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# VARIATION IS IN THE LEXICON: YER-BASED AND EPENTHETIC VOWEL-ZERO ALTERNATIONS IN POLISH

## 1. Purpose[1]

(1)  Polish
     (non-)vocalisation of monomorphemic root-final clusters in Gpl
     a.  two competing patterns
         pattern A - no vocalisation: *cyfr-a - cyfr* "number Nsg, Gpl"
         pattern B - vocalisation: *wiadr-o - wiader* "pail Nsg, Gpl"
     b.  before a C-initial suffix, this contrast is neutralised: both patterns always vocalise:
         pattern A: *cyfer-k-a* "id., dim."
         pattern B: *wiader-k-o* "id., dim."
     c.  variation:
         - free variation for some roots: *wydr-a - wydr* / *wyder* "otter Nsg, Gpl"
         - cross-speaker variation: *kurw-a - kurew* / *?kurw* "whore Nsg, Gpl"

(2)  context
     a.  pattern A cannot be done with the regular instrument for the analysis of vowel-zero alternations:
         the presence of the vowel in *cyfer-k-a* witnesses the presence of a yer, which should surface in Gpl, but does not: Gpl *cyfr*.
     b.  literature
         1.  the phenomenon is often ignored, e.g. Gussmann (1980) and Rubach (1984)
         2.  we have a closer look at
             - Laskowski (1975:29ff), Szpyra (1995:97) (also Bajerowa 1953)
             - Bethin (1992:146ff)
             - GP-based analyses: Cyran (2005), Gussmann (2007)

(3)  analysis I
     pattern A vs. pattern B
     [based on elements of Bethin (epenthesis) and Laskowski/Szpyra (lexical marking)]
     a.  an important piece of the standard Slavic yer-based account of vowel-zero alternations needs to be abandoned: it is not true that all vowels which alternate with zero are underlyingly yers.
         Bethin (1992:153) says that "[v]owel-zero alternations in Polish are not attributable to a unique underlying representation".

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[1]  This talk is an oral version of Scheer (forth). Polish data have been controlled and enriched by Gienek Cyran, to whom I am indebted.

    b.    pattern B (regular): alternating vowels are yers /wiader/
           pattern A (irregular): alternating vowels are epenthetic /cyfr/
           i.e. lexically absent and inserted in order to repair an ill-formed structure (three consonants in a row in surface description, two empty nuclei in a row in the analysis below)
    c.    critical diagnostic: behaviour of stem- or root-final clusters in Gpl
    d.    pattern A: alternating vowel is epenthetic
           pattern B: alternating vowel is a yer (underlyingly present)
           ==> Worth (1968) on Russian

(4)    analysis II
        variation: lexical, free, cross-speaker
    a.    all variation encountered is **lexical** in nature
    b.    Chomsky-Borer Conjecture in current minimalist syntax: variation reduces to variation in the lexicon (e.g. Biberauer 2008, Baker 2008, Roberts & Holmberg 2010).
    c.    what kind of variation?
        - pattern A vs. pattern B: lexical, free, cross-speaker
        - before C/yer-initial suffixes: creation of an illegal /CCC/ cluster

| | CC-V | C(e)C# | /C(e)C(e)C/ |
| --- | --- | --- | --- |
| | Nsg | Gpl | C/yer-initial suff. |
| 1. epenthesis: CeCC | cyfr-a | cyfr | cyfer-k-a |
| 2. yer vocalisation: CeCC | srebr-o | sreber | sreber-k-o |
| 3. trapped sonorant | srebr-o | sreber | srebr-n-y |
| 4. branching coda-sonorant | kart-a | kart | kart-k-a |
| 5. $C_2$ eliminated | mas-ł-o | mas-eł | mas-nic-a (mas-el-nic-a) |

    c.    opposite to the OT-strategy of encoding variation that is produced by different repair strategies. In OT this variation is often interpreted as variation of the computational system: constraint interaction
        - differnet constraint rankings: cophonologies, indexed constraints

(5)    heteromorphemic clusters
    a.    służ-b-a - służ-b - służ-eb-n-y
        vs.
        pies-k-a - pies-ek (Nsg) - pies-ecz-ek
    b.    situation EXACTLY identical
        1. pattern A vs. pattern B items: yer lexically present (/has-el/) or absent (/służ-b/)
        2. except that yers are lexically recorded in SUFFIXES:
        - yer-bearing suffixes: -eł    has-ł-o - has-eł
        - yer-lacking suffixes: -b     służ-b-a - służ-b

(6)    broader Slavic picture
        individual languages may or may not have epenthetic vowels that alternate with zero:
        - Czech: no
        - Russian, BCS: yes

## 2. Pattern A vs. pattern B: data

(7)  pattern A: -CC# does not vocalise in Gpl
     ==> but vocalises before C/yer-initial suffixes
     - judgement of natives not clear or weak: in brackets (bister-k-o)
     - unvocalised forms before C/yer-initial suffixes: in talics *Piotr-k-a (!)*

| | | CC-V#<br>Nsg | CC#<br>Gpl | CeC-C<br>C/yer-initial suffix | gloss |
|---|---|---|---|---|---|
| TR# | Tr | cyfr-a | cyfr | cyfer-k-a | number |
| | | zebr-a | zebr | zeber-k-a | zebra |
| | | tundr-a | tundr | tunder-k-a | tundra |
| | | bistr-o | bistr | (bister-k-o) | bistro |
| | | Tatr-y | Tatr | tater-nik | toponym |
| | | algebra | algebr | | algebra |
| | | siostr-a | sióstr | | sister |
| | | sutr-a | sutr | (suter-k-a) | Hindu aphorism |
| | | Piotr-a | Piotr | *Piotr-k-a (!)* | first name |
| | | ikr-a | ikr | (ikier-k-a) | fish eggs |
| | | podagr-a | podagr | (podagier-k-a) | gout |
| | Tn | blizn-a | blizn | (blizen-k-a)<br>(*blizn-k-a (!)*) | scar |
| | | tętn-o | tętn | tęten-k-o | pulse |
| | | piętn-o | piętn | pięten-k-o | stamp |
| | Tm | wydm-a | wydm | wydem-k-a | dune |
| | | taśm-a | taśm | tasiem-k-a | ribbon, tape |
| | | jarzm-o | jarzm | jarzem-k-o | yoke |
| | | piżm-o | piżm | piżem-k-o | musk |
| | | pism-o | pism | pisem-k-o<br>pisem-n-y | document |
| | | drachm-a | drachm | drachem-k-a | drachma |
| | Tv | płetw-a | płetw | płetew-k-a | fin (fish) |
| | | warstw-a | warstw | warstew-k-a | layer |
| | | sakw-a | sakw | sakiew-k-a | pannier |
| | | żuchw-a | żuchw | żuchew-k-a | lower jaw bone |
| RT# | rT | farb-a | farb | *farb-k-a (!)* | paint |
| | | kart-a | kart | *kart-k-a (!)* | card |
| | | musztard-a | musztard | *musztard-k-a (!)* | mustard |
| | rv | larw-a | larw | *larw-k-a (!)* | grub |
| | | barw-a | barw | *barw-n-y (!)* | colour |
| | | ścierw-o | ścierw | *ścierw-nik (!)* | corpse |
| | | bulw-a | bulw | *bulw-k-a (!)* | root tuber |
| | | salw-a | salw | *salw-k-a (!)* | salvo |
| | | morw-a | morw | morew-k-a<br>*morw-k-a (!)* | mulberry |
| | lT | walk-a | walk | walecz-n-y | war |
| | | palt-o | palt | palet-k-o | coat |
| | | małp-a | małp | *małp-k-a (!)* | monkey |
| | | olch-a | olch | | alder |
| | | Kielc-e | Kielc | Kielec-k-i | toponym |

