei) in a row
      at the right periphery of syllabic consonants:
      cz srdce, vlhký, uprchlík, blbec - blbce
      Blaho (2001,2004), Scheer (2004:§§298s)

III. When Codas branch on the following empty Nucleus

(14) case 8: VRoC
   two empirical consequences:
   a. C will be intervocalic, instead of strong
   b. produces Weight-by-position only for sonorant Codas

(15) strength of post-Coda consonants
   a. general picture: the Strong Position is a disjunction
      (something that has gone unnoticed in the OT-literature on lenition, e.g. Kirchner

   | Strong Position | Coda |
   | {#,C} | {#,C} |

   b. the Coda Mirror (Ségéral & Scheer 2001, Szigetvári 1999)
      reduces this disjunction just as much as the Coda disjunction was reduced in the 70s -
      only that the regular syllabic inventory fails to do this job: word-initial and post-Coda
      consonants are
   c. there are two binary cross-linguistic parameters on the Strong Position
      Ségéral & Scheer (forth)
      1. word-initial consonants may or may not be strong
         - strong: Romance, Germanic
         - weak (= intervocalic): Greek (Seigneur-Froli 2003,forth), Polish (Krup dialect)
           (Kijak 2005)
      2. consonants after sonorant Codas may be strong or weak (= intervocalic)
         (while consonants after obstruent Codas are always strong)
(16) illustration of the latter parameter (on post-sonorant consonants)

post-Coda consonants are

a. "strong no matter what"

1. Romance: evolution of Latin obstruents in French:
   cantare > chanter = rupta > route

b. "strong after obstruents, weak after sonorants"

1. evolution of aspirated stops from Classical to Modern Greek (Demotic)

<table>
<thead>
<tr>
<th>evolution of Classical Greek voiceless aspirated stops in Demotic</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. after obstruents</td>
</tr>
<tr>
<td>dyporia</td>
</tr>
<tr>
<td>disforia</td>
</tr>
<tr>
<td>diaphoria</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. after sonorants</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>δυσφορία</td>
<td>ορφανος</td>
</tr>
<tr>
<td>δυσφορία</td>
<td>άδελφος</td>
</tr>
<tr>
<td>δυσφορία</td>
<td>κυμάρι</td>
</tr>
</tbody>
</table>

2. Grimm’s Law
   
   R__: lat. mentum, uerto = goth munþs, wairþan "mouth, to become"

   T__: lat. captus, nocte = OHG haft, naht "captivity, night"

3. Korean
   [sorry, too complicated to fit in here]

4. Finnish consonant gradation
   "onsets appear in strong grade in open, in weak grade in closed syllables"

   R__: kulta, ranta "gold, beach NOMsg" vs. kulla-n, ranna-n "id. GENsg"

   T__: matka "journey NOMsg" = matka-n, not *matta-n "id. GENsg"

5. Liverpool English (Honeybone 2001 et passim)

6. flapping and glottaling in varieties of English:

   R__: quarter, winter is flapped/ glottalised

   T__: after, custard, chapter, doctor must be pronounced with a [t]

(17) the parameter at hand is due to the branching ability of sonorants

a. the Coda Mirror - how it works

b. reduction of the two disjunctions:

1. Coda __{#,C} = __ø "before a governed empty Nucleus"

2. Strong Position {#,C} = __ø "after an empty Nucleus"

3. intervocalic V__V = "no adjacent empty Nucleus"

c. illustration of the 5 positions

1. consonants in the Coda Mirror: ungoverned but licensed

<table>
<thead>
<tr>
<th>initial consonant #</th>
<th>post-Coda consonant C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gvt</td>
<td>Gvt</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C V</th>
<th>C V</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>C</td>
<td>V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V C</th>
<th>V C</th>
<th>V C</th>
<th>V V</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>C</td>
<td>V</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R</th>
<th>T</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lic</td>
<td>Lic</td>
<td></td>
</tr>
</tbody>
</table>
2. consonants in Codas: ungoverned and unlicensed
3. intervocalic consonants: both governed and licensed

\[
\begin{array}{ccc}
\text{internal Coda} & \text{final Coda} & \text{intervoc. V}\_V \\
\text{Gvt} & \text{Gvt} & \text{Gvt} \\
V\_C\_V & V\_C\_V & V\_C\_V \\
V\_R\_T\_V & V\_C\_V & V\_C\_V \\
\text{Lic} & \text{Lic} & \text{Lic}
\end{array}
\]

