Why Phonology needs a theory of consonantal interaction

Tobias Scheer
Université de Paris 7
Département de Linguistique
2, place Jussieu, F-75005 Paris cedex 5, FRANCE
e-mail: tobias.scheer@linguist.jussieu.fr

(1) purpose
a. show that vowel-zero alternations in Czech prefixes falsify
  government phonology's device proper government (PG) as currently
  understood.
b. present an alternative way of running PG within a strict
  CVCCV-frame that is not falsified by the Czech data.
c. indicate the explanatory and unifying advantages provided by
  the alternative model of PG.
d. show that the price to pay in order for phonology to
  dispose of a general theory of vowel-zero alternations is the
  elaboration of a theory of consonantal interaction.
e. review the problem of word-initial consonant clusters and
  suggest that a theory of consonantal interaction can provide an
  explanatory account.

(2) vowel-zero alternations
1. zero obligatory: Czech, Moroccan Arabic, Tangale

<table>
<thead>
<tr>
<th>CC.CV</th>
<th>CC.CV + C#</th>
</tr>
</thead>
<tbody>
<tr>
<td>=zero</td>
<td>=vowel</td>
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</tbody>
</table>

a. Czech
   - Hudgb-a
   - Hudgb-S
   - Hudgb-ni
   - Sgv-S
   - Sgv-ec
   - Sgv-oc-e

b. Moroccan Arabic
   - Kgt-tb-S
   - Kgt-b-u
   - Kgt-tb-S
   - Kgtt-b-u

b. Tangale
   - Tang-S
   - Tan-g-S
   - Dob-S-no
   - Dobg-nS-go

2. zero optional: German, French

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d. (standard) German
   - Inngr
   - Inngr-e
   - Inngr-lich
   - Ver-Inngr-te

e. French
   - Sgmna
   - Sgeret
   - Fortgresse
   - Crever
language-specific parameters:

a. obligatory/ optional realisation of the zero-forms
b. the vowel that alternates with zero:
   - German: [e]
   - French: [e]
   - Moroccan Arabic: [i]
   - Czech: [e]
   - Tangale: [u, (a)]

generalisations

a. in order to get a zero, there must be a vowel in the right context of the alternation-site. This vowel triggers the alternation:
   - vC-⊂ but əC-V
b. in order to get a zero, the triggering vowel mustn't be separated from the alternation-site by more than one consonant:
   - əC-V but vC-⊂
c. in order to get a zero, the alternating vowel mustn't be preceded by more than one consonant
   - CəC-V but CCvC-V

proposal by KLV (1987) relative to (4a, b):
these vowel-zero alternations are instances of an internuclear relation:
   - Proper Government (PG)

Proper Government (cf. KLV (1987), Kaye (1990), Charette (1990))

a. a Nucleus may not be expressed if it is governed by a vowel to its right
b. a properly governed Nucleus cannot itself govern

Government Licensing

a. as seen above, a governing relation holds within a [CC]-cluster (either Constituent- or Interconstituent Government)
b. in order for the consonantal Head to be able to exert this government, it must be Government-Licensed by a vowel to its right.

Illustration of Government-Licensing: [ə] cannot disappear because it has a job to do: it must government-licence the Head of the preceding cluster.
vowel-zero alternations in Czech prefixes
+e -e
bez-g-dny bez-g-kvetny "without bottom/ without flowers"
vz-g-dmout vz-g-hled "blow up/ expression (face)"
predo-vsim pred-g-skok "before all/ test-jump"
roz-g-dmout roz-g-dmychat "blow up/ fan"
roz-g-prif roz-g-prhvat "strut/ remove"

(10)

(11) conditions: alternations occur only if
a. the stem begins with at least two consonants: prefix- CCCV
b. the prefix is consonant-final:
   e.g. prefix po-: pog- never occurs

(12)

<table>
<thead>
<tr>
<th>prefix</th>
<th>+e</th>
<th>-e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bez</td>
<td>16</td>
<td>39</td>
</tr>
<tr>
<td>Vz</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>Pred</td>
<td>16</td>
<td>48</td>
</tr>
<tr>
<td>Roz</td>
<td>80</td>
<td>295</td>
</tr>
<tr>
<td>Nad</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>Pod</td>
<td>26</td>
<td>74</td>
</tr>
<tr>
<td>Od</td>
<td>41</td>
<td>253</td>
</tr>
<tr>
<td>TOTAL</td>
<td>195</td>
<td>762</td>
</tr>
</tbody>
</table>

(13) pf=perfective, ipf=imperfective, pap=past active participle

(14) Who is who in the stem?