(7)  pattern A: -CC# does not vocalise in Gpl
==> but vocalises before C/yer-initial suffixes
- judgement of natives not clear or weak: in brackets (bister-k-o)
- unvocalised forms before C/yer-initial suffixes: in talics *Piotr-k-a (!)*

| | | CC-V#<br>Nsg | CC#<br>Gpl | CeC-C<br>C/yer-initial suffix | gloss |
|---|---|---|---|---|---|
| | NT | słońc-e | słońc | słonecz-n-y<br>słonecz-k-o | sun |
| | | czeremch-a | czeremch | (czeremesz-k-a) | bird cherry |
| | | legend-a | legend | *legend-k-a (!)* | legend |
| | | rumb-a | rumb | *rumb-k-a (!)* | rumba |
| TT# | cht | płacht-a | płacht | płachet-k-a | sheet |
| | | szlacht-a | szlacht | szlachet-n-y<br>szlachet-k-a (arch.) | nobility |
| sT# | sp | wysp-a | wysp | wysep-k-a | island |
| RR# | rm | form-a | form | forem-n-y<br>forem-k-a | form |
| | | firm-a | firm | firem-k-a | firm |
| | rn | urn-a | urn | uren-k-a | urn |
| | | tawern-a | tawern | taweren-k-a<br>*tawern-k-a (!)* | tavern |
| | lm | palm-a | palm | palem-k-a | palm |

(8)  pattern B: CC# vocalise in Gpl
and also before C/yer-initial suffixes

| | | CøC-V<br>Nsg | CeC#<br>Gpl | CeC-C<br>C/yer-initial suffix | gloss |
|---|---|---|---|---|---|
| TR# | Tr | żebr-o | żeber | żeber-k-o | rib |
| | | srebr-o | sreber | sreber-k-o<br>*srebr-n-y (!)* | silver |
| | | piętr-o | pięter | pięter-k-o | floor |
| | | futr-o | futer | futer-k-o | fur |
| | | lustr-o | luster | luster-k-o | mirror |
| | | jądr-o | jąder | jąder-k-o<br>*jędr-n-y (!)* | nucleus |
| | | wiadr-o | wiader | wiader-k-o | pail |
| | | iskr-a | iskier | iskier-k-a | sparkle |
| | | chuchr-o | chucher | chucher-k-o | weakling |
| | Tl | ciepł-o | ciepeł | ciepeł-k-o<br>*ciepl-n-y (!)* | warmth |
| | | szabla | szabel | szabel-k-a | sword |
| | | krzesł-o | krzeseł | krzeseł-k-o | chair |
| | | kukł-a | kukieł | kukieł-k-a | puppet |
| | | jagł-a | jagieł | (jagieł-k-i) | millet |
| | | igł-a | igieł | igieł-k-a | needle |
| | | cegł-a | cegieł | cegieł-k-a | brick |

(8)  pattern B: CC# vocalise in Gpl
     and also before C/yer-initial suffixes

|      |     |         |          |                |            |
|------|-----|---------|----------|----------------|------------|
|      | Tn  | krosn-o | krosien  | krosien-k-o    | loom       |
|      |     | wiosn-a | wiosen   | wiosen-k-a     | spring     |
|      |     | okn-o   | okien    | okien-k-o      | window     |
|      |     | sukn-ia | sukien   | sukien-k-a     | dress      |
|      |     | sukn-o  | sukien   | (sukien-k-o)   | cloth      |
|      |     | bagn-o  | bagien   | bagien-k-o     | mud        |
|      | Tv  | mątw-a  | mątew    | (mątew-k-a)    | cuttlefish |
|      |     | płatw-a | płatew   | (płatew-k-a)   | roof       |
| RR#  |     | durni-a | dureń    |                | fool       |
|      |     | perł-a  | pereł    | pereł-k-a      | perl       |

(9)  numeric situation
   a.  the list of pattern B items under (8) aims at exhaustivity
       (e.g. Laskowski 1975:29ff, Bethin 1992:146ff, Cyran 2003:176ff, 188, 2005, Gussmann 2007:230ff)
   b.  pattern A items under (7) are but a (representative) selection of what can be found in the Polish lexicon
   c.  numerically, then, non-vocalisation in Gpl (pattern A) appears to be more common than vocalisation (pattern B).

(10)  pattern B: the sonority slope of the cluster is a relevant conditioning factor
   a.  pattern A:
       any type of cluster can be of the non-vocalising type: TR#, RT#, TT#, RR#
   b.  pattern B:
       RT clusters are unable to vocalise
       only TR clusters seem to be able to vocalise
   c.  Bethin (1992:149) for loanwords: "if the vowel does appear, it is more likely to appear within final sequences of rising sonority. Sequences which form optimal syllable codas of falling sonority [i.e. word-final RT and RR clusters in her examples] […] generally do not acquire the alternation".
       Cyran (2003:176ff, 2010:160ff) makes the same observation.
   d.  the distribution of alternating vowels in root-final clusters is not entirely arbitrary, i.e. lexical: only the rising sonority slope TR (and maybe RR: table (8) mentions two cases) allows for the acquisition of a yer. Whether a TR cluster acquires / possesses a yer, though, is entirely arbitrary (i.e. lexical).
       ==> **the question regarding the sonority-based condition is not further pursued below.**
   e.  Cyran (2005) (also Cyran 2003:176ff, 2010:160ff) offers an analysis in terms of his CSL (Complexity Scales and Licensing) model: (word-final) TRs are more difficult to license (by the final empty nucleus) than word-final RTs (this is also what the above quote from Bethin implies). Therefore "easy" word-final clusters, i.e. RTs, are safe, while breakdown, i.e. vocalisation, is lurking for more fragile TRs.

(11)  roots with free variation in Gpl
      but vocalisation is the only option with C/yer-initial suffixes

| | | CøC-V Nsg | CC# / CeC# Gpl | CeC-C C/yer-initial suffix | gloss |
|---|---|---|---|---|---|
| TR# | Tr | wydr-a | wydr / wyder | wyder-k-a | otter |
| | | biodr-o | bioder / biódr | bioder-k-o | hip |
| | Tv | brzytw-a | brzytw / brzytew | brzytew-k-a | razor |
| | | pochw-a | pochew / pochw | pochew-k-a | vagina/sheath |
| | | poszw-a | poszew / poszw | poszew-k-a | duvet cover |
| | | bitw-a | bitw / bitew | bitew-n-y | battle |
| | | kotw-a | kotew / kotw | | anchor |
| | | tratw-a | tratew / tratw | tratew-k-a | raft |
| | | listw-a | listew / listw | listew-k-a | lath |
| | Tm | pasm-o | pasm / pasem | pasem-k-o | wisp |
| | | karczm-a | karczem / karczm | karczem-n-y | inn |
| | | ciżm-y | ciżm / ciżem | ciżem-k-a | shoes (arch.) |
| RT# | lT | kalk-a | kalk / kalek | kalecz-k-a | carbon paper |
| | rT | kurw-a | kurew / kurw | kurew-k-a | whore |
| | | torb-a | toreb / torb | toreb-k-a | bag |
| RR# | rn | sarn-a | sarn / saren | saren-k-a | roe deer |
| | | żarn-a | żarn / żaren | żaren-k-a | quern |
| | | ziarn-o | ziarn / ziaren | ziaren-k-o | grain |
| | | | | *ziarn-k-o (!)* | |
| | mn | gumn-o | gumien / gumn | gumien-k-o | barnyard |
| | wn | grzywn-a | grzywien / grzywn | grzywien-k-a | fine |
| | łn | wełn-a | wełen / wełn | (wełen-k-a) | wool |

(12)  comments
   a.  material:
       Laskowski (1975:40), Bethin (1992:125), Gussmann (2007:230), Cyran (2005, 2010:170f)
   b.  the trend to only allow for vocalised forms in TR clusters is also visible here, but less so than with non-variable vocalisation
   c.  as before, vocalisation before C/yer-initial suffixes is systematic, i.e. the only option.

(13)  evolution pattern A CC# > pattern B CeC#
   a.  numerical situation: only a limited number of roots is able to vocalise
   b.  for many roots the vocalised variant is substandard and stigmatised.
       This may be seen when looking at the recommendation of normative dictionaries like Szober's (1969, "dictionary of correct Polish"), who warns for instance against Gpl *cyfer* (Nsg *cyfr-a*).
   c.  vocalised forms are also substandard and/or dialectal in Nsg/Asg,
       which is the other zero case marker in Polish (apart from Gpl).
       *wiatr, Piotr, metr, filtr* "wind, Peter, meter, filter, beaver Nsg"
       are commonly encountered as *wiater, Pioter, meter, filter*.
       Vocalised forms identify uneducated speakers, or speakers of non-standard varieties.
       It is true, however, that the movement can also go in the other direction: vocalised *sweter* "jumper Nsg" is standard, but unvocalised *swetr* is commonly heard.

d. Cyran's interpretation of the sonority restrictions on vocalisation also supports this diachronic scenario: vocalisation exists in Gpl because "difficult" clusters, i.e. only word-final TRs, break down successively along a lexical diffusion perspective (while "easy" clusters are safe).