\hspace{1cm}

d. prediction of the Coda Mirror (Pöchtrager 2001): 

**if in a VRóTV sequence R branches on the following empty Nucleus, T is both governed and licensed, hence in intervocalic position**

post-Coda after a branching sonorant Coda: 
governed and licensed = intervocalic

\[
\begin{array}{c}
V\_C\_V \\
V\_R\_T\_V \\
\text{Lic}
\end{array}
\]

(18) conclusion: the effect of branching R in VRóCV sequences in a language where 
R branches, post-sonorant consonants are weak
R does not branch, post-sonorant consonants are strong

(19) Weight-by-Position only for sonorant Codas 
Szigetvári & Scheer (2005)

\text{a. typicality of syllable weight: the two major patterns}
\hspace{1cm} = "usual" Weight-by-Position (Hayes 1989a): Codas do or do not count

\[
\begin{array}{ccc}
\text{CVV} & \text{CVC} & \text{CV} \\
\text{heavy} & \text{light} & \text{light}
\end{array}
\]

\begin{enumerate}
\item OFF 
syllables are heavy iff they contain a long vowel 
examples: Malayalam, Lardil, Khalkha Mongolian
\item ON
syllables are heavy iff they contain a long vowel or a 
rhymal consonant; examples: Latin, English
\end{enumerate}

\text{b. interpretation of Weight-by-Position in CVCV}

\begin{enumerate}
\item recall that Coda consonants are followed by an empty Nucleus, while Onset 
consonants are not.
\item what is really counted when "Codas are counted" is the empty Nucleus that it hides.
\end{enumerate}
3. Weight-by-Position ON = empty Nuclei are counted
   Weight-by-Position OFF = empty Nuclei are not counted
   
   ===> "stress falls on the third but last Nucleus"

e.g. Latin = Weight-by-Position ON
   
   proparoxytons: monomoraic penult
   
   \[
   \begin{array}{cccccc}
   C & V & C & V & C & V \\
   \hline
   d & i & c & e & r & e
   \end{array}
   \]
   
   dicere "to say"

   paroxytons: himoraic penult
   
   \[
   \begin{array}{cccccccccccc}
   C & V & C & V & C & V & C & V & C & V & C & V \\
   \hline
   h & a & b & e & r & e & a & r & i & s & t & a
   \end{array}
   \]
   
   habèere "to have" \hspace{1cm} arista "ear (of corn)"

c. advantages
   1. unified representations for the syllable and stress
   2. unification of the objects that are counted: Nuclei + some Codas > only Nuclei
   3. explanation why Onsets never count: they are followed by a filled Nucleus

d. a third pattern:
   found in native American Wakashan languages, namely in Kwakwala and

e. stress falls on the leftmost CVV or CVR syllable of the word; if there is no such item,
   the word is oxytonic.
   
   ===> closed syllables are heavy only if their Coda is a sonorant

f. interpretation
   1. Weight-by-Position is OFF = empty Nuclei are not counted
   2. sonorants branch on following empty Nuclei
   
   ===> all contentful Nuclei are counted
   
   syllable with a long vowel \hspace{1cm} syllable with a sonorant Coda
   
   \[
   \begin{array}{cccccc}
   C & V & C & V & C & V \\
   \hline
   C & V & C & V & C & V
   \end{array}
   \]

   syllable with a short vowel \hspace{1cm} syllable with an obstruent Coda
   
   \[
   \begin{array}{cccccc}
   C & V & C & V & C & V \\
   \hline
   C & V & T & C & V
   \end{array}
   \]
summary VRøCV

a. prediction:
   the two effects (strength of the following consonant and weight of sonorant Codas) must be concomitant in a given language.