C₁ is stem-final C₁ is stem-initial

<table>
<thead>
<tr>
<th>prefix</th>
<th>C₁</th>
<th>C₂</th>
<th>whether</th>
</tr>
</thead>
</table>
| /BR/   | ode-B_R-at vs. bez-Brad-y
| /DR/   | roze-D_r-at vs. roz-Drat
| /HR/   | predo-H_r-a vs. od-Hrad-at
| /ML/   | roze-M_l-it vs. predo-Mluva
| /PR/   | ode-P_R-at vs. vz-Pruh-a
| /SN/   | beze-S_N-y vs. pod-Sneznik
| /SL/   | vze-S_l-y vs. roz-Slapat
| /ZD/   | pode-Z_d-it vs. od-Zdola
| /DN/   | beze-D_N-y |

(15) distributional solution: the alternation is conditioned by the structure of the stem (" position where a vowel can be observed):

- both Cs are stem-initial \[ C_1 C_2 \] \Rightarrow -e
- C₁ is stem-initial, C₂ is stem-final, both enclose a zero \[ C_1 C_2 \] \Rightarrow +e

(16) a. JBRd

b. thus, (6c) "PG cannot apply over governing domains" is falsified:

JBRd

(17) /CC-

<table>
<thead>
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<th>b.</th>
<th>c.</th>
</tr>
</thead>
<tbody>
<tr>
<td>/BR/</td>
<td>ode-brat y/</td>
<td>od-bjrat y/</td>
<td>bez-brady</td>
</tr>
<tr>
<td>/DR/</td>
<td>roze-drat inf</td>
<td>roze-dgru i'g</td>
<td>roz-drobat</td>
</tr>
<tr>
<td>/HR/</td>
<td>predo-hra ssom N(t)</td>
<td>her ssom GENp</td>
<td>od-hradat</td>
</tr>
<tr>
<td>/ML/</td>
<td>roze-mlit y/</td>
<td>roze-mlijat y/</td>
<td>predo-mluva</td>
</tr>
<tr>
<td>/PR/</td>
<td>ode-prat inf</td>
<td>od-pgru i'g</td>
<td>vz-pruh-a</td>
</tr>
<tr>
<td>/SN/</td>
<td>beze-sn(y) adj</td>
<td>ssom</td>
<td>pod-sneznik</td>
</tr>
<tr>
<td>/SL/</td>
<td>vze-sl(y) adj</td>
<td>sgl</td>
<td>pod-sneznik</td>
</tr>
<tr>
<td>/ZD/</td>
<td>pode-zd(it) inf</td>
<td>zed</td>
<td>od-zdola</td>
</tr>
<tr>
<td>/DN/</td>
<td>beze-dny y/ adj</td>
<td>den</td>
<td></td>
</tr>
</tbody>
</table>

PG

O N O N O N O N O
ode e b r a t odg-brat
alternative proposal within in CVCV-frame (for CVCV, cf. Lowenstamm (1995)):

a. PG applies to the potential alternation-site

b. PG does not apply to the potential alternation-site BECAUSE there is a much better candidate: the empty Nucleus N₉ seeks PG

c. cases of Government-Licensing: PG cannot apply to the potential alternation-site because the vowel hosted by this site has a job to do: it must properly govern the empty Nucleus N₉ hidden within the preceding [CC]-cluster

advantages of PG running in a CVCV-frame:
a. it unifies the grammar: the KLV/Charette model needs four different devices in order to account for vowel-zero alternations:
   1. Constituent Government
   2. Interconstituent Government
   3. Government-Licensing
   4. Proper Government
   In a CVCV-frame, PG alone drives all alternations.
b. PG doesn’t sometimes apply (...[CV cases] and sometimes is blocked (...[CC])V). It always applies, only the targets are variable: [a] in ...[CV configurations, the empty Nucleus N₉ in ...[CC]V cases.
c. it replaces the observation
   "PG is blocked by an intervening governing domain" by the explanation
   "PG doesn’t reach the potential alternation-site in case of a [CC]-cluster to its right ...[CC]V because the empty Nucleus N₉ hidden within this cluster seeks PG"

facing the Czech cases of PG applying over [CC]-clusters:
a. the KLV/Charette-model is falsified
b. PG running in a CVCV-frame has a problem but is not falsified: GP