(14) summary
    a. the core of words has predictable (non-)vocalisation and does not show any variation: roots belong either to pattern A or B.
    b. a fair amount of words, though, show variation, either free or socially relevant.
    c. the exact set of words that belong to the three categories (A, B or variable) is a matter of inter-speaker variation.

## 3. Non-vocalisation before C/yer-initial suffixes: data

(15) number of items is relatively small, but they need to be accounted for
    a. namely Laskowski (1975:39) and Bethin (1992:148)
    b. cases studied:
       1. Nsg ends in -CC-V      farb-a, farb-k-a "paint"
       2. Nsg ends in -CC       wiatr - wietrz-n-y "wind"

## 3.1. Nsg ends in -CC-V

(16) CC# that do not vocalise before a C/yer-initial suffix
Nsg -CC-V

| | | Nsg | Gpl | C/yer-initial suffix | gloss |
|---|---|---|---|---|---|
| A | tr | Piotr-a | Piotr | Piotr-k-a | first name |
| | rb | farb-a | farb | farb-k-a | paint |
| | rt | kart-a | kart | kart-k-a | card |
| | rd | musztard-a | musztard | musztard-k-a | mustard |
| | rw | larw-a | larw | larw-k-a | grub |
| | | barw-a | barw | barw-n-y | colour |
| | | ścierw-o | ścierw | ścierw-nik | corpse |
| | lw | bulw-a | bulw | bulw-k-a | root tuber |
| | | salw-a | salw | salw-k-a | salvo |
| | rn | tawern-a | tawern | taweren-k-a | tavern |
| | | | | *tawern-k-a (!)* | |
| | nd | legend-a | legend | legend-k-a | legend |
| | mb | rumb-a | rumb | rumb-k-a | rumba |
| B | TR | srebr-o | sreber | srebr-n-y | silver |
| | | | | but: sreber-k-o | |
| | | ciepł-o | ciepeł | ciepl-n-y | warmth |
| | | | | białoskrzydl-n-y | white-winged |
| | | jądr-o | jąder | jędr-n-y | core |

(17) description
- a. both patterns A and B deliver -CC-C-V forms
- b. the sonority restrictions mentioned are visible here as well: TR occurs only with pattern B items
- c. the same root may derive vocalising as well as non-vocalising items:
    *srebro* "silver"
    → *srebr-n-y*
    → *sreber-k-o*

(18) pre-theoretical analysis
- a. whatever the class membership of the root, pattern A ot B, the vocalisation before C/yer-initial suffixes does not depend on them:
    *srebr-o - sreber*
    ==> regular        *sreber-k-o*
    ==> irregular      *srebr-n-y*
- b. CRC clusters (-brn- of *srebr-n-y*) are well-formed and perfectly unspectacular in Polish:
    sonorants that occur between consonants (or in #RC and CR# position) are called trapped (as opposed to syllabic, see Scheer 2008, 2009). Examples are *trwać* "to last", *brzmieć* "to sound", *klnę* "I curse", *plwocina* "sputum", *krnąbrny* "unruly", *brnąć* "to wade" etc.
    **==> hence there is no reluctance against the creation of CRC clusters, and a priori there is no reason why TR-final roots should vocalise before C-initial suffixes.**
- c. *srebr-n-y* is *not* synchronically derived from *srebr-o*.
    1. the root *srebro* has an alternating vowel: *sreber* (pattern B)
    2. this vowel should appear before C/yer-initial suffixes, but it does not: *srebr-n-y*
    3. hence *srebr-n-y* is NOT the result of the concatenation of the root whose Gpl is *sreber* and the suffix *-ny*.
    4. of course *srebr-n-y* was derived from *srebr-o* at some point in the history of Polish, i.e. when the adjective *srebr-n-y* was first created – but the output of this primitive derivation was then stored in the lexicon and from that point in time on, derivationally speaking, had got nothing to do with the root *srebr-o* anymore.
- d. we are facing lexical idiosyncrasy of the derived words:
    1. either they are independent lexical recordings (and hence there is no synchronic derivation based on the root),.
    2. or there are two separate roots (root allomorphy), one deriving vocalised, the other unvocalised items
    ==> we will see below that root allomorphy is viable.
- e. -CC-C-V forms: no free (or inter-speaker) variation with a -CeC-C-V form[2]
    *srebr-n-y* is the only possibility for this item: nobody says or can say *\*sreber-n-y*. I could not come by any item parallel to the *wydr-a - wydr/wyder* pattern, i.e. where a -CC-C-V form would show free (or inter-speaker) variation with a -CeC-C-V form. For any given root-suffix combination, either one or the other are found – never both. This effect is predicted by the lexicalisation-based analysis: a lexical item (such as *srebr-n-*) that is unsubjected to derivational activity cannot vary

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[2] The absence of variation concerns only -CCs that 1) are monomorphemic and 2) based on a vowel-final Nsg -CC-V. I know of one item with free variation in a heteromorphemic cluster: *myd-el-niczka / myd-l-niczka* "soap dish" (from *myd-ł-o* "soap", data from Laskowski 1975:39). Hetermorphemic clusters are

## 3.2. Nsg ends in something else than -CC-V

(19) Nsg -CC# clusters most often vocalise in presence of -*ek*
(whose vowel is a yer), at least in native vocabulary

Nsg -CC# → Nsg -CeC-ek

| Nsg | Gpl | C/yer-initial suffix | gloss |
|---|---|---|---|
| wiatr | | wiater-ek | wind |
| bóbr | | bober-ek | beaver |
| filtr | | filter-ek | filter |
| trefl | | trefel-ek | club |

(20) CC# that do not vocalise before a C/yer-initial suffix

- Nsg -CC#   *wiatr - wietrz-n-y*
- Nsg -CC-eC#  *Piotr - Piotr-ek*
- Nsg -CC-C-V  *jabł-k-o*

| Nsg | Gpl | C/yer-initial suffix | gloss |
|---|---|---|---|
| a. no specificity | | | |
| wiatr | | wietrz-n-y but: wiater-ek | wind |
| pieśń | | piosn-k-a piosen-k-a | song |
| – | | Jędr-ek | first name |
| Piotr | | Piotr-ek | first name |
| alarm | | alarm-ek[3] | alarm |
| uniform | | uniform-ek | unifmorm |
| film | | film-ek | film |
| park | | parcz-ek | park |
| b. s+C clusters | | | |
| myśl | – | myśl-nik | thought |
| c. derived from adjectives | | | |
| mędr-ek | | mędr-k-a mędr-szy | know-it-all wiser (compar.) |
| podl-ec | | podl-c-a | rascal |
| d. isolated words | | | |
| | jabł-ek | jabł-k-o | apple |
| | bedł-ek | bedł-k-a | agaric (mushroom) |
| | | Siedl-ce | city in Mazowia |
| | | nabiodr-ek | cuisse |
| Sewr | | sewr-ski | city in France |

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discussed in section 8 below. There is also one item I am aware of where a Nsg form in -CC#, *pieśń* "song", derives forms with free variation before a C/yer-initial cluster: *piosn-k-a / piosen-k-a* "id., dim.". The root-final cluster is most probably monomorphemic synchronically speaking, although it has a hetermorphemic origin (compare CS *pěti > Cz pět "to sing").

[3] *Alarm-ek, uniform-ek* and *film-ek* are quoted by Bethin (1992:148), but the native that I have consulted has a strong preference for forms in -*ik*: *alarm-ik, uniform-ik* and *film-ik*.