b. it takes quite some parametric accident to get the appropriate testing configuration:
   1. presence of a lenition/fortition phenomenon
   2. difference between post-sonorant and post-obstruent
   3. stress-assigning mechanism in a non-Weight-by-Position language

IV. When Onsets branch on the preceding empty Nucleus

(21) case 7: VCøRV

a. two possible configurations:
   1. the preceding C is an obstruent
   2. the preceding C is a sonorant

| | | |     | |  | |
| V C V C V | V | C | V | C | V |
| V T R V | V R R V |

b. VTøRV
   1. typical configuration of a branching Onset
   2. this has indeed been proposed by Szigetvári (1999)
   hence parametric variation:
   R branches = branching Onset = solidary cluster
   R does not branch = Coda capture = Semitic TR cluster

3. problems
   - predicts that TRs may be sensitive to stress
   - precisely when they represent branching Onsets - which are never visible for stress
   - why should branching Onsets be the heaviest ("most difficult") cluster? Does R need to be licensed in order to be able to branch left?

c. VR₁øR₂V
   a priori both Rs can branch.
   1. in case R1 does, we are facing an instantiation of 8) VRøTV: R2 is predicted to be weak, instead of strong.
      ))) difficult to test since sonorants in strong position are rarely involved in lenition/fortition phenomena. But cf. j > tʃ lat rabia > fr rage
   2. in case R2 branches, the same prediction is made: R2 will be weak instead of strong.

d. ))) no obvious match for this configuration
   VTøRV needs to be sorted out in further work
V. Conclusion

(22) a. an attempt at running the predictions made by the basic autosegmental architecture against reality.

b. CVCV offers a fairly good match: 7 out of 8 logically possible have clearly profiled empirical counterparts. The (non-)branching controls basic parametric variation:
1. syllabicity of sonorants
2. trappedness of sonorants
3. strength of post-Coda consonants after sonorant Codas
4. visibility of sonorant Codas for stress
5. ? TR is a solidary cluster (branching Onset) or not ("Coda capture")

c. certain empirical effects shown are only possible in CVCV:
strength of post-Codas, visibility of sonorant Codas for stress.

Appendix - data about syllabic & trapped consonants that are missing above

(1) trapped consonants in Polish
a. lexically trapped (some examples)

<table>
<thead>
<tr>
<th>Common Slavic</th>
<th>Polish</th>
<th>Czech</th>
<th>gloss (Polish)</th>
<th>gloss (Czech)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CrC trvati</td>
<td>trwać</td>
<td>trvat</td>
<td>to last</td>
<td>to last</td>
</tr>
<tr>
<td>CrzC dvęgi</td>
<td>dźwi</td>
<td>dveře</td>
<td>door</td>
<td>door</td>
</tr>
<tr>
<td></td>
<td>grżměći</td>
<td>hřmět</td>
<td>to thunder</td>
<td>to thunder</td>
</tr>
<tr>
<td></td>
<td>brzmięć</td>
<td>brňět</td>
<td>sound</td>
<td>tickle</td>
</tr>
<tr>
<td></td>
<td>grzbiet</td>
<td>hřbet</td>
<td>back</td>
<td>back</td>
</tr>
<tr>
<td></td>
<td>trzcina</td>
<td>trstina</td>
<td>reed (plant)</td>
<td>reed (plant)</td>
</tr>
<tr>
<td>ClC kląp-</td>
<td>klęć</td>
<td>klńout</td>
<td>1 curse</td>
<td>to curse</td>
</tr>
<tr>
<td>plv-</td>
<td>plwocina</td>
<td>plvout</td>
<td>sputum</td>
<td>to spit</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Common Slavic</th>
<th>Polish NOMsg</th>
<th>Polish GENsg</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>kręć</td>
<td>krew</td>
<td>krwi</td>
<td>blood</td>
</tr>
<tr>
<td>bręć</td>
<td>brew</td>
<td>brwi</td>
<td>eyebrow</td>
</tr>
<tr>
<td>kręć</td>
<td>chrzęst</td>
<td>chrztu</td>
<td>baptism</td>
</tr>
<tr>
<td>płęć</td>
<td>plć</td>
<td>plci</td>
<td>sex</td>
</tr>
<tr>
<td>bliścha</td>
<td>pchła</td>
<td>pcheł</td>
<td>flea</td>
</tr>
<tr>
<td>slżza</td>
<td>łź</td>
<td>łęz</td>
<td>tear</td>
</tr>
<tr>
<td>Ćesmęk</td>
<td>czosnek</td>
<td>czosnku</td>
<td>garlic</td>
</tr>
<tr>
<td>rę-ępę</td>
<td>pierwiosnek</td>
<td>pierwiosnka</td>
<td>primroses</td>
</tr>
<tr>
<td></td>
<td>piosnka</td>
<td>piosnka GENpl</td>
<td>song</td>
</tr>
</tbody>
</table>
(2) transparency of trapped consonants
a. trapped consonants are transparent to voice assimilation. Put another way, their flanking consonants must always agree in voicing. *\( C_{\text{voice}}R C_{\text{voice}} \) where R is trapped is ill-formed.
b. illustration: word-final trapped consonants in Polish
"Polish has word-final devoicing, which applies 'through' the final trapped C"