Why doesn’t N₉ appear on the surface?
Nₙ doesn't surface because the relation holding between the 
surrounding consonants closes the domain:

\[
\begin{array}{c}
\text{GP} \\
\text{O N O N - O Nₙ O N O N} \\
\text{b e z e b} \\
\text{r a d y}
\end{array}
\]

(21) evaluation of the obtaining situation:

a. the theory of PG running in a non-CVCV frame is falsified by 
the Czech data. Hence, within a non-CVCV frame, there is no 
general theory accounting for vowel-zero alternations anymore.

b. the theory of PG running in a CVCV-frame
   1. offers the explanatory and unifying advantages mentioned 
      above
   2. is not falsified by the Czech data
   3. needs a theory of consonantal interaction in order to 
      account for the Czech data

(22) all of the discussed alternations are obviously instances of one 
sole phonological principle: they all exhibit a coherent 
phenomenology.

=> if Phonology is to dispose of a theory accounting for all these 
alternations, it needs a theory of consonantal interaction.

(23) outline of such a theory:

a. it must say why the surrounding consonants close the domain 
in the case of Czech bez⁷-dₙₙₙ₌ₙ radₙₙₙ

\[
\begin{array}{c}
\text{GP} \\
\text{O N O N - O Nₙ O N O N} \\
\text{b e z e b} \\
\text{r a d y}
\end{array}
\]

but not in cases like French *sₙₙₙₙrt

\[
\begin{array}{c}
\text{PG} \\
\text{O N O N - O Nₙ O N} \\
\text{b e z e b} \\
\text{r a d y}
\end{array}
\]

b. syntagmatic aspect

Czech (and more generally slavic languages) is reputed to 
exhibit word-initial [CC]-clusters that violate sonority 
restrictions or are unknown in other indo-european languages:

e.g.
rt rty "lips"
dn dno "bottom"
jm jméno "name"
rv rvát "brawl"

NONE of these unorthodox clusters closes its domain: these 
stems, if occurring with a prefix, do ALWAYS provoke the 
prefixal -e-, PG does never apply over such clusters. E.g.

\[
\begin{array}{c}
\text{beze-dₙₙₙₙ}ₙ, *bezₙ₋ₙₙₙₙₙ "without bottom"
\end{array}
\]

Thus, the [CC]s over which PG applies are strictly the ones 
occuring word-initially in IE languages

| restrictions on word-initial [CC]s and [CC]s over 
| which PG can apply are instances of the same 
| phonological phenomenon |

Thus, answering the question "why can PG apply over [vr] but not 
over [rv]?,", the theory must provide an answer to the question 
"why can [vr] exist word-initially, but not typically [rv]?


c. paradigmatic (segmental) aspect
the theory must say why the consonants of clusters like [kr] can interact and close their domain, while the ones of, say, [nr] cannot ([kr] can exist word-initially and be jumped by PG, [nr] cannot).

(proposals in Scheer (1996):)

a. the key to the segmental restrictions must be found in the phonological identity of the various consonants. A model of consonantal representation is therefore needed. Within this model, Harris’ (1990) notion of segmental complexity provides this key.

b. the key to the syntagmatic restrictions must be found in the lateral relations holding between the segments. Charette’s (1990) idea of Government-Licensing provides this key.

(25)

the theory of consonantal interaction will provide an explanatory approach to the restrictions within word-initial [CC]s. Until now, phonological models do no more than observe these restrictions:

a. "sonority must increase within a branching Onset". WHY? The only answer comes from the observation, this statement does not follow from any phonological principle.

b. "within a branching Onset, government goes from left to right" (KLV (1987)). WHY? The only answer comes from the observation, this statement does not follow from any phonological principle.

References