(21) comments
    a.  the categorisation under (20) follows Laskowski (1975:39), who tries to identify specific patterns that lead to non-vocalisation before C/yer-initial suffixes.
    b.  for instance, he singles out s+C as a vocalisation inhibitor, and this may sound plausible given the standard suspicion that s+C are solidary and some kind of contour segment (affricate) (e.g. Selkirk 1982:346ff, Carr 1993:212). This generalisation, however, does not fare well since we have already come across the pattern A item *wysp-a - wysp - wysep-k-a*.
    c.  whether deadjectival derivation has any bearing on vocalisation remains to be seen: Laskowski provides only two items.
    d.  **==> lexical idiosyncrasy: which words do not vocalise before a C/yer-initial suffix cannot be predicted from any of their properties.**

## 4. Analysis of the basic A-B pattern

(22) Insertion disqualified in the standard analysis
    a.  pattern B is regular in the realm of Slavic vowel-zero alternations:
        vowels that alternate with zero are underlying yers, which vocalise in presence of a following yer, and otherwise remain mute: *wiadro* is /wiadEro/, and the yer E appears on the surface in Gpl /wiadEr-O/ → *wiader* (Gpl is a yer itself) as well as before a yer-initial suffix /wiadEr-Ek-o/ → *wiader-k-o*.
    b.  this analysis of Slavic vowel-zero alternations is the insight encoded in the Lower rule that was introduced by Lightner (1965) and adapted to various linear and autosegmental frameworks in the following decades (Gussmann 1980, Rubach 1984, 1986, Gussmann & Kaye 1993, Scheer 2005, see the overviews in Cyran 2005 and Scheer 2011).
        For the time being it does not matter which implementation of Lower is used: the only thing that matters is that ***all* versions share the basic assumption according to which vowels that alternate with zero are underlying yers**.
    c.  the standard analysis is thus **based on deletion, rather than on insertion**.
        The two perspectives were debated at length in the literature: are alternating vowels underlyingly absent and inserted, or present and deleted? Insertion-based analyses have been proposed by, among others, Laskowski (1975), Czaykowska-Higgins (1988) and Piotrowski (1992). They are convincingly refuted by Gussmann (1980:26ff), Rubach (1984:28f, 1993: 134ff) and Szpyra (1992:280ff, 1995:94ff).

(23) the challenge: what exactly is the difference between A and B roots?
    a.  pattern A misbehaves: Lower predicts it cannot exist
        the presence of the vowel in *cyfer-k-a* witnesses the presence of a yer, which should surface in Gpl, but does not: Gpl *cyfr*.
    b.  the difference between A- and B-roots must be lexical
        1. membership in class A,B is arbitrary
        2. there are doublets
        3. there is substantial dialectal, register-related and inter-speaker variation
        ==> all signs of variable lexical representations

    c.   but Lower can't be wrong. Hence we need a scenario where
- the computation is uniform (Lower) for both A- and B-roots,
- but based on distinct lexical representations
**==> invitation to reconsider the Slavic mantra according to which *all* alternating vowels are underlying yers**

## 4.1. Non-phonological solution: root allomorphy for A-roots (Gussmann 2007)

(24)   Gussmann (2007)
    a.   instead of trying to isolate the lexical specificity of A-roots, the Gpl puzzle may also be taken to be the witness of irregularity, which leaves no hope for a management under the roof of the Lower rule.
==> The alternative, then, is root allomorphy.
    b.   this is Gussmann's (2007) solution:
Gussmann's general project is to reduce computational activity to a strict minimum: the labour is outsourced to morphology and an increased number of lexical recordings (allomorphy) on the one hand, and to the phonology-phonetics mapping on the other (see Scheer 2010).
    c.   Gussmann doubts that vowel-zero alternations are managed by phonology at all, despite their regularity elsewhere (in Polish and Slavic).
    d.   derived vs. underived
Gussmann (2007:230) hints at a non-phonological reason for the failure of A-roots to vocalise in word-final position: "when the nouns become the input to further derivations, the floating vowel normally appears in them". In other words, Gpl *cyfr* remains unvocalised because it is underived, while *cyfer-k-a* is vocalised because the root was subject to derivational activity.
    e.   Gussmann (2007:233) concludes that there are two distinct lexical recordings for every A-root: one where the root-final cluster is separated by a nucleus (which contains a floating piece of melody), and one where the root-final cluster is a branching onset.
allomorph 1: yer present     allomorph 2: yer absent

```
O  N  O  N  O  N        O  N  O  N
|  |  |     |           |  |  /\
c  y  f  e  r           c  y  f  r
```

(25) government-based Lower (used by Gussmann)
Scheer (2005, 2011), Scheer & Ziková (2010)
   a.   stable vs. alternating vowels
        in Government Phonology (Scheer 2004:§76, 2005)
        lexically associated vowel:     floating piece of melody: alternating vowel (yer)
        stable

```
 O   N   O   N              O   N   O   N
 |   |   |                  |           |
 bʲ  e   s                  pʲ  e       s
```

   b.   1. yers are floating vowels
        2. they are associated to their nucleus (i.e. pronounced) iff they remain ungoverned,
        i.e. iff the following nucleus is empty
        3. they remain unassociated (i.e. unpronounced) iff they are governed, i.e. iff the
        following nucleus is contentful

(26) government-based Lower: illustration

        a. wiadr-o: yer governed         b. Gpl wiader: yer ungoverned

```
              Gvt                             Gvt
        ┌──────┐                         ┌───/──┐
        ↓      │                         ↓      │
 O  N  O  N  O  N                 O  N  O  N  O  N
 |  |  |     |  |                 |  |  |  ↑     |
 wʲ a  d  e  r  o                 wʲ a  d  e     r
```

                        c. yer-initial suffix: yer ungoverned

```
                              Gvt        Gvt
                         ┌──/──┐    ┌─────┐
                         ↓     │↓   │     │
                  O  N  O  N  O  N  O  N
                  |  |  |  ↑  |     |  |
                  wʲ a  d  e  r  e  k  o
```

(27) Gussmann's allomorphy-based analysis
   a.   underived forms of A-roots select the allomorph (25)e2
        the root-final cluster is a branching onset. Therefore, in Gpl the root does not
        contain any yer that could surface, and the result is /cyfr-O/ → *cyfr*
   b.   derived forms of A- roots select the allomorph (25)e1
        and yer-initial suffixes trigger regular yer-vocalisation along the lines of (26)c
   c.   doublets (such as *wydra - wydr/wyder* "otter Nsg, Gpl")
        are due to the competition of two independent lexical representations, one along the
        lines of A-roots with the allomorphy described, the other along B-roots where no
        allomorphy occurs.

## 4.2. Non-phonological solution: root allomorphy for A-roots (Cyran 2005)

(28) Cyran (2005): CVCV, and only epenthesis
    a.    same approach as Gussmann's: allomorphy
        BUT:
        1. couched in CVCV (no branching constituents, Lowenstamm 1996, Scheer 2004)
        2. only based on Gpl: forms with C/yer-final suffixes are not examined
    b.    purely epenthetic analysis
        i.e. departing from the standard yer-based analysis
        1. all alternating vowels that appear in word-final clusters in Polish are epenthetic
        2. their insertion repairs an ill-formed structure that accommodates two empty nuclei in a row:
        3. the leftmost empty nucleus receives a vowel
        4. → and ← : licensing relations
        empty nuclei enclosed in licensing domains are circumscribed or "locked" = do not count as empty
        5. "unlockable" = lexical marking: this nucleus cannot be circumscribed by a licensing relation.

(29) illustration: vowel-zero alternations according to Cyran (2005)
    a. pattern B: CC# broken up    b. pattern A: stable CC#
    **==> two phonologically**    **==> only one phonologically**
    **active empty nuclei in a row**    **active nucleus**

lexically marked as unlockable

$$O\ N_1\ O\ (N_2)\ O\ N_3 \qquad O\ N_1\ O\ N_2\ O\ N_3$$
$$\quad |\ \ |\ \ |\qquad\quad |\qquad\quad |\ \ |\ \ |\qquad |$$
$$sw\ \ e\ \ t\qquad\quad r\qquad\quad l\ \ i\ \ t\ \rightarrow\ r$$
$$d\ \ u\ \ r\qquad\quad ń\qquad\quad d\ \ a\ \ r\ \leftarrow\ ń$$

    result: *sweter* "jumper Nsg",  result: *litr* "liter Nsg",
    *dureń* "fool Nsg"          *darń* "sod Nsg"

(30) classical arguments against insertion
    a.    the locus of alternating vowels cannot be predicted; it is a lexical property of each morpheme.
        ==> Cyran's analysis covers this constraint: **lexical** marking.
    b.    in Slavic languages where more than one vowel alternates with zero (such as Eastern Slavic), it cannot be predeicted which vowel will be inserted: this again is a lexical property of each morpheme.
        **==> Cyran's analysis cannot do that, and does not address the issue**