<table>
<thead>
<tr>
<th>…TR#</th>
<th>…TR-V</th>
<th>spelling</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>katr</td>
<td>kadr-a</td>
<td>kadr GENpl, NOMsg</td>
<td>staff</td>
</tr>
<tr>
<td>bupr</td>
<td>bóbr-a</td>
<td>bóbr NOMsg, GENsg</td>
<td>beaver</td>
</tr>
<tr>
<td>ʒupr</td>
<td>ʒubr-a</td>
<td>ʒubr NOMsg, GENsg</td>
<td>bison</td>
</tr>
<tr>
<td>mukw</td>
<td>mọgw-a</td>
<td>mọgl masc., fem.</td>
<td>could</td>
</tr>
</tbody>
</table>

c. illustration: word-internal trapped consonants in Polish
"Polish progressive devoicing goes 'through' internal trapped consonants"

<table>
<thead>
<tr>
<th>spelling</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>trfatɛ</td>
<td>to last</td>
</tr>
<tr>
<td>plfatɛ</td>
<td>to spit</td>
</tr>
<tr>
<td>křf i</td>
<td>křew GENsg, krwi GENsg, blood, relative</td>
</tr>
<tr>
<td>břf i</td>
<td>brew NOMsg, brwi GENsg</td>
</tr>
<tr>
<td>jɛntɪka</td>
<td>Jędrka GENsg, Jędrek NOMsg</td>
</tr>
</tbody>
</table>

d. syllabic consonants are not transparent to voice: Czech
Czech obstruents devoice word-finally
(e.g. *holub* [holup] vs. *holuba* [holuba] "pigeon NOMsg, GENsg")

<table>
<thead>
<tr>
<th>spelling</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>bobf</td>
<td>bobr-a</td>
</tr>
<tr>
<td>ʒubf</td>
<td>ʒubr-a</td>
</tr>
<tr>
<td>mohl</td>
<td>mohl-a</td>
</tr>
<tr>
<td>trvat</td>
<td>to last</td>
</tr>
<tr>
<td>křve</td>
<td>krve GENsg</td>
</tr>
</tbody>
</table>

(3) syllabic consonants always provoke unvocalised prefixes
hence, they pattern with #CV stems, NOT with #CC stems.
Polish: influence of trapped consonants on prefixes (the list aims at exhaustivity)

conclusion: trapped consonants provoke vocalised prefixes.