## 4.3. A purely phonological solution: Bethin (1992)

(31)  general vowel-zero alternations
      Bethin's (1992) epenthesis is on the right track, but its scope is both too narrow and too wide
      a.  major line of division for Bethin:
          1.  native vocabulary – regular yers, but no analysis for pattern A-B provided
              "More information is needed to study how Polish speakers interpret the vowel-zero alternation" (Bethin 1992:146)
          2.  loanwords: alternating vowels are epenthetic
      b.  native words and loans behave alike
          loanwords and native vocabulary
          1.  are equally represented in pattern A and B
          2.  produce items that are subject to Gpl variation and derive forms that refuse to vocalise before a C/yer-initial suffix.
          Hence there is no reason to believe that loans and native items are any different regarding the workings of vowel-zero alternations.
      c.  how could the locus of epenthesis be predicted?
          1.  Bethin (1992:152) wonders why in the $C_1C_2C_3$ cluster that is in need of repair epenthesis only ever occurs between $C_1$ and $C_2$, rather than between $C_2$ and $C_3$. Why *cyfer-ka*, rather than *cyfr-eka*?
          2.  her answer is cyclicity: *cyferka* is cyclically derived from [[[cyfr]k]a], and epenthesis breaks up fr because this is the first cluster that is encountered by the derivation on the innermost cycle.
          3.  this cannot be the reason, though, since Gpl *cyfr* then should also be subject to epenthesis: it is made only of the innermost cycle.
          ==> the government-based analysis below correctly predicts the locus of epenthesis for free.
      d.  Bethin (1992) was on the right track for the solution of the puzzle by proposing two distinct mechanisms for vowel-zero alternations (yers and epenthesis), but he scope of epenthesis is
          1.  too narrow: not only loans are concerned
          2.  too wide: not all vowel-zero alternations that occur in loans are the result of epenthesis

(32)  Bethin's (1992) analysis of pattern A vs. pattern B
      **internal vs. final**
      a.  regarding *forem-n-y* (*form-a - form*), she writes that

          "the sonorant is no longer at the end of the word, and a vowel is epenthesised to facilitate syllabification. Although word medial adjunction seems to be characteristic of a few items in Polish such as *piosnka* 'song', *srebrny* 'silver', *cieplny* 'thermal', the usual adjustment of borrowings into Polish phonology seems to call for vowel epenthesis." (Bethin 1992:152)

(32) Bethin's (1992) analysis of pattern A vs. pattern B
  **internal vs. final**
  b. pattern A: Gpl *form*, Nsg *filtr*: C# adjoined to the PhonWord
  in Bethin's analysis, unsyllabifiable root-final consonants such as the m in Gpl *form* or the r in Nsg *filtr* are saved by being directly adjoined to a higher prosodic constituent (the phonological word): [[for]$_\sigma$m]$_\omega$ and [[filt]$_\sigma$r]$_\omega$ are well-formed since all consonants are integrated into prosodic structure.
  c. pattern B: Nsg *cygiel*: adjunction blocked, hence C# unsyllabifiable
  lexical marking then discriminates between items that favour this solution (which is the regular way to go) and those where adjunction to the phonological word is blocked: this is the case of Nsg *cyngiel* "trigger" (< German *Züngel*), where the word-final consonant remains unsyllabifiable and therefore can only be saved by epenthesis (Bethin 1992:150)
  d. marking of word-final consonants by a lexical diacritic:
  pattern A = C# marked as adjoinable
  pattern B = C# marked as unadjoinable
  e. this does not work word-internally
  since the occurrence of extrasyllabic consonants is restricted to word edges by the Peripherality Condition (e.g. Hayes 1995:57f, Clements 1990:290)
  f. but:
  "a few items" where adjunction of an extrasyllabic consonant also applies to the middle consonant of CRC clusters: *piosnka* etc., see section 3.
  1. Bethin's way out is again to call on the native vs. loan contrast (word-internal adjunction to the phonological word is possible in words belonging to the former, but not in the latter set)
  2. but this does not work: Bethin (1992:148) herself provides a list of loans that refuse to vocalise before C/yer-initial suffixes (e.g. *barw-a - barw - barw-n-y* "colour Nsg, Gpl, adj." (< German *Farbe*)
  g. ==> as before, Bethin's general direction was correct: the contrast between the **word-internal** and **word-final** locus is responsible for the distribution of variability (final) and stability (internal).
  The representational environment in which she evolved, though, did not allow her to bring home this intuition.

(33) the key to the puzzle: internal vs. final
  what makes the difference between pattern A and pattern B?
  a. Gussmann: derived vs. underived
  ==> non-phonological way of looking at things
  ==> lexical marking by **two distinct lexical recordings**
  b. Bethin: internal vs. final
  ==> phonological way of looking at things
  ==> lexical marking by a **diacritic feature**
  c. internal vs. final: summary
  1. root-final CC is **word-internal**: *cyfer-ka*
  ==> regular behaviour = vocalisation
  ==> no variation
  2. root-final CC is **word-final**: *cyfr*
  ==> irregular behaviour = no vocalisation
  ==> variation: pattern A vs. pattern B

## 4.4. A purely phonological solution that predicts the locus: CVCV
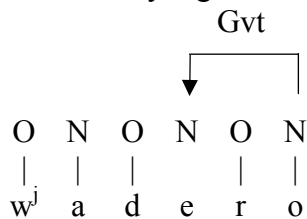
(34) Government Phonology (Standard and strict CV alike)
   a. the internal-final contrast translates into the difference between internal and final empty nuclei
   b. the nucleus that decides on the vocalisation of the putative yer in the preceding cluster under (35)b is word- (or domain-) final, but word- (or domain-) internal under (35)c
   c. it is well known that the right edge of words allows for more clustering than what can be found word-internally (e.g. Broselow 2003).
      This and other specific properties of the right edge have been translated into Government Phonology as a difference in the lateral actorship of **final empty nuclei** (FEN), as opposed to **internal empty nuclei**.
      In short, **FEN can do more than their internal peers**, i.e. they may be able to license and govern where internal empty nuclei are unable to dispense lateral forces (e.g. Charette 1990, 1992, Scheer 2004:§524, Cyran 2010).

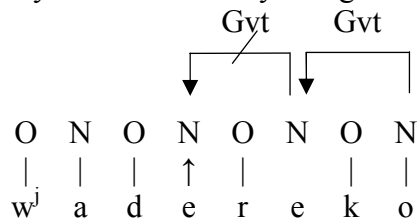(35) government-based Lower: illustration

a. wiadr-o: yer governed

```
           Gvt
      ┌──────┐
      ▼      │
  O  N  O  N  O  N
  |  |  |    |  |
  wʲ a  d  e  r  o
```

b. Gpl wiader: yer ungoverned

```
           Gvt
      ┌───/──┐
      ▼      │
  O  N  O  N  O  N
  |  |  |  ↑  |
  wʲ a  d  e  r
```

c. yer-initial suffix: yer ungoverned

```
          Gvt      Gvt
      ┌───/──┐  ┌─────┐
      ▼     ▼│  ▼     │
  O  N  O  N  O  N  O  N
  |  |  |  ↑  |    |  |
  wʲ a  d  e  r  e  k  o
```
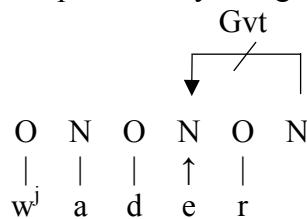
(36) CVCV
   lexical contrast between A- and B-roots

a. A-root: yer absent

```
  O  N  O  N  O  N
  |  |  |     |
  c  y  f     r
```

b. B-root: yer present

```
  O  N  O  N  O  N
  |  |  |     |
  wʲ a  d     r
```

(37) derivation of Gpl
    a. A-root: form          b. B-root: wiader
    FEN governs empty nucleus   FEN is unable to govern contentful
                                 nucleus

```
              Gvt                        Gvt
          ┌────┐                     ┌───/──┐
          ↓    │                     ↓      │
 O  N₁  O  N₂  O  N₃        O   N  O  N  O  N
 |  |   |      |            |   |  |  ↑  |
 c  y   f      r            wʲ  a  d  e  r
```
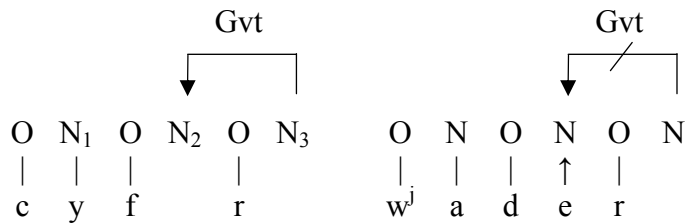
(38) Gpl: how it works
    **FEN are unable to govern contentful nuclei**
    a.   FEN are able to govern empty nuclei (as under (37)a), but not nuclei that have a lexical content (i.e. a floating piece of melody, as under (37)b).[4]
    b.   therefore the yer of B-roots surfaces: its nucleus is ungoverned ((37)b).
    c.   under (37)a, however, nothing can surface in A-roots since they lack floating pieces of melody (yers). This is also the reason why the FEN is able to govern the preceding nucleus: it is empty.
    d.   in Nsg forms, the vowel in the final nucleus will always govern the preceding nucleus, irrespectively of whether it is empty or not. The result are non-vocalised forms with both A- and B-roots (*form-a, wiadr-o*).
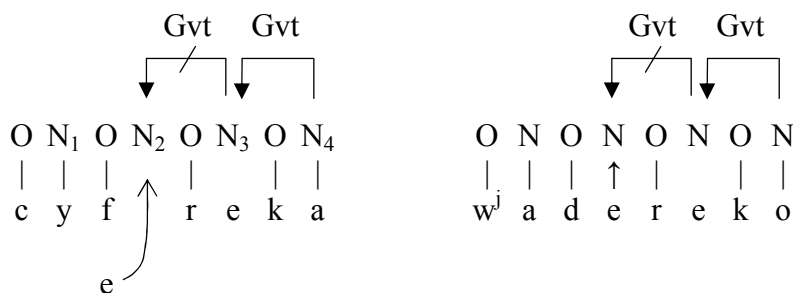
(39) lexical representation of C/yer-initial suffixes
    they begin with a floating piece of melody (the yer), which after concatenation ends up in the root-final empty nucleus.

```
    O  N
       |
 e  n       adjectival -n-y
 e  k       diminutive -ek, -k-a, -k-o
            etc.
```
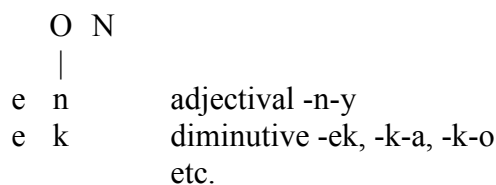
(40) derivation of forms with C/yer-initial suffixes
    a. A-root                  b. B-root

```
         Gvt    Gvt                    Gvt    Gvt
      ┌───/─┐ ┌────┐               ┌───/─┐ ┌────┐
      ↓     │ ↓    │               ↓     │ ↓    │
 O  N₁ O  N₂ O  N₃ O  N₄      O  N  O  N  O  N  O  N
 |  |  |  ↑  |     |  |        |  |  |  ↑  |     |  |
 c  y  f  │  r  e  k  a        wʲ a  d  e  r  e  k  o
         │
       e/
```

---

[4]  Were FEN able to also govern contentful nuclei, /pʲEsø/ would not surface as *pies*, but as *\*ps* (Scheer 2004:§541).

(41)  C/yer-initial forms: how it works
**surface result identical, but for different reasons: yer vocalisation vs. epenthesis**
a.  pattern A:
the concatenation of the suffix and the application of government produces a configuration that features two unpronounced empty nuclei in a row ($N_2$ and $N_3$). Such a structure is ill-formed. $N_3$ is governed and therefore cannot surface; but being itself unpronounced it cannot govern $N_2$, which therefore remains orphan. In this situation, the structure is repaired by an epenthesis that fills in the orphan nucleus $N_2$, i.e. the one that is not governed ($N_3$ has no demands since it is governed).
b.  FEN can govern ==> no epenthesis under (37)a Gpl *form*
internal empty nuclei cannot govern ==> epenthesis under (40)a
==> **the SAME nucleus is internal or final according to the presence/absence of the suffix**

(42)  summary government-based analysis
pattern A vs. pattern B
a.  lexical contrast:
presence (B) vs. absence (A) of a yer (=floating vowel)
b.  irregulariy and variability at the right edge
are due to the fact that FEN can do more, i.e. govern empty (but not contentful) nuclei
c.  regularity and non-variability in word-internal position
are due to the fact that internal empty nuclei cannot govern: the lexical contrast is neutralised.
d.  doublets *wydr-a - wydr / wyder*
are produced when speakers have lexicalised both A- and B-forms for the same root.
e.  the LOCUS of epenthesis is correctly predicted:
*cyfer-ka*, rather than *\*cyfr-eka*
lateral relations (government) apply from right to left, hence the ungoverned nucleus under (40)a is $N_2$, not $N_3$.
f.  elimination of diacritics
lexical marking by an item of regular representations (presence/absence of a floating vowel), rather than by a diacritic feature (Bethin's (in)ability to adjoin).

## 5. Unvocalised clusters before C/yer-initial suffixes: analysis

(43)  types of unvocalised root-final CCs before C/yer-initial suffixes

| | | CC-V | C(e)C# | /C(e)C(e)C/ |
| | | Nsg | Gpl | C/yer-initial suff. |
|---|---|---|---|---|
| 1. | epenthesis: CeCC | cyfr-a | cyfr | cyfer-k-a |
| 2. | yer vocalisation: CeCC | srebr-o | sreber | sreber-k-o |
| 3. | trapped sonorant | srebr-o | sreber | srebr-n-y |
| 4. | branching coda-sonorant | kart-a | kart | kart-k-a |
| 5. | $C_2$ eliminated | mas-ł-o | mas-eł | mas-nic-a (mas-el-nic-a) |

(44)  recall the pre-theoretical analysis from (18)
  a. unvocalised roots before C/yer-initial clusters
    1. are lexicalised
    2. *srebr-n-y* "silver adj." is not synchronically derived from *srebr-o* "silver"
  b. CRC clusters such as brn are perfectly well-formed and unspectacular in Polish: *trwać* "to last" etc.


## 5.1. Absence of vocalisation: CRC with a trapped R, *srebr-n-y*

(45)  trapped consonants: *trwać*
  Scheer (2008, 2009)
  a. trapped vs. syllabic consonants
    have identical distribution:
    1. between two other consonants *trwać*
    2. between a word edge and another consonant:
    - *rtęć* "quicksilver"
    - *Piotr* "Peter"
  b. diagnostics for telling apart trapped and syllabic consonants
    exactly reverse properties:
    1. syllabic consonants are counted in verse and by natives, while their trapped cousins are not (Polish *trwać* is a monosyllable, Czech *trvat* "to last" on the other hand, where the r is syllabic, is a bisyllable)
    2. syllabic consonants can bear stress (the r of Czech *trvat* is stressed), while trapped consonants cannot (penultimate stress would fall on the r of Polish *trwać*, were it stressable); also, trapped consonants are invisible for stress assignment (were the r counted in Polish *jesiotr* "sturgeon", penultimate stress would fall on the o, not on the e)
    3. trapped consonants are transparent for voicing: the two Ts in a TRT sequence where R is trapped always agree in voicing (the /v/ of Polish *krew* "blood Nsg" devoices in *krw-i* [krfi] "id., Gsg"), whereas syllabic consonants are not transparent (Czech /v/ does not devoice in *krev - krv-e* "blood Nsg, Gsg")
    4. syllabic consonants provoke the non-vocalisation of preceding alternation sites (i.e. where a vowel alternates with zero), as opposed to trapped consonants, which produce vocalisation
    ==> conclusion: Polish has only trapped consonants
    shorthand description: they are invisible to the vocalic world

c. analyses
1. classical analysis: trapped = extrasyllabic
Rubach & Booij (1990) and Rubach (1997): trapped consonants are unsyllabifiable and therefore extrasyllabic; they are integrated into autosegmental structure by being adjoined directly to the phonological word, i.e. bypassing syllable structure. It was also mentioned that this analysis faces trouble because extrasylabicity (as much as extrametricality or extraprosodicity) is only encountered at word- (or morpheme-) edges (Peripherality Condition)
2. Government Phonology: branching onsets followed by an empty nucleus
- in Government Phonology, the analysis of trapped consonants is based on the insight that they are always involved in branching onsets, i.e. in a solidary relationship with the preceding consonant (Charette 1992).
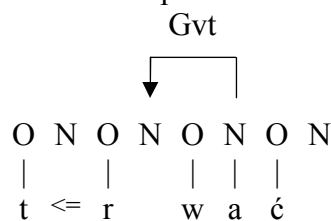- in strict CV, this is how the empty nucleus to their left is circumscribed (Scheer 2009). The systematic opposition with syllabic consonants, then, is due to the non-association of trapped consonants to any nucleus, while the essence of syllabic consonants is to sit in an onset, but to branch on a neighbouring nucleus (whether to the one that precedes or follows is subject to debate, see the summary in Scheer 2008). Hence their participation in the vocalic world.