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

- **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-krztusieć od-krztuszać to cough up (pf), id. (ipf)
  - płć- bez-plćiovy sexless, boring
  - krew roz-krawać to cause to bleed (pf), id. (ipf)
  - bez-krawačy bloodless (with no casualties)
  - bez-krewisty bloodless (e.g. meet)
  - s-krawačy to stain with blood (pf)

**consonant clusters following syllabic consonants in Czech**

<table>
<thead>
<tr>
<th></th>
<th>a. __RT, __TT</th>
<th>b. __RTR</th>
<th>c. __TR</th>
<th>d. __C-e/οC C-eC</th>
<th>C-οC-V</th>
</tr>
</thead>
<tbody>
<tr>
<td>brnkat</td>
<td>brknout</td>
<td>vrchní</td>
<td>blbec</td>
<td>blbcek</td>
<td></td>
</tr>
<tr>
<td>cvrnkat</td>
<td>natrpklý</td>
<td>brylat</td>
<td>čtvrtík</td>
<td>čtvrtků</td>
<td></td>
</tr>
<tr>
<td>drnčet</td>
<td>trpknout</td>
<td>nazrzlý</td>
<td>cvrček</td>
<td>cvrčku</td>
<td></td>
</tr>
<tr>
<td>hrncř</td>
<td>uprchlík</td>
<td>přiblý</td>
<td>držeb</td>
<td>držba</td>
<td></td>
</tr>
<tr>
<td>mrrký</td>
<td>zamlkly</td>
<td>hmrnc</td>
<td>hmrnce</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vllký</td>
<td>blbnout</td>
<td>krt</td>
<td>krtka</td>
<td></td>
<td></td>
</tr>
<tr>
<td>srdce</td>
<td>drhout</td>
<td>mrt</td>
<td>mrtvý</td>
<td></td>
<td></td>
</tr>
<tr>
<td>umrlčí</td>
<td>mlzný</td>
<td>smrc</td>
<td>smrc</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>trlnout</td>
<td>vrste</td>
<td>vrstva</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>trpnost</td>
<td>zrnk</td>
<td>zrnka</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>vyržník</td>
<td>hrdel</td>
<td>hrdlo</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ztvrdnout</td>
<td>prk</td>
<td>prkno</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

what has happened to Old Czech (and Slovak) trapped consonants?

- **a.** CS pre- and postvocalised sonorants have merged in Czech: they are both syllabic.
- **b.** CS trst should produce trapped consonants as much as it does in Polish.
- **c.** crux:
  1. Polish motivates a right-branching identity for trapped consonants, but is mute on the syllabic side: CS C♭RC > CVRC vs. CS CR♭C > trapped CRC.
  2. Czech motivates a left-branching identity for syllabic consonants, but is mute on the trapped side:
    - CS C♭RC > syllabic CRC merged with CS CR♭C > syllabic CRC.
- **d.** the ideal language for the purpose of the demonstration would be one where CS C♭RC appear as syllabic consonants, against CS CR♭C giving trapped reflexes. In other words, a language where there is a synchronic opposition between syllabic and trapped consonants.
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 tršt do not count in poetry and thereby identify as trapped, whereas the reflexes of CS tršt > OCz CrC weigh in versification. By the end of the 14th century, however, trapped CrC < CS tršt start to count as well. Therefore, the evolution demonstrated in table (11) CS tršt > trapped OCz trt > syllabic OCz, MCz trt can be almost followed in real time.

(7) here are some examples of older sources. In all cases, the poetry obeys typical Old Czech Alexandrine verse, i.e. counting eight syllables. 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-Spławinski & Stieber (1957:97), Komárek (1969:128s).