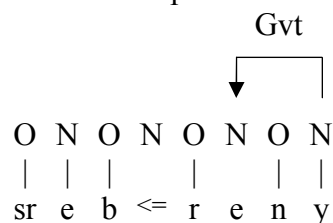(46) representation of trapped consonants
- branching onset = consonants that contract a relationship "<="
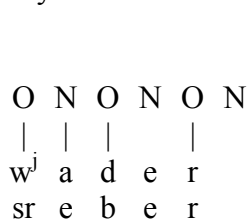- the nucleus enclosed is circumscribed and may remain empty
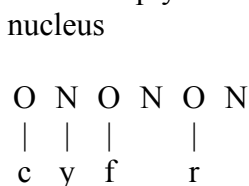a. monomorphemic CRC            b. heteromorphemic CRC
          Gvt                             Gvt

```
        ┌──────┐                       ┌──────┐
        ▼      │                       ▼      │
O  N  O  N  O  N  O  N          O  N  O  N  O  N  O  N
|     |  |  |  |                |  |  |     |     |  |
t  <= r     w  a  ć             sr e  b  <= r  e  n  y
```

(47) LEXICAL contrasts
root-final CC clusters: three distinct lexical identities
a. yer                   b. free empty         c. empty nucleus
                            nucleus               involved in a
                                                  branching onset

```
O  N  O  N  O  N         O  N  O  N  O  N       O  N  O  N  O  N
|  |  |     |           |  |  |     |          |  |  |     |
wʲ a  d  e  r            c  y  f     r          sr e  b  <= r
sr e  b     r
```
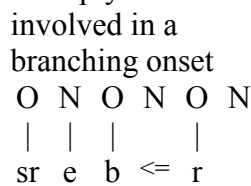
(48)  root allomorphy
there are two distinct lexical recordings for *srebr-o*
1. /sreber/ (47)a, with a yer in the cluster, derives Nsg, Gpl *srebr-o, sreber, sreber-k-o*
2. /sreb<=r/ (47)c, with a branching onset, derives *srebr-n-y*

## 5.2. Absence of vocalisation: $C_1C_2C_3$ with $C_1 \neq$ sonorant, *kart-k-a*

(49)  a challenge for everybody
    a.  everybody agrees that only sonorants can be trapped (in Polish, and maybe elsewhere)
    b.  hence how can $C_1C_2C_3$ remain unvocalised if $C_2$ does not qualify for being trapped?
    c.  there are 10 cases on (my) record:

| | | | | |
|---|---|---|---|---|
| rb | farb-a | farb | farb-k-a | paint |
| rt | kart-a | kart | kart-k-a | card |
| rd | musztard-a | musztard | musztard-k-a | mustard |
| rw | larw-a | larw | larw-k-a | grub |
| | barw-a | barw | barw-n-y | colour |
| | ścierw-o | ścierw | ścierw-nik | corpse |
| lw | bulw-a | bulw | bulw-k-a | root tuber |
| | salw-a | salw | salw-k-a | salvo |
| nd | legend-a | legend | legend-k-a | legend |
| mb | rumb-a | rumb | rumb-k-a | rumba |

    d.  one may be tempted to discount the Rw-C cases (like *bulw-a - bulw - bulw-k-a* "root tuber Nsg, Gpl, dim.") on the grounds of the fact that [v] (spelt w) is probably an underlying sonorant /w/, rather than an obstruent (Gussmann 1981, 1998, Cyran & Nilsson 1998).
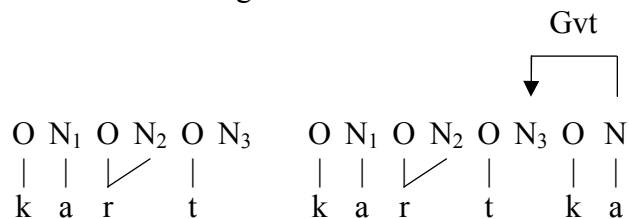    e.  possible solution:
      Polish counts into the class of languages where coda sonorants can branch on the nucleus to their right.
      Ségéral & Scheer (2008a,b), Szigetvári & Scheer (2005:62ff)

(50) coda sonorants can branch in Polish
    a. lexical recording     b. non.vocalisation before -k-a

```
                                        Gvt
                                     ┌────┐
                                     ▼    │
   O N₁ O N₂ O N₃      O N₁ O N₂ O N₃ O N
   |  |  ∠  |          |  |  ∠  |    |  |
   k  a  r  t          k  a  r  t    k  a
```

## 6. Heteromorphemic clusters

### 6.1. Identical behaviour

(51) (non-)vocalisation in Nsg or Gpl is an individual property of each suffix
==> **suffixes come with or without initial yers = floating vowels**
a. non-vocalising suffixes
(heteromorphemic pattern A)

|  | C-C# | C-C-V | C-eC-C | gloss |
|---|---|---|---|---|
|  | Gpl | Nsg | C/yer-initial suffix |  |
| -b-a | służ-b | służ-b-a | służ-eb-n-y | service |
| -stw-o | świń-stw | świń-stw-o | świń-stew-k-o | mess |
| -ń-a | kawiar-ń | kawiarni-a | kawiar-en-k-a | Café |
| -w-a | lich-w | lich-w-a | lich-ew-k-a | usury |

b. vocalising suffixes
(heteromorphemic pattern B)

|  | C-eC# | C-C-V | C-eC-yerC | gloss |
|---|---|---|---|---|
| -ek | pies-ek (Nsg) | pies-k-a | pies-ecz-ek | dog |
| -ec | wzorz-ec (Nsg) | wzor-c-a |  | pattern |
| -ew | kon-ew (Nsg) | kon-w-i | kon-ew-k-a | can |
| -eł-o | has-eł (Gpl) | has-ł-o | has-eł-k-o | password |
| -en-a/o | pani-en (Gpl) | pan-n-a | pani-eń-sk-i | Miss |
| -en-ia | kuch-en (Gpl) | kuchni-a | kuch-en-k-a | kitchen |
|  |  |  | kuch-en-n-y |  |

(52) lexical representation of suffixes
a. yer-initial       b. non yer-initial

```
   O  N            O  N
   |               |
e  k            b          -a
e  c            st  e  w   -o
e  w            ń          -a
e  ł     -o     w          -a
e  n     -a/o
e  n     -ia
```

(53)   generalisation
a.   the A-B variation is thus lexical in all morphemes, roots and suffixes (affixes) alike.
b.   the concatenation of the two types of suffixes produces strings that are exactly identical to the A- and B-items that we know already from monomorphemic clusters.

(54)  hetermorphemic and monomorphemic A- and B-items
              a. pattern A                    b. pattern B

|  |  | O | N | O | N | O | N |  | O | N | O | N | O | N |
|--|--|---|---|---|---|---|---|--|---|---|---|---|---|---|
|  |  | \| | \| | \| |  | \| | \| |  | \| | \| | \| |  | \| | \| |
| heteromorphemic |  | sł | u | ż |  | b | a |  | h | a | s | e | ł | o |
| monomorphemic |  | c | y | f |  | r | a |  | wʲ | a | d | e | r | o |

## 6.2. Identification and incidence of some individual suffixes

(55)  Laskowski (1975:41ff)
      a.  examines various suffixed forms
      b.  he tries to identify purely phonological properties that are able to predict (non-)vocalisation of heteromorphemic clusters.
      c.  in his treatment, like almost everywhere else (Cyran 2005 is an exception), heteromorphemic clusters are not any different from monomorphemic items.
      d.  this puts him on the wrong track on a number of occasions: the only thing that decides on vocalisation is the lexical shape of the suffix.

(56)  suffixes /-n-ia/ and /-eń-a/, both -nia on the surface
      a.  /-n-ia/

| C-C-V Nsg | C-eC# Gpl | CeC-C C/yer-initial suffix | gloss |
|---|---|---|---|
| kuch-ni-a | kuch-en | kuch-en-k-a kuch-en-n-y | kitchen |
| wiś-n-ia | wisi-en | wisi-en-k-a | sour cherry |
| stud-n-ia | studzi-en | studzi-en-ka | well (fountain) |
| suk-n-ia | suki-en | suki-en-ka | dress |

      b.  /-eń-a/[5]

| C-C-V Nsg | C-C# Gpl | C-eC-yerC C/yer-initial suffix | gloss |
|---|---|---|---|
| kawiar-ni-a | kawiar-ń | kawiar-en-k-a | Café |
| kasar-ni-a | kasar-ń | (kasar-en-k-a) | barracks, watchtower |
| cukier-ni-a | cukier-ń | cukier-en-ka | pastry shop |
| kotel-ni-a | kotel-ń | (kotel-en-k-a) | period of pairing up sheep |
| kopal-ni-a | kopal-ń | kopal-en-k-a | mine |
| chłod-ni-a | chłod-ń | chłod-en-k-a | cold room |
| czereś-ni-a | czereś-ń | czeresi-en-k-a | sweet cherry |
| grzyb-ni-a | grzyb-ń | grzybi-en-k-a | mycelium (kind of fungus) |

---

[5]  Some of the words below have competing Gpl forms where the case marker is -i, rather than zero: Nsg *chłod-ni-a*, *czereś-ni-a* and *grzyb-ni-a* also derive Gpl *chłod-n-i*, *czeres-n-i* and *grzyb-n-i*.

(57)  Laskowski (1975:41)
    a.  tries to tell (56)a from (56)b on the basis of the root-final consonant:
    b.  the Gpl vocalises after obstruents in the former, but remains unvocalised after sonorants in the latter case
    c.  this is not true: there are non-vocalising items under (56)b whose root-final consonant is an obstruent (and which Laskowski does not mention).
    d.  that we are facing two distinct suffixes may also be seen when looking at the forms where the suffixal consonant is word-final (i.e. column two):[6] vocalising items under (56)a have a plain n, while non-vocalising clusters show a palatal ń.
    e.  interestingly, this contrast is neutralised before C/yer-initial suffixes, where only plain n occurs.

(58)  surface -Cw-a
    a.  which Laskowski (1975) does not analyze morphologically either.
    b.  all instances remain unvocalised in Gpl
    c.  vocalisation may (*lich-ew-ka*) or may not (larw-k-a) occur before C-initial suffixes
    d.  like before, Laskowski (1975:42) tries to predict this contrast on the basis of the consonant that precedes the -wa: clusters are vocalised, he holds, after obstruents, while they remain unvocalised after sonorants.
    e.  this time I could only find one item that shows that vocalisation is independent from the nature of the preceding consonant: *lin-ew-k-a* "small line", where a sonorant precedes the w (whose derivational basis, however, is unclear: there is no Nsg *\*lin-w-a*).
    f.  but even without that, it is clear from the morphological analysis that the decisive property which allows us to predict (non-)vocalisation is the mono- or heteromorphemic character of the Cw-cluster:
        **vocalisation is encountered only when the -w- is a suffix.**

(59)  mono- and heteromorphemic -Cw-a
    a. monomorphemic -Cw-a

| Cw-V<br>Nsg | Cw#<br>Gpl | Cw-C<br>C/yer-initial suffix | gloss |
|---|---|---|---|
| larw-a | larw | larw-k-a | grub |
| barw-a | barw | barw-n-y | colour |
| ścierw-o | ścierw | ścierw-nik | corpse |
| bulw-a | bulw | bulw-k-a | root tuber |
| salw-a | salw | salw-k-a | salvo |

    b. heteromorphemic -C-w-a

| C-w-V<br>Nsg | C-w#<br>Gpl | C-ew-C<br>C/yer-initial suffix | gloss |
|---|---|---|---|
| lich-w-a | lich-w | lich-ew-k-a | usury |
| past-w-a | past-w | past-ew-n-y | victim |
| modlit-w-a | modlit-w | modlit-ew-nik | prayer |
| Lit-w-in | Litw | lit-ew-sk-i | Lithuania |
| sak-w-a | sak-w | sak-iew-k-a | nosebag |
| Mosk-w-a | Mosk-w | Mosk-iev-sk-i | Moskow |
| lin-k-a | lin-ek | lin-ew-k-a | small line |

---

[6]  Note that it does not matter whether the suffix is followed by a vowel in Nsg: Nsg *grzybi-eń* behaves exactly like Nsg *chłod-ni-a* etc.

(60)  variation associated to heteromorphemic clusters:
      same as with monomorphemic clusters
      a.  C-eC-C vs. C-C-C
          *myd-ł-o*                          *pieś-ń* "song"
          *myd-el-nicz-k-a* "soap dish"      *pios-en-k-a*
          *myd-l-nicz-k-a* "id."             *pios-n-k-a* "song dim."
      b.  only C-eC-C
          *mas-ł-o* "butter"                 *piek-ł-o* "hell"
          *mas-el-nicz-k-a* "butter dish"    *piek-el-nic-a* "witch"
      c.  lexicalised $C_1$-$C_2$-$C_3$ with $C_2$=non-R
          *strzel-b-a - strzel-b - strzel-b-ka* "rifle Nsg, Gpl, dim."
          *proś-b-a - próś-b - próś-b-k-a* "demand Nsg, Gpl, dim."
          equivalent to monomorphemic
          *kart-a - kart - kart-k-a*
      d.  same root (B type) produces vocalised and unvocalised C(e)-C-C
          *światł-o - świateł* "light Nsg, Gpl"
          *świateł-k-o* "id., dim."
          *świetl-n-y* "id., adj."


## 7. Slavic beyond Polish

(61)  Czech is not like Polish
      a.  Gpl is always vocalised: *form-a - forem - ne-forem-n-ý*) "form Nsg, Gpl, adj."
      b.  Czech is a language where all roots are of the B-type, and hence where all vowel-zero alternations represent yer vocalisation.
      c.  diachronically speaking, then, it may be the case that Polish is on the way to become like Czech (the movement is from A- to B-roots).

(62)  BCS is like Polish
      a.  alternating vowels are either yers or epenthetic
      b.   Nsg        Gsg             Gpl
          dokumen**a**t  dokument-a      dokumenat-a      yer
          student      student-a       studenat-a       epenthetic a
      c.  Scheer *et al.* et al. (2009, 2011)

(63)  Russian is like Polish
      a.  monomorphemic clusters may or may not vocalise in Gpl -Ø, but always do before C-/yer-initial suffixes.
      b.  the vocalisation of heteromorphemic CC is an idiosyncratic property of each suffix.
      d.  the analysis opposing yers and epenthetic vowels follows Worth (1968), who proposes exactly this distinction on the grounds of Russian.

(64)  pattern A vs. pattern B (monomorphemic clusters)

| pattern A: no vocalisation in Gpl | | | | pattern B: vocalisation in Gpl | | | |
|---|---|---|---|---|---|---|---|
| CC-V Nsg | CeC-C C-/yer-initial suffix | CC# Gpl | gloss | CC-V Nsg | CeC-C C-/yer-initial suffix | CeC# Gpl | gloss |
| igr-á | igór-k-a igór-n-yj | ígr | game | rebr-ó | rëber-n-yj | rëber | rib |
| ikr-á | ikór-k-a ikór-n-yj | íkr | calf muscle | vedr-ó | vedër-n-yj | vëder | pail |
| výdr-a | | vydr | otter | bedr-ó | bedër-n-yj | bëder | hip |
| igl-á | igól-k-a | ígl | needle | sestr-á | | sestër | sister |
| sverl-ó | | svërl | drill | vesl-ó | vesél'-nyj | vësel | paddle |
| voln-á | | vóln | wool | metl-á | metél'-nyj metël-k-a | mëtel | broom |
| vojn-á | vojén-n-yj | vójn | war | kúkl-a | kúkol'-nyj | kúkol | doll |
| arb-á | | arb | wain | sáblj-a | | sábel' | saber |
| bárž-a | | barž | trailer | okn-ó | | ókon | window |
| mórd-a | | mord | snout | grívn-a | gríven-k-a | gríven | talent |

(65)  prediction
for Slavic languages where more than one vowel alternates with zero, such as Russian
a.   in case they feature the Polish pattern and thus have epenthetic vowels, there must be a way to predict which vowel (e or o in Russian for example) will be inserted.
b.   either it is always the same vowel, i.e. e or o,
or the quality of the vowel must be predictable from the consonantal environment
c.   in other words,
alternating vowels which appear in presence of yer-initial suffixes, but not in Gpl (e.g. *igr-á - ígr - igór-k-a* "game Nsg, Gpl, dim."), must not be able to sustain the lexical contrast between e and o.

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