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

<table>
<thead>
<tr>
<th>a. C__C within a root</th>
<th>CrC &lt; tršt</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
</tr>
<tr>
<td>we krwi jakžto vodě kalé</td>
<td>krwi &lt; krvě</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
</tr>
<tr>
<td>a z jich srdce krwe utočie</td>
<td>krwe &lt; krvě srdce</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
</tr>
<tr>
<td>Mezi oči jemu plvali</td>
<td>plvati &lt; plvati</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. C__C outside a root</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
</tr>
<tr>
<td>a ty zlaté jablko jmiechu</td>
<td>jablko &lt; jablko</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
</tr>
<tr>
<td>v cyprskéj zemi v dobrém slově</td>
<td>cyprský &lt; cyprský</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>c. C__#</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8</td>
</tr>
<tr>
<td>bratr Filotóv, jenž boj bráše</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8</td>
</tr>
<tr>
<td>vňuž by sě třás vsvět i moře</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8</td>
</tr>
<tr>
<td>matko pro tvých sedm radosti</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8</td>
</tr>
</tbody>
</table>

Texts from the 15th century and younger systematically do count liquids in CrC < CS tršt. On the other hand, CrC from CS tršt 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 (7)a where the liquid in the word "heart" srdce < CS srdce does count in presence of the metrical irrelevance of its mate in "blood GENsg" krwe < CS krvě.

---

1 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).
there is an OCz minimal pair syllabic vs. trapped consonant. This was identified by Troubetzkoy (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  

<table>
<thead>
<tr>
<th>Syllabic</th>
<th>Trapped</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;hold&quot;</td>
<td>&quot;tremble, shake&quot;</td>
</tr>
</tbody>
</table>

Common Slavic          |  
| dýržatí | drýžatí |

Polish           |  
| dzierżyć | drzeć |

Russian            |  
| deržat' | drožat' |

Old Czech        |  
| držěti | držěti |

Modern Czech | držet |

(9) illustration in verse

Old Czech  

| 
| a. držěti = 3 syllables |
| 1 2 3 4 5 6 7 8 |
| to jmě držal takým kmenem |  
| Kat. verse 24 |
| b. držěti = 2 syllables |
| 1 2 3 4 5 6 7 8 |
| všecko pohanstvo držalo |  
| Kat. verse 2803 |

(10) summary

Western Slavic reflexes of Common Slavic tšt and tšt

<table>
<thead>
<tr>
<th>Common Slavic</th>
<th>tšt</th>
<th>tšt</th>
<th>example</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCS</td>
<td>tšt</td>
<td>tšt</td>
<td>trapped (?)</td>
</tr>
<tr>
<td>Sarna - trvati</td>
<td>sšt</td>
<td>sšt</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Old Czech</th>
<th>tšt</th>
<th>syllabic</th>
<th>tšt</th>
<th>trapped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarna - trvati</td>
<td>sšt</td>
<td>sšt</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modern Czech, Slovak</th>
<th>tšt</th>
<th>syllabic</th>
<th>tšt</th>
<th>syllabic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarna - trvati</td>
<td>sšt</td>
<td>sšt</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Polish</th>
<th>tVřt</th>
<th>vocalized</th>
<th>tšt</th>
<th>trapped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarna - trwać</td>
<td>sšť</td>
<td>sšť</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(11) the Czech merger of syllabic and trapped consonants:

spontaneous sound shift OCz trapped > MCz syllabic consonants,

e.g. Trávníček (1935:57s, 111ss, 226ss), Lehr-Spławinski & Stieber (1957:97ss), Komárek (1969:60s, 82, 97ss, 127ss), Liewehr (1933:93s, 162s).
(12) evolution of Common Slavic тьрт and тьрт in Czech

<table>
<thead>
<tr>
<th>Language</th>
<th>Sign</th>
<th>Syllabic</th>
<th>Trapped</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>тьрт</td>
<td>тьрт</td>
<td>трпт</td>
</tr>
<tr>
<td>OCz</td>
<td>тр’т</td>
<td>трт</td>
<td>трт</td>
</tr>
<tr>
<td>MCz</td>
<td>тřт</td>
<td>тьрт</td>
<td>тьрт</td>
</tr>
</tbody>
</table>


**Literature**


Hale, Mark & Charles Reiss 2003. The subset principle in phonology: Why the tabula can’t be
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Smetánka, Emil 1940. K vzniku m*, r*, l* z m, r, l v češtině. Listy Filologické 67, 354-357.
